



COLORADO

Small Business Assistance Program

Department of Public Health & Environment

An Overview of Colorado Air Regulations for Small Boilers Includes Federal New Source Performance Standards for Boilers Subject to 40 CFR 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

Boilers operated in Colorado may be 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:

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 before June 9, 1989	✓ Yes	No
10 MMBtu/hr \leq Heat input capacity \leq 100 MMBtu/hr Constructed, reconstructed or modified after June 9, 1989	✓ Yes	✓ Yes

➤ COLORADO AIR EMISSIONS REPORTING AND PERMITTING REQUIREMENTS

All small boilers subject to NSPS, Subpart Dc must submit an Initial Notification to the APCD. Boilers must submit an APEN, to the division, only if the level of air emissions from the boiler exceeds the thresholds shown in Table 2.

Pollutant	Attainment & Attainment/Maintenance Areas	Non-Attainment Areas
Total Suspended Particulate (TSP)	2	1
Particulate Matter < 10 Microns (PM ₁₀)	2	1
Volatile Organic Compounds (VOC)	2	1
Nitrogen Oxides (NO _x)	2	1
Carbon Monoxide (CO)	2	1
Sulfur Dioxide (SO ₂)	2	1
Non-criteria pollutants	Listed in Appendix A of Regulation No. 3, Part A	

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:

Fuel Type	Fuel Consumption Thresholds Typically Requiring an APEN for Boilers Rated < 10 MMBtu/hr	
	1 (ton/yr)	2 (ton/yr)
Liquid Petroleum Gas (gallons/yr)	95,238	190,476
Natural Gas (million standard cubic feet, mmscf/yr)	20	40
Fuel Oil No. 4, 5, 6 (residual) and distillate (No. 1 and 2) (gallons/yr)	36,364	72,727

• 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: www.colorado.gov/pacific/cdphe/APENforms. 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**

You must obtain a permit for your boiler if the level of air emissions from the boiler exceeds the thresholds shown in Table 3.

Pollutant	Attainment & Attainment/Maintenance Area	Non-Attainment
Total Suspended Particulate (TSP)	10	5
Particulate Matter < 10 Microns (PM ₁₀)	5	1
Volatile Organic Compounds (VOC)	5	2
Nitrogen Oxides (NO _x)	10	5
Carbon Monoxide (CO)	10	5
Sulfur Dioxide (SO ₂)	10	5

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:¹

Fuel Type	Fuel Consumption Thresholds Typically Requiring a Permit for Boilers Rated < 10 MM NOx	
	5 (ton/yr)	10 (ton/yr)
Liquid Petroleum Gas (gallons/year)	476,190	952,380
Natural Gas (million standard cubic feet, mmscf/year)	100	200
Fuel Oil No. 4, 5, 6 (residual) and distillate (No. 1, 2) (gallons/year)	181,818	363,636

¹ Emission rates listed are the applicable APEN emission reporting and permit thresholds for both attainment and non-attainment areas. Attainment/Maintenance areas are subject to attainment area thresholds. 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 called Construction Permits. Permits will be issued as “Issuances” (i.e. Issuance 1, Issuance 2, etc). A new Issuance will be written for each modification to a permit. The final step of the air permitting process, to finalize the permit, is to submit the Self-Certification Package. This step requires that the business certifies compliance with the terms and conditions of the permit and allows the business to make changes to the permit if necessary.

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: www.colorado.gov/pacific/sites/default/files/AP_Air-Permits-Step-By-Step.pdf

- **Reporting and Permitting Fees**

Filing Fee: A \$152.90 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 \$22.90 per ton of criteria pollutants emitted and \$152.90 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 \$152.90 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 \$76.45/hr.

➤ **NSPS, SUBPART DC FOR SMALL BOILERS**

The USEPA established federal standards (New Source Performance Standards or NSPS) to regulate air emissions for many types of industrial facilities. The NSPS for small boilers is 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.

Low Sulfur Diesel Fuel (LSD): standard diesel fuel with lowered sulfur contents (500 ppm or .05 weight percent sulfur).

Very Low (Ultra Low) Sulfur Diesel Fuel (ULSD): diesel fuel with substantially lowered sulfur contents (at or below 15 ppm or .0015 weight percent sulfur).

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

NSPS Subpart Dc regulates the amount of sulfur dioxide (SO₂) 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 SO₂ standard may be demonstrated using *one* of the following options:

- A. Demonstrate that actual SO₂ emissions are less than or equal to 0.5 pounds of SO₂ /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 SO₂ emission rates and 30-day average SO₂ emission rates.

- Requires the user to conduct daily calibration drift tests;
- Requires the user to conduct 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 SO₂ 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"> a. The name of the oil supplier, and 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 (this can be a letter from the supplier certifying that the fuel meets the SO₂ standard or a certification statement from the oil supplier included on the fuel purchase receipt). 	<ol style="list-style-type: none"> a. The name of the oil supplier, 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; c. The sulfur content of the oil from which the shipment came (or of the shipment itself); and d. The method used to determine the sulfur content of the oil.

