



State of Oregon Department of Environmental Quality Draft Rules

Landfill Gas Emissions 2021 Rulemaking Advisory Committee Meeting #3

Oregon Department of Environmental Quality Division 239 (new)

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340-239-0010 Applicability

(1) This division applies in all areas of the state and to all new landfills and all landfills that have received solid waste after November 8, 1987, excluding those sources located on either tribal or federal lands that are not subject to regulation by DEQ and except as provided in OAR 340-239-0010(3).

(2) Subject to the requirements in this division and OAR 340-200-0010(3), LRAPA is designated by the EQC to implement the rules in this division within its area of jurisdiction.

(3) Exemptions

(a) This division does not apply to landfills that are regulated under the Resource Conservation and Recovery Act (RCRA) Subtitle C or the Comprehensive Environmental Response, Compensation and Liability Act 42, U.S.C, Chapter 103 (Promulgated 12/11/80; Amended 10/17/86).

(b) This division does not apply to landfills that receive only nondecomposable wastes.

(c) This division does not apply to closed or inactive landfills with less than 200,000 tons of waste-in-place.

Statutory/Other Authority: ORS 468.020, 468A.025 & 468A.135

Statutes/Other Implemented: ORS 468A.025 & 468A.135

340-239-0015 Definitions

The definitions in OAR 340-200-0020, 340-218-0030 and this rule apply to this division. If the same term is defined in this rule and 340-200-0020 or 340-218-0030, the definition in this rule applies to this division.

- (1) “Active landfill” means a landfill in which solid waste is being placed or a landfill that is planned to accept waste in the future.
- (2) “Bioreactor” means a landfill or portion of a 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.
- (3) “Component” means any equipment that is part of the gas collection and control system and that contains landfill gas including, but not limited to, wells, pipes, flanges, fittings, valves, flame arrestors, knock-out drums, sampling ports, blowers, compressors, or connectors.
- (4) “Component leak” means the concentration of methane measured one half of an inch or less from a component source that exceeds 500 parts per million by volume (ppmv), other than nonrepeatable, momentary readings. Measurements from any vault must be taken within three inches above the surface of the vault exposed to the atmosphere.
- (5) “Closed landfill” means that a landfill is no longer accepting solid waste for disposal and has documentation that the closure was conducted in accordance with the applicable statutes, regulations, and local ordinances in effect at the time of closure.
- (6) “Continuous operation” means that the gas collection and control system is operated continuously, the existing gas collection wells are operating under vacuum while maintaining landfill gas flow, and the collected landfill gas is processed by a gas control system 24 hours per day.
- (7) “Controlled landfill” means any landfill at which collection and control systems are required under this division. The landfill is considered controlled at the time a Collection and Control System Design Plan is required to comply with OAR 340-239-105(5) or OAR 340-239-105(6).
- (8) “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.
- (9) “Decomposable solid waste” means any solid waste that is not nondecomposable solid waste.
- (10) “Destruction efficiency” means a measure of the ability of a gas control device to combust, transform, or otherwise prevent emissions of methane from entering the atmosphere.

- (11) “Enclosed combustor” means an enclosed flare, steam generating boiler, internal combustion engine, or gas turbine.
- (12) “Energy recovery device” means any combustion device that uses landfill gas to recover energy in the form of steam or electricity, including, but not limited to, gas turbines, internal combustion engines, boilers, and boiler-to-steam turbine systems.
- (13) “Gas control device” means any device used to dispose of or treat collected landfill gas, including, but not limited to, enclosed flares, internal combustion engines, boilers and boiler-to-steam turbine systems, fuel cells, and gas turbines.
- (14) “Gas collection system” means any system that employs various gas collection wells and connected piping, and gas mover equipment.
- (15) “Gas control system” means any system that disposes of or treats collected landfill gas by one or more of the following means: combustion, gas treatment for subsequent sale, or sale for processing offsite, including for transportation fuel and injection into the natural gas pipeline.
- (16) “Gas mover equipment” means the equipment (i.e., fan, blower, compressor) used to transport landfill gas through the header system.
- (17) “Gas mover system” includes all of the gas mover equipment,
- (18) “Gas collection and control system” means any system consisting of a Gas Collection System and a Gas Control System.
- (19) “Inactive area” means a separate area of a landfill in which solid waste is no longer being placed. The area must be separated from other areas of the landfill to ensure that the landfill gas does not migrate between active and inactive areas.
- (20) “Inactive landfill” means a landfill that is no longer accepting solid waste for disposal, or can document that the landfill is no longer receiving solid waste.
- (21) “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 40 C.F.R. § 257.2.
- (22) “Landfill gas” means any untreated, raw gas derived through a natural process from the decomposition of organic waste deposited in a landfill, from the evolution of volatile species in the waste, or from chemical reactions of substances in the waste.
- (23) “Landfill surface” means the area of the landfill under which decomposable solid waste has been placed, excluding the working face.
- (24) “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.
- (25) “Nondecomposable solid waste” means solid waste that is biologically and chemically inactive and does not form landfill gas. Examples include, but are not limited to, earth, rock, concrete asphalt paving fragments, uncontaminated concrete (including fiberglass or steel reinforcing rods embedded in the concrete), brick, glass, ceramics, clay products, inert slag, asbestos-containing waste, waste tire chips, and demolition materials containing minor amounts (less than 10 percent by volume) of wood and metals.
- (26) “Nonrepeatable, Momentary Readings” means indications of the presence of methane, which persist for less than five seconds and do not recur when the sampling probe of a portable gas detector is placed in the same location.
- (27) “Open Flare” means an open combustor without enclosure or shroud.
- (28) “Operator” means any person that:

- (a) Operates the landfill or controls the operations of the landfill;
 - (b) Is responsible for complying with any federal, state, or local requirements relating to methane emissions from real property used for landfill purposes and subject to this division;
 - (c) Operates any stationary equipment for the collection of landfill gas;
 - (d) Purchases landfill gas from an owner or operator of a landfill and operates any stationary equipment for the treatment of landfill gas; or
 - (e) Purchases untreated landfill gas from an owner or operator of a landfill and operates any stationary equipment for the combustion of landfill gas.
- (29) "Owner" means any person that:
- (a) Holds title to the real property on which the landfill is located, including but not limited to title held by joint tenancy, tenancy in common, community property, life estate, estate for years, lease, sublease, or assignment, except title held solely as security for a debt such as mortgage;
 - (b) Is responsible for complying with any federal, state, or local requirements relating to methane emissions from real property used for landfill purposes and subject to this rule;
 - (c) Owns any stationary equipment for the collection of landfill gas;
 - (d) Purchases the landfill gas from an owner or operator of a landfill and owns any stationary equipment for the treatment of landfill gas; or
 - (e) Purchases untreated landfill gas from an owner or operator of a landfill and owns any stationary equipment for the combustion of landfill gas.
- (30) "Ppmv" means parts per million by volume
- (31) "Professional engineer" means an individual who is registered in Oregon and holds a valid certificate to practice engineering in Oregon as provided under ORS 672.002 to 672.325.
- (32) "Remedial Action" means the definition provided under ORS 465.200.
- (33) "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.
- (34) "Scfm" means standard cubic feet per minute
- (35) "SEM" means Surface Emission Monitoring
- (36) "Solid waste" means all decomposable and nondecomposable solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial waste, manure, vegetable or animal solid and semisolid wastes, sludge, and other discarded solid and semisolid wastes. Solid waste also includes any material meeting the definition of solid waste in 40 C.F.R. § 60.751.
- (37) "Treatment system" means a system that filters, de-waters, and compresses landfill gas.
- (38) "Waste-in-Place" means the total amount of solid waste placed in the landfill in tons. The solid waste density is assumed to be 1,300 pounds per cubic yard and the decomposable fraction is assumed to be 70 percent by weight unless DEQ approves alternative values.
- (39) "Well raising" means a landfill activity where an existing gas collection well is temporarily disconnected from a vacuum source, and the nonperforated pipe attached to the well is extended vertically to allow the addition of a new layer of solid waste or the final cover; or is extended horizontally to allow the horizontal extension of an existing layer of solid waste or cover material. The extended pipe (well extension) is then reconnected in order to continue collecting gas from that well.
- (40) "Working face" means the open area where solid waste is deposited daily and compacted by landfill equipment.

Statutory/Other Authority: ORS 468.020 & 468A.025

Statutes/Other Implemented: ORS 468A.025

340-239-0100 Landfills with Less Than 200,000 Tons of Waste-in-Place

(1) By July 1, 2022 the owner or operator of a landfill listed in Table 1, Part A of OAR 340-216-8010, having less than 200,000 tons (181,000 metric tons) of waste-in-place, must submit to DEQ an administratively complete permit application, pursuant to OAR chapter 340, divisions 216, and an initial Waste-in-Place Report for calendar year 2021, pursuant to OAR 340-239-0700(3)(e).

(2) The owner or operator of a proposed new landfill that is designed to receive less than 200,000 tons in the first year of operations after initial waste acceptance must submit an administratively complete permit application, pursuant to OAR chapter 340, divisions 216. The owner or operator of a new landfill also must submit to DEQ an initial Waste-in-Place Report 30 days after the end of the first calendar year after initial waste acceptance, pursuant to OAR 340-0700(3)(e).

(3) Following the initial Waste-In-Place Report submitted according to section (1) or (2) of this rule, the owner or operator of a landfill having less than 200,000 tons of waste-in-place must submit an annual Waste-in-Place Report to DEQ pursuant to OAR 340-239-0700(3)(e), until the owner or operator submits a Closure Notification pursuant to OAR 340-239-0700(3)(a).

(4) The owner or operator of a landfill subject to section (1) or (2) of this rule must maintain the cover in any areas of the landfill not exempt under OAR 340-239-0300 so as to minimize landfill gas emissions.

(5) The owner or operator of a landfill must notify DEQ prior to reaching 200,000 tons waste-in-place by submitting an administratively complete permit application, pursuant to OAR chapter 340, division 216 and a Methane Generation Rate Report, pursuant to OAR 340-239-0700(3)(f). Once the landfill reaches a size greater than or equal to 200,000 tons of waste-in-place, the owner or operator is subject to OAR 340-239-0105.

