

## RULE 2.43 BIOMASS BOILERS

ADOPTED November 10, 2010

AMENDED April 12, 2023

[AMENDED December 13, 2023](#)

### INDEX

#### 100 GENERAL

- 101 PURPOSE
- 102 APPLICABILITY
- 110 EXEMPTIONS

#### 200 DEFINITIONS

- 201 BIOMASS
- 202 BIOMASS FUELED BOILER (BOILER)
- 203 BLOCK 24-HOUR AVERAGE
- 204 BRITISH THERMAL UNIT (BTU)
- 205 CARBON MONOXIDE (CO) EMISSIONS
- 206 CURING STARTUP
- 207 HEAT INPUT
- 208 HIGHER HEATING VALUE (HHV)
- 209 NITROGEN OXIDE (NO<sub>x</sub>) EMISSIONS
- 210 RATED HEAT INPUT
- 211 SHUTDOWN
- 212 STARTUP
- 213 UNIT

#### 300 STANDARDS

- 301 EMISSION LIMITS
- 302 STARTUP/SHUTDOWN PROVISIONS
- 303 CONTINUOUS EMISSION MONITORING SYSTEM (CEMS)
- 304 SOURCE TESTING

#### 400 ADMINISTRATIVE REQUIREMENTS

- 401 COMPLIANCE SCHEDULE
- 402 CEMS OPERATING AND MAINTENANCE PLAN

#### 500 REPORTING AND RECORDKEEPING

- 501 REPORTING
- 502 RECORDKEEPING
- [503 SOURCE TEST REPORTS](#)
- [504 FEDERAL REPORTING](#)

#### 600 TEST METHODS

Yolo-Solano AQMD

Amended [April 12, 2023](#)[December 13, 2023](#)

[\(Final draft language November 28, 2023\)](#)

- 601 GENERAL
- 602 NO<sub>x</sub> EMISSION CONCENTRATION
- 603 CO EMISSION CONCENTRATION
- 604 STACK GAS OXYGEN
- 605 STACK GAS VELOCITY (FLOW)
- 606 STACK GAS MOISTURE CONTENT
- 607 FUEL HHV

## 100 GENERAL

- 101 **PURPOSE:** The purpose of this rule is to limit the emissions of oxides of nitrogen(NOx) and carbon monoxide (CO) from biomass fueled boilers.
- 102 **APPLICABILITY:** The provisions of this rule are applicable to boilers and steam generators with rated heat inputs of greater than or equal to 5 million BTU per hour and which combust biomass as a fuel.
- 110 **EXEMPTIONS:** The provisions of this rule shall not apply to the following:
- 110.1 **Boilers, Steam Generators, and Process heaters:** Boilers, steam generators, and process heaters which are subject to the provisions of District Rule 2.27 - Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters.
  - 110.2 **Solid Waste Incinerators:** Combustion units whose primary purpose is to burn municipal solid waste.
  - 110.3 **Waste Heat Recovery Boilers:** Waste heat recovery boilers that are used to recover sensible heat from the exhaust of combustion turbines or unfired waste heat recovery boilers used to recover sensible heat from the exhaust of any combustion equipment.

## 200 DEFINITIONS

- 201 **BIOMASS:** Any organic material not derived from fossil fuels, such as agricultural crop residues, bark, lawn, yard and garden clippings, leaves, silvicultural residue, tree and brush pruning, wood and wood chips, and wood waste, including these materials when separated from other waste streams. Biomass does not include material containing sewage sludge, industrial sludge, medical waste, hazardous waste, or radioactive waste.
- 202 **BIOMASS FUELED BOILER (BOILER):** Any combustion equipment designed to burn biomass to produce steam, heat water or other fluids, and/or produce electricity, including but not limited to boilers and steam generators.
- 203 **BLOCK 24-HOUR AVERAGE:** the arithmetic average of the hourly NOx or CO 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.

- 204 BRITISH THERMAL UNIT (BTU): The amount of heat required to raise the temperature of one pound of water from 59 degrees Fahrenheit to 60 degrees Fahrenheit at one atmosphere.
- 205 CARBON MONOXIDE (CO) EMISSIONS: Carbon monoxide in the flue gas.
- 206 CURING STARTUP: A startup which includes heating the boiler at a predetermined rate and holding the temperature at several points to allow for insulating materials to cure in the boiler refractory.
- 207 HEAT INPUT: The chemical heat released due to fuel combustion in a unit, using the higher heating value of the fuel. This does not include the sensible heat of incoming combustion air.
- 208 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 resultant products are brought to their standard states at standard conditions.
- 209 NITROGEN OXIDE (NO<sub>x</sub>) EMISSIONS: The sum of nitric oxides and nitrogen dioxide in the flue gas, collectively expressed as nitrogen dioxide (NO<sub>2</sub>).
- 210 RATED HEAT INPUT: The heat input capacity, in million BTU per hour, specified on the nameplate of the unit. If the unit has been altered or modified such that the maximum heat input is different than the heat input capacity specified on the nameplate, the maximum heat input shall be considered as the rated heat input.
- 211 SHUTDOWN: The period of time when fuel feed is curtailed and the unit cools down from its normal operating temperature, to an ambient temperature.
- 212 STARTUP: The period of time that a unit is heated to the normal operating temperature, from a shutdown status.
- 213 **UNIT:** Any biomass fueled boiler, as defined in section 202.

