Appendix E

Comparison of the Major Provisions of the Emission Guidelines and California's Landfill Methane Regulation

Regulation Topic	Federal Requirements[1]	State Requirements[2]	More Stringent
Applicability to Municipal Solid Waste Landfills	*§60.31f - Designated Facilities*	*§95461 – Applicability*	
	Applies to "existing" municipal solid waste (MSW) landfills constructed, reconstructed, or modified on or before 7/17/14, and accepted waste after 11/8/87 (EG).	Applies to all MSW landfills that received waste after 1/1/77; unless exemption conditions are met (Control Measure).	State
Implementation and Compliance Schedule	*§60.32f - Compliance Times* *§60.33f - Emission Guidelines for Municipal Solid Waste Landfill Emissions* *§60.38f - Reporting Guidelines*	*§95463 - Determination for Installing a Gas Collection and Control System* *§95464 - Gas Collection and Control System Requirements*	
	MSW landfills having a design capacity of ≤ 2.5 million Mg by mass and 2.5 million m3 by volume, must submit an initial design capacity report within 90 days of the EPA approved State Plan.	Active MSW landfills having <450,000 tons of waste-in-place (WIP), must submit a WIP report within 90 days of effective date of this subarticle.	State
	MSW landfills having a design capacity of ≥ 2.5 million Mg by mass and 2.5 million m3 by volume, must submit a non-methane organic compound (NMOC) emission rate report within 90 days of the EPA approved State Plan.	If a MSW landfill has ≥ 450,000 tons of WIP or upon reaching 450,000 tons of WIP, a landfill gas heat capacity report must be submitted within 90 days of effective date of this subarticle.	State
	Design Plan within one year after determining NMOC emission rate is ≥ 34 Mg/yr (or ≥ 50 Mg/yr for closed landfill subcategory).	Design Plan by June 17, 2011; or within one year after determining landfill gas heat input capacity is ≥ 3.0 MMBtu/hr; or within one year of measuring a leak on the landfill surface > 200 ppm pursuant to the surface methane demonstration test.	State
	If a MSW landfill has a design capacity of ≥ 2.5 million Mg by mass and 2.5 million m3 by volume, install gas collection and control system (GCCS):	If a MSW landfill has a WIP of ≥ 450,000 tons and gas heat input capacity (HIC) is ≥ 3.0 MMBtu/hr, install GCCS:	State
	Within 30 months after NMOC emission rate is ≥ 34 Mg/yr, or within 30 months after NMOC emission rate is 50 Mg/yr for closed landfill subcategory, or	Within 18 months after approval of the Design Plan for active MSW landfills.	State

Regulation Topic	Federal Requirements[1]	State Requirements[2]	More Stringent
	Within 30 months after the date of the most recent NMOC emission rate is ≥ 34 Mg/yr, or Tier 4 surface emissions monitoring shows a surface methane emission measurement of ≥ 500 ppm.	Within 30 months after approval of the Design Plan for closed or inactive MSW landfills.	State
	Initial Performance Test of control system within 180 days from initial startup.	Initial Performance Test of control system within 180 days from initial start-up.	Same
Gas Collection and Control System	*§60.33f - Emission Guidelines for Municipal Solid Waste Landfill Emissions* *§60.34f - Operational Standards for Collection and Control Systems*	*§ 95464- Gas Collection and Control System Requirements*	
	An active collection system shall be designed to handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control or treatment system equipment.	Requires an active collection system that must be designed and operated to draw all the gas toward the gas control device or devices.	Similar
	Install a control device that achieves a NMOC reduction efficiency of 98 percent. If enclosed combustion device, reduce the outlet NMOC concentration to less than 20 ppmv, dry basis as hexane at 3 percent oxygen or less.	Install a control device that achieves a methane reduction efficiency of 99 percent for most control devices; lean-burn engines must reduce outlet methane concentration to < 3,000 ppmv, dry basis, corrected to 15 percent oxygen.	State
	Gas can be routed to an open flare, enclosed combustion device, or a treatment system that processes the collected gas for subsequent sale or beneficial use.	Gas can be routed to an enclosed combustion device, or a treatment system that processes the collected gas for subsequent sale or beneficial use. Open flares are not allowed; except under specific conditions.	State
	Carbon adsorption and passive gas collection systems allowed if conditions are met.	Carbon adsorption and passive gas collection systems are not allowed.	State
	Collect gas from each area, cell, or group of cells in the landfill in which the initial solid waste has been placed for a period of 5 years or more if active; or 2 years or more if closed or at final grade.	Expansion of the collection system based on exceedance of either the integrated and/or instantaneous surface methane emission limits that cannot be corrected after the third measured exceedance.	State

Regulation Topic	Federal Requirements[1]	State Requirements[2]	More Stringent
	Not specified.	The owner or operator must conduct an annual source test for any gas control device using the test methods specified in this control measure.	State
	Not specified.	If a gas control device remains in compliance after three consecutive source tests the owner or operator may conduct the source test every three years. If a subsequent source test shows the gas collection and control system is out of compliance the source testing frequency will return to annual.	State
	Not specified.	Components containing landfill gas and under positive pressure must be monitored quarterly for leaks. Any component leak must be tagged and repaired within 10 calendar days. Component leak testing at MSW landfills having landfill gas-to-energy facilities may be conducted prior to scheduled maintenance or planned outage periods.	State
	Operate the collection system with negative pressure at each wellhead except under certain conditions indicative of a fire, area cover type, or decommissioned well.	Each wellhead must be operated under a vacuum (negative pressure) except for circumstances specified in the control measure.	Similar
Component Leak Testing	Not specified.	*§ 95464- Gas Collection and Control System Requirements*	
	Not specified.	Operate the gas collection and control system so that there is no landfill gas leak that exceeds 500 ppmv, measured as methane, at any component under positive pressure. Component leak testing at MSW landfills having landfill gas-to-energy facilities may be conducted prior to scheduled maintenance or planned outage periods.	State