Statutory/Other Authority: ORS 468.020, 468A.025, 468A.040 & 468A.050

Statutes/Other Implemented: ORS 468A.025, 468A.040 & 468A.050

340-239-0105 Landfills with Greater Than or Equal to 200,000 Tons of Waste-in-Place

(1) By July 1, 2022 the owner or operator of a landfill listed in Table 1 Part A or B of OAR 340-216-8010, having greater than 200,000 tons (181,000 metric tons) of Waste-in-Place, must submit to DEQ an administratively complete permit application, pursuant to OAR chapter 340, division 216, an initial Waste-in-Place Report, pursuant to OAR 340-239-0700(3)(e), and a Methane Generation Rate Report, pursuant to OAR 340-239-0700(3)(f).

(2) The owner or operator of a proposed new landfill that is designed to receive over 200,000 tons in the first year must submit an administratively complete permit application, pursuant to

OAR chapter 340, division 216. The owner or operator of a new landfill also must submit to DEQ an initial Waste-in-Place Report 30 days after the end of the first calendar year after initial waste acceptance, pursuant to OAR 340-239-0700(3)(e), and a Methane Generation Rate Report, pursuant to OAR 340-239-0700(3)(f).

(3) Following the initial Waste-In-Place Report submitted according to section (1) or (2) of this rule, the owner or operator of a landfill having greater than or equal to 200,000 tons of waste-in-place must submit an annual Waste-in-Place Report to DEQ pursuant to OAR 340-239-0700(3)(e), until the owner or operator submits a Closure Notification pursuant to OAR 340-239-0700(3)(a).

(4) If the calculated methane generation rate reported by the owner or operator according to section (1) or (2) of this rule is less than 664 metric tons (732 tons) per year, the owner or operator must:

(a) If the landfill is active:

(A) Recalculate the methane generation rate annually using the procedures specified in OAR 340-239-0800(2);

(B) Submit an annual Methane Generation Rate Report to DEQ pursuant to OAR 340-239-0700(3)(f) until either of the following conditions is met:

(i) The calculated methane generation rate is greater than or equal to 664 metric tons (732 tons) per year, or

(ii) The owner or operator submits a Closure Notification pursuant to OAR 340-239-0700(3)(a).

(C) Maintain the cover in any areas of the landfill not exempt per OAR 340-239-0300 so as to minimize landfill gas emissions and visually inspect the landfill surface annually for signs of methane releases including distressed vegetation, cracks or seeps.

(b) If the landfill is closed or inactive, submit to DEQ a Methane Generation Rate Report pursuant to OAR 340-239-0700(3)(f) and all required Closure Notifications pursuant to OAR 340-239-0700(3)(a).

(5) If the methane generation rate reported by the owner or operator according to section (1) or (2) of this rule is greater than or equal to 664 metric tons (732 tons) per year but less than 7,755 metric tons (8,548 tons) per year, then the owner or operator must either:

(a) Comply with the requirements of OAR 340-239-0110 through OAR 340-239-0800. The owner or operator is subject to OAR 340-239-0110 through OAR 340-239-0800 at the time they are required to submit the Methane Generation Rate Report that shows methane generation above 664 metric tons per year; or

(b) Demonstrate that after four consecutive quarterly monitoring periods there is no measured concentration of methane of 200 parts per million by volume (ppmv) or greater using the

instantaneous surface monitoring procedures specified in OAR 340-239-0800(3). The owner or operator of the landfill must begin quarterly monitoring within 90 days after the Methane Generation Rate Report is required to be submitted under section (1) or (2) of this rule or OAR 340-239-0100(5) and submit Instantaneous Surface Monitoring Reports according to OAR 340-239-0700(3)(l). Based on the monitoring results, the owner or operator must do one of the following:

(A) Except as provided in OAR 340-239-0600(1)(a), if there is any measured concentration of methane of 200 ppmv or greater, other than non-repeatable, momentary readings, from the surface of an active, inactive, or closed landfill, the landfill owner or operator must comply with OAR 340-239-0110 through OAR 340-239-0800. The owner or operator is subject to OAR 340-239-0110 through OAR 340-239-0800 at the time they are required to submit the Instantaneous Surface Monitoring Report that shows surface emissions of methane above 200 ppmv;

(B) If there is no measured concentration of methane of 200 ppmv or greater from the surface of an active landfill, recalculate the methane generation rate annually using the procedures specified in OAR 340-239-0800(2) and submit a Methane Generation Rate Report annually to DEQ pursuant to OAR 340-239-0700(3)(f), and:

(i) If the landfill is active, the owner or operator must continue quarterly surface emission monitoring using the methods specified in this subsection and prepare and submit an annual Instantaneous Surface Monitoring Report according to OAR 340-239-0700(3)(l); or

(ii) If the landfill is closed, the owner or operator must conduct annual surface emission monitoring using the methods specified in this subsection and prepare and submit an annual Instantaneous Surface Monitoring Report according to OAR 340-239-0700(3)(l).

(C) If there is no measured concentration of methane of 200 ppmv or greater from the surface of a closed or inactive landfill, the requirements of OAR 340-239-0110 through OAR 340-239-0800 no longer apply provided that the owner or operator has completed all of the following:

(i) Satisfied all applicable requirements of OAR 340-239-0400.

(ii) Submitted to DEQ a Waste-in-Place Report, pursuant to section (1), (2), or (3) of this rule.

(iii) Submitted to DEQ all required Instantaneous Surface Monitoring Reports, pursuant to subsection (5)(b.) of this rule.

(6) If the methane generation rate reported according to section (1), (2), or (3) of this rule is greater than or equal to 7,755 metric tons (8,548 tons) per year, then the owner or operator must comply with the requirements of OAR 340-239-0110 through OAR 340-239-0800.

(7) If the landfill owner or operator adds any liquid other than leachate in a controlled fashion to the waste mass to reach a minimum average moisture content of at least 40 percent by weight to accelerate or enhance the anaerobic biodegradation of the waste, the owner or operator must install and operate a gas collection and control system that meets the criteria in OAR 340-239-0110 according to the following:

(a) Install the gas collection and control system for the bioreactor before initiating liquids addition. Extend the collection and control system into each new cell or area of the bioreactor prior to initiating liquids addition in that area; and

(b) 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. Bioreactor moisture content must be calculated in accordance with OAR 340-239-0800(109).

Statutory/Other Authority: ORS 468.020, 468A.025, 468A.040 & 468A.050

Statutes/Other Implemented: ORS 468A.025, 468A.040 & 468A.050

340-239-0110 Gas Collection and Control System Requirements

When required pursuant to OAR 340-239-0105, the owner or operator of a landfill must comply with the gas collection and control system requirements, system operational standards, and well head sampling requirements in this rule.

(1) Design Plan and Installation

(a) If a gas collection and control system which meets the requirements of section (2) of this rule has not been installed, the owner or operator of a landfill must submit a Design Plan to DEQ within one year of becoming subject to this rule.

(b) If an owner or operator of a landfill is modifying an existing gas collection and control system to meet the requirements of this division, the owner or operator must submit an amended Design Plan to DEQ that includes any necessary updates or addenda, in accordance with OAR 340-239-0700(3)(j).

(c) At a minimum, the Design Plan must meet all of the following requirements:

(A) The Design Plan must be prepared and certified by a professional engineer. The following issues must be addressed in the design: Depths of solid waste, solid waste 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 solid waste decomposition heat, and ability to isolate individual components or sections for repair or troubleshooting without shutting down entire collection system.

(B) The Design Plan must provide for the control of the collected gas through the use of a gas collection and control system meeting the requirements of OAR 340-239-0110(2) or an alternative method approved pursuant to OAR 340-239-0500.

(C) The Design Plan must demonstrate that the gas collection and control system is designed to handle the maximum expected gas generation flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control system equipment. The

maximum expected gas generation flow rate must be calculated using the method in OAR 340-239-0800(5) or an alternative method approved pursuant to OAR 340-239-0500.

(D) The Design Plan must include any proposed alternatives to the requirements, justification for the need for any proposed alternatives, test methods, procedures, compliance measures, monitoring, and recordkeeping or reporting requirements pursuant to OAR 340-239-0500.

(E) The Design Plan must include a description of potential mitigation measures to be used to prevent the release of methane or other pollutants into the atmosphere during the installation or preparation of wells, piping, or other equipment; during repairs or the temporary shutdown of gas collection system components; or, when solid waste is to be excavated and moved.

(F) For active landfills, the design plan must identify areas of the landfill that are closed or inactive.

(G) The gas collection and control system must be designed to collect gas at an extraction rate to comply with the surface methane emission limits in OAR 340-239-0200, component leak standard in OAR 340-239-0600(2)(c), and be sufficient to meet all operational and performance standards in this division. The expected gas generation flow rate from the landfill must be calculated pursuant to OAR 340-239-0800(5).

(H) The gas collection and control system must be designed 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.

(I) Any areas of the landfill that contain only asbestos-containing waste, or nondecomposable solid waste may be excluded from collection provided that the owner or operator submits documentation to DEQ containing the nature of the waste, date of deposition, location and amount of asbestos or non-decomposable solid waste deposited in the area. This documentation may be included as part of the Design Plan.

(J) The density of wells, horizontal collectors, surface collectors, or other gas extraction devices necessary to achieve compliance with section (2) of this rule.

(d) The owner or operator of an active landfill must install and operate a gas collection and control system not later than 18 months after the date that the landfill is required to comply with this rule.

(e) The owner or operator of a closed or inactive landfill must install and operate a gas collection and control system not later than 30 months after the date that the landfill is required to comply with this rule.

(f) The owner or operator of a controlled landfill must place each well or design component as specified in the approved Design Plan. Following initial construction, each new component must be installed no later than 60 days after the date on which the area controlled by the well is required to be controlled pursuant to this division.

(g) The owner or operator of a landfill must operate, maintain and expand the gas collection system in accordance with the procedures and schedules in the approved Design Plan.

(2) Gas Collection and Control System Operational Standards

(a) The owner or operator of a landfill must satisfy all of the following requirements when operating a gas collection and control system:

(A) Route all collected gas to a gas control device or devices, and operate the gas collection and control system continuously except as provided in sections (4) and (5) of this rule.

