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RULE 431
Sulfur Content of Fuels

(A) General

(1) Purpose

The purpose of this Rule is to limit the sulfur content in fuels for the purpose of both reducing the formation of sulfur oxides and particulates during combustion in stationary equipment.

(2) Applicability

This Rule applies to all Importers and other fuel suppliers, such as distributors, marketers and retailers, as well as to users of fuels for Stationary Source applications in the District, unless said fuel is supplied solely for use in locomotives or marine vessels.

(B) Definitions

The definitions contained in District Rule 102 – *Definition of Terms* shall apply unless a term is otherwise defined herein. Terms that are defined within these Rules, have been capitalized for ease of recognition.

(1) "Importer" – A Person who supplies or brings Diesel Fuel, Low Sulfur Diesel Fuel, and/or other Liquid Fuels into the District from any location outside the District, except for fuels contained in the dedicated fuel tank of a vehicle.

(C) Requirements

(1) Gaseous Fuels

(a) Natural Gas

A Person shall not burn, purchase, transfer, sell or offer for sale for any Stationary Source application in the District, any Natural Gas, other than pipeline quality Natural Gas, containing sulfur compounds, calculated as H_2S, in excess of 16 Parts Per Million by Volume (ppmv).

(b) Other Gaseous Fuels

A Person shall not burn, purchase, transfer, sell or offer for sale for any Stationary Source application in 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 Periods
Refinery Gas	40	4 Hours
Landfill Gas	250	Daily
Sewage Digester Gas	40 or	Daily or
	40 and 500	Monthly and 15-Minutes
Other Gases	40	4 Hours

(2) Liquid Fuels

(a) Diesel Fuels

A Person shall not burn, purchase, transfer, sell or offer for sale for any Stationary Source application in the District, Diesel Fuel with a sulfur content in excess of 15 ppm by weight.

(b) Other Liquid Fuels

A Person shall not burn, purchase, transfer, sell or offer for sale for any Stationary Source application in the District, Liquid Fuel with a sulfur content in excess of 500 ppm by weight.

(3) Solid Fuels

A Person shall not burn, purchase, transfer, sell or offer for sale for any Stationary Source application in the District, Solid Fuel having a sulfur content in excess of 0.5 percent by weight.

(D) Monitoring Requirements

(1) Gaseous Fuels

(a) Except as provided in subsection (D)(1)(c), a Person burning gaseous fuels, other than exclusively pipeline quality Natural Gas, in a District Permit Unit, 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.

(i) A Person shall install the CFGMS upstream of any mixing of refinery gases with Natural Gas, propane or other fuels.

(ii) A Person subject to Section (H) of this Rule shall comply with subsections (D)(1)(a) and (D)(1)(b) no later than twelve months after the date an Authority to Construct (ATC) is issued by the District for a sulfur removal system or comply with subsection (D)(1)(c).

(iii) Compliance with the Table 1 sulfur limits shall be determined based on readings obtained from an approved Continuous Monitor.

(iv) A Person installing a CEMS or a CFGMS shall comply with Sections (C) through (G) in District Rule - 218 - *Stack Monitoring*

(b) A Person installing a Continuous Monitor shall submit to the District for approval, a quality assurance procedure as specified in USEPA 40 CFR Part 60, Appendix F, Procedure 1 for CEMS and, as applicable, for CFGMS.

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

(ii) 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 APCO shall be corrected within 72 hours.

a. The Person operating the CFGMS or CEMS shall notify the APCO in accordance with District Rule - 430 – *Breakdown Provisions* of any Breakdown(s) of the monitoring system(s) if the duration of the Breakdown is in excess of 60 minutes or if there are three (3) 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.

b. The Person who complies with the provisions of subsection (D)(1)(b)(ii)a. and subsection (E)(2)(c) 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.

