

**MARICOPA COUNTY
AIR POLLUTION CONTROL REGULATIONS
REGULATION III – CONTROL OF AIR CONTAMINANTS**

**RULE 321
EXISTING MUNICIPAL SOLID WASTE (MSW) LANDFILLS**

INDEX

SECTION 100 – GENERAL

- 101 PURPOSE
- 102 APPLICABILITY

SECTION 200 – DEFINITIONS

- 201 AFFECTED FACILITY
- 202 COMMENCED

SECTION 300 – STANDARDS

- 301 REQUIREMENTS FOR EXISTING MSW LANDFILLS WITH NMOC EMISSION RATES AT OR ABOVE FEDERAL THRESHOLDS
- 302 REQUIREMENTS FOR EXISTING MSW LANDFILLS WITH NMOC EMISSION RATES BELOW FEDERAL THRESHOLDS

SECTION 400 – ADMINISTRATIVE REQUIREMENTS

SECTION 500 – MONITORING AND RECORDS

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**RULE 321
EXISTING MUNICIPAL SOLID WASTE (MSW) LANDFILLS**

SECTION 100 – GENERAL

- 101 PURPOSE:** To limit the emissions of non-methane organic compounds (NMOC) from existing MSW landfills.
- 102 APPLICABILITY:** The provisions of this rule shall apply to existing MSW landfills that:
- 102.1** Commenced construction, reconstruction, or modification on or before July 17, 2014; and
 - 102.2** Have accepted waste at any time since November 8, 1987 or have additional design capacity available for future waste deposition.

SECTION 200 – DEFINITIONS: See Maricopa County Air Control Regulations, Rule 100 (General Provisions and Definitions) and 40 CFR 60, Subpart Cf for definitions of terms that are used but not specifically defined in this rule. For the purpose of this rule, the following definitions shall apply, in addition to those definitions found in Rule 100 and 40 CFR 60, Subpart Cf. In the event of any inconsistency between any of the Maricopa County Air Pollution Control Regulations, the definitions in this rule take precedence.

- 201 AFFECTED FACILITY:** Any MSW landfill to which this rule is applicable.
- 202 COMMENCED:** State or condition where an owner or operator has undertaken a continuous program of construction; or where an owner or operator has entered into a contractual obligation to undertake and complete such a program.

SECTION 300 – STANDARDS

- 301 REQUIREMENTS FOR EXISTING MSW LANDFILLS WITH NMOC EMISSION RATES AT OR ABOVE FEDERAL THRESHOLDS:** Each owner or operator of an affected facility which reaches or exceeds the annual NMOC emission rates specified in 40 CFR 60.33f(a)(3) or 40 CFR 60.33f(a)(4) shall comply with all requirements of 40 CFR 60, Subpart Cf. All references to the Administrator in 40 CFR 60, Subpart Cf shall be understood as the Control Officer, except that the Control Officer shall not be empowered to approve alternative test methods to determine the NMOC emission rate.

302 REQUIREMENTS FOR EXISTING MSW LANDFILLS WITH NMOC

EMISSION RATES BELOW FEDERAL THRESHOLDS: Each owner or operator of an affected facility with annual NMOC emission rates below those specified in 40 CFR 60.33f(a)(3) or 40 CFR 60.33f(a)(4) with an installed and operational landfill gas collection and control system (GCCS) shall comply with the following requirements:

302.1 Operational Requirements: Each owner or operator shall operate and maintain an existing GCCS that meets the following requirements:

