



## Small Business Assistance Program

Colorado Department of Public Health and Environment  
<http://www.cdphe.state.co.us/ap/sbap.asp>

### An Overview of Colorado Air Regulations for: Small Boilers, including Federal New Source Performance Standards for Boilers Subject to 40 C.F.R. Subpart Dc

Steam generating units (boilers), release air pollutants that are regulated by the Air Pollution Control Division (APCD) at the Colorado Department of Public Health and Environment. This guidance document provides an overview of air emission reporting and permitting requirements for small boilers using distillate oil, residual oil, natural gas and liquid petroleum gas (LPG). Contact the APCD Small Business Assistance Program for information on other boilers or fuel types.

#### ➤ SUMMARY OF AIR REQUIREMENTS FOR SMALL BOILERS

All boilers in Colorado are subject to general air emission reporting and permitting requirements. In addition, select small boilers that were constructed, reconstructed or modified *after June 9, 1989* are also subject to specific federal requirements called New Source Performance Standards (NSPS), Subpart Dc for Small Industrial-Commercial-Institutional Steam Generating Units (Boilers). Table 1 provides a summary of the air requirements for various small boilers:

Table 1 Summary of Requirements		
Boiler Description	Subject to Colorado's Air Reporting and Permitting Requirements?	Subject to NSPS, Subpart Dc?
Heat input capacity $\leq 10$ MMBtu/hr	✓ Yes	No
10 MMBtu/hr $\leq$ Heat input capacity $\leq 100$ MMBtu/hr Constructed, reconstructed or modified <b>before</b> June 9, 1989	✓ Yes	No
10 MMBtu/hr $\leq$ Heat input capacity $\leq 100$ MMBtu/hr Constructed, reconstructed or modified <b>after</b> June 9, 1989	✓ Yes	✓ Yes

## ➤ COLORADO AIR EMISSIONS REPORTING AND PERMITTING REQUIREMENTS

All small boilers subject to NSPS, Subpart Dc must report air emissions by submitting an Air Pollution Emission Notice (APEN) to the APCD. Boilers that are not subject to NSPS, Subpart Dc must submit an APEN only if the level of air emissions from the boiler exceed the thresholds shown in Table 2.

<b>Table 2</b> <b>Air Emission Reporting Thresholds</b>	
<b>Pollutant</b>	<b>Thresholds for Attainment &amp; Attainment/Maintenance Areas<sup>1</sup> (tpy)</b>
Total Suspended Particulate (TSP)	2
Particulate Matter < 10 Microns PM <sub>10</sub> )	2
Volatile Organic Compounds (VOC)	2
Nitrogen Oxides (NO <sub>x</sub> )	2
Carbon Monoxide (CO)	2
Sulfur Dioxide (SO <sub>2</sub> )	2
Non-criteria pollutants	Listed in Appendix A of Regulation No. 3, Part A

<sup>1</sup> All areas of Colorado are currently designated as either attainment or attainment/maintenance.

As a general rule of thumb, boilers with heat input capacity *greater than* 10 MMBtu/hr typically require an APEN, while boilers with heat input capacity *less than* 10 MMBtu/hr typically require an APEN only when the following fuel throughputs are exceeded:

<b>Fuel Type</b>	<b>Fuel Consumption Thresholds Typically Requiring an APEN for Boilers Rated &lt; 10 MMBtu/hr<sup>1</sup></b>
Liquid Petroleum Gas	190,476 gallons/year
Natural Gas	40 million standard cubic feet (mmscf)/yr
Fuel Oil Nos. 4, 5, 6 and distillate	72,727 gallons/year

<sup>1</sup> Fuel estimates are based on emission factors obtained from EPA's AP-42, "Compilation of Air Pollution Emission Factors."

### • APEN Exemptions:

Colorado air regulations include two reporting exemptions for small boilers:

1. Boilers that use only gaseous fuel with a maximum heat input capacity of 5 MMBtu/hr are exempt from APEN requirements, unless the unit is a part of a process (Regulation No. 3, Part A, Section II.D.1.k); and
2. Boilers that use only gaseous fuel, with a maximum heat input capacity of 10 MMBtu/hr, that are used solely for heating buildings for personal comfort are exempt from APEN requirements (Regulation No. 3, Part A, Section II.D.1.ggg)

- **APEN Forms:**

The General APEN form is available through the APCD and may be downloaded at:

<http://www.cdphe.state.co.us/ap/downloadforms.asp>. Use the APEN form to report information about your boiler, including design heat input rate, types of fuel burned, fuel consumption rates, fuel heating values, and any control technology that is used to reduce the emissions of regulated pollutants. A single APEN may be used to list multiple identical boilers. However, boilers subject to NSPS, Subpart Dc cannot be combined on the same APEN with boilers that are not subject to NSPS, Subpart Dc.