(B) Operate the gas collection and control system to comply with paragraph (1)(a)(G) of this rule.

(C) Design and operate the gas collection system to draw all the gas toward the gas control device or devices.

(D) Design and operate the gas collection system to minimize off-site and on-site migration of subsurface gas in compliance with OAR chapter 340, divisions 093, 094, and 095.

(E) In the event the collection or control system is inoperable, the gas mover system shall be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere shall be closed within one hour of the collection or control system not operating.

(F) 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.

(G) Install all passive collection systems with liners on the bottom and all sides in all areas in which gas is to be collected. The liners must be installed as required under 40 C.F.R. § 258.40.

(H) Any area of the landfill may be excluded from control, provided that the total of all excluded areas can be shown to contribute less than one percent (1%) of the total amount of methane emissions from the landfill. The amount, location, and age of the material must be documented and provided to DEQ. If data on actual amounts and age is not available, the landfill owner or operator must estimate based on known information and provide all documentation used to make the estimates. A separate methane emissions estimate must be made for each section proposed for exclusion, and the sum of all such sections must be compared to the methane emissions estimate for the entire landfill, and all calculations, data and documentation used to perform the calculations must be submitted to DEQ. The methane emissions from each section proposed for exclusion must be computed using the methods provided in OAR 340-239-0800(5).

(I) 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.

(J) 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, into the solid waste, 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.

(K) 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.

(L) Landfill gas must be conveyed to a control system in compliance with section (2) of this rule 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:

(i) For existing collection systems, the flow data must be used to project the maximum flow rate. If no flow data exists, the procedures in subparagraph (2)(a)(L)(ii) of this rule must be used; or

(ii) For new collection systems, the maximum flow rate must be determined in accordance with OAR 340-239-0800(5).

(b) Requirements for Enclosed Flares. A landfill owner or operator who operates an enclosed flare must route the collected gas to an enclosed flare that meets all of the following requirements:

(A) Achieves a methane destruction efficiency of at least 99 percent by weight.

(B) Is equipped with automatic dampers, an automatic shutdown device, a flame arrester, and continuous recording temperature sensors.

(C) During restart or startup there must be a sufficient flow of propane, commercial natural gas, or other approved fuel source, to the pilot light to prevent unburned collected methane from being emitted to the atmosphere.

(D) The gas control device must be operated within the parameter ranges established in the landfill's Air Contaminant Discharge Permit or Oregon Title V Operating Permit.

(c) Requirements for open flares: A landfill owner or operator who operates an open flare must route the collected gas to an open flare that meets the requirements of 40 C.F.R. § 60.18. The owner or operator of an open flare must comply with all of the following requirements:

(A) Install, calibrate, maintain, and operate the following equipment according to the manufacturer's specifications:

(i) 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

(ii) 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.

(B) An open flare installed and operating prior to August 1, 2021, may operate until January 1, 2024, but is thereafter prohibited except as provided in paragraph (2)(c)(C) of this rule.

(C) Operation of an open flare on or after January 1, 2024, is only allowed with DEQ's written approval, which DEQ will determine based on whether the owner or operator demonstrates to the satisfaction of DEQ that one of the following conditions apply:

(i) The methane generation rate is less than 664 metric tons per year pursuant to OAR 340-239-800(2) and is insufficient to support the continuous operation of an enclosed flare or other gas control device;

(ii) The owner or operator is seeking to temporarily operate an open flare during the repair or maintenance of the gas control system, or while awaiting the installation of an enclosed flare, or to address offsite gas migration issues. An owner seeking to temporarily operate an open flare under this subparagraph must submit a written request to DEQ pursuant to OAR 340-239-0500;

(iii) The owner or operator has landfill gas emissions that are unable to be controlled using enclosed flare gas control devices in the gas control system. These emissions being controlled using an open flare may not exceed 664 metric tons (732 tons) per year of methane. An owner seeking to operate an open flare under this subparagraph must submit a written request to DEQ pursuant to OAR 340-239-0500. The request must include an analysis verifying that there is no feasible alternative control device configuration that would use the landfill gas emissions without use of an open flare; or

(iv) The owner or operator otherwise has received written approval from DEQ to operate an open flare pursuant to OAR 340-239-0500.

(d) Requirements for Gas Control Devices other than Flares. A landfill owner or operator may operate a gas control device other than a flare only if the owner or operator complies with one of the following requirements:

(A) The device is a boiler or process heater with a design heat input capacity equal to or greater than 44 megawatts per hour (150 million British thermal units per hour), provided that the landfill gas stream is introduced into the flame zone. The performance test is not required for boilers and process heaters with design heat input capacities equal to or greater than 44 megawatts per hour (150 million British thermal units per hour) that burn landfill gas for compliance with this division;

(B) Route the collected gas to an energy recovery device, or series of devices that meets all of the following requirements:

(i) Achieves a methane destruction efficiency of at least 99 percent by weight pursuant to OAR 340-239-0800(6). Lean burn internal combustion engines must reduce the outlet methane concentration to less than 3,000 ppmv, dry basis, corrected to 15 percent oxygen.

(ii) For new gas control devices, the destruction efficiency or parts per million by volume required according to OAR 340-239-0110(2)(d)(A)(i) 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 OAR 340-239-0800(6) and the DEQ Source Test Manual.

(iii) Existing gas control devices must demonstrate compliance with this rule not later than 180 days from the effective date of this rule using the performance test methods specified in OAR 340-239-0800(6) and the DEQ Source Test Manual.

(iv) Operate the gas control device within the parameter ranges established during the initial or most recent performance test that demonstrates compliance with the standard in OAR 340-239-0110(2)(d)(A)(i). Until a performance test is performed, operate the gas control device within engineering or manufacturer's established parameter ranges.

(C) Route the collected gas to a treatment system that processes the collected gas for subsequent sale or use. 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 subsection (2)(b), (2)(c) or (2)(d) of this rule. All emissions vented to the atmosphere from the gas treatment system are subject to the requirements of subsection (2)(b) or (2)(c) of this rule. The owner or operator must prepare a site-specific treatment monitoring plan to include all of the following:

(i) 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 must include records of filtration, de-watering, and compression parameters.

- (ii) Monitoring methods, frequencies, and operating ranges for each monitored operating parameter based on manufacturer's recommendations or engineering analysis for each intended end use of the treated landfill gas.
 - (iii) Documentation of the monitoring methods and ranges, along with justification for their use.
 - (iv) List of responsible staff (by name and job title) for data collection.
 - (v) Processes and methods used to collect the necessary data.
 - (vi) Description of the procedures and methods that are used for quality assurance, maintenance, and repair of all continuous monitoring systems (CMS).
- (e) The owner or operator complying with section (2)(d) of this rule by 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). The 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 by paragraph (2)(d)(C) of this rule. The owner or operator must:
- (A) Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the treatment system at least every 15 minutes;
 - (B) Install liners or equivalent non-permeable materials on the bottom and all sides in all areas in which gas is to be collected. The liners must be installed as required under 40 C.F.R. 258.40; and
 - (C) 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.
- (f) Performance Test Requirements. The owner or operator must conduct annual performance tests for any gas control device(s) subject to the requirements of section (2) of this rule using the test methods identified in OAR 340-239-0800(6). Following an initial performance test, the owner or operator must conduct a complete annual performance test each calendar year, no later than 45 days after the anniversary date of the initial performance test. Performance tests must be conducted in compliance with all of the following requirements:
- (A) An initial performance test must be conducted within 180 days of start up of the gas collection and control system.
 - (B) Existing gas control devices must demonstrate compliance with this rule not later than 180 days from the effective date of this rule using the test methods specified in OAR 340-239-0800(6) and the DEQ Source Test Manual.
 - (C) If a gas control device remains in compliance with standards in section (2) of this rule after three consecutive performance tests, the owner or operator may conduct performance tests once

every three years, but no later than 45 days after each third anniversary date of the initial performance test. If a subsequent performance test shows the gas collection and control system does not demonstrate compliance with the standard(s) in section (2) of this rule, the performance testing frequency must return to annual.

(D) The performance tests must be conducted under such conditions as DEQ 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 DEQ. 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 DEQ such records as may be necessary to determine the conditions of performance tests.

(3) Wellhead sampling. A landfill owner or operator required to comply with section (2) of this rule for an active gas collection system must install a sampling port and measuring devices, or an access port for measuring devices, at each wellhead and comply with the following, using measuring devices that meet the requirements of OAR 340-239-0800(7):

(a) Monitor nitrogen or oxygen concentration in the landfill gas on a monthly basis as provided in OAR 340-239-0600(3);

(b) Monitor temperature of the landfill gas on a monthly basis as provided in OAR 340-239-0600(3); and

(c) Measure the gauge pressure in the gas collection header on a monthly basis as provided in OAR 340-239-0600(2)(d).

(4) Well Raising. The requirements of paragraph (2)(a)(A), paragraph (2)(a)(B), and section (3) of this rule do not apply to individual wells involved in well raising provided the following conditions are met:

(a) New fill is being added or compacted in the immediate vicinity around the well; and

(b) Once installed, a gas collection well extension is sealed or capped until the raised well is reconnected to a vacuum source.

(5) Repairs and Temporary Shutdown of Gas Collection System Components: The requirements of paragraphs (2)(a)(A) and (2)(a)(B) do not apply to individual landfill gas collection system components that must be temporarily shut down in order to repair the components due to emergencies, catastrophic events such as earthquakes, to extinguish landfill fires, to prevent landfill fires, to connect new landfill gas collection system components to the existing system, to perform construction activities pursuant to OAR 340-239-0300, or to conduct performance testing, provided the following requirements are met:

(a) Any new gas collection system components required to maintain compliance with this division must be included in the most recent Design Plan pursuant to section (1) of this rule. The owner or operator must comply with applicable provisions of the Notice of Construction requirements in OAR chapter 340, division 210 and permit modification requirements of OAR chapter 340, division 216 or 218 prior to the construction, installation and operation of new landfill gas collection system components;

(b) Methane emissions are minimized during shutdown pursuant to paragraph (1)(a)(E) of this rule; and

(c) The owner or operator must submit a notification to DEQ after any temporary shutdown due to an emergency, catastrophic event or landfill fires in accordance with OAR 340-239-0700(3)(n).