- a. The GCCS shall:
 - (1) Be designed and operated to handle the expected gas flow rate;
 - (2) Contain extraction wells which shall be maintained in any number and spacing necessary to maintain emission and migration control and to collect gas from each area, cell, or group of cells in the landfill which are still generating gas as determined by measures of performance set forth in this rule;
 - (3) Collect gas at a rate sufficient to maintain a negative pressure at all wellheads in the collection system without causing air infiltration, including any wellheads connected to the system as a result of expansion or excess surface emissions, for the life of the blower; and
 - (4) Be designed and operated to minimize off-site migration of subsurface gas and potential offsite impacts.
- b. All collected gas shall be routed to a control system that complies with the requirements in either paragraph (1), (2), or (3) of this section.
 - (1) A non-enclosed flare designed and operated in accordance with the parameters established in 40 CFR 60.18; or
 - (2) A control system designed and operated to reduce NMOC by 98 weight percent, or, when an enclosed combustion device is used for control, to either reduce NMOC by 98 weight percent or reduce the outlet NMOC concentration to less than 20 parts per million (ppm) by volume, dry basis as hexane at 3% oxygen. The reduction efficiency or ppm by volume must be established by an initial performance test to be completed no later than 180 days after the initial startup of the approved control system using the test methods specified in § 302.2(a). The performance test is not required for boilers and process heaters with design heat input capacities equal to or greater than 44 megawatts that burn landfill gas for compliance with § 302.
 - (a) If a boiler or process heater is used as the control device, the landfill gas stream must be introduced into the flame zone.
 - (b) The control device must be operated within the parameter ranges established during the initial or most recent performance test. The operating parameters to be monitored are specified in § 302.1(c);
 - (3) Route all the collected gas to a treatment system that processes the collected gas for subsequent sale or beneficial use such as fuel for combustion, production of vehicle fuel, production of high-Btu gas for pipeline injection,

or use as a raw material in a chemical manufacturing process. Venting of treated landfill gas to the ambient air is not allowed. If the treated landfill gas cannot be routed for subsequent sale or beneficial use, then the treated landfill gas must be controlled according to either paragraph (1) or (2) of this section.

- (4) All emissions from any atmospheric vent from the gas treatment system are subject to the requirements of paragraph (1) or (2) of this section. For purposes of § 302, atmospheric vents located on the condensate storage tank are not part of the treatment system and are exempt from the requirements of paragraph (1) or (2) of this section.

c. The GCCS shall be operated:

- (1) Within the parameter ranges established during the most recent performance test.
- (2) With negative pressure at each wellhead except under the following conditions:
 - (a) A fire or increased well temperature. The owner or operator shall record instances when positive pressure occurs in efforts to avoid a fire.
 - (b) Use of a geomembrane or synthetic cover. The owner or operator shall develop acceptable pressure limits in the GCCS design plan.
 - (c) A decommissioned well. The owner or operator shall record any decommissioning of wells.
 - (d) When the GCCS is not operating. The owner or operator shall record instances when the GCCS is not operating or being used intermittently.
 - (e) When using a passive venting system, as included in the approved GCCS design plan.
- (3) At all times when the collected gas is routed to the control device.
- (4) So that the methane concentration is less than 500 ppm above background at the surface of the landfill, as per the requirements and frequencies under § 302.4(c). To determine if this level is exceeded, the owner or operator must:
 - (a) Conduct surface testing using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the compliance specifications in § 302.3(b).
 - (b) Conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at no more than 30-meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover and all cover penetrations which extend into the waste mass. Thus, the owner or operator must monitor any openings that are within an area of the landfill where waste has been placed and a gas collection system is required. The owner or operator may establish an alternative traversing pattern that ensures equivalent coverage.

- (c) Develop a surface monitoring plan to be included in the design plan that includes a topographical map with the monitoring route and the rationale for any site-specific deviations from the 30-meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing.
- d. The owner or operator shall submit a revision to the most current GCCS design plan whenever a change is made to the GCCS.

302.2 Test Methods and Procedures: Each owner or operator of a control system described in § 302.1(b)(2) shall conduct a performance test of the control system at least once every five years in accordance with Rule 270 of these regulations and the provisions below:

- a. Performance testing shall be conducted using the following test methods:
 - (1) EPA Method 25, 25C, or 18 shall be used to determine compliance with the 98 weight percent efficiency or the 20 ppm by volume outlet concentration level requirement.
 - (a) In cases where the outlet concentration is less than 50 ppm NMOC as carbon (8 ppm NMOC as hexane), EPA Method 25A should be used in place of EPA Method 25.
 - (b) If using EPA Method 18, the minimum list of compounds to be tested shall be those published in the most recent Compilation of Air Pollutant Emission Factors (AP-42).

