**Section 220.240 Compliance Procedures for Gas Collection Systems**

a) The methods specified in subsections (a)(1) through (a)(6) of this Section shall be used to determine whether the gas collection system is in compliance with Section 220.220 of this Subpart.

1) To calculate the maximum expected gas generation flow rate from the MSW landfill, one of the following equations shall be used. The k and Lo kinetic factors shall be those published in the Compilation of Air Pollutant Emission Factors (AP-42) incorporated by reference in Section 220.130 of this Part, or other site-specific emission factors approved by the Agency. If k has been determined as specified in Section 220.260(a)(4) of this Subpart, the value of k determined from the test shall be used. A value of no more than 15 years shall be used for the intended use period of the gas mover equipment, the variable t. The active life of the landfill is the age of the landfill plus the estimated number of years until closure.

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

|  |  |  |
| --- | --- | --- |
| Qm | = | 2LoR(e-kc-e-kt) |

where:

|  |  |  |
| --- | --- | --- |
| Qm | = | maximum expected gas generation flow rate, m3/yr |
| Lo | = | methane generation potential, m3 per Mg solid waste |
| R | = | average annual acceptance rate, Mg/yr |
| k | = | methane generation rate constant, yr-1 |
| t | = | age in years of the landfill at equipment installation plus time the owner or operator intends to use the gas mover equipment or active life of the landfill, whichever is less. If the equipment is installed after closure, t in years is the age of the landfill at installation |
| c | = | time since closure, years (for an active landfill c = 0 and e-kc=1) |

B) For sites with known year-to-year solid waste acceptance rates:

|  |  |  |  |
| --- | --- | --- | --- |
| Qm | = | n | 2kLoMi(e-kti) |
| Σ |
| i=1 |

where:

|  |  |  |
| --- | --- | --- |
| Qm | = | maximum expected gas generation flow rate, m3/yr |
|  |  |  |
| k | = | methane generation rate constant, yr-1 |
|  |  |  |
| Lo | = | methane generation potential, m3 per Mg solid waste |
|  |  |  |
| Mi | = | mass of solid waste in the ith section, Mg |
|  |  |  |
| ti | = | age of the ith section, yr |

C) If a collection and control system has been installed, actual flow data may be used to project the maximum expected gas generation flow rate instead of, or in conjunction with, the equations in subsections (a)(1)(A) and (a)(1)(B) of this Section. If the landfill is still accepting waste, the actual measured flow data will not equal the maximum expected gas generation rate, so calculations made using the equations in subsection (a)(1)(A) or (a)(1)(B) of this Section or other methods shall be used to predict the maximum gas generation rate over the intended period of use of the gas control system equipment.

2) For the purpose of determining the sufficient number of gas collectors, the owner or operator shall design a system of vertical wells, horizontal collectors, or other type of collection device, capable of controlling and extracting gas from all portions of the landfill sufficient to meet the operational and performance standards of Sections 220.220 through 220.250. Such design must be approved by the Agency as part of an air construction permit or a CAAPP permit, if the gas collection system was installed prior to July 31, 1998.

3) For the purpose of demonstrating whether the gas collection system flow rate of an active collection system is sufficient, the owner or operator shall measure gauge pressure in the gas collection header at each individual well monthly. If positive pressure exists, action shall be initiated to correct the exceedence within 5 calendar days, except for the three conditions allowed under Section 220.250(b) of this Subpart. If negative pressure cannot be achieved without excess air infiltration within 15 calendar days after the first measurement, the gas collection system shall be expanded to correct the exceedence within 120 days after the initial measurement of positive pressure. Any attempted corrective measure must not cause exceedences of other operational or performance standards. An alternate timeline for correcting the exceedence may be submitted to the Agency for approval.

4) Owners or operators are not required to expand the system, as required in subsection (a)(3) of this Section, during the first 180 days after gas collection system startup.