### 300 STANDARDS

- 301 **EMISSION LIMITS:** The owner/operator of an affected unit shall limit the emissions of that unit to less than the following, excluding startup/shutdown:

NOx	CO
90 ppm, corrected to 3% O2 (block 24 hour average)	400 ppm, corrected to 3% O2 (block 24 hour average)

302 **STARTUP/SHUTDOWN PROVISIONS:** The emission limits of section 301 shall not apply during startup/shutdown, provided the following requirements are met:

302.1 A normal startup shall not exceed 24 hours in duration. A curing startup shall not exceed 96 hours in duration.

302.2 A shutdown shall not exceed 24 hours.

302.3 The frequency and duration of startup/shutdown periods and their associated emissions shall be minimized as much as technologically feasible.

302.4 During startup/shutdown periods, the owner/operator of an affected unit shall limit the emissions of that unit to less than the following:

NOx	CO
215 ppm, corrected to 3% O2 (block 24 hour average)	400 ppm, corrected to 3% O2 (block 24 hour average)

303 **CONTINUOUS EMISSION MONITORING SYSTEM (CEMS):** The owner/operator of an affected unit shall install, calibrate, maintain, and operate a Continuous Emission Monitoring System (CEMS) for measuring NOx and CO emission concentrations.

303.1 The CEMS shall comply with the requirements specified in 40 Code of Federal Regulations (CFR) Part 60, Appendix B, Specification 2 and Appendix F or other alternative methods approved by the U.S. EPA and the District.

304 **SOURCE TESTING:** The owner/operator of an affected unit subject to the provisions of this rule shall perform a Relative Accuracy Test Audit (RATA) to verify compliance with 40 CFR Part 60, Appendix F at least once every four (4) calendar quarters, in accordance with a District-approved protocol and the procedures listed in Appendix F.

#### 400 ADMINISTRATIVE REQUIREMENTS

Yolo-Solano AQMD

Amended [April 12, 2023](#) [December 13, 2023](#)  
(Final draft language November 28, 2023)

401 **COMPLIANCE SCHEDULE:** The owner/operator of an affected unit subject to the requirements of this rule shall demonstrate full compliance with all provisions by July 1, 2011.

402 **CEMS OPERATING AND MAINTENANCE (O&M) PLAN:** The owner/operator of an affected unit shall submit an O&M Plan for the CEMS to the Air Pollution Control Officer (APCO) for approval. The plan shall include:

402.1 The procedures for collecting and recording required data and other information in a form approved by the APCO.

402.2 The procedures and schedules for preventive and corrective maintenance performed for the purpose of maintaining the CEMS in proper operating condition.

## 500 REPORTING AND RECORDKEEPING

501 **REPORTING:** All records required by this Rule shall be maintained on-site for a period of five (5) years and made available to the APCO upon request.

502 **RECORDKEEPING:** The owner/operator of an affected unit shall maintain an operating log for the unit that includes, on a daily basis:

502.1 The actual startup/shutdown time and total operating hours;

502.2. Type and amount of each biomass fuel burned;

502.3 The exhaust gas CO and NO<sub>x</sub> concentrations in parts per million volume (ppmv), corrected to 3% O<sub>2</sub>, for block 24-hour average.

503 **SOURCE TEST REPORTS:** The owner/operator of an affected unit shall maintain the results of any RATA performed under section 304.

504 **FEDERAL REPORTING:** At least every six (6) months, the owner/operator of an affected unit shall submit all records required by this rule to the U.S. EPA via the Compliance and Emissions Data Reporting Interface (CEDRI), which can be accessed through U.S. EPA's Central Data Exchange (CDX) (<https://cdx.epa.gov>), or analogous electronic submission system provided by U.S. EPA.

## 600 TEST METHODS

- 601 GENERAL: For the purposes of this Rule, the following test methods (or their most recent approved versions) shall be used. Other alternative test methods that are approved in writing by the District and the EPA may also be used.
- 602 NO<sub>x</sub> EMISSION CONCENTRATION: NO<sub>x</sub> emission concentrations shall be determined in accordance with U.S. EPA Method 7.
- 603 CO EMISSION CONCENTRATION: CO emission concentrations shall be determined in accordance with U.S. EPA Method 10.
- 604 STACK GAS OXYGEN: The oxygen content of the stack gas shall be determined in accordance with U.S. EPA Method 3.
- 605 STACK GAS VELOCITY (FLOW): Velocity of the stack gases shall be determined in accordance with U.S. EPA Method 2.
- 606 STACK GAS MOISTURE CONTENT: Moisture content of the stack gases shall be determined in accordance with U.S. EPA Method 4.
- 607 FUEL HHV: The HHV of solid fuels shall be determined in accordance with ASTM E 711-87 or ASTM D 2015-96.