Statutory/Other Authority: ORS 468.020, 468A.025, 468A.040 & 468A.050

Statutes/Other Implemented: ORS 468A.025, 468A.040 & 468A.050

340-239-0200 Compliance Standards

When required as provided in OAR 340-239-0105 through 340-239-0800, the owner or operator of a landfill must comply with this rule.

(1) Surface Emission Methane Concentration Limits. Except as provided in OAR 340-239-0110(4), OAR 340-239-0110(5), OAR 340-239-0300, and OAR 340-239-0600(1), beginning August 1, 2022, or upon commencing operation of a newly installed gas collection and control system or modification of an existing gas collection and control system pursuant to OAR 340-239-0110(1), whichever is later, no location on the landfill surface may exceed either of the following methane concentration limits:

(a) 500 ppmv, other than nonrepeatable, momentary readings, as determined by instantaneous surface emissions monitoring conducted in accordance with OAR 340-239-0800(3)(b);

(b) An average methane concentration limit of 25 ppmv as determined by integrated surface emissions monitoring conducted in accordance with OAR 340-239-800(3)(c).

(2) Wellhead Gauge Pressure Requirement: Each landfill gas collection and control system wellhead must be operated under a negative pressure without causing air infiltration, except as provided in OAR 340-239-0110(4) and OAR 340-239-110(5), or under any of the following conditions:

(a) Use of a geomembrane or synthetic cover. The owner or operator must develop acceptable pressure limits for the wellheads and include them in the Design Plan;

(b) A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows; or

(c) 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 OAR 340-239-700(3)(c).

(3) Wellhead Temperature Requirement:

(a) Each landfill gas collection and control system interior wellhead in the collection system must be operated with a landfill gas temperature less than 62.8 degrees Celsius (145 degrees Fahrenheit).

(b) The landfill owner or operator may request a higher operating temperature value at a particular well. A higher operating value demonstration must be submitted to DEQ 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., it is only acceptable if it neither causes fires nor kills methanogens).

Statutory/Other Authority: ORS 468.020, 468A.025, 468A.040 & 468A.050

Statutes/Other Implemented: ORS 468A.025, 468A.040 & 468A.050

340-239-0300 Construction Activities

The requirements of OAR 340-239-0200 do not apply to the working face of the landfill or to areas of the landfill surface where the landfill cover material has been removed and solid waste has been exposed for the purpose of installing, expanding, replacing, or repairing components of the landfill gas, leachate, or gas condensate collection and removal system, for conducting a remedial action, or for law enforcement activities requiring excavation; as long as these areas are kept to the minimum size and time duration as possible.

Statutory/Other Authority: ORS 468.020, 468A.025, 468A.040 & 468A.050

Statutes/Other Implemented: ORS 468A.025, 468A.040 & 468A.050

340-239-0400 Permanent Shutdown and Removal of the Gas Collection and Control System

When a landfill owner or operator has installed a gas collection and control system pursuant to OAR 340-239-0105, the owner or operator may permanently shutdown and remove the system only as provided in this rule.

(1) The gas collection and control system at a closed landfill, or at a closed area of a landfill, may be capped or removed provided all of the following requirements are met:

(a) The gas collection and control system was in operation for at least 15-years, unless the owner or operator can demonstrate to the satisfaction of DEQ that due to declining methane rates the

owner or operator of the landfill will be unable to operate the gas collection and control system for a 15-year period.

(b) The calculated or measured methane generation rate at the landfill is less than 664 metric tons (732 tons) per year on three successive test dates. For measured methane generation rates, the test dates must be no less than 90 days apart and no more than 180 days apart. The calculated methane generation rate must be calculated pursuant to OAR 340-239-0800(2).

(c) Surface methane concentration measurements of methane do not exceed 200 ppmv.

(d) The owner or operator submits an Equipment Removal Report to DEQ pursuant to OAR 340-239-0700(3)(b).

(e) The concentration of methane gas at the landfill does not exceed 25 percent of its lower explosive limit in facility structures (excluding gas collection and control system components) or its lower explosive limit at the property boundary.

(2) The owner or operator of the landfill that has capped or removed a gas collection and control system under section (1) of this rule must conduct surface methane concentration measurements over the portion of the landfill with the capped or removed gas collection and control system pursuant to OAR 340-239-0800(3) for at least eight consecutive calendar quarters after the gas collection and control system is capped or removed. The measurements must comply with the following requirements:

(a) The walking grid in OAR 340-239-0800(3)(a)(B) may be reduced to 100-foot spacing so long as the walking grid is offset by 25-feet each quarter so that by the end of one year of monitoring, the entire surface area has been monitored every 25 feet;

(b) If there is no measured concentration of methane of 200 ppmv or greater from the surface of the closed landfill in any of these measurement events, the owner or operator must submit a final gas collection and control system Closure Notification to DEQ pursuant to OAR 340-239-0700(3)(a); and

(c) If there is any measured concentration of methane of 200 ppmv or greater in any of these measurement events, other than nonrepeatable, momentary readings, as determined by instantaneous surface emissions monitoring, from the surface of the closed landfill, the owner or operator must comply with OAR 340-239-0110 through OAR 340-239-0800.

Statutory/Other Authority: ORS 468.020, 468A.025, 468A.040 & 468A.050

Statutes/Other Implemented: ORS 468A.025, 468A.040 & 468A.050

340-239-0500 Alternative Compliance Options

(1) The owner or operator of a landfill may request alternatives to the compliance measures, monitoring requirements, test methods and procedures of OAR 340-239-0110, OAR 340-239-0600, and OAR 340-239-0800. Any alternatives requested by the owner or operator of a landfill

must be submitted in writing to DEQ and receive written approval from DEQ before they may be implemented. Alternative compliance option requests may include, but are not limited to, the following:

- (a) Semi-continuous (batch) operation of the gas collection and control system due to insufficient landfill gas flow rates;
- (b) Alternative wind speed requirements for landfills consistently having winds in excess of the limits specified in this division;
- (c) Alternative walking patterns to address potential safety and other issues, such as: steep or slippery slopes, monitoring instrument obstructions, and physical obstructions;
- (d) Exclusion of construction areas and other dangerous areas from landfill surface inspection; and
- (e) Exclusion of paved roads that do not have any cracks, pot holes, or other penetrations from landfill surface inspection.

(2) The owner or operator of a landfill seeking to use an alternative compliance option pursuant to this rule must provide information satisfactory to DEQ demonstrating that:

- (a) Off-site migration of landfill gas is being, and will be, effectively controlled; and
- (b) The proposed alternatives provide an equivalent level of methane emission control, as compared with the methane controls that would have been required of the owner or operator of the landfill under OAR 340-239-0110, OAR 340-239-0600 and OAR 340-239-0800, as applicable. DEQ may not approve use of an alternative compliance option unless it determines the proposed alternative will provide an equivalent level of methane emission control and effectively control off-site migration of landfill gas.

Statutory/Other Authority: ORS 468.020, 468A.025, 468A.040 & 468A.050

Statutes/Other Implemented: ORS 468A.025, 468A.040 & 468A.050

340-239-0600 Monitoring Requirements

When required as provided in OAR 340-239-0105 through 340-239-0800, the owner or operator of a landfill must comply with the monitoring requirements in this rule.

(1) Surface Emissions Monitoring Requirements. The owner or operator of a landfill with a gas collection and control system must conduct quarterly instantaneous and integrated surface monitoring of the landfill surface using the procedures specified in OAR 340-239-0800(3). All of the following requirements apply to such monitoring:

(a) Instantaneous Surface Monitoring. Any reading exceeding a limit specified in OAR 340-239-0105(5)(b), OAR 340-239-0200(1)(a), or OAR 340-239-0400(2)(c) must be recorded as an exceedance and all of the following actions must be taken:

(A) The owner or operator must record the name of the individual that conducted SEM, date, location, and value of each exceedance, along with retest dates and results. The location of each exceedance must be clearly marked and identified on a topographic map of the landfill, drawn to scale with the location of both the grids and the gas collection system clearly identified. The documentation required under this subsection must be retained in the landfill's files and reported to DEQ as provided in OAR 340-239-0700.

(B) The owner or operator must take corrective action such as, but not limited to, cover maintenance or repair, or well vacuum adjustments.

(C) The owner or operator must remonitor the location of the exceedance, and the location must be remonitored within ten days of a measured exceedance. The owner or operator must comply with all of the following requirements:

(i) If the remonitoring of the location shows a second exceedance, the owner or operator must take additional corrective action and the location must be re-monitored again no later than 10 days after the second exceedance.

(ii) If the remonitoring shows a third exceedance, the owner or owner or operator must install a new or replacement collection device and must demonstrate compliance no later than 120 days after detecting the third exceedance.

(iii) Any location that initially showed an exceedance but has a methane concentration at the 10-day remonitoring of less than 500 ppmv methane, or 200 ppmv methane if this is to determine compliance with OAR 340-239-0105(5)(b), must be re-monitored one month from the initial exceedance. If the one-month re-monitoring shows a concentration less than 500 ppmv methane, or 200 ppmv methane if this is to determine compliance with OAR 340-239-0105(5)(b), no further monitoring of that location is required until the next quarterly monitoring period. If the one-month re-monitoring shows an exceedance, the owner or operator must install a new or replacement well to achieve compliance no later than 120 days after detecting the third exceedance.

(iv) For any location where monitored methane concentration equals or exceeds 500 ppmv, or 200 ppmv methane if this is to determine compliance with OAR 340-239-0105(5)(b), 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 DEQ for approval pursuant to OAR 340-239-0500.

(D) The owner or operator of a closed or inactive landfill, or of any closed or inactive areas on an active landfill that has no monitored exceedances of the limits specified in OAR 340-239-0200(1)(a) after four consecutive quarterly instantaneous surface monitoring periods, may shift to annual instantaneous surface monitoring.

(E) An owner or operator that has shifted to annual instantaneous surface monitoring under paragraph (1)(a)(C) of this rule must return to quarterly instantaneous surface monitoring upon any exceedances of the limits specified in OAR 340-239-0200(1)(a) that cannot be remediated within 10 days or upon any exceedances detected during a DEQ inspection.