- (2) The following equation shall be used to calculate control efficiency:

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

where,

NMOC_{in} = mass of NMOC entering control device

NMOC_{out} = mass of NMOC exiting control device

- (3) EPA Method 3 or 3A shall be used to determine the oxygen content for correcting the NMOC concentration as hexane to 3% oxygen. EPA Method 19 shall be used to determine the exhaust stream flowrate.
- (4) EPA Method 7E shall be used to determine emissions of NO_x and EPA Method 10 shall be used to determine emissions of CO.
- (5) If using an enclosed flare, the owner or operator shall record the combustion chamber temperature and landfill gas flow rate during the performance test.
- b. The NMOC emission rate for the landfill shall be calculated using the following equation:

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

where,

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

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

C_{NMOC} = NMOC concentration, ppm by volume as hexane

- (1) The flow rate of landfill gas, Q_{LFG} , shall be determined by measuring the total landfill gas flow rate at the common header pipe that leads to the control device using a gas flow measuring device calibrated according to the provisions of section 10 of EPA Method 2E or according to manufacturer recommendations.
- (2) The average NMOC concentration, C_{NMOC} , shall be determined by collecting and analyzing landfill gas sampled from the common header pipe before the gas moving or condensate removal equipment using the procedures in EPA Methods 25C or 18. If using EPA Method 18, the minimum list of compounds to be tested shall be those published most recently in AP-42. The sample location on the common header pipe shall be before any condensate removal or other gas refining units. The owner or operator shall divide the NMOC concentration from EPA Method 25C by six to convert from C_{NMOC} as carbon to C_{NMOC} as hexane.
- (3) The NMOC emission rate for the landfill will be assumed to be greater than 17 megagrams per year until the owner or operator calculates the NMOC rate for the landfill to be less than 17 megagrams per year as described in § 302.6(c).

302.3 Compliance: Each owner or operator shall utilize the following methods to determine compliance with the operational requirements of § 302.1.

- a. The following procedures must be used for compliance with the GCCS operational requirements as provided in § 302.1:
 - (1) Actual flow data may be used instead of, or in conjunction with, the equations in 40 CFR 60.36f(a)(1) to project the expected gas generation flow rate.
 - (2) For the purposes of determining sufficient density of gas collectors, the owner or operator shall maintain a system of vertical wells, horizontal collectors, or other collection devices consistent with the approved GCCS design plan, capable of controlling and extracting gas from all portions of the landfill sufficient to meet all operational and performance standards.
 - (3) The provisions of this rule apply at all times that the GCCS is in operation. The gas mover system must be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere must be closed within one hour of the collection or control system not operating.
- b. The following procedures must be used for compliance with the surface methane operational requirements as provided in § 302.1 and frequencies as provided in § 302.4(c):
 - (1) After startup of the GCCS, the owner or operator must monitor surface concentrations of methane along the entire perimeter of the collection area and along a pattern that traverses the landfill at no more than 30-meter intervals (or a site-specific established spacing) for each collection area on a quarterly basis using an organic vapor analyzer, flame ionization detector, or

other portable monitor meeting the specifications provided in paragraph b(6) of this section, or through the use of alternative technologies if approved by the Control Officer.