(c) A Person burning landfill gas or sewage digester gas, or who is subject to Section (H) of this Rule may use an alternative monitoring method, in lieu of the requirements in subsections (D)(1)(a) and (D)(1)(b), 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 APCO, the California Air Resources Board (CARB), and the United States Environmental Protection Agency (USEPA), or their designees.

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

(ii) A Person subject to Section (H) of this Rule shall submit an alternative monitoring method for approval no later than 45 days after the date an ATC for a sulfur removal system is issued.

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

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

(E) Reporting and Recordkeeping Requirements

(1) Sulfur Content Determination

(a) Continuous Fuel Monitoring for sulfur; or

(b) Annual source testing as outlined in Section (F); or

(c) Sulfur content certification from supplier.

(2) Gaseous Fuels

(a) All records required by this Rule shall be maintained at the Facility for at least five (5) years and be made available to District staff upon request.

(b) 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 (PTO), shall submit to the APCO 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 subsections (D)(1)(a), (D)(1)(b), or (D)(1)(c) of this Rule, and total SO_X emissions calculated as SO_2.

(c) A Person burning gaseous fuel in stationary equipment located at electric utility generating facilities or refineries shall submit to the APCO 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 subsection (D)(1)(a) 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.

(d) The Person operating a Continuous Monitor shall keep records as specified in subsection (D)(1)(b)(ii)a. for monitor Breakdown(s).

(F) Test Methods

(1) Gaseous Fuels

(a) For determination of compliance with sulfur content requirements of Section (C):

(i) The reference method for determining the concentration of sulfur compounds in a gaseous fuel, calculated as H_2S, shall be SCAQMD 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 APCO, CARB, and the USEPA, or their designees, or

(ii) Data obtained from a Continuous Monitor, which is required to be installed and properly operated according to Section (D) and as approved by the APCO pursuant to the guidelines specified in Attachment A, or

(iii) The results obtained using the approved alternative monitoring method as specified in (D)(1)(c).

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

(c) The methane content of Gaseous Fuels shall be determined by ASTM Method D 1945-81.

(2) Liquid Fuels

(a) The sulfur content of non-Low Sulfur Diesel Liquid Fuels shall be determined by ASTM Method D 4294, D 2622, D 5453, or any other

equivalent method approved in writing by the APCO, CARB, and USEPA.

(b) The sulfur content of Low Sulfur Diesel, shall be determined by ASTM Method D 5453, or any other equivalent method approved in writing by the APCO, CARB, and the USEPA.

(3) Solid Fuels

(a) The sulfur content of Solid Fuels shall be determined by ASTM Method D4239-18e1.

(G) Equivalency for Stationary Source End Use Applications

(1) Gaseous Fuels

Optional Facility Compliance Plan ("OFCP") A Person may comply with subsection (C)(1)(b) by achieving equivalent sulfur oxides (SO_X) emission reductions within the Facility, provided that the applicant submits and complies with an "OFCP" which has been approved in writing by the APCO. 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 subsection (G)(1)(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 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 CEMS specified in Section (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 Section (D) of this Rule.

(2) Liquid Fuels

(a) Regardless of the provisions in Sections (C) through (H) of this Rule, a Person may burn, purchase, transfer, sell, or offer for sale to be burned at a Stationary Source in the District, Liquid Fuel with higher sulfur content provided that the resulting emissions into the atmosphere are not greater than the potential emissions with a fuel which complies with the provisions of this Rule.

(b) The equivalency provisions of subsection (G)(2)(a) shall be demonstrated in advance in writing to the satisfaction of the APCO with a plan which describes at a minimum process conditions and/or Control Equipment that will remove the pollutants from the stack gases.

(H) 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 subsection (I)(12); 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 APCO 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 APCO an application for a fuel gas control system within six months of the time of exceedance of the exemption criteria specified in subsection (I)(12), 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 subsections (D)(1)(a) and (D)(1)(b), or (D)(1)(c).