(b) Integrated Surface Monitoring. Any reading exceeding the limit specified in OAR 340-239-0200(1)(b) must be recorded as an exceedance and all of the following actions must be taken:

(A) The owner or operator must record the average surface concentration measured as methane for each grid along with retest dates and results. The location of the grids and the gas collection system must be clearly marked and identified on a topographic map of the landfill drawn to scale. The documentation required under this subsection must be retained in the landfill's files and reported to DEQ as provided in OAR 340-239-0700.

(B) Within 10 days of a measured exceedance, corrective action must be taken by the owner or operator such as, but not limited to; cover maintenance or repair, or well vacuum adjustments and the grid must be remonitored. The owner or operator must comply with all of the following requirements:

(i) If the remonitoring of the grid shows a second exceedance, additional corrective action must be taken and the location must be re-monitored again no later than 10 days after the second exceedance.

(ii) If the remonitoring in subparagraph (1)(b)(B)(i) of this rule shows a third exceedance, the owner or operator must install a new or replacement well to achieve compliance no later than 120 days after detecting the third exceedance.

(C) The owner or operator of a closed or inactive landfill, or of any closed or inactive areas on an active landfill that has no monitored exceedances of the limits specified in OAR 340-239-0200(1)(b) after four consecutive quarterly integrated surface monitoring periods, may shift to annual integrated surface monitoring.

(D) An owner or operator that has shifted to annual integrated surface monitoring under paragraph (1)(b)(C) of this rule must return to quarterly integrated surface monitoring upon the occurrence of any exceedances of the limits specified in OAR 340-239-0200(1)(b) during annual monitoring or detected during any DEQ inspection.

(2) Gas Control System Equipment Monitoring. The landfill owner or operator must monitor the gas control system using the following procedures:

(a) For enclosed flares all of the following equipment must be installed, calibrated, maintained, and operated according to the manufacturer's specifications:

(A) A temperature monitoring device equipped with a continuous recorder that has an accuracy of plus or minus (\pm) one percent of the temperature being measured expressed in degrees Celsius or Fahrenheit. A temperature monitoring device is not required for boilers or process heaters

with design heat input capacity equal to or greater than 44 megawatts per hour (150 million British thermal units per hour).

(B) A device that records gas 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 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.

(b) For a gas control device other than an enclosed flare, the owner or operator must provide information describing the operation of the gas control device, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The owner or operator must maintain, operate, and monitor the device according to the written manufacturer instructions and specifications. Alternative compliance requests must be submitted to DEQ as specified in OAR 340-239-0500. DEQ may specify additional monitoring procedures.

(c) Components containing landfill gas and under positive pressure must be monitored quarterly for leaks. Any component leak over 500 ppmv methane must be tagged and repaired within 10 days. Quarterly component leak testing at landfills having landfill gas-to-energy facilities may be conducted prior to scheduled maintenance or planned outage periods.

(d) The owner or operator must measure gauge pressure in the gas collection header applied to each individual well on a monthly basis. If a positive pressure exists, other than as provided in OAR 340-239-0200(2), 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.

(3) Wellhead Monitoring. On a monthly basis for each individual wellhead, the landfill owner or operator must determine and record gauge pressure, temperature, and nitrogen or oxygen content of gas emissions. Such monitoring must comply with all of the following requirements:

(a) If there is any positive pressure reading other than as provided in OAR 340-239-0110(4) or (5), the owner or operator must take the following actions. Any attempted corrective measure must not cause exceedances of other operational or performance standards:

(A) Initiate corrective action within five days of the positive pressure measurement;

(B) If negative pressure cannot be achieved without excess air infiltration within 15 days of the date the positive pressure was first measured, 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 submit a Corrective Action Report to DEQ pursuant to OAR 340-239-0700(3)(k);

(C) 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; and

(D) 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 DEQ.

(b) If a well exceeds the operating parameter for temperature, action must be initiated to correct the exceedance within five days. Any attempted corrective measure must not cause exceedances of other operational or performance standards, and the owner or operator must comply with all of the following requirements:

(A) If a landfill gas temperature less than 62.8 degrees Celsius (145 degrees Fahrenheit), or as established in OAR 340-239-200(3), 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 OAR 340-239-0700(2).

(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 OAR 340-239-0700(3)(c)(A) as part of the next semi-annual report. The owner or operator must keep records according to OAR 340-239-0700(2).

(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 DEQ, according to OAR 340-239-0700(3)(c)(A) and OAR 340-239-600(3)(a)(C). The owner or operator must keep records according to OAR 340-239-0700(2).

(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 OAR 340-239-0800(7), 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.

(E) If a higher operating temperature has not been approved by DEQ, the enhanced monitoring specified in OAR 340-239-0800(8) is required at each well with a measurement of landfill gas temperature greater than 62.8 degrees Celsius (145 degrees Fahrenheit).

(4) Cover integrity. The landfill owner or operator shall implement a program to monitor for cover integrity and implement cover repairs as necessary on a monthly basis. The cover must conform with requirements in OAR chapter 340, divisions 094 and 095.

(5) The monitoring requirements of this division apply at all times, 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. Monitoring system repairs completed in response to monitoring system malfunctions to return the monitoring system to operation must be completed as expeditiously as practicable.

Statutory/Other Authority: ORS 468.020, 468A.025, 468A.040 & 468A.050

Statutes/Other Implemented: ORS 468A.025, 468A.040 & 468A.050

340-239-0700 Recordkeeping and Reporting Requirements.

When required as provided in OAR 340-239-0100 through 340-239-0800, the owner or operator of a landfill must comply with the recordkeeping and reporting requirements in this rule.

(1) The electronic reporting requirements of 40 C.F.R. § 60.38f(j), 40 C.F.R. § 60.767(i), and C.F.R. § 63.1981(i) are incorporated by reference herein. Owners or operators of landfills that meet the applicability or designated facility requirements in 40 C.F.R. § 60.31f, 40 C.F.R. § 60.760, or 40 C.F.R. § 63.1935 must comply with the electronic reporting requirements of 40 C.F.R. § 60.38f(j), 40 C.F.R. § 60.767(i), or C.F.R. § 63.1981(i), respectively and as applicable.

(2) Recordkeeping Requirements.

(a) A landfill owner or operator subject to this division must maintain the following records for at least five years:(A) All gas collection system downtime exceeding five days, including dates of the downtime, individual well shutdown and disconnection times, the reason for the downtime, and any corrective actions conducted in response to the downtime;

(B) All gas control system downtime in excess of one consecutive hour, the reason for the downtime, the length of time the gas control system was shutdown, and any corrective actions conducted in response to the downtime;

(C) All instantaneous surface readings of 100 ppmv methane or greater. All exceedances of the limits in OAR 340-239-0105(5)(b) and OAR 340-239-0200, including the location of the leak (or affected grid), leak concentration in ppmv methane, date and time of measurement, the action taken to repair the leak, date of repair, any required remonitoring and the remonitored concentration in ppmv methane, wind speed during surface sampling, and the installation date and location of each well installed as part of a gas collection system expansion;

(D) Any positive wellhead gauge pressure measurements, the name of the individual that conducted the actions, the date and time of the measurements, the well identification number, and the corrective action taken;

(E) Each wellhead temperature monitoring value of 62.8 degrees Celsius (145 degrees Fahrenheit) or above, each wellhead nitrogen level at or above 20 percent, and each wellhead oxygen level at or above 5 percent;

(F) Monthly solid waste acceptance rate, for active landfills or landfills that have accepted waste within the last five years;

(G) The current amount of waste-in-place including waste composition;

(H) The nature, location, amount, and date of deposition of nondecomposable waste for any landfill areas excluded from the collection system;

(I) Results of any performance tests conducted pursuant to OAR 340-239-0110(2)(f);

(J) Descriptions of mitigation measures taken to prevent the release of methane or other emissions into the atmosphere:

(i) When solid waste was brought to the surface during the installation or preparation of wells, piping, or other equipment;

(ii) During repairs or the temporary shutdown of gas collection system components; and

(iii) When solid waste was excavated and moved;

(K) Any construction activities pursuant to OAR 340-239-0300. Records must contain the following information:

(i) A description of the actions being taken, the areas of the landfill that will be affected by these actions, the reason the actions are required, and any landfill gas collection system components that will be affected by these actions;

(ii) Construction start and finish dates, projected equipment installation dates, and projected shut down times for individual gas collection system components; and

(iii) A description of the mitigation measures taken to minimize methane emissions and other potential air quality impacts;

(L) For any root cause analysis for which corrective actions are required, records 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 DEQ;

(M) The equipment operating parameters specified to be monitored under OAR 340-239-0600(2) as well as records for periods of operation during which the parameter boundaries established during the most recent performance test are exceeded. The records must include the following information:

(i) For enclosed flares, all 3-hour periods of operation during which the average temperature difference was more than 28 degrees Celsius (or 50 degrees Fahrenheit) below the average combustion temperature during the most recent performance test at which compliance with OAR 340-239-0110(2)(b) and OAR 340-239-0110(2)(c) was determined;

(ii) For any owner or operator who uses a boiler or process heater with a design heat input capacity of 44 megawatts per hour (150 million British thermal units per hour) or greater to comply with OAR 340-239-0110(2)(c), all periods of operation of the boiler or process heater (e.g., steam use, fuel use, or monitoring data collected pursuant to other federal, State, local, or tribal regulatory requirements), readily accessible continuous records of the equipment operating parameters specified to be monitored in OAR 340-239-0600(2) and up-to-date, readily accessible records for periods of operation during which the parameter boundaries established during the most recent performance test are exceeded;

(iii) For open flares, continuous records of the flame or flare pilot flame monitoring, and up-to-date, readily accessible records of all periods of operation in which the flame or flare pilot flame is absent; and

(iv) 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;

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

(O) Landfill owners or operators who convert waste-in-place from volume to mass to demonstrate that waste-in-place is less than 200,000 tons, must keep readily accessible, records of the annual recalculation of site-specific density, design capacity, and the supporting documentation;

