

SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT

**RULE 4352 - SOLID FUEL FIRED BOILERS, STEAM GENERATORS AND PROCESS HEATERS**

*(Adopted September 14, 1994)(Amended October 19, 1995; May 18, 2006)*

1.0 Purpose

The purpose of this rule is to limit emissions of oxides of nitrogen (NO<sub>x</sub>) and carbon monoxide (CO) from solid fuel fired boilers, steam generators and process heaters.

2.0 Applicability

This rule applies to any boiler, steam generator or process heater fired on solid fuel. Heat may be supplied by liquid or gaseous fuels for start-ups, shutdowns, and during other flame stabilization periods, as deemed necessary by the owner/operator.

3.0 Definitions

3.1 Air Pollution Control Officer (APCO): as defined in Rule 1020 (Definitions).

3.2 ARB: California Air Resources Board.

3.3 Block 24-hour Average: the arithmetic average of the hourly NO<sub>x</sub> emission rates of a unit as measured over 24 one-hour periods, daily, from 12:00 AM to 11:59 PM, excluding periods of system calibration.

3.4 Boiler or Steam Generator: any combustion equipment fired directly or indirectly with any solid fuel used to produce hot water or steam.

3.5 British Thermal Unit (Btu): the amount of heat required to raise the temperature of one pound of water from 59°F to 60°F at one atmosphere.

3.6 EPA: United States Environmental Protection Agency.

3.7 Gaseous Fuel: any fuel which is a gas at standard conditions.

3.8 Heat Input: the heat of combustion released due to burning a fuel in a unit, based on the higher heating value of the fuel, not including the sensible heat of incoming combustion air and fuel.

3.9 Higher Heating Value (hhv): the total heat liberated per mass of fuel burned (Btu per pound), when fuel and dry air at standard conditions undergo complete combustion and all resulting products are brought to their standard states at standard conditions.

3.10 Liquid Fuel: any fuel which is a liquid at standard conditions.

- 3.11 Potential to Emit: as defined in Rule 2201 (New and Modified Stationary Source Rule).
- 3.12 Process Heater: any combustion equipment fired on solid fuel, which transfers heat from combustion gases to water or process streams. Process heaters exclude kilns or ovens used for drying, baking, cooking, calcining, heat treating or vitrifying.
- 3.13 NO<sub>x</sub> Emissions: the sum of oxides of nitrogen (NO) in the flue gas, collectively expressed as nitrogen dioxide.
- 3.14 Rated Heat Input: Rated Heat Input (million Btu per hour): the heat input capacity specified on the nameplate of the unit. If the unit has been physically modified such that its maximum heat input differs from what is specified on the nameplate, the modified maximum heat input shall be considered as the rated heat input and made enforceable by Permit to Operate.
- 3.15 Shutdown: the period of time during which a unit is taken from operational to non-operational status by allowing it to cool down from its operating temperature and pressure to an ambient temperature.
- 3.16 Solid Fuel: any fuel which is a solid at standard conditions.
- 3.17 Standard Conditions: defined in Rule 1020 (Definitions).
- 3.18 Start-up: the period of time during which a unit is heated to the operating temperature and pressure from a shutdown status.
- 3.19 Stationary Source: as defined in Rule 2201 (New and Modified Stationary Source Review Rule).
- 3.20 Unit: any boiler, steam generator or process heater as defined in this rule. For the purpose of this rule, two boilers, two steam generators, or two process heaters may be considered as one unit, if, they are operated as one single unit sharing a single common stack and have been issued only one District Permit to Operate (PTO).

#### 4.0 Exemptions

Except for complying with the recordkeeping requirements of Section 6.2 and applicable compliance schedule in Section 7.0, this rule shall not apply to units operated at a Stationary Source that has a potential to emit less than 10 tons per year of oxides of nitrogen (NO<sub>x</sub>) or volatile organic compounds (VOC).

#### 5.0 Requirements

- 5.1 The owner/operator of a boiler, steam generator or process heater shall not operate such a unit in a manner that results in NO<sub>x</sub> and CO emissions exceeding the limits

specified in Table 1. The emission limits measured in parts per million by volume (ppmv) are referenced at dry stack gas conditions and shall be corrected to the applicable percent O<sub>2</sub> or CO<sub>2</sub> specified in Table 1 in accordance with EPA Method 19.