(I) Exemptions

The provisions of this Rule shall not apply to:

(1) The burning of sulfur, hydrogen sulfide, acid sludge or other sulfur compounds in the manufacturing of sulfur or sulfur compounds.

(2) The incinerating of waste gases provided that the gross heating value of such gases is less than 2 kilogram-calories per cubic meter (280 British Thermal Units per cubic foot) at standard conditions and the fuel used to incinerate such waste gases does not contain sulfur or sulfur compounds in excess of the amount specified in this Rule.

(3) The use of Solid Fuels in any metallurgical process.

(4) The use of fuels where the gaseous products of combustion are used as raw materials for other processes.

(5) The use of Liquid or Solid Fuel to propel or test any vehicle, aircraft, locomotive, boat or ship.

(6) The use of fuel with higher sulfur content where process conditions or Control Equipment remove sulfur compounds from the stack gases to the extent that the emission of sulfur compounds in to the atmosphere is no greater than that which could be emitted by using a fuel which complies with the provisions of this Rule.

(7) The use of any Liquid or Solid Fuel having a sulfur content in excess of 0.5 percent by weight for a period not to exceed three (3) days and that period of time necessary for the Hearing Board to render a decision, provided, however, that an application for a variance is filed within said three-day period and fuel which complies with this Rule is not available for use due to accident, strike, sabotage, act of God, act of war, act of the public enemy or failure of supplier.

(8) A Person selling, for use in the District, any Gaseous Fuel not complying with subsections (C)(1)(b) 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 subsection (C)(1)(b);

(b) The seller notifies the APCO 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 District Permit Unit for the sulfur removal unit that will be used to treat the purchased gas.

(9) 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.

(10) 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.

(11) 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.

(12) Any Facility which emits less than five (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, and the maximum daily Gaseous Fuel consumption.

(13) The use of Liquid Fuels at remote pipeline pumping stations where the APCO determines that conditions do not allow the use of alternate fuels, pollution Control Equipment, or electric equipment, provided that the increased emissions from the operation under this exemption, if any, are compensated by a reduction of at least twice such increased emissions at any other locations within the District and in a manner approved by the APCO.

(14) A Person is exempt from the requirements of subsections (D)(1)(a) and (D)(1)(b) if the Person demonstrates to the satisfaction of the APCO that the supplier of the gaseous fuel has complied with the requirements of subsection (D)(1) for such fuel.

See SIP Table at http://www.mdaqmd.ca.gov/

ATTACHMENT A

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

A CFGMS 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 subsection (D)(1)(b)(ii) 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.

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 hydrogen sulfide in the gaseous fuels;

(5) Use SCAQMD Methods 100.1 or 6.1 (as applicable for sulfur compound analysis) and SCAQMD Method 3.1 (for oxygen content analysis), or SCAQMD Method 2.1 (for flowrate determination), whichever is applicable, or any other methods demonstrated by MDAQMD Rule 431 - *Sulfur Content of Gaseous Fuels* the applicant to be equivalent and approved in writing by the APCO, CARB, and the USEPA, 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 five (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 (2) concentrations, one high level and one low level. Whenever the daily high level or low level calibration drift exceeds five percent (5%) of analyzer full scale span, the monitoring system shall be deemed to be out of control and subject to the requirements of subsection (D)(1)(b)(ii) 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.

SECTION III –
GUIDELINES FOR APPROVAL OF
ALTERNATIVE MONITORING PLAN BY THE APCO

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 APCO, CARB, and the USEPA, 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 SCAQMD Method 307-91. If a correlation is established, a colorimetric test, or other alternative method approved by the APCO 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 SCAQMD Method 307-91. To demonstrate equivalency between the two methods of analyses, the relative accuracy shall not exceed 20 percent of average SCAQMD 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 SCAQMD Method 307-91. A different frequency of analysis may be used if the APCO 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 SCAQMD Method 307-91 until three consecutive daily samples show that total sulfur is below the sulfur content requirements of Table 1.

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