APENs are valid for five years, and each APEN must be renewed at least 30 days before it expires. Additionally, revised APENs must be submitted to the Division when certain changes occur at your facility. Examples of such changes include, but are not limited to: a name change, a change in ownership, a change in the business location, a significant change in emissions, or a modification to the emission unit.

- **Obtaining a Permit**

All small boilers subject to NSPS, Subpart Dc must obtain an air permit. Boilers that are not subject to NSPS, Subpart Dc must obtain a permit only if the level of air emissions from the boiler exceed the thresholds shown in Table 3.

<b>Table 3 Permit Thresholds</b>	
<b>Pollutant</b>	<b>Thresholds for Attainment &amp; Attainment/Maintenance Areas<sup>1</sup> (tpy)</b>
Total Suspended Particulate (TSP)	10
Particulate Matter < 10 Microns PM <sub>10</sub> )	5
Volatile Organic Compounds (VOC)	5
Nitrogen Oxides (NO <sub>x</sub> )	10
Carbon Monoxide (CO)	10
Sulfur Dioxide (SO <sub>2</sub> )	10

<sup>1</sup> All areas of Colorado are currently designated as either attainment or attainment/maintenance.

As a general rule of thumb, boilers with heat input capacity *greater than* 10 MMbtu/hr typically require a permit, while boilers with heat input capacity *less than* 10 MMbtu/hr typically require a permit only when the following fuel throughputs are exceeded:

<b>Fuel Type</b>	<b>Fuel Consumption Thresholds Typically Requiring a Permit for Boilers Rated &lt; 10 MM NO<sub>x</sub><sup>1</sup></b>
Liquid Petroleum Gas	952,380 gallons/year
Natural Gas	200 mmscf/year
Fuel Oil Nos. 4, 5, 6 and distillate	363,636 gallons/year

<sup>1</sup> Fuel estimates are based on emission factors obtained from EPA's AP-42, "Compilation of Air Pollution Emission Factors."

- **Permit Exemptions:**

Colorado air regulations include one permit exemption for small boilers:

1. Boilers with a maximum design heat input capacity less than or equal to 10 MMBtu/hr and combusts only gaseous fuels (such as liquid petroleum gas or natural gas), are exempt from air permit requirements (Regulation No. 3, Part B, Section II.D.1.e).

- **The Permit Process:**

If your small boiler requires a permit, the APCD will use the information provided in your APEN to determine the specific terms and conditions for your permit. In Colorado, air permits are issued in two phases: Initial Approval and Final Approval.

- An **Initial Approval** (IA) permit allows a business to construct the facility and begin operation.
- A **Final Approval** (FA) permit is issued after a business certifies that the facility is in compliance with the conditions of the Initial Approval permit. The information required to certify compliance may include, but is not limited to, opacity observations, fuel supplier certification forms, and various case-specific requirements. Information on how to self-certify compliance with an IA permit may be found online at <http://www.cdphe.state.co/ap/downloadforms.asp>

More information on air emissions reporting and air permitting requirements can be found in the guidance document, “Reporting Your Air Emissions and Applying for Air Permits Step-by-Step for Colorado Small Businesses.” This document is available on the Division’s webpage at: <http://www.cdphe.state.co.us/ap/stationarylibrary.html>

- **Reporting and Permitting Fees**

**Filing Fee:** A \$119.96 filing fee is required for each APEN submitted. This includes APENs submitted for administrative changes (e.g., change in ownership, change in location). Fees are subject to change by the legislature on an annual basis.

**Annual Fee:** All sources required to file an APEN must pay annual fees based on the estimated annual emissions of air pollutants. The Division bills each source subject to an annual fee of \$13.54 per ton of criteria pollutants emitted and \$90.34 per ton of non-criteria (hazardous air pollutants) emitted. The Division mails invoices for these fees in May or June of each year. Fees are subject to change by the legislature on an annual basis.

**Permit Processing Fee:** In addition to the \$119.96 APEN filing fee, the Division assesses a fee for the review of the permit application and processing by an engineer. The application review fee is \$59.98/hr.

## ➤ NSPS, SUBPART DC FOR SMALL BOILERS

The USEPA established federal standards (New Source Performance Standards or NSPS) to regulate air emissions by many types of industrial facilities. NSPS for small boilers are found in **Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units (Dc Boilers), Code of Federal Regulations (CFR), Title 40, Part 60, Sections 60.40c to 60.48c**. NSPS are available for download at <http://ecfr.gpoaccess.gov/>. The following subsections provide an overview of the NSPS, Subpart Dc applicability and requirements.