Table 1 - NO<sub>x</sub> and CO Emission Limits

Fuel Type	Tier 1 Emission Limits effective until December 31, 2006		Tier 2 Emission Limits effective on and after January 1, 2007	
	NO <sub>x</sub> Limit	CO Limit	NO <sub>x</sub> Limit	CO Limit
Municipal Solid Waste	200 ppmv corrected to 12% CO <sub>2</sub>	400 ppmv corrected to 3% O <sub>2</sub> , or 310 ppmv corrected to 7% O <sub>2</sub> , or 310 ppmv corrected to 12% CO <sub>2</sub>	200 ppmv corrected to 12% CO <sub>2</sub>	400 ppmv corrected to 3% O <sub>2</sub>
Biomass using Multiple Hearth Furnace	0.35 lb/MMBtu of heat input		115 ppmv corrected to 3% O <sub>2</sub>	
All Others	0.20 lb/MMBtu of heat input		115 ppmv corrected to 3% O <sub>2</sub>	

5.2 All NO<sub>x</sub> and CO emission limits shall be based on a block 24-hour average. A violation of the emission limits as measured by the test methods listed in Section 6.4 shall constitute a violation of this rule.

5.3 Start-up and Shutdown Provisions

The applicable emission limits of Section 5.1 shall not apply during start-up or shutdown provided an operator complies with the requirements specified below.

5.3.1 The duration of each shut down shall not exceed twelve (12) hours, except as provided in Section 5.3.4.

5.3.2 Except as provided in Section 5.3.4, the duration of each start-up shall not exceed 96 hours. If curing of the refractory is required after a modification to the unit is made, the duration of start-up shall not exceed 192 hours, except as provided in Section 5.3.4.

5.3.3 The emission control system shall be in operation and emissions shall be minimized insofar as technologically feasible during start-up or shutdown.

5.3.4 Notwithstanding the requirements of Section 5.3.1 or Section 5.3.2, the APCO, ARB, and EPA may approve a longer start-up or shutdown duration,

if an operator submits an application for a Permit to Operate which provides a justification for the requested additional duration.

5.3.4.1 The maximum allowable duration of start-up or shutdown will be determined by the APCO, ARB, and EPA.

5.3.4.2 At a minimum, a justification for increased start-up or shutdown duration shall include the following:

5.3.4.2.1 A clear identification of the control technologies or strategies to be utilized; and

5.3.4.2.2 A description of what physical conditions prevail during start-up or shutdown periods that prevent the controls from being effective; and

5.3.4.2.3 A reasonably precise estimate as to when the physical conditions will have reached a state that allows for the effective control of emissions; and

5.3.4.2.4 A detailed list of activities to be performed during start-up or shutdown and a reasonable explanation for the length of time needed to complete each activity; and

5.3.4.2.5 A description of the material process flow rates and system operating parameters, etc., the owner/operator plans to evaluate during the process optimization; and an explanation of how the activities and process flow affect the operation of the emissions control equipment; and

5.3.4.2.6 Basis for the requested additional duration of start-up or shutdown.

#### 5.4 Units operated at less than 50 percent of rated heat input (RHI)

Notwithstanding the requirements of Section 5.1, the APCO, ARB, and EPA may approve an increased emission limit if the owner/operator submits an application for a Permit to Operate, which provides a justification for the requested limit. Operations above 50 percent of RHI shall comply with the emission limits in Section 5.1.

5.4.1 The maximum NO<sub>x</sub> or CO emission limit for operations less than 50 percent of RHI will be determined by the APCO, ARB, and EPA.

- 5.4.2 At a minimum, a justification for an increased emission limit shall include the following:
- 5.4.2.1 The basis for the requested increased emission limit; and
  - 5.4.2.2 A clear identification of the control technologies or strategies to be utilized; and
  - 5.4.2.3 A description of what physical conditions prevail at less than 50% of RHI that prevent the controls from being completely effective; and
  - 5.4.2.4 A reasonably precise estimate as to when the physical conditions must be reached that allows for the effective control of emissions; and
  - 5.4.2.5 A detailed list of activities to be performed to control emissions and a reasonable explanation for the length of time needed to complete each activity; and
  - 5.4.2.6 A description of the material process flow rates and system operating parameters, etc., the owner/operator plans to evaluate during the process optimization; and an explanation of how the activities and process flow affect the operation of the emissions control equipment.

