WAC 173-408-120 Test methods and procedures. (1) Hydrocarbon detector specifications: Any instrument used for the measurement of methane must be a hydrocarbon detector or other equivalent instrument approved by the department or local authority that meets the following calibration, specifications, and performance criteria, as applicable:

(a) EPA Reference Method 21, Determination of Volatile Organic Compound Leaks, 40 C.F.R. Part 60, Appendix A (in effect on the date in WAC 173-400-025), which is incorporated by reference herein, except as follows:

(i) "Methane" replaces all references to volatile organic compounds (VOC).

(ii) The calibration gas shall be methane.

(b) EPA Other Test Method 51 (OTM-51) as specified in WAC 173-408-990 (Appendix II) of this chapter.

(c) Other approved EPA test methods with concurrent department or local authority approval.

(2) Determination of landfill gas heat input capacity: The landfill gas HIC must be determined in accordance with this subsection:

(a) MSW landfills without carbon adsorption or passive venting systems: The HIC must be calculated using the procedure as specified in WAC 173-408-980 (Appendix I). Additional information may be requested by the department or local authority as necessary to verify the HIC from the MSW landfill. Site-specific data may be substituted when available.

(b) MSW landfills with carbon adsorption systems: The landfill gas HIC at a MSW landfill with a carbon adsorption system must be determined by measuring:

(i) 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

(ii) The methane concentration (percent by volume) using a hydrocarbon detector meeting the requirements of subsection (1) of this section. The total landfill gas flow rate must be multiplied by the methane concentration and then multiplied by the gross heating value (GHV) of methane of 1,012 Btu/scf to determine the landfill gas HIC.

(c) MSW landfills with passive venting systems: The landfill gas HIC at a MSW landfill with a passive venting system must be determined using both of the following, and is the higher of those determined values:

(i) The calculation described in (a) of this subsection; and

(ii) The owner or operator must measure:

(A) The actual landfill gas flow rates (in units of scfm), using a flow meter or other flow measuring device such as a standard pitot tube; and

(B) The methane concentration (percent by volume), using a hydrocarbon detector meeting the requirements of subsection (1) of this section, 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 and then multiplied by the GHV of methane of 1,012 Btu/scf to determine the landfill gas HIC.

(3) Surface emissions monitoring procedures: The owner or operator of a MSW landfill must measure the landfill surface concentration of methane using a hydrocarbon detector meeting the requirements of subsection (1) of this section. The landfill surface must be inspected using the following procedures:

(a) Monitoring area: The entire landfill surface must be divided into individually identified 50,000 square foot grids. The grids must be used for both instantaneous and integrated surface emissions monitoring.

(i) Testing must be performed by holding the hydrocarbon detector's probe within three inches of the landfill surface while traversing the grid, except where alternatives to EPA Reference Method 21 are used.

(ii) The walking pattern must be no more than 25-foot spacing intervals and must traverse each monitoring grid.

(A) If the owner or operator measures no exceedances of the limits in WAC 173-408-100(2), 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 detection of any exceedances of the limits in WAC 173-408-100(2) that cannot be remediated within 10 calendar days or upon any exceedances detected during a compliance inspection.

(B) If an owner or operator of a MSW landfill can demonstrate that in the three years before the effective date of this chapter that there were no measured exceedances of the limits in WAC 173-408-100(2), by annual or quarterly instantaneous surface emissions 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 detection of any exceedances of the limits in WAC 173-408-100(2) that cannot be remediated within 10 calendar days, or upon any exceedances detected during a compliance inspection. The demonstration must prove to the satisfaction of the department or local authority that any instrument used for methane detection meets the requirements of subsection (1) of this section.

(iii) Surface testing must be terminated when the average wind speed exceeds five miles per hour, or the instantaneous wind speed exceeds 10 miles per hour. Surface testing can continue when the average wind speed is five miles per hour or less. The department or local authority may approve alternatives to this wind speed surface testing termination for MSW landfills consistently having measured winds in excess of these specified limits. Average wind speed must be determined on a 15-minute average using an on-site anemometer with a continuous recorder for the entire duration of the monitoring event.

(iv) Surface emissions testing must be conducted only when there has been no measurable precipitation in the preceding 72 hours. The department or local authority may approve alternatives to this procedure for MSW landfills that cannot meet the requirements of this subsection.

(v) Monitoring should be conducted during average barometric pressure conditions to the extent possible.

(b) Instantaneous surface emissions monitoring procedures:

(i) The owner or operator must record any instantaneous surface readings of methane 200 ppmv or greater, other than those measured by "nonrepeatable, momentary readings," as defined in WAC 173-408-020;

(ii) Surface areas of the MSW landfill that exceed a methane concentration limit of 500 ppmv must be marked and remediated in accordance with WAC 173-408-110 (1)(b) and (c);

(iii) The entirety of landfill surface areas with cover penetrations, distressed vegetation, cracks, or seeps must also be inspected visually and with a hydrocarbon detector that meets the requirements of subsection (1) of this section. Exceedances of a methane concentra-

tion limit of 500 ppmv must be marked and remediated in accordance with WAC 173-408-110 (1)(b) and (c);

(iv) 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 14 feet. The coordinated must be in decimal degrees with at least five decimal places; and

(v) The wind speed and barometric pressure must be recorded during the sampling period.

(c) Integrated surface emissions monitoring procedures:

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

(ii) Individual monitoring grids that exceed an average methane concentration of 25 ppmv must be identified and remediated in accordance with WAC 173-408-110 (1)(b) and (d); and

(iii) The wind speed and barometric pressure must be recorded during the sampling period.

(4) Gas collection and control system leak procedures: The owner or operator of a MSW landfill, or third-party owner or operator of a landfill gas control system, must measure leaks using a hydrocarbon detector meeting the requirements of subsection (1) of this section.

(5) Determination of expected gas generation flow rate: The expected gas generation flow rate must be determined as prescribed by the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories, Chapter 3, which is incorporated by reference herein, using a recovery rate of 75 percent.

(6) Control device destruction efficiency determination: The control device destruction efficiency must be determined according to the following methods:

(a) Enclosed combustors: One of the following test methods in 40 C.F.R., Part 60, Appendix A (in effect on the date in WAC 173-400-025), must be used to determine the efficiency of the control device:

(i) U.S. EPA Reference Method 18, Measurement of Gaseous Organic Compound Emissions by Gas Chromatography (in effect on the date in WAC 173-400-025);

(ii) U.S. EPA Reference Method 25, Determination of Total Gaseous Nonmethane Organic Emissions as Carbon (in effect on the date in WAC 173-400-025);

(iii) U.S. EPA Reference Method 25A, Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer (in effect on the date in WAC 173-400-025); or

(iv) U.S. EPA Reference Method 25C, Determination of Nonmethane Organic Compounds in Landfill Gases (in effect on the date in WAC 173-400-025).

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

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

(b) Open flares: Open flares must meet the requirements of 40 C.F.R. 60.18 (in effect on the date in WAC 173-400-025).

(7) Determination of gauge pressure: Gauge pressure must be determined using a hand-held manometer, magnehelic gauge, or other pressure measuring device approved by the department or local authority.

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

(8) Alternative test methods: Alternative test methods may be used if they are approved in writing by the department or local authority.

[Statutory Authority: Chapter 70A.540 RCW. WSR 24-11-052 (Order 22-15), § 173-408-120, filed 5/13/24, effective 6/13/24.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.