- (2) The background concentration must be determined by moving the probe inlet upwind and downwind outside the boundary of the landfill at a distance of at least 30 meters from the perimeter wells.
- (3) Surface emission monitoring must be performed in accordance with EPA Method 21, except that the probe inlet must be placed within 5 to 10 centimeters of the ground. Monitoring must be performed during typical meteorological conditions.
- (4) Any reading of 500 ppm or more above background at any location must be recorded as a monitored exceedance and the below actions must be taken. As long as the specified actions are taken, the exceedance is not a violation of the operational requirements of § 302.1:
 - (a) The location of each monitored exceedance must be marked and the location and concentration recorded. Location shall be recorded as 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.
 - (b) Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection in the vicinity of each exceedance must be made and the location must be re-monitored within 10 calendar days of detecting the exceedance.
 - (c) If the re-monitoring of the location shows a second exceedance, additional corrective action must be taken and the location must be monitored again within 10 days of the second exceedance. If the re-monitoring shows a third exceedance for the same location, the action specified in paragraph (b)(4)(e) of this section must be taken, and no further monitoring of that location is required until the action specified in paragraph (b)(4)(e) of this section has been taken.
 - (d) Any location that initially showed an exceedance but has a methane concentration less than 500 ppm methane above background at the 10-day re-monitoring specified in paragraph (b)(4)(b) or (c) of this section must be re-monitored one month from the initial exceedance. If the one-month re-monitoring shows a concentration less than 500 ppm above background, no further monitoring of that location is required until the next quarterly monitoring period. If the one-month re-monitoring shows an exceedance, the actions specified in paragraph (b)(4)(c) or (e) of this section must be taken.
 - (e) 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 must be installed within 120 calendar days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header pipes or control device, and a

corresponding timeline for installation may be submitted to the Control Officer for approval.

- (5) The owner or operator must implement a program to monitor for cover integrity and implement cover repairs as necessary on a quarterly basis. If there are no cover issues identified for three consecutive quarterly monitoring periods, then the owner or operator may skip to annual monitoring. Any closed landfill that has skipped to annual monitoring and has had no cover issues identified for three consecutive years may stop monitoring for cover integrity, except after extreme weather events. In the case of extreme weather events, such as receiving 1 inch or more of rain over any 24 hour period as measured from the nearest Flood Control District of Maricopa County rain gauge, all necessary cover repairs must be made as soon as practical.
- (6) Each owner or operator seeking to comply with the provisions in this section must comply with the following instrumentation specifications and procedures for surface emission monitoring devices:
 - (a) The portable analyzer must meet the instrument specifications provided in section 6 of EPA Method 21, except that “methane” replaces all references to “VOC”.
 - (b) The calibration gas must be methane, diluted to a nominal concentration of 500 ppm in air.
 - (c) To meet the performance evaluation requirements in section 8.1 of EPA Method 21, the instrument evaluation procedures of section 8.1 of EPA Method 21 must be used.
 - (d) The calibration procedures provided in sections 8 and 10 of EPA Method 21 must be followed immediately before commencing a surface monitoring survey.

302.4 Monitoring of Operations: Each owner or operator shall monitor landfill operations by complying with the following requirements, as applicable:

- a. If using an enclosed combustor, it shall be installed, calibrated, maintained, and operated according to the manufacturer's specifications, including the following equipment:
 - (1) A temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of +/- 1% of the temperature being measured expressed in degrees Celsius or +/- 0.5 degrees Celsius, whichever is greater. A temperature monitoring device is not required for boilers or process heaters with design heat input capacity equal to or greater than 44 megawatts.
 - (2) A device that records flow to, or bypass of, the control device. The owner or operator shall either:
 - (a) Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least every 15 minutes; or

- (b) If equipped, 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 shall 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. If using a non-enclosed flare, it shall be installed, calibrated, maintained, and operated according to the manufacturer's specifications, including the following equipment:
 - (1) A heat sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light or the flame itself to indicate the continuous presence of a flame.
 - (2) A device that records flow to the flare and bypass of the flare (if applicable). The owner or operator must:
 - (a) Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the control device at least every 15 minutes; and
 - (b) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism must be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.
- c. Each owner or operator seeking to demonstrate compliance with the 500 ppm surface methane operational standard in § 302.1 must monitor surface concentrations of methane according to the compliance procedures and instrument specifications provided in § 302.3. In addition:
 - (1) Any closed landfill that has no monitored exceedances of the operational standard in three consecutive quarterly monitoring periods may skip to annual monitoring.
 - (2) Any methane reading of 500 ppm or more above background detected during the annual monitoring returns the frequency for that landfill to quarterly monitoring.
 - (3) Any closed landfill that has skipped to annual monitoring and has had no monitored exceedances of the operational standard in three consecutive years may stop monitoring surface methane emissions.