(P) Landfill owners or operators demonstrating that site-specific surface methane emissions are below 200 ppmv by conducting surface emission monitoring under OAR 340-239-0105(5)(b) must keep for at least five years up-to-date, readily accessible records of all surface emissions monitoring and information related to monitoring instrument calibrations conducted according to sections 8 and 10 of Method 21 of appendix A of 40 C.F.R. Part 60, including all of the following items:

(i) Calibration records, including:

(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; and

(V) If an owner or operator makes their own calibration gas, a description of the procedure(s) used;

(ii) Digital photographs of the instrument setup, including the wind barrier. The photographs must be accurately 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;

(iii) Timestamp of each surface scan reading which must be detailed to the nearest second, based on when the sample collection begins and log for the length of time each sample was taken using a stopwatch (*e.g.*, the time the probe was held over the area);

(iv) Location of each surface scan reading. The owner or operator must determine the coordinates using an instrument with an accuracy of at least four meters. Coordinates must be in decimal degrees with at least five decimal places;

(v) Monitored methane concentration (ppmv) of each reading;

(vi) Background methane concentration (ppmv) after each instrument calibration test;

(vii) For readings taken at each surface penetration, the unique identification location label matching the label specified in subparagraph OAR 340-239-0700(2)(a)(P) (iv); and

(viii) Records of the operating hours of the gas collection system for each destruction device;

(Q) For each owner or operator reporting leachate or other liquids addition under OAR 340-239-0700(3)(g), 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;

(R) The date of initial placement of waste in newly constructed landfill cells; and

(S) Documentation of any component leaks above 250 ppmv methane detected pursuant to OAR 340-239-0600(2)(c) and all repairs performed in response to any component leaks above 500 ppmv.

(b) The landfill owner or operator must maintain the following records for the life of the control system equipment, as measured during the initial performance test or compliance determination. Records of subsequent tests or monitoring must be maintained for a minimum of five years. Records of the control device vendor specifications must be maintained until removal:

(A) The density of wells, horizontal collectors, surface collectors, or other gas extraction devices determined using the procedures specified in OAR 340-239-0110(1)(a);

- (B) The expected gas generation flow rate as calculated pursuant to OAR 340-239-0800(5);
- (C) The percent reduction of methane achieved by the control device determined pursuant to OAR 340-239-0800(6);
- (D) For a boiler or process heater, the 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 test;
- (E) When an owner or operator subject to the provisions of this division is demonstrating compliance with OAR 340-239-0110(2) 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 per hour (150 million British thermal units per hour):
- (i) The average temperature measured at least every 15 minutes and averaged over the same time period of the performance test; and
 - (ii) The percent reduction of methane determined as specified in OAR 340-239-0800(6) achieved by the control device;
- (F) For an open 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 C.F.R. § 60.18, which is incorporated by reference herein; and 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;
- (G) An up to date map showing each existing and planned gas collector in the system;
- (H) Where an owner or operator subject to the provisions of this division is demonstrating compliance with OAR 340-239-0110(2) 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; and
 - (ii) Site-specific treatment monitoring plan meeting the requirements of OAR 340-239-0110(2)(d)(C).
- (I) An up-to-date, readily accessible plot map showing each existing and planned collectors in the system and providing a unique identification location label for each collector.
- (c) Bioreactor moisture content calculations: Any landfill owner or operator conducting calculations to determine the moisture content of a bioreactor must document the calculations and the basis of any assumptions. made to make such calculations. The records of the calculations must be kept for at least five years and until liquids addition ceases.

(d) Record Retention: The landfill owner or operator must maintain copies of the records and reports required by this division and provide them to DEQ within five business days upon request.

(3) Reporting Requirements.

(a) Closure Notification. Any owner or operator of a landfill that has ceased accepting waste must submit a Closure Notification to DEQ within 30 days of waste acceptance cessation, and:

(A) The Closure Notification must include the last day solid waste was accepted, the anticipated closure date of the landfill, and the estimated waste-in-place; and

(B) DEQ may request additional information as necessary to verify that permanent closure has taken place in accordance with the requirements of any applicable regulations, requirements, or ordinances in effect at the time of closure.

(b) Equipment Removal Report. The landfill owner or operator must submit a gas collection and control system Equipment Removal Report to DEQ 30 days prior to well capping, removal or cessation of operation of the gas collection, treatment, or control system equipment. The report must contain the following information:

(A) A copy of the Closure Notification submitted pursuant to OAR 340-239-0700(3)(a);

(B) A copy of the Initial Performance Test Report or other documentation demonstrating that the gas collection and control system has been installed and operated for a minimum of 15 years, unless the owner or operator can demonstrate to the satisfaction of DEQ that due to declining methane rates the landfill is unable to operate the gas collection and control system for a 15-year period; and

(C) Surface emissions monitoring results needed to verify that landfill surface methane concentration measurements do not exceed the limits specified in OAR 340-239-0200.

(c) Semi-Annual Report. A landfill owner or operator subject to the requirements of this rule, must prepare semi-annual reports for the periods of January 1 through June 30 of each year, unless otherwise approved in writing by DEQ. The Semi-Annual Report will be due on July 30, unless otherwise approved in writing by DEQ. The Semi-Annual Report must contain the following information:

(A) All instantaneous surface readings of 100 ppmv or greater. All exceedances of the limits in OAR 340-239-0105(5)(b), OAR 340-239-0200 and OAR 340-239-0600(2)(c) including the location of the leak (or affected grid), leak concentration in ppmv, date and time of measurement, the action taken to repair the leak, date of repair, any required remonitoring and the remonitored concentration in ppmv, wind speed during surface sampling, the concentration recorded at each location for which an exceedance was recorded in the previous month, and the installation date and location of each well installed as part of a gas collection system expansion;

(B) For any corrective action analysis for which corrective actions are required in OAR 340-239-0600(3)(a) and OAR 340-239-0600(3)(b) 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;

(C) All known, prevented, or suspected subsurface landfill fire(s) along with potential causes and any efforts conducted to avoid or put out the fire(s). Any positive pressure readings that may have contributed to the known, prevented, or suspected fire;

(D) The number of times that applicable parameters monitored under OAR 340-239-0110(2) or OAR 340-239-0200, were exceeded and when the gas collection and control system was not operating in compliance with OAR 340-0110(2)(a) including periods of startup, shutdown, and malfunction. For each instance, report the date, time, and duration of each exceedance. Where an owner or operator subject to the requirements of this division is demonstrating compliance with the operational standard for temperature OAR 340-239-0600(3)(b), the owner or operator must provide a statement of the wellhead operational standard for temperature and oxygen the landfill is complying with for the period covered by the report. The report must indicate:

(i) The number of times each of those parameters monitored under OAR 340-239-0600(3)(b), were exceeded. For each instance, report the date, time, and duration of each exceedance; and

(ii) The number of times the parameters for the site-specific treatment system in OAR 340-239-0110(2)(d)(C) were exceeded;

(E) 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 OAR 340-239-0110(2)(c);

(F) 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;

(G) All periods when the collection system was not operating;

(H) The date of installation and the location of each well or collection system expansion;

(I) Each owner or operator required to conduct enhanced monitoring in accordance with OAR 340-239-0800(8) for temperatures exceeding 62.8 degrees Celsius (145 degrees Fahrenheit) must include the results of all monitoring activities conducted during the period;

(J) For enclosed combustors except for boilers and process heaters with design heat input capacity of 44 megawatts per hour (150 million British thermal units per hour) or greater, all three-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; and

(K) For boilers or process heaters, whenever there is a change in the location at which the vent stream is introduced into the flame zone.

(d) Annual Report. An owner or operator subject to the requirements of this rule must prepare an Annual Report for the period of January 1 through December 31 of each year. Each Annual Report must be submitted to DEQ by February 15 of the following year, unless otherwise specified by DEQ, but may not be due later than March 15. The Annual Report must consist of the semi-annual and the following annual reporting requirements:

(A) Landfill name, owner and operator, address, and permit number as issued according to division 216 or 218;

(B) Total volume of landfill gas collected (reported in standard cubic feet);

(C) Average composition of the landfill gas collected over the reporting period (reported in percent methane and percent carbon dioxide by volume);

(D) Gas control device type, year of installation, rating, fuel type, and total amount of landfill gas combusted in each control device;

(E) The date that the gas collection and control system was installed and in full operation;

(F) The percent methane destruction efficiency of each gas control device(s);

(G) Type and amount of supplemental fuels burned with the landfill gas in each device, if applicable;

(H) Total volume of landfill gas shipped off-site (MMscf), the composition of the landfill gas collected (reported in percent methane and percent carbon dioxide by volume), and the recipient of the gas;

(I) Most recent topographic map of the site showing the areas with final cover and a geomembrane and the areas with final cover without a geomembrane with corresponding percentages over the landfill surface;

(J) The information required paragraphs (2)(a)(A) through (2)(a)(E), (2)(a)(G), (2)(a)(J) through (2)(a)(L) of this rule;

(K) Instrument specifications for all instruments used for monitoring compliance with this division; and (e) Waste-in-Place Report. An owner or operator subject to the requirements of OAR 340-239-0100(1), OAR 340-239-0100(2), OAR 340-239-0105(1), OAR 340-239-0105(2), or OAR 340-239-0105(3) must prepare an initial Waste-in-Place Report and annual Waste-in-Place reports each following year. The initial Waste-in-Place Report must be submitted by July 1, 2022. Each annual Waste-in-Place Report must be prepared for the period of January 1 through December 31 of each year and be submitted to DEQ by January 31 of the following year. DEQ may extend this deadline through March 1 in the form of a permit condition. The report also must include:

(A) Landfill name, owner and operator, address, and the permit number as issued according to division 216 or 218;

(B) The landfill's status (active, closed, or inactive) and the estimated waste-in-place, as of December 31 of the prior year, in tons;

(C) A description of the known and assumed waste composition in the landfill;

(D) The most recent topographic map of the site showing the areas with final cover and a geomembrane and the areas with final cover without a geomembrane with a calculation of the corresponding percentage geomembrane coverage over the landfill surface.