## 5.5 Monitoring Provisions

The owner/operator of any unit using ammonia injection as a NO<sub>x</sub> control technique, shall operate a Continuous Emissions Monitoring system (CEM) to monitor and record NO<sub>x</sub> concentrations, CO<sub>2</sub> or O<sub>2</sub> concentrations, as well as the NO<sub>x</sub> emission rate. Continuous Emission Monitoring systems shall be operated, maintained, and calibrated pursuant to the requirements of 40 CFR 60.7 (c) and 60.13. CEMs must also satisfy the Performance Specifications of 40 CFR 60 Appendix B and the Relative Accuracy Test Audit of Appendix F.

## 6.0 Administrative Requirements

### 6.1 Emission Control Plan

The owner/operator of any unit subject to the provisions of this rule shall submit to the APCO an emissions control plan of all actions to be taken to satisfy the requirements of Section 5.0. Such plan shall identify the type of emission controls to be applied to each unit and a construction schedule, or shall provide source tests,

in accordance with Section 6.4, sufficient to demonstrate that the unit is currently in compliance with the emission limits of this rule.

## 6.2 Recordkeeping

6.2.1 Except for municipal solid waste (MSW) fired units; the owner/operator of any unit subject to the requirements of this rule shall maintain, on a monthly basis, an operating log for each unit that includes the following information:

6.2.1.1 type and quantity of fuel used.

6.2.1.2 the higher heating value (hhv) of each fuel as determined by Section 6.4, or as certified by a third party fuel supplier.

6.2.2 The records required by Section 6.2.1 shall be retained on site for a period of five years, and shall be made available to the APCO, ARB, and EPA upon request.

## 6.3 Compliance Source Testing

6.3.1 Each unit subject to the requirements of this rule shall be tested at least once every twelve (12) months, to determine compliance with the applicable requirements of Section 5.0.

6.3.2 All emission measurements shall be made with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate.

6.3.3 No compliance determination shall be established within two hours after a period in which fuel flow to the unit is zero, or is shut off for 30 minutes or longer.

## 6.4 Test Methods

6.4.1 Compliance with the requirements of Section 5.0 shall be determined in accordance with the following source test procedures unless otherwise approved by the APCO, ARB, and EPA:

6.4.1.1 Oxides of nitrogen (ppmv) – EPA Method 7E, or ARB Method 100.

6.4.1.2 Carbon monoxide (ppmv) - EPA Method 10, or ARB Method 100.

- 6.4.1.3 Stack gas oxygen - EPA Method 3 or 3A, or ARB Method 100.
- 6.4.1.4 NOx emission rate (Heat input basis) - EPA Method 19.
- 6.4.1.5 Stack gas velocities - EPA Method 2.
- 6.4.1.6 Stack gas moisture content - EPA Method 4.
- 6.4.1.7 Solid fuel higher heating value (hhv) - ASTM Method D 2015-96,  
or
- 6.4.1.8 Solid fuel higher heating value (hhv) - ASTM Method E 711-87.
- 6.4.1.9 ASTM D 1826-94 or D 1945-96 in conjunction with ASTM D  
3588-98 for gaseous fuels.

## 7.0 Compliance Schedule

- 7.1 Owners/operators of each unit subject to the provisions of this rule shall demonstrate compliance in accordance to the following schedule:
  - 7.1.1 For units at a stationary source that has the potential to emit 10 to 50 tons per year of NOx or VOC:

On and after January 1, 2007, demonstrate compliance with the Table 1 Tier 2 emissions limits and all applicable requirements of this rule.
  - 7.1.2 For units at a stationary source that has the potential to emit greater than or equal to 50 tons per year of NOx or VOC:
    - 7.1.2.1 By March 14, 1995, submit to the APCO an emission control plan pursuant to Section 6.1 and a complete application for an Authority to Construct (ATC), if necessary.
    - 7.1.2.2 By May 31, 1995, demonstrate full compliance with Table 1 Tier 1 emission limits and all applicable requirements of this rule.
    - 7.1.2.3 On and after January 1, 2007, demonstrate compliance with Table 1 Tier 2 emissions limits and all applicable requirements of this rule.
  - 7.1.3 For units exempted pursuant to Section 4.0, on and after January 1, 2007 comply with the recordkeeping requirements of Section 6.2.