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(Amended June 12, 1998)

RULE 431.1. SULFUR CONTENT OF GASEOUS FUELS

(a) Purpose

The purpose of this rule is to reduce sulfur oxides (SO_x) emissions from the burning of gaseous fuels in stationary equipment requiring a permit to operate by the South Coast Air Quality Management District (District).

(b) Definitions

(1) BURN means to combust any gaseous fuel, whether for useful heat or by incineration without heat recovery, except for flaring of emergency vent gases.

(2) CONTINUOUS EMISSION MONITORING SYSTEM (CEMS) means a system of equipment that continuously measures and records all parameters necessary to directly determine concentrations or mass emissions of selected pollutants, and which meets all of the requirements of Attachment A, Section II.

(3) CONTINUOUS FUEL GAS MONITORING SYSTEM (CFGMS) means a system of equipment that continuously measures and records total sulfur concentration in the gaseous fuel prior to burning, and which meets all the requirements of Attachment A, Section I.

(4) CONTINUOUS MONITOR means a CEMS or CFGMS.

(5) DAILY AVERAGE means an arithmetic mean of all of a facility's sulfur compounds readings within a calendar day obtained according to the guideline specified in Attachment A.

(6) EMERGENCY VENT GAS means any gas released from a process unit as a result of any process upset or breakdown.

(7) GASEOUS FUEL means any gaseous material which releases heat when burned including, but not limited to, any natural, refinery, field produced, process, synthetic, landfill, sewage digester, or waste gases with a gross heating value of 2670 kilocalories per cubic meter (300 BTU per cubic foot) or higher, at standard conditions.

(8) LANDFILL GAS means any gas derived through any biological process from the decomposition of organic waste buried within a waste disposal site.

(9) MONTHLY WEIGHTED AVERAGE SULFUR CONTENT means the result of the summation of average daily sulfur contents of the fuel(s) consumed multiplied by the average daily consumption rates of the fuel(s) consumed in any month divided by the total gaseous fuel consumption rate for that month.

(10) NATURAL GAS means a mixture of gaseous hydrocarbons, with at least 80 percent methane (by volume), and of pipeline quality, such as the gas sold or distributed by any utility company regulated by the California Public Utilities Commission.

(11) RECLAIM SO_x FACILITY means a facility that has been included in the RECLAIM (Regional Clean Air Incentives Market) program in accordance with the requirements of Rule 2001 "Applicability," and/or which has been issued a RECLAIM Facility Permit and is subject to the requirements of Rule 2011, "Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Sulfur (SO_x) Emissions."

(12) REFINERY GAS means any combustible gaseous by-product generated from a petroleum refinery process unit operation, with a gross heating value of 2670 kilocalories per cubic meter (300 BTU per cubic foot) or higher, at standard conditions.

(13) SEWAGE DIGESTER GAS means any gas derived from anaerobic decomposition of organic sewage within its containment.

(14) SMALL REFINER means any person owning or operating a facility in California that produces materials from the processing of crude oil provided such facility:

(A) has and at all times had since January 1, 1978, a crude oil capacity of not more than 55,000 barrels per stream day; and

(B) has not been, at any time since September 1, 1988, owned or controlled by any refiner that at the same time owned or controlled refineries in California with a total combined crude oil capacity of more than 55,000 barrels per stream day; and

(C) has not been at any time since September 1, 1988, owned or controlled by any refiner that at the same time owned or controlled

refineries in the United States with a total combined crude oil capacity of more than 137,500 barrels per stream day; and

(D) has received a two-year extension for compliance with California Air Resources Board's Phase II Reformulated Gasoline Requirements.

(15) STANDARD CONDITIONS means the atmospheric state where the temperature is 60^{o}F and barometric pressure is 14.7 pounds per square inch absolute.

(16) STREAM DAY means any day or part of a day when a facility or a process unit is in operation.

(c) Sulfur Content Requirements

(1) Natural gas

A person shall not transfer, sell or offer for sale for use in the jurisdiction of the District natural gas containing sulfur compounds calculated as H_2S in excess of 16 parts per million by volume (ppmv).