5) For purposes of identifying whether excess air infiltration into the landfill is occurring, the owner or operator shall monitor each well on a monthly basis for temperature and nitrogen or oxygen, as provided in Section 220.250(c) of this Subpart. If a well exceeds one of these operating parameters, action shall be initiated to correct the exceedence within 5 calendar days. If correction of the exceedence cannot be achieved within 15 calendar days after the first measurement, the gas collection system shall be expanded to correct the exceedence within 120 days after the initial exceedence. An alternate timeline for correcting the exceedence may be submitted to the Agency for approval.

6) An owner or operator using a collection system that does not conform to the specifications provided in Section 220.220(b) or (c) of this Subpart shall provide information satisfactory to the Agency, as specified in Section 220.220(d) of this Subpart, demonstrating that off-site migration is being controlled.

b) To comply with the operational standards in Section 220.250(a) of this Subpart, each owner or operator of a controlled landfill shall install each well or design component as specified in a construction permit issued by the Agency. Each well shall be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of:

1) 5 years or more if active; or

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

c) The following procedures shall be used for compliance with the surface methane operational standard as provided in Section 220.250(d) of this Subpart.

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

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

3) Surface emission monitoring shall be performed in accordance with section 4.3.1 of Method 21 of Appendix A, 40 CFR 60, incorporated by reference in Section 220.130 of this Part, except that the probe inlet shall be placed within 5 to 10 cm of the ground. Monitoring shall be performed during typical meteorological conditions.

4) Any reading of 500 ppm or more above background at any location shall be recorded as a monitored exceedence and the actions specified in subsections (c)(4)(A) through (c)(4)(E) of this Section shall be taken. As long as the actions specified below are taken, the exceedence is not a violation of the operational requirements of Section 220.250(d) of this Subpart.

A) The location of each monitored exceedence shall be marked and the location recorded.

B) Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection in the vicinity of each exceedence shall be made and the location shall be remonitored within 10 calendar days after detecting the exceedence.

C) If the remonitoring of the location shows a second exceedence, additional corrective action shall be taken and the location shall be monitored again within 10 days after the second exceedence. If the remonitoring shows a third exceedence for the same location, the action specified in subsection (c)(4)(E) of this Section shall be taken. No further monitoring of that location is required until the action specified in subsection (c)(4)(E) of this Section has been taken.

D) If the remonitoring of the location does not show an exceedence, as specified by subsection (c)(4)(B) or (c)(4)(C), the location shall be remonitored 1 month from the initial exceedence. If the 1 month remonitoring shows a concentration less than 500 ppm above background, no further monitoring of that location is required until the next quarterly monitoring period. If the 1 month remonitoring shows an exceedence, the actions specified in subsection (c)(4)(C) or (c)(4)(E) of this Section, as appropriate, shall be taken.

E) For any location where there are three monitored exceedences within a quarterly period, a new well or other collection device shall be installed within 120 calendar days after the initial exceedence. An alternate remedy to the exceedence, such as upgrading the blower, header pipes, or control device, and a corresponding timeline for installation may be submitted to the Agency for approval.

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

d) The following instrumentation specifications and procedures for surface emission monitoring devices apply to the monitoring required by subsection (c) of this Section:

1) The portable analyzer shall meet the instrument specifications provided in Section 3, Method 21, Appendix A, 40 CFR 60, incorporated by reference in Section 220.130 of this Part, except that methane shall replace all references to VOC.

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

3) To meet the performance evaluation requirements in Section 3.1.3, Method 21, Appendix A, 40 CFR 60, incorporated by reference in Section 220.130 of this Part, the instrument evaluation procedures of Section 4.4 of Method 21, Appendix A, 40 CFR 60, incorporated by reference in Section 220.130 of this Part, shall be used.

4) The calibration procedures provided in Section 4.2, Method 21, Appendix A, 40 CFR 60, incorporated by reference in Section 220.130 of this Part, shall be followed immediately before commencing a surface monitoring survey.

e) The MSW landfill owners or operators are required to comply with the provisions of this Subpart at all times, except during periods of start-up, shutdown, or malfunction, provided that the duration of start-up, shutdown, or malfunction must not exceed 5 days for collection systems and must not exceed 1 hour for treatment or control devices.