(f) Methane Generation Rate Report. An owner or operator subject to the requirements of OAR 340-239-0105(1), OAR 340-239-0105(2), or OAR 340-239-0105(3) must calculate the methane generation rate using the calculation procedures specified in OAR 340-239-0800(2) and report the results, along with a summary of efforts being implemented at the landfill to reduce landfill gas emissions, to DEQ:

(A) By July 1, 2022 for landfills with greater than 200,000 tons waste-in-place;

(B) Within 90 days of reaching 200,000 tons of waste-in-place;

(C) By March 15 of each subsequent year while waste-in-place is greater than 200,000 tons and the methane generation rate is less than 664 metric tons (732 tons) per year. The calculation, along with relevant parameters, must be provided as part of the report; and

(D) The report must include the results of a visual inspection of the landfill cover and any actions done to fix leaks and minimize methane releases.

(g) Liquids Addition Report. An owner or operator subject to the requirements of OAR 340-239-0110 that has employed leachate recirculation or added liquids based on a Research, Development, and Demonstration permit (issued through Resource Conservation and Recovery Act, subtitle D, part 258) within the last 10 years must submit to DEQ, annually, the following information:

(A) Volume of leachate recirculated (gallons per year) and the reported basis of those estimates (records or engineering estimates);

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

(C) Surface area (acres) over which the leachate is recirculated (or otherwise applied);

(D) Surface area (acres) over which any other liquids are applied;

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

(F) The annual waste acceptance rates (megagrams per year) in the areas with recirculated leachate, added liquids, or both, based on on-site records to the extent data are available, or engineering estimates;

(G) The initial report must contain items in OAR 340-239-0700(2)(g)(A) through OAR 340-239-0700(2)(g)(F) per year for the initial annual reporting period as well as for each of the previous 10 years, to the extent historical data are available in on-site records, and the report must be submitted no later than thirteen months after the date of commenced construction, modification, or reconstruction;

(H) Subsequent annual reports must contain items in OAR 340-239-0700(2)(g) (A) through OAR 340-239-0700(2)(g)(F) 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; and

(I) Landfills may cease annual reporting of items in paragraphs OAR 340-239-0700(2)(g) (A) through OAR 340-239-0700(2)(g)(F) once they have submitted the Closure Notification in OAR 340-239-0700(3)(a).

(h) Performance Test Report. For a control system designed and operated to meet the requirements of this division, the owner or operator must submit a Performance Test Report that establishes the reduction efficiency or parts per million by volume no later than 180 days after the initial startup of the approved control system using EPA Method 25 or 25C, 40 C.F.R. Part 60, Appendix A, which is incorporated by reference herein. The owner or operator must submit any additional Performance Test Reports within 30 days after the date of completing each performance test, including any associated fuel analyses. The Performance Test Report must meet the following requirements:

(A) The Performance Test Report must include the following information:

(i) 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;

(ii) 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;

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

(iv) 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;

(v) 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

(vi) The provisions for the control of off-site migration.

(D) The control device must be operated within the parameter ranges established during the initial or most recent performance test, the most recent permit, or manufacturer written specifications. The operating parameters to be monitored are specified in OAR 340-239-0600(2); and

(i) 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:

(A) The collection and control system as described in the design plan must meet the design requirements in OAR 340-239-0110(1);

(B) If DEQ 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 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

(C) If the owner or operator chooses to demonstrate compliance with the emission control requirements of this division using a treatment system as defined in this division, then the owner or operator must prepare a site-specific treatment system monitoring plan as specified in OAR 340-0110(2)(d)(C).

(j) Amended Design Plan. The owner or operator who has already been required to submit a design plan under OAR 340-239-0110(2) must submit an Amended Design Plan to DEQ within 90 days of any event that requires a change to the Design Plan as follows:

(A) At least 90 days before expanding operations to an area not covered by the previously approved Design Plan; and

(B) Prior to installing, repairing, or expanding the gas collection system in a way that is not consistent with the Design Plan previously approved by DEQ.

(k) Corrective Action reports:

(A) For corrective action that is required according to OAR 340-239-0600(3) and is expected to take longer than 120 days after the initial exceedance to complete, the landfill owner or operator must submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to DEQ as soon as practicable but no later than 75 days after the first measurement of positive pressure or temperature monitoring value of 55 degrees Celsius (131

degrees Fahrenheit). The owner or operator must receive DEQ approval regarding the plan for corrective action and the corresponding timeline.

(B) For corrective action that is required according to OAR 340-239-0600(3) and is not completed within 60 days after the initial exceedance, the landfill owner or operator must submit a notification to DEQ as soon as practicable but no later than 75 days after the first measurement of positive pressure or temperature exceedance.

(C) If a landfill owner or operator cannot fully implement a corrective action described in paragraph (3)(k)(A) or (3)(k)(B) of this rule within 60 days following the positive pressure or excess 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 positive pressure measurement.

(l) Instantaneous Surface Emission Monitoring Report.

(A) A landfill owner or operator conducting surface emission monitoring pursuant to OAR 340-239-0105(5)(b) must submit an Instantaneous Surface Monitoring Report within 30 days after the fourth consecutive quarter or monitoring if no exceedances are detected, or 30 days after a measured concentration of methane of 200 ppmv or greater, whichever is first.

(B) An Instantaneous Surface Emissions Monitoring Report required under paragraph (3)(l)(A) or (3)(l)(B) of this rule must include documentation of the following:

(i) Any corrective actions taken as a result of the surface emissions monitoring and clearly identify the location, date and time (to nearest second), average wind speeds including wind gusts, and reading (in parts per million) of concentrations of methane above 100 ppmv, other than non-repeatable, momentary readings. For location, the landfill owner or operator must determine the latitude and longitude coordinates using an instrument with an accuracy of at least four meters. The coordinates must be in decimal degrees with at least five decimal places; and

(ii) The results of the most recent methane generation rate calculation.

(m) 24-hour high temperature report. Where a landfill owner or operator must demonstrate compliance with the operational standard for temperature in OAR 340-239-0600(3)(b), 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, the owner or operator must report the date, time, well identifier, temperature and carbon monoxide reading to DEQ within 24 hours of the measurement unless a higher operating temperature value has been approved by DEQ for the well.

(n) Repairs and Temporary Shutdown Notification. At least 30 days prior to a scheduled shutdown, any landfill owner or operator that temporarily shuts down a gas collection and control system per OAR 340-239-0110(5) must submit a notification of the shutdown that includes a justification for the shutdown, the system component(s) that will require shutdown,

and the approximate timeline for the shutdown. If the shutdown occurred due to catastrophic or other unplanned event as stipulated in OAR 340-239-0110(5), the notification must be submitted within 10 days after the shutdown.

(o) Root Cause Analysis Report. If a landfill owner or operator cannot fully implement a corrective action required according to OAR 340-239-0600(3) within 120 days after the initial exceedance, the landfill owner or operator must submit the root cause analysis and additional analysis and reporting according to OAR 340-239-0700(3)(k) as soon as practicable but no later than 75 days after the first measurement of positive pressure or temperature monitoring value of 55 degrees Celsius (131 degrees Fahrenheit). The root cause analysis must include a thorough investigation of the landfill gas collection and control system to determine the primary cause, and any other contributing causes, of positive pressure or high temperature at a wellhead. The report must include all factors investigated, methods used, and alternative causes that were analyzed.

(p) Bioreactor Moisture Content Report. If a landfill owner or operator calculates moisture content to establish the date the bioreactor is required to begin operating the collection and control system, within 90 days after the bioreactor achieves 40-percent moisture content, the landfill owner or operator must submit a Bioreactor Moisture Content Report that includes the results of the calculation, the date the bioreactor achieved 40-percent moisture content by weight, and the date the landfill owner or operator will begin collection and control system operation.

(q) Notwithstanding any other provision of this division, when any provision of this division requires that any report, or information be submitted by a landfill owner or operator, the report must contain certification by a responsible official of the truth, accuracy, and completeness of the report. This certification, and any other certification required under this division, must state that, based on information and belief formed after reasonable inquiry, the statements and information in the report are true, accurate, and complete.

Statutory/Other Authority: ORS 468.020, 468A.025, 468A.040 & 468A.050

Statutes/Other Implemented: ORS 468A.025, 468A.040 & 468A.050

340-239-0800 Test Methods and Procedures

When required as provided in OAR 340-239-0105 through 340-239-0700, the owner or operator of a landfill must comply with the test methods and procedures for monitoring and measurements in this rule.

(1) Hydrocarbon Detector Specifications. Any instrument used for the measurement of methane must be a gas detector, or other equivalent instrument approved by DEQ, that meets the calibration, specifications, and performance criteria of EPA Reference Method 21, Determination of Volatile Organic Compound Leaks, 40 C.F.R. Part 60, Appendix A, except that those rules shall be applied with the following adjustments:

(a) "Methane" replaces all references to volatile organic compounds (VOC);

(b) The calibration gas shall be methane, diluted to a nominal concentration of 500 parts per million in air;

(c) To meet the performance evaluation requirements in section 8.1 of Method 21 of 40 C.F.R. Part 60, Appendix A, the instrument evaluation procedures of section 8.1 of Method 21 of 40 C.F.R. Part 60, Appendix A must be used; and

(d) The calibration procedures provided in sections 8 and 10 of Method 21 of 40 C.F.R. Part 60, Appendix A must be followed immediately before commencing a surface monitoring survey.

(2) Determination of methane generation rate. The methane generation rate must include wastes received up to December 31 of the previous year. The methane generation rate must be determined as follows, as applicable:

(a) For Landfills without Carbon Adsorption or Passive Venting Systems, the methane generation rate must be calculated using the procedures specified in 40 C.F.R. § 98.343(a)(1) or 40 C.F.R. 98.463(a)(1). DEQ may request additional information as may be necessary to verify the methane generation rate from the landfill. Site-specific data may be substituted when available.

(b) For Landfills with Carbon Adsorption Systems, the methane generation rate must be determined by measuring the actual total landfill gas flow rate, in standard cubic feet per minute (scfm), using a flow meter or other flow measuring device such as a standard pitot tube and methane concentration (percent by volume) using a hydrocarbon detector meeting the requirements of OAR 340-239-0800(1). The total landfill gas flow rate must be multiplied by the methane concentration to determine the methane generation rate.