(2) Other Gaseous Fuels

On or after the applicable compliance dates specified in Table 1, a person shall not burn in equipment requiring a Permit to Operate, purchase, transfer, sell or offer for sale for use in the jurisdiction of the District, any gaseous fuel containing sulfur compounds calculated as H_2S, in excess of the concentration limits as measured over the averaging periods for various gaseous fuels as specified in Table 1.

TABLE 1

Fuel Type	Sulfur Limits ppmv	Averaging Period	Compliance Date On or After
Refinery Gas			
Small Refiners	40	4 hrs	May 4, 1996
Other Refiners	40	4 hrs	May 4, 1994
Landfill Gas	150	Daily	June 12, 1998
Sewage Digester Gas	40 or 40 and 500	Daily or Monthly and 15-minutes	November 17, 1995 November 17, 1995
Other Gases	40	4 hrs	May 4, 1994

(3) Optional Facility Compliance Plan ("OFCP")

A person may comply with paragraph (c)(2) by achieving equivalent sulfur oxides (SO_x) emission reductions within the facility, provided that the applicant submits and complies with an Optional Facility Compliance Plan ("OFCP") which has been approved in writing by the Executive Officer. The OFCP shall:

(A) Contain, at a minimum, all data, records, and other information necessary to determine eligibility for alternative emission control, including but not limited to:

(i) A list of equipment and a description of the equipment where the gaseous fuel is being produced and/or burned;

(ii) The amount of fuel produced by and/or to be burned in each piece of equipment listed in clause (c)(3)(A)(i);

(iii) The estimated emissions of sulfur dioxide from each piece of equipment; and

(iv) Historical and projected information on fuel usage;

(B) Demonstrate that daily total SO_x emissions under the OFCP from all sources within the facility regulated under Rule 431.1 would be less than or equal to SO_x emissions that would have been emitted based on actual total SO_x emissions from each source, or the sulfur content limits of this rule, whichever results in lower SO_x emissions. The total SO_x emissions generated from the subject fuel shall be determined using a continuous emission monitoring system (CEMS) specified in subdivision (d). The total emissions may be determined by monitoring the sulfur dioxide emissions from at least 70 percent of the total fuel gas consumed as obtained from a totalizing meter, and calculating the total emissions using the CEMS data;

(C) Demonstrate that the permit units subject to the specified rule emission limitations are in compliance with all applicable District rules or are on an approved schedule of compliance; and

(D) Demonstrate compliance with the continuous monitoring requirements as specified in subdivision (d) of this rule.

(4) Previously Exempt or Previously Compliant Facilities

A person burning gaseous fuel containing sulfur compounds in excess of the limits specified in Table 1 and whose facility had been previously

exempt from this rule pursuant to paragraph (g)(8); or any person who, without the use of any sulfur removal or control system, had been previously in compliance with the limits specified in Table 1, shall:

(A) Submit for approval by the Executive Officer within 30 days from the time of exceedance or non-compliance, a plan to demonstrate compliance with the requirements of the rule;

(B) Submit to the Executive Officer an application for a fuel gas control system within six months of the time of exceedance of the exemption criteria specified in paragraph (g)(8), or non-compliance with the limit;

(C) Demonstrate compliance with the limit specified in Table 1 no later than eighteen (18) months after the time of exceedance; and

(D) Comply with paragraphs (d)(1) and (d)(2), or (d)(3).

(d) Monitoring Requirements

(1) Except as provided in paragraph (d)(3), a person burning gaseous fuels, other than exclusively natural gas, in stationary equipment requiring a Permit to Operate by the District shall have a properly operating continuous fuel gas monitoring system (CFGMS) to determine the sulfur content, calculated as H_2S, of the fuel gas prior to burning; or a continuous emission monitoring system (CEMS) to determine SO_x emissions after burning. All continuous monitors require District approval, which shall be based on the requirements as specified in Attachment A.

(A) A person shall install the CFGMS upstream of any mixing of refinery gases with natural gas, propane or other fuels.

(B) A person subject to paragraph (c)(4) of this rule shall comply with paragraphs (d)(1) and (d)(2) no later than twelve months after the date a Permit to Construct is issued by the District for a sulfur removal system or comply with paragraph (d)(3).

(C) Compliance with the Table 1 sulfur limits shall be determined based on readings obtained from an approved continuous monitor.