Regulation Topic	Federal Requirements[1]	State Requirements[2]	More Stringent
Surface Emissions Monitoring	*§60.34f – Operational Standards for Collection and Control Systems* *§60.35f - Test Methods and Procedures* *§60.37f – Monitoring of Operations* *§60.38f - Reporting Guidelines*	*§ 95465- Surface Methane Emission Standards* *§ 95469- Monitoring Requirements* *§ 95471- Test Methods and Procedures*	
	Operate the collection system so that the methane concentration is less than 500 ppm above background at the surface of the landfill.	No location on the MSW landfill surface may exceed the 500 ppmv methane concentration limits, as determined by instantaneous surface emissions monitoring except for situations listed in this control measure.	Similar
	Not specified.	No location on the MSW landfill surface may exceed an average methane concentration limit of 25 ppmv as determined by integrated surface emissions monitoring.	State
	Not specified.	Conduct integrated surface monitoring of the landfill surface quarterly.	State
	Not specified.	Integrated surface readings must be recorded and then averaged for each grid.	State
	Not specified.	Individual monitoring grids that exceed an average methane concentration of 25 ppmv must be identified and remediated.	State
	Not specified.	The wind speed must be recorded during the integrated sampling period.	State
	Monitor surface concentrations of methane for each collection area on a quarterly basis.	Conduct instantaneous surface monitoring of the landfill surface quarterly.	State
	Any reading of 500 ppm or more above background at any location shall be recorded as a monitored exceedance and the actions specified in the regulation shall be taken.	Surface areas of the MSW landfill that exceed a methane concentration limit of 500 ppmv must be marked and remediated.	Similar

Regulation Topic	Federal Requirements[1]	State Requirements[2]	More Stringent
	Not specified.	The owner or operator must record any instantaneous surface readings of methane 200 ppmv or greater, other than non-repeatable, momentary readings.	State
	Not specified.	The wind speed must be recorded during the instantaneous sampling period.	State
	Surface testing shall be conducted where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover. Areas with steep slopes or other dangerous areas may be excluded from the surface testing.	The landfill surface areas with cover penetrations, distressed vegetation, cracks or seeps must also be inspected visually and with a hydrocarbon detector.	Same
	The portable analyzer shall meet the calibration, performance, and instrument specifications provided in EPA Method 21, except that methane shall replace all references to VOC.	Any instrument used for the measurement of methane must be a gas detector or other equivalent instrument must meet the calibration, specifications, and performance criteria of EPA Reference Method 21, “Methane” replaces all references to VOC.	Same
	Not specified.	The entire landfill surface must be divided into individually identified 50,000 square foot grids. The grids must be used for instantaneous and integrated surface emissions monitoring.	State
	Monitor surface concentrations of methane along the entire perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals (or a site-specific established spacing).	The walking pattern must be no more than a 25-foot spacing interval and must traverse each monitoring grid. If the owner or operator has no exceedances of the limits after any four consecutive quarterly monitoring periods or can demonstrate that in the past three years before the effective date of this subarticle that there were no measured exceedance of the limits, the walking pattern spacing may be increased to 100-foot intervals.	State

Regulation Topic	Federal Requirements[1]	State Requirements[2]	More Stringent
	Monitoring shall be performed during typical meteorological conditions.	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. 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. Surface emissions testing must be conducted only when there has been no measurable precipitation in the preceding 72 hours.	State
	Using optional Tier 4 procedures - Any closed landfill that has no monitored exceedances of the operational standard in four consecutive quarterly monitoring periods may skip to annual monitoring. Any methane reading of 500 ppm or more detected during the annual monitoring requires the owner or operator to submit a GCCS design plan.	Optional surface demonstration test can be used if landfill gas heat input capacity is ≥ 3.0 MMBtu/hr (for uncontrolled landfills only). This test is used for determining when a GCCS is required to be installed and is based on surface methane emissions being < 200 ppmv for 4 consecutive quarters (regardless if the landfill is closed, active, or inactive).	State
	A surface monitoring design plan shall be developed that includes a topographical map with the monitoring route and the rationale for any site-specific deviations from the 30 meter intervals.	The location of the grids and the gas collection system must be clearly marked and identified on a topographic map of the MSW landfill drawn to scale.	State
	Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection in the vicinity of each exceedance shall be made and the location shall be re-monitored within 10 calendar days of detecting the exceedance.	Within 10 calendar days of a measured exceedance of the 500 ppmv instantaneous or 25 ppmv integrated surface methane emission standards, 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 re-monitored.	State
	If the re-monitoring of the location shows a second exceedance, additional corrective action shall be taken and the location shall be monitored again within 10 days of the second exceedance.	If the re-monitoring of the grid shows a second exceedance of the surface methane emission standards, additional corrective action must be taken and the location must be re-monitored again no later than 10 calendar days after the second exceedance.	Similar

Regulation Topic	Federal Requirements[1]	State Requirements[2]	More Stringent
	For any location where monitored methane concentration equals or exceeds 500 ppm above background 3 times within a quarterly period, a new well or other collection device shall be installed within 120 calendar days of the initial exceedance.	If the re-monitoring shows a third exceedance of the surface methane emission standards, the owner or operator must install a new or replacement well as determined to achieve compliance no later than 120 calendar days after detecting the third exceedance.	State