(c) For Landfills with Passive Venting Systems, the methane generation rate must be determined pursuant to both of the following and is the higher of these determined values:

(A) OAR 340-239-0800(2)(a); and

(B) The owner or operator must measure actual landfill gas flow rates (in units of scfm) by using a flow measuring device such as a standard pitot tube and methane concentration (percent by volume) using a hydrocarbon detector meeting the requirements of OAR 340-239-0800(1) from each venting pipe that is within the waste mass. Each gas flow rate must then be multiplied by its corresponding methane concentration to obtain the individual methane flow rate. The individual methane flow rates must be added together to determine the methane generation rate.

(3) Surface Emissions Monitoring Procedures. The landfill owner or operator must measure the landfill surface concentration of methane using a hydrocarbon detector meeting the requirements of OAR 340-239-0800(1). The landfill surface must be inspected and monitored quarterly using all of the following procedures:

(a) Monitoring Area. The entire landfill surface must be divided into individually identified 50,000 square foot grids and include the entire perimeter of the collection area. The grids must

be used for both instantaneous and integrated surface emissions monitoring. The monitoring must comply with all of the following requirements:

(A) Surface monitoring must be performed in accordance with section 8.3.1 of EPA Method 21 of appendix A of 40 C.F.R. Part 60, except that the probe inlet must be placed within three to two inches of the landfill surface while traversing the grid.

(B) The walking pattern must be no more than a 25-foot spacing interval and must traverse each monitoring grid and:

(i) If the owner or operator has no exceedances of the limits specified in OAR 340-239-0200 after any four consecutive quarterly monitoring periods, the walking pattern spacing may be increased to 100-foot intervals. The owner or operator must return to a 25-foot spacing interval upon any exceedances of the limits specified in OAR 340-239-0200 that cannot be remediated within 10 days or upon any exceedances detected during a DEQ inspection; and

(ii) If an owner or operator of a landfill can demonstrate that in the past three years before the effective date of this division that there were no measured exceedances of the limit specified in OAR 340-239-0200(1)(a) by annual or quarterly monitoring, the owner or operator may increase the walking pattern spacing to 100-foot intervals. The owner or operator must return to a 25-foot spacing interval upon any exceedances of the limits specified in OAR 340-239-0200 that cannot be remediated within 10 days or upon any exceedances detected during a DEQ inspection.

(C) Surface testing must be terminated when the average wind speed exceeds four miles per hour or the instantaneous wind speed exceeds 10 miles per hour. Pursuant to OAR 340-239-0500, DEQ may approve alternatives to this wind speed surface testing termination for landfills consistently having measured winds in excess of these specified limits. Average wind speed must be determined on a five-minute average using an on-site anemometer placed in an open area with a continuous recorder and data logger for the entire duration of the monitoring event. The owner or operator must use a wind barrier, similar to a funnel, when onsite average wind speed exceeds four miles per hour or two meters per second or gust exceeding 10 miles per hour. The wind barrier must surround the SEM monitor, and must be placed on the ground, to ensure wind turbulence is blocked. SEM cannot be conducted if average wind speed exceeds 25 miles per hour.

(D) Monitoring must be performed during typical meteorological conditions.

(b) Instantaneous Surface Emissions Monitoring Procedures must comply with the following:

(A) The landfill owner or operator must record any instantaneous surface readings of methane 100 ppmv or greater. The landfill owner or operator must document if the reading is a confirmed reading or whether it is a nonrepeatable, momentary reading;

(B) Surface areas of the landfill that exceed a methane concentration limit of 500 ppmv, or 200 ppmv if this is to determine compliance with OAR 340-239-0105(5)(b), must be marked and remediated pursuant to OAR 340-239-0600(1)(a);

(C) Surface areas of the landfill that exceed a methane concentration limit of 250 ppmv, or 100 ppmv if this is to determine compliance with OAR 340-239-0105(5)(b), must be monitored in a five foot grid around the location to determine the extents of the methane leak.;

(D) The wind speed must be recorded during the sampling period;

(E) The landfill surface areas with cover penetrations, distressed vegetation, cracks or seeps must also be inspected visually and with a hydrocarbon detector meeting the requirements of OAR 340-239-0800(1). If a landfill would not be subject to quarterly penetration monitoring as otherwise required pursuant to another state or federal regulation such as, including: OAR 340-236-0500, 40 C.F.R. Part 63 Subpart AAAA, 40 C.F.R. 60 Subpart WWW or XXX, and if no methane is detected with the hydrocarbon detector at a specific penetration point for four consecutive quarters, then the landfill monitoring may be reduced to annually at that penetration. If any methane concentration is detected during annual monitoring, the penetration location must return to quarterly monitoring; and

(F) The location of each monitored exceedance must be marked and the location and concentration recorded. The location must be recorded using an instrument with an accuracy of at least four meters. The coordinates must be in decimal degrees with at least five decimal places.

(c) Integrated Surface Emissions Monitoring Procedures must comply with the following:

(A) Integrated surface readings must be recorded and then averaged for each grid;

(B) Individual monitoring grids that exceed an average methane concentration of 25 ppmv must be identified and remediated pursuant to OAR 340-239-0600(1)(b); and

(C) The wind speed must be recorded during the sampling period.

(4) Gas Collection and Control System Leak Inspection Procedures. Landfill owners and operators must measure leaks using a hydrocarbon detector meeting the requirements of OAR 340-239-0800(1).

(5) Determination of Expected Gas Generation Flow Rate. Landfill owners and operators must determine the expected gas generation flow rate as prescribed in 40 C.F.R. § 98.343(1)(a) or 40 C.F.R. § 63.1960(a)(1), which are incorporated by reference herein.

(6) Control Device Destruction Efficiency Determination. Landfill owners and operators must use the following methods of analysis to determine the efficiency of the control device in reducing methane:

(a) For Enclosed Combustors, one of the following test methods, all of which are incorporated by reference herein (and all as promulgated in 40 C.F.R., Part 60, Appendix A), must be used to determine the efficiency of the control device in reducing methane by at least 99 percent, or in reducing the outlet methane concentration for lean burn engines to less than 3,000 ppmv, dry basis, corrected to 15 percent oxygen:

(A) U.S. EPA Reference Method 18, Measurement of Gaseous Organic Compound Emissions By Gas Chromatography;

(B) U.S. EPA Reference Method 25, Determination of Total Gaseous Nonmethane Organic Emissions as Carbon. EPA Reference Method 25A, Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer; or

(C) U.S. EPA Reference Method 25C, Determination of Nonmethane Organic Compounds in Landfill Gases;

(b) The following equation must be used to calculate destruction efficiency:

$$\text{Destruction Efficiency} = \left[1 - \left(\frac{\text{Mass of Methane-Outlet}}{\text{Mass of Methane-Inlet}} \right) \right] \times 100\%$$

(7) Wellhead monitoring.

(a) Landfill owners and operators must determine wellhead nitrogen levels using EPA Reference Method 3C, Determination of Volatile Organic Compound Leaks, 40 C.F.R. Part 60, Appendix A, unless an alternative test method is approved by DEQ.

(b) Unless an alternative test method is established and approved by DEQ, landfill owners and operators must determine wellhead oxygen levels by an oxygen meter using EPA Reference Method 3A or 3C, 40 C.F.R. Part 60, Appendix A, or ASTM D6522-20, except that, if sample location is prior to combustion:

(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.

(c) Landfill owners and operators may use a portable gas composition analyzer to monitor wellhead oxygen levels provided that the analyzer is calibrated and the analyzer meets all quality assurance and quality control requirements for 40 C.F.R. Part 60, Appendix A-1, Method 3A or ASTM D6522-11.

(d) Determination of Gauge Pressure. Landfill owners and operators must determine wellhead gauge pressure using a hand-held manometer, magnahelic gauge, or other pressure measuring

device approved by DEQ. The device must be calibrated and operated in accordance with the manufacturer's specifications.

(e) Landfill owners and operators must calibrate wellhead temperature measuring devices annually using the procedure in 40 C.F.R. Part 60, Appendix A-1, Method 2, Section 10.3 except that a minimum of two temperature points, bracket within 10 percent of all landfill absolute temperature measurements or two fixed points of ice bath and boiling water, corrected for barometric pressure, are used.

(8) Enhanced monitoring. The landfill owner or operator 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:

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

(b) Monitor oxygen or nitrogen concentration as provided in OAR 340-239-0110(3)(a);

(c) Monitor temperature of the landfill gas at the wellhead as provided in OAR 340-239-0600(3);

(d) Monitor temperature of the landfill gas every 10 vertical feet of the well as provided in OAR 340-239-0600(3);

(e) Monitor the methane concentration with a methane meter using EPA Method 3C of Appendix A-6 to 40 C.F.R. Part 60, EPA Method 18 of Appendix A-6 to 40 C.F.R. part 60, 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;

(f) 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, 40 C.F.R. Part 60, Appendix A-4, 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, 40 C.F.R. Part 60, Appendix A-4 to measure carbon monoxide concentrations;

(g) The enhanced monitoring must begin 7 days after the first measurement of landfill gas temperature greater than 62.8 degrees Celsius (145 degrees Fahrenheit);

(h) The enhanced monitoring 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. If monthly carbon monoxide readings exceed 100 ppmv, the landfill must return to weekly monitoring;

(i) The enhanced monitoring can be stopped once a higher operating value is approved, at which time the monitoring provisions issued with the higher operating value must 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); and

(j) 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.

(9) Bioreactor moisture content. The bioreactor moisture content 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. The landfill owner or operator must document the calculations and the basis of any assumptions. Keep the record of the calculations until liquids addition ceases.

(10) Open flares must meet the requirements of 40 C.F.R. § 60.18.

(11) The performance test is not required for boilers and process heaters with design heat input capacities equal to or greater than 44 megawatts per hour (150 million British thermal units per hour) that burn landfill gas for compliance with this division.

(12) Alternative Test Methods. Notwithstanding any other provision in this division, landfill owners and operators may use alternative test methods for any of the test methods described in this rule provided that the alternative methods are approved in writing by DEQ pursuant to OAR 340-239-0500.

Statutory/Other Authority: ORS 468.020, 468A.025, 468A.040 & 468A.050

Statutes/Other Implemented: ORS 468A.025, 468A.040 & 468A.050