### • **Applicability:**

NSPS Subpart Dc applies to steam generating units that meet the following criteria:

- The unit has a maximum design heat input capacity input greater than or equal to 10 MMBtu/hr but less than or equal to 100 MMBtu/hr, and
- The unit was constructed, modified, or reconstructed after June 9, 1989.

While Subpart Dc applies to boilers that combust any of several fuel types, this guidance addresses only requirements for small boilers combusting residual or distillate oil, alone or with natural gas.

### • **Subpart Dc Fuel Type Definitions**

Residual Oil: crude oil, fuel oil that does not comply with the specifications of the definition of distillate oil; this includes, but is not limited to all fuel oil number 4, 5, and 6, as defined by American Society for Testing and Materials, ASTM D396-78, 89, 90, 92, 96, or 98, and waste oil.

Distillate Oil: Fuel oil numbers 1 and 2, as defined by the American Society for Testing and Materials in ASTM D396-78. According to this definition, distillate oil contains a maximum of 0.5 percent sulfur by weight.

Natural Gas: (1) a naturally occurring mixture of hydrocarbon and non-hydrocarbon gases found in geologic formations beneath the earth's surface, of which the principal constituent is methane, or (2) liquefied petroleum (LP) gas, as defined in ASTM D1835-86, 87, 91, or 97.

### • **Subpart Dc - Sulfur Dioxide Standards for Residual and Distillate Oil and Natural Gas:**

NSPS Subpart Dc regulates the amount of sulfur dioxide (SO<sub>2</sub>) that may be emitted from small steam generating units that combust residual or distillate oil (alone or with natural gas) at all times including periods of unit startup, shutdown, and malfunction. If your small boiler combusts only natural gas, you are not required to demonstrate compliance with this standard. Under Subpart Dc, Section 60.42c(d), compliance with the SO<sub>2</sub> standard may be demonstrated using one of the following options:

- A. Demonstrate that actual SO<sub>2</sub> emissions are less than or equal to 0.5 pounds of SO<sub>2</sub>/MMBtu heat input.

To demonstrate compliance using this option, you must install and operate a Continuous Emissions Monitoring System (CEMS) on the boiler in accordance with 40 C.F.R. §60.13 and use the data generated from the CEMS in conjunction with EPA Method 19 procedures to determine the hourly SO<sub>2</sub> emission rates and 30-day average SO<sub>2</sub> emission rates.

- requires the user to conduct daily calibration drift tests;
- requires the user to conducted ongoing quarterly accuracy determinations; and
- requires the user to maintain detailed recordkeeping requirements in 60.48c(a)-(e) as described below.
- performance tests must be conducted pursuant to Subpart Dc and Section §60.8, as applicable, within 30 days after reaching maximum production, but within 180 days of initial startup.

**B.** Demonstrate that the fuel sulfur content is less than or equal to 0.5 percent by weight. The following procedures/methodologies must be used to demonstrate that all fuel supplied to the boiler meets the SO<sub>2</sub> standard.

1. Conduct ongoing shipment fuel sampling, including an initial performance test of the oil in the first fuel tank to be fired in the steam generating unit, and fuel sampling analyses conducted after each shipment of oil is received and prior to its use in the boiler. **OR**
2. Obtain fuel supplier certifications for all fuel supplied to the boiler, and maintain certified statements that the fuel certifications represent all of the fuel combusted during the reporting period. Fuel supplier certifications must be maintained for at least two years and made available to the Division upon request, and contain the following information:

For Distillate Oil:	For Residual Oil:
<ol style="list-style-type: none"> <li>a. The name of the oil supplier, and</li> <li>b. A statement from the oil supplier that the oil complies with the specifications under the definition of distillate oil in Subpart Dc 60.41c</li> </ol>	<ol style="list-style-type: none"> <li>a. The name of the oil supplier,</li> <li>b. The location of the oil when the sample was drawn for analysis to determine the sulfur content of the oil, specifically including whether the oil was sampled as delivered to the affected facility, or whether the sample was drawn from oil in storage at the oil supplier's or oil refiner's facility, or other location;</li> <li>c. The sulfur content of the oil from which the shipment came (or of the shipment itself); and</li> <li>d. The method used to determine the sulfur content of the oil.</li> </ol>

**NOTE:** Small Boilers with a heat input capacity greater than 30 MMBtu/hr that combust distillate oil may not use fuel supplier certifications to demonstrate compliance with the SO<sub>2</sub> standard, and must either conduct fuel sample analyses or install and operate a CEMS.

- **Subpart Dc – Particulate Matter (PM) Standard for Residual and Distillate Oil and Natural Gas**

The PM Standard in Subpart Dc only applies to small boilers with a heat input capacity greater than 30 MMBtu/hr but less than or equal to 100 million Btu/hr (**30 MMBtu/hr ≤ boiler heat input capacity ≤ 100 MMBtu/hr**).