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 SO₂ 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 \leq boiler heat input capacity \leq 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 reports and maintain records of their operations. Records must be maintained for at least two years. 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 SO₂ emissions.
- Note: 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. Facilities combusting residual oil and subject to the opacity limits under 60.43c(c), must submit excess emission reports for any excess particulate emissions from the facility that may have occurred during the reporting period (60.48c(c)). This report can be combined with the fuel oil sulfur limit report as described below. An example of this report is included in Appendix A of this document.
 - D. Records of the amounts of each fuel combusted during each day. *Note: Owners or operators that only burn very low (or ultra low) sulfur fuel oil (≤ 15 ppm or .0015 weight percent sulfur) can record and maintain records of the fuels combusted during each calendar month instead of daily.*

If your facility does not operate individual fuel flow meters to determine actual fuel use, you may allocate fuel usage to individual boilers based on your process knowledge.

- E. Any facility that is subject to SO₂ emission limits must submit a semi-annual (every 6 months) report to the Air Pollution Control Division as described in 60.48c(d). Reports must be postmarked by the 30th day following the end of the reporting period.
- F. Facilities using the fuel supplier certification to demonstrate compliance with the SO₂ Standard must also submit the semi-annual report as described in Section 60.48c(e)(11). Since this is the typical method to demonstrate compliance with the SO₂ standard for small boilers, an example of this report is included in Appendix B of this document. The report must include the following:
- Calendar dates covered in the report period.
 - A certified statement signed by the owner or operator of the affected facility that the records of fuel supplier certifications submitted represents all of the fuel combusted during the reporting period and;
 - Records of fuel supplier certifications for the reporting period. The fuel supplier certification must state that the fuel oil complies with the specifications under the definition of distillate oil in Subpart Dc 60.41c.

Note: the fuel supplier should include a statement on the fuel purchase receipt that states that the fuel oil complies with these specifications or specifications under D396-78, 89, 90, 92, 96, 98, Standard Specification for Fuel Oils (included by reference 60.17).

APPENDIX A

Semi-Annual Report Example - NSPS Subpart Dc Sulfur Dioxide and Particulate Fuel Oil Reporting

Date: _____

Chief of Enforcement Section
Stationary Sources Program
Colorado Department of Public Health and Environment
Air Pollution Control Division
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, CO 80246-1530

RE: Semi-Annual Report Under 40 CFR Part 60 Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units - Sulfur Dioxide & Particulate Standard-Fuel Oil Reporting Requirements

Facility Name: _____

Facility Location: _____

Air Permit No. _____

Reporting time period: _____ to _____

In accordance with 40 CFR 60.48c, I have enclosed the semi-annual report for the facility, source, and location listed above. The boiler(s) listed in the above air permit that combust fuel oil are subject to the sulfur dioxide standard of 40 CFR 60.42c(d) which limits the emissions of Sulfur dioxide (SO₂) to 0.50 lb./million Btu or alternatively, a fuel sulfur limitation of 0.5% by weight.

Records of fuel supplier certification(s) are used to demonstrate compliance with the standard (40 CFR 60.48c (f)(1)). By signing this semi-annual report, I certify that the fuel supplier certification(s) submitted represent all of the fuel combusted during the reporting period. The fuel supplier certification(s) include the name of the fuel oil supplier(s) and a statement from the supplier(s) that the fuel oil complies with the specifications under the definition of distillate oil in 40 CFR 60.41c.

Due to the size of the boiler(s) listed in the air permit (30 MMBtu/hour or greater) and their fuel source, the boilers are also subject to 40 CFR 60.43c(c) and, therefore, emissions from the source do not exceed the 20 percent opacity (6-minute average) requirement as listed in the standard.

Please contact me if you have any questions.

Sincerely,

APPENDIX B

Semi-Annual Report Example - NSPS Subpart Dc Sulfur Dioxide Fuel Oil Reporting

Date: _____

Chief of Enforcement Section
Stationary Sources Program
Colorado Department of Public Health and Environment
Air Pollution Control Division
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, CO 80246-1530

RE: Semi-Annual Report Under 40 CFR Part 60 Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units - Sulfur Dioxide Standard-Fuel Oil Reporting Requirements

Facility Name: _____

Facility Location: _____

Air Permit No. _____

Reporting time period: _____ to _____

In accordance with 40 CFR 60.48c, I have enclosed the semi-annual report for the facility, source, and location listed above. The boiler(s) listed in the above air permit that combust fuel oil are subject to the sulfur dioxide standard of 40 CFR 60.42c(d) which limits the emissions of Sulfur dioxide (SO₂) to 0.50 lb./million Btu or alternatively, a fuel sulfur limitation of 0.5% by weight.

Records of fuel supplier certification(s) are used to demonstrate compliance with the standard (40 CFR 60.48c (f)(1)). By signing this semi-annual report, I certify that the fuel supplier certification(s) submitted represent all of the fuel combusted during the reporting period. The fuel supplier certification(s) include the name of the fuel oil supplier(s) and a statement from the supplier(s) that the fuel oil complies with the specifications under the definition of distillate oil in 40 CFR 60.41c.

Please contact me if you have any questions.

Sincerely,

➤ RESOURCES

- ❖ The Small Business Assistance Program offers free assistance to small businesses with environmental questions.

Small Business Assistance Program: (303) 692-3175 or 3148
Small Business Ombudsman: (303) 692-2135

Website: www.colorado.gov/pacific/cdphe/categories/services-and-information/environment/air-quality/business-and-industry

- ❖ Air Pollution Control Division (APCD): (303) 692-3100