302.5 Recordkeeping: Each owner or operator shall maintain the following records and make them available upon request. Records shall be retained for five years, except for the GCCS design plan which shall be kept and made available upon request while the GCCS is in use.

- a. A GCCS design plan that meets the design requirements in 40 CFR 60.33f(b) and 40 CFR 60.33f(c).
 - (1) The GCCS design plan must include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring,

recordkeeping, or reporting provisions of § 302 proposed by the owner or operator.

- (2)** The GCCS design plan must either conform to specifications for active collection systems in 40 CFR 60.40f or include a demonstration to the Control Officer's satisfaction of the sufficiency of the alternative provisions to 40 CFR 60.40f.
- (3)** An owner or operator of a GCCS control device shall maintain records of all GCCS control device's maintenance (including the date when maintenance was performed and the maintenance procedures that were performed). In addition, one of the following documents shall be available at all times at the facility where the GCCS control device is located:

 - (a)** The manufacturer's written instructions for operation and maintenance of the GCCS control device; or
 - (b)** A written maintenance schedule.
- b.** Records of subsequent tests or monitoring shall be maintained for a minimum of five years.
- c.** Records of the control device vendor specifications shall be maintained until removal of that control device.
- d.** A record of the enclosed flare temperature recorded every 15 minutes or less by a continuous temperature recorder.
- e.** Records of any cover integrity monitoring and repair, as described in § 302.3(b)(5).
- f.** Records of any instance of wellhead positive pressure or insufficient pressure.
- g.** Description and duration of all periods when the GCCS was not operating and length of time the GCCS was not operating, including periods of intermittent use of the GCCS.
- h.** The calculation methodology used to estimate current emissions.
- i.** A schedule for the replacement of the carbon canisters and any filter replacement for the leachate/condensate collection system, if applicable.
- j.** Records of the location of each exceedance of the 500 ppm methane concentration as provided in § 302.3 and the concentration recorded at each location for which an exceedance was recorded in the previous month. Location shall be recorded as 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.
- k.** Records of any wells that have been decommissioned.
- l.** Records of any supplemental fuel used in the operation of the GCCS.
- m.** An up-to-date plot map showing each existing and planned collector in the system and providing a unique identification location label for each collector.

- n. Records of the installation date and location of all newly installed collectors as specified under 40 CFR 60.36f(b).

302.6 Discontinuation of the GCCS: An owner or operator subject to this rule may submit a request to the Control Officer to cap, remove or decommission their GCCS if all of the following requirements are met:

- a. The landfill is a closed landfill, as defined in 40 CFR 60.41f;
- b. A closure report is submitted to the Control Officer as provided in 40 CFR 60.38f(f); and
- c. Following the procedures specified in 40 CFR 60.35f(b), the owner or operator demonstrates that the calculated NMOC emission rate at the landfill is less than 17 megagrams per year on 3 successive test dates. The test dates must be no less than 90 days apart, and no more than 180 days apart and must be submitted to the Control Officer within 60 days after the date of calculating the NMOC emission rate.

SECTION 400 – ADMINISTRATIVE REQUIREMENTS: For the purpose of this rule, sources subject to § 301 shall comply with the administrative requirements in 40 CFR 60.38f and 40 CFR 60.39f. Sources subject to § 302 shall comply with the administrative requirements in § 302 of this rule.

SECTION 500 – MONITORING AND RECORDS: For the purpose of this rule, sources subject to § 301 shall comply with the monitoring and recordkeeping requirements in 40 CFR 60.37f and 40 CFR 60.39f. Sources subject to § 302 shall comply with the monitoring and recordkeeping requirements in § 302 of this rule.