(2) A person installing a continuous monitor shall submit to the District for approval, a quality assurance procedure as specified in U.S. EPA 40 CFR, Part 60, Appendix F, Procedure 1 for CEMS and, as applicable, for CFGMS.

(A) The quality assurance procedure specified above shall be submitted to the District for written approval by the Executive Officer prior to the CFGMS or CEMS final certification.

(B) Any CFGMS or CEMS deemed to be out of control, as specified in Attachment A, according to the facility quality assurance procedure approved by the Executive Officer shall be corrected within 72 hours.

(i) The person operating the CFGMS or CEMS shall notify the Executive Officer by telephone or facsimile of any breakdown(s) of the monitoring systems if the duration of the breakdown is in excess of 60 minutes or if there are three or more breakdowns in any one day within 24 hours of the occurrence of the breakdown which triggers notification. Such report shall identify the time, location, equipment involved, and contact person.

(ii) The person who complies with the provisions of clause (d)(2)(B)(i) and paragraph (e)(3) shall not be considered in violation of this rule for the 72 hour period of breakdown provided that the breakdown did not result from operator error, neglect or improper operation or maintenance procedures.

(3) A person burning landfill gas or sewage digester gas, or who is subject to paragraph (c)(4) of this rule may use an alternative monitoring method, in lieu of the requirements in paragraphs (d)(1) and (d)(2), that ensures compliance with the daily total sulfur content limitation as specified in Table 1. Alternative monitoring methods shall not be used unless first approved in writing by the Executive Officers of the District, the California Air Resources Board (CARB), and the Regional Administrator of the Environmental Protection Agency (EPA), Region IX, or their designees.

(A) At a minimum, the alternative monitoring method shall meet the guidelines of Attachment A, Section III.

(B) A person subject to (c)(4) of this rule shall submit an alternative monitoring method for approval no later than 45 days after the date a Permit to Construct a sulfur removal system is issued.

(C) All monitoring must comply with the approved alternative monitoring method.

(D) District personnel shall use the approved alternative monitoring method to determine compliance with the limits of this rule.

(e) Reporting and Recordkeeping Requirements

(1) All records required by this rule shall be maintained at the facility for at least two years, and be made available to District staff upon request.

(2) Except at electric utility generating facilities and refineries, a person burning gaseous fuel, other than exclusively natural gas, in stationary equipment requiring a District Permit to Operate, shall submit to the Executive Officer annual reports of the monthly fuel consumption and the total sulfur content of the fuel consumed. The annual report shall be submitted no later than 60 days following the end of the reporting year, and shall consist of the amount of any gaseous fuel consumed monthly, the applicable hourly, daily or monthly average sulfur content as determined by the continuous monitor or approved alternative monitoring method as specified in paragraphs (d)(1), (d)(2), or (d)(3) of this rule, and total SO_x emissions calculated as SO_2.

(3) A person burning gaseous fuel in stationary equipment located at electric utility generating facilities or refineries shall submit to the Executive Officer monthly reports of the daily fuel consumption, the monthly weighted average sulfur content (except for natural gas), and the maximum 4-hour average sulfur content of the fuel consumed, as determined by the device specified in paragraph (d)(1) of this rule and the total SO_x emissions calculated as SO_2. The report shall be submitted no later than 30 days following the end of the reporting month.

(4) The person operating a continuous monitor shall keep records as specified in clause (d)(2)(B)(i) for monitor breakdown(s).

(f) Test Methods

The following shall be used by the Executive Officer to verify compliance with the provisions of this rule:

(1) For determination of compliance with sulfur content requirements of subdivision (c):

(A) The reference method for determining the concentration of sulfur compounds in a gaseous fuel, calculated as H_2S, shall be District Method 307-91 - Determination of Sulfur in a Gaseous Matrix, or

any other method demonstrated by the applicant to be equivalent and approved in writing by the Executive Officers of the District, the CARB, and the Regional Administrator of the EPA, Region IX, or their designees, or

(B) Data obtained from a continuous monitor, which is required to be installed and properly operated according to subdivision (d) and as approved by the Executive Officer pursuant to the guidelines specified in Attachment A, or

(C) The results obtained using the approved alternative monitoring method as specified in (d)(3).

