

# Air Permitting Requirements for Biomass



What is biomass and what are the air permitting requirements for small **COMBUSTION** sources of biomass in Virginia?

**Definition:** "Biomass" means organic material that is available on a renewable or recurring basis, including:

1. Forest-related materials, including uncontaminated mill residues, logging residues, forest thinning, slash, brush, low-commercial value materials or undesirable species, and woody material harvested for the purpose of forest fire fuel reduction or forest health and watershed improvement;
2. Agricultural-related materials, including orchard trees, vineyard, grain or crop residues, including straws, aquatic plants and agricultural processed co-products and waste products, including fats, oils, greases, whey, and lactose;
3. Animal waste, including manure and slaughterhouse and other animal processing waste;
4. Solid woody waste materials, including landscape trimmings, waste pallets, crates and manufacturing, construction, and demolition wood wastes, excluding pressure-treated, chemically treated or painted wood wastes and wood contaminated with plastic;
5. Crops and trees planted for the purpose of being used to produce energy;
6. Landfill gas, wastewater treatment gas, and biosolids, including organic waste byproducts generated during the wastewater treatment process; and
7. Municipal solid waste, excluding tires and medical and hazardous waste.

**Permitting Exemption:** An air permit is not required if uncontrolled emissions of equipment and process units are below exemption levels in (1) For criteria pollutants: 9 VAC 5-80-1320 C (new sources) and D (modified sources) of state regulations ([9 VAC 5, Chapter 80, Article 6](#)) **AND** (2) For toxics: 9 VAC 5-80-1320 E ([toxic spreadsheet listing exemption levels](#)). The criteria pollutant exemption levels are as follows:

Pollutant	New Source (tons/yr)	Modified Source (tons/yr)
PM	25	15
PM-10	15	10
CO	100	100
NO <sub>x</sub>	40	10
SO <sub>2</sub>	40	10
VOC	25	10

“Uncontrolled emissions” are the emissions from an emissions unit when:

- operating at maximum capacity
- without air pollution control equipment
- based on 8,760 hours of operation per year (or an enforceable permitted throughput condition)

Uncontrolled emissions are calculated by taking the maximum rated capacity of the emission unit, multiplying it by an emission factor, and multiplying it by 8,760 hrs/yr (and dividing by 2000 lbs/ton). An emission factor is the relationship between the amount of pollution produced and the amount of raw material processed or number of product units produced. Emission factors can be [AP-42 factors](#), manufacturer specifications, and/or stack test data. An example uncontrolled emissions calculation is below:

**Example: #2 fuel oil boiler rated at 30 MMBtu/hr, NO<sub>x</sub> emissions**

Average Heat Content (taken from AP-42) = 140,000 Btu/gal

Emission Factor (taken from AP-42) = 20 lb NO<sub>x</sub>/Mgal

Where: Mgal = thousand gallon

MMBtu = million Btu

$$\text{Fuel Rating: } \left( \frac{30 \text{ MMBtu}}{\text{hr}} \right) * \left( \frac{1,000,000 \text{ Btu}}{1 \text{ MMBtu}} \right) * \left( \frac{\text{gal}}{140,000 \text{ Btu}} \right) * \left( \frac{\text{Mgal}}{1000 \text{ gal}} \right) = 0.214 \frac{\text{Mgal}}{\text{hr}}$$

$$\text{Hourly Emissions: } \left( \frac{0.214 \text{ Mgal}}{\text{hr}} \right) * \left( \frac{20 \text{ lb NO}_x}{\text{Mgal}} \right) = 4.28 \frac{\text{lbs NO}_x}{\text{hr}}$$

$$\text{Annual Emissions: } \left( \frac{4.28 \text{ lbs NO}_x}{\text{hr}} \right) * \left( \frac{8760 \text{ hrs}}{\text{yr}} \right) * \left( \frac{\text{ton}}{2000 \text{ lbs}} \right) = 18.75 \frac{\text{tons NO}_x}{\text{yr}}$$

Once all uncontrolled emissions are calculated for the equipment and process units at the facility, compare these aggregated values with the exemption levels stated above. If uncontrolled emissions are below those levels, then it is exempt. **Any owner claiming that a facility is exempt must keep records in accordance with 9 VAC 5-80-1320 A.4 as may be necessary to demonstrate to the satisfaction of the Department its continued exempt status.** The facility may contact the appropriate DEQ [regional office](#) (i.e. the region where the facility is/will be located) for help in determining if you qualify for an exemption.

**If Not Exempt From Permitting:** If the exemption does not apply, then a permit is needed! The facility has two options for permitting:

1. The normal [Minor New Source Review \(NSR\) Program](#), OR
2. The [Biomass Pilot Test Facility General Permit](#)

All important information on the two options is located in the links above, such as applications, where to send the applications, timeframes, etc.

Note: If the facility is already operating and discovers that an air permit is needed, the facility must still complete and submit a complete application for evaluation of the regulatory status by the DEQ.

\*\*Updated May 25, 2011\*\*