- Under Subpart Dc, Section 60.43c(c), a boiler may not discharge gases with more than 20 percent opacity (based on a 6-minute average) except for one 6-minute period per hour of no more than 27% opacity.
- compliance with opacity limit applies at all times except times of unit startup, shutdown, or malfunction.
- Opacity compliance tests must be conducted using EPA Method 9.

A facility that combusts *residual oil* in a boiler having a heat capacity of 30 million Btu/hour or greater must also install, certify, operate, and maintain a continuous opacity monitoring system (COMS) on the boiler.

## • NSPS Subpart Dc - Additional Recordkeeping Requirements

Operators of Subpart Dc boilers are required to submit notifications and maintain records (for at least two years) of their operations. Recordkeeping requirements are found at Subpart Dc, Section 60.48c(a)-(e), and are typically referenced in the air permit. Some of the notification and recordkeeping requirements include:

- A. Notification of the date of boiler construction or reconstruction, and anticipated and actual startup dates (within the timeframe specified in subpart A of the NSPS), including:
  - The design heat-input capacity of the boiler and identification of the fuels to be combusted in the boiler;
  - the annual capacity at which you anticipate operating the boiler based on all fuels fired and based on each individual fuel fired; and
  - if an emerging technology will be used for controlling SO<sub>2</sub> emissions.

This information is provided by your business to the Division in the Air Pollutant Emission Notice (APEN).

- B. Records of any performance test data from any performance tests, submitted within 45 days following the completion of the test.
- C. For facilities combusting residual oil, reports of any excess emissions from the affected facility that occurred during the reporting period.
- D. Records of the amounts of each fuel combusted during each day.

## ➤ FREQUENTLY ASKED QUESTIONS (FAQ)

**Question:** NSPS Subpart Dc requires my facility to maintain daily records of fuel consumption for each Dc boiler under 40 CFR §60.48c(g). May I request a reduction in recordkeeping to monthly records of fuel use?

**Answer:** Operators of small boilers subject to NSPS Subpart Dc may request approval for a reduction in daily fuel use recordkeeping to monthly fuel use records. This approval must be obtained from the Environmental Protection Agency (EPA), pursuant to the authority in 40 CFR §60.13(i) and cannot be issued by the Colorado state Air Pollution Control Division.



Based on alternative recordkeeping plans previously approved by EPA, facilities meeting the following criteria are likely to obtain approval from EPA to reduce fuel use recordkeeping from daily to monthly:

- The Dc boiler is fired solely on natural gas, LPG or low sulfur fuel oil (less than 0.5% by weight)

**Question:** The Dc boiler(s) that operate at my facility do not operate individual fuel flow meters to determine actual fuel use by each unit for my records. The fuel use is measured by a common fuel flow meter. In this case, may I use an indirect method of fuel use monitoring to determine the fuel use (daily or monthly) for each Dc boiler at my facility?

**Answer:** Operators of small boilers subject to NSPS Subpart Dc may request approval for an indirect method of fuel use determination to generate records of actual fuel use. This approval must be obtained from the Environmental Protection Agency (EPA), pursuant to the authority in 40 CFR §60.13(i) and cannot be issued by the Colorado state Air Pollution Control Division.

Based on alternative indirect fuel recordkeeping plans previously approved by EPA, facilities that propose the following indirect method of fuel use determination are likely to obtain approval from EPA:

- The Dc boilers are fired solely on natural gas, LPG or low sulfur fuel oil (less than 0.5% by weight)
- The operator will track the actual hours of operation (daily or monthly) of each Dc boiler and multiply this number by the manufacturers maximum hourly fuel consumption rate for each Dc boiler.

If you desire to obtain approval for alternative recordkeeping as described above, submit a written request to:

EPA Region 8  
Office of Enforcement, Compliance and Environmental Justice  
Attn: Technical Enforcement Director of the Air Toxics Program  
999 18<sup>th</sup> Street  
Denver, CO 80202-2466

If EPA approves your request, you may apply to the Air Pollution Control Division to modify the recordkeeping requirements contained in your air pollution emission permit.

## ➤ **HELP IS AVAILABLE**

The Small Business Assistance Program (SBAP) is available to answer questions you may have regarding small boilers, Subpart Dc boilers, or other environmental issues at your facility. The SBAP can help you understand the regulations, determine what your company has to do to be in compliance, file required forms, and complete the APEN and permitting process. Our services are always free and confidential.

### **SBAP Contacts:**

Joni Canterbury – (303) 692-3175  
Margo Griffin – (303) 692-3148