(2) The gross heating value of gaseous fuels shall be determined by ASTM Method D 3588-91 or, if applicable, ASTM Method D 4891-89.

(3) The methane content of gaseous fuels shall be determined by ASTM Method D 1945-81.

(g) Exemptions

Unless otherwise specified, and provided that the person seeking the exemption supplies proof and verification upon request of applicable criteria to the satisfaction of the Executive Officer, the provisions of this rule shall not apply to the following:

(1) A person selling, for use in the jurisdiction of the District, any gaseous fuel not complying with paragraphs (c)(1) and (c)(2) provided that:

(A) The gaseous fuel is delivered directly to a sulfur removal unit which is in full operation and which reduces the sulfur content to the limits specified in paragraphs (c)(1) and (c)(2); and

(B) The seller notifies the Executive Officer prior to any such sale of the quantity, heating value, and composition of the gaseous fuel to be sold; and

(C) The buyer has an approved Permit to Construct and/or Operate for the sulfur removal unit that will be used to treat the purchased gas.

(2) Gaseous fuels containing sulfur used in the production of sulfur or sulfur compounds.

(3) Waste gases being burned provided that:

(A) The gross heating value of such gases is less than 2670 kilocalories per cubic meter (300 British Thermal Units per cubic foot) at standard conditions; and

(B) Any supplemental fuel used to burn such waste gases does not contain sulfur or sulfur compounds in excess of the amount specified in this rule.

(4) Gases being burned from fluidized catalytic cracking unit (FCCU) regenerators subject to District Rule 1105 or Regulation XX.

(5) Gases vented during refinery turnaround pursuant to District Rule 1123 or Regulation XX.

(6) Gases vented to a control system pursuant to District Rule 466 and 1173 or Regulation XX.

(7) Gases vented intermittently to fuel gas or waste disposal system from pressure control valves, sight glasses, compressor bottles, sampling systems, and pump and compressor case vents.

(8) Any facility which emits less than 5 pounds per day total sulfur compounds, calculated as H_2S, from the burning of gaseous fuels other than natural gas. Emissions of total sulfur compounds shall be measured based on fuel analysis, using the test method specified in paragraph (g)(1), and the maximum daily gaseous fuel consumption. This exemption shall not apply to the requirement of paragraph (c)(1).

(9) A person is exempt from the requirements of paragraphs (d)(1) and (d)(2) if the person demonstrates to the satisfaction of the Executive Officer that the supplier of the gaseous fuel has complied with the requirements of subdivision (d) for such fuel.

(10) Until December 31, 1998, a person burning LFG is exempt from the requirements of paragraph (d)(1) and (d)(2) provided that they determine and report the sulfur content of the fuel gas according to the approved Rule 1150.1 Compliance Plan for the landfill providing the LFG. If the person burning LFG elects to use an alternative monitoring method as specified in paragraph (d)(3), the plan or revision to the plan shall be submitted to the District by September 1, 1998 and the sulfur content of the fuel gas shall be determined and reported according to the approved Rule 1150.1 Compliance Plan for the landfill providing the LFG, until plan approval or disapproval.

(11) On or after July 1, 1997, a person previously in compliance with the limits specified in Table 1 of this rule shall be exempt from the requirements of paragraph (c)(4) provided that: the alternative monitoring method pursuant to paragraph (d)(3) yields no more than three individual readings

in a calendar year in excess of the limits specified in Table 1; that no single reading exceeds a fuel sulfur limit by 25 percent; and that the sampling frequency is no longer than once per week.

ATTACHMENT A

SECTION I
REQUIREMENTS FOR
CONTINUOUS FUEL GAS MONITORING SYSTEM (CFGMS)

A continuous fuel gas monitor used for determining the sulfur content of any gaseous fuel shall:

(1) Continuously monitor and record the concentration by volume (dry basis) of sulfur compounds in ppmv as H_2S in the gaseous fuel.

(2) Have the span value of the monitor set so that all readings fall between 20 and 95 percent of scale.

(3) Check for calibration drift of the monitoring system at least once daily (approximately 24-hr interval) at two concentrations, one high level and one low level. Whenever the daily high level or low level calibration drift exceeds 5% of analyzer full scale span, the monitoring system shall be deemed to be out of control and subject to the requirements of subparagraph (d)(2)(B) of this rule.

(4) Determine the relative accuracy of the monitor which shall be no greater than 20 percent of the mean value of the reference method test data.

(5) Be able to record negative values of zero drift.

(6) Report the concentration of the sulfur compounds calculated as H_2S.

ATTACHMENT A

SECTION II
REQUIREMENTS FOR
CONTINUOUS EMISSIONS MONITORING SYSTEMS (CEMS)

A stack CEMS used for monitoring the sulfur dioxide emissions from the burning of any gaseous fuel shall:

(1) Continuously monitor and record the concentration by volume (dry basis, zero percent excess air) of sulfur compounds in ppmv as SO_2 emitted into the atmosphere;

(2) Include either an oxygen monitor for correcting the data for excess air or a fuel gas and exhaust gas flowmeter for the determination of mass emissions;

(3) Have the span value of all the monitors set so that all readings fall between 20 and 95 percent, for four-hour and daily averages, and between 10 and 95 percent, for monthly averages, of full scale;

(4) When using an oxygen monitor for the correction of excess air, be able to measure a sulfur compound concentration emission limit of 5 ppm (dry basis, zero percent excess air), which is stoichiometrically equivalent to the limit of sulfur compound content of 40 ppm calculated as H_2S in the gaseous fuels;

(5) Use District Methods 100.1 or 6.1 (as applicable for sulfur compound analysis) and District Method 3.1 (for oxygen content analysis), or District Method 2.1 (for flowrate determination), whichever is applicable, or any other methods demonstrated by the applicant to be equivalent and approved in writing by the Executive Officers of the District and the CARB, and the Regional Administrator of the EPA, Region IX, or their designees, for conducting the relative accuracy evaluations. The relative accuracy limit shall be 1 ppm and zero drift (2-hour and 24-hour) and calibration drift (2-hour and 24-hour) limits for sulfur compounds monitor shall be 5 percent of the span range; and

(6) Check for calibration drift of the monitoring system at least once daily (approximately 24-hr interval) at two concentrations, one high level and one low level. Whenever the daily high level or low level calibration drift exceeds 5% of analyzer full scale span, the monitoring system shall be deemed to be out of control and subject to the requirements of subparagraph (d)(2)(B) of this rule.

(7) Facilities burning fuel gas subject to this rule shall comply with the requirements of Rule 218 except where specific requirements have been incorporated into this rule.

ATTACHMENT A

SECTION III
GUIDELINES FOR APPROVAL OF
ALTERNATIVE MONITORING PLAN
BY THE EXECUTIVE OFFICER

In lieu of a continuous fuel gas monitoring system (CFGMS) or a continuous emission monitoring system (CEMS), a person subject to this rule may submit an alternative monitoring plan to the Executive Officers of the District, the California Air Resources Board (CARB), and the Regional Administrator of the Environmental Protection Agency (EPA), Region IX, or their designees for their review and decision.

(1) A test program to determine the correlation between H_2S and total sulfur in the fuel gas using District Method 307-91. If a correlation is established, a colorimetric test, or other alternative method approved by the Executive Officer as being equivalent or better in establishing such correlation, may be conducted regularly to determine total sulfur using H_2S as a surrogate.

(2) An error analysis between colorimetric, or other approved alternative method readings and the total reduced sulfur analysis obtained from District Method 307-91. To demonstrate equivalency between the two methods of analyses, the relative accuracy shall not exceed 20 percent of average District Method 307-91 readings.

(3) A schedule for a daily or more frequent analysis of the fuel gas for H_2S using the colorimetric test, or other approved alternative method, and a minimum weekly analysis of the fuel gas using District Method 307-91. A different frequency of analysis may be used if the Executive Officer determines that such frequency will ensure compliance with the daily total sulfur limits of this rule.

(4) When the sulfur level is suspected to be at or above the sulfur content requirements of Table 1 as determined by the colorimetric or other alternative method, a procedure to obtain at minimum a daily sample to be tested according to District Method 307-91 until three consecutive daily samples show that total sulfur is below the sulfur content requirements of Table 1.