



Southwest Clean Air Agency

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April 25, 2014

Mr. Sam Bauder
Vancouver School District
PO Box 8937
Vancouver, WA 98668-8937

Subject: Notification of Boiler Installation at Washington Elementary School – (SUN-054)

Dear Mr. Bauder:

The Southwest Clean Air Agency (SWCAA) received your Small Unit Notification (SUN) on April 15, 2014 for installation and operation of a new boiler at Washington Elementary. The new boiler provides hydronic heating to the school and replaces one GasMaster model 1ML (serial number 156.02). For administrative and tracking purposes SWCAA has assigned tracking number SUN-054 to this notification. This notification was filed in accordance with SWCAA 400-072 and applies to the installation of one boiler. The new boiler was identified as:

- (1) Cleaver-Brooks Clearfire CFC-700-1000, natural gas fired condensing boiler with a rated heat input capacity of 1.00 MMBtu/hr.

SWCAA has completed a review of your notification and the associated support information and has determined that the notification meets the requirements of SWCAA 400-072(2). Once installed, affected equipment must maintain compliance with the requirements of SWCAA 400-072(4)(b) "**Small gas fired boilers/heaters**". A copy of the relevant SWCAA 400-072 section is attached for your information. SWCAA 400-072(4)(b)(v) requires that emissions from the unit be tested within 60 days of initial operation and annually thereafter. To be consistent with the emission monitoring schedule for the other Vancouver School District boilers and heaters, emissions monitoring must be conducted no later than the end of February each year unless an alternative schedule is approved by SWCAA.

Be advised that emission units installed pursuant to SWCAA 400-072 are subject to source registration and periodic inspection. Registration fees for this equipment will be invoiced consistent with SWCAA 400-100.

If you need further assistance or have any questions regarding these matters, please contact me at (360) 574-3058 extension 130.

Sincerely,

Paul T. Mairose
Chief Engineer

cc: Mr. Chuck Saylor
Vancouver School District
PO Box 8937
Vancouver, WA 98668-8937



SWCAA 400-072 Emission Standards for Selected Small Source Categories

[Statutory Authority: Chapter 70.94.141 RCW. Original adoption 09-21-056 filed 10/15/09, effective 11/15/09.]

(4) Source categories.

(b) Small gas fired boilers/heaters.

- (i) **Applicability.** The provisions of this section apply to gas fired (natural gas/propane/LPG) boilers and heaters with individual rated heat inputs equal to or greater than 0.4 MMBtu/hr and equal to or less than 2.0 MMBtu/hr. For the purposes of this subsection, the term "boiler" means any combustion equipment designed to produce steam or to heat water that is not used exclusively to produce electricity for sale.
- (ii) **Emission limits and standards.**
 - (A) Visible emissions from the boiler exhaust stack shall not exceed zero percent opacity for more than 3 minutes in any one hour period as determined in accordance with SWCAA Method 9. (SWCAA 400, Appendix A).
 - (B) Each boiler/heater shall be equipped with combustion technology capable of maintaining NO_x and CO emissions at, or below, 30 ppmv and 50 ppmv, respectively (corrected to 3% O₂, dry).
- (iii) **General requirements.**
 - (A) Each boiler/heater shall only be fired on natural gas, propane, or LPG.
 - (B) Boiler/heater exhaust shall be discharged vertically above the roof peak of the building in which the emission unit is housed, and at a point higher than surrounding buildings. Any device that obstructs or prevents vertical discharge is prohibited.
- (iv) **Monitoring and recordkeeping requirements.** The information listed below shall be recorded at the specified intervals, and maintained in a readily accessible form for a minimum of 3 years. With the exception of data logged by a computerized data acquisition system, each required record shall include the date and the name of the person making the record entry.
 - (A) Quantity of fuel consumed by the boiler/heater shall be recorded for each calendar month;
 - (B) Maintenance activities for the boiler/heater shall be logged for each occurrence;
 - (C) Upset conditions that cause excess emissions shall be recorded for each occurrence; and
 - (D) All air quality related complaints received by the permittee and the results of any subsequent investigation or corrective action shall be recorded for each occurrence.
- (v) **Testing requirements.**
 - (A) Each boiler/heater shall undergo emission monitoring no later than 60 calendar days after commencing initial operation. Subsequent monitoring shall be conducted annually thereafter no later the end of the month in which the original monitoring was conducted. An alternate monitoring schedule may be implemented, but must be approved by the Agency prior to use. All emission monitoring shall be conducted in accordance with the requirements of SWCAA 400-106(2).
 - (B) If emission monitoring results for a boiler/heater indicate that emission concentrations may exceed 30 ppmvd NO_x or 50 ppmvd

CO, corrected to 3% O₂, the owner or operator shall either perform 60 minutes of additional monitoring to more accurately quantify CO and NO_x emissions, or initiate corrective action. Corrective action shall be initiated as soon as practical but no later than 3 business days after the potential exceedance is identified. Corrective action includes burner tuning, maintenance by service personnel, limitation of unit load, or other action taken to lower emission concentrations. Corrective action shall be pursued until observed emission concentrations no longer exceed 30 ppmvd NO_x or 50 ppmvd CO, corrected to 3% O₂.

(vi) **Reporting requirements.**

- (A) All air quality related complaints received by the owner or operator shall be reported to the Agency within 3 business days of receipt.
- (B) Emission monitoring results for each boiler/heater shall be reported to the Agency within 15 calendar days of completion on forms provided by the Agency.
- (C) The owner or operator of an affected boiler/heater shall report the following information to the Agency no later than March 15th for the preceding calendar year:
 - (I) Quantity of fuel consumed; and
 - (II) Air emissions of criteria air pollutants, VOCs, and toxic air pollutants (TAPs).

Summary Information (by SWCAA) for SUN-054

Vancouver School District – Washington Elementary

One 1.00 MMBtu/hr Cleaver-Brooks Clearfire condensing boiler has been installed to replace one GasMaster model 1ML (serial number 152.02). The new boiler provides hydronic heating to the school.

Cleaver Brooks Clearfire C Boiler.

Location:	2908 S Street, Vancouver, WA 98663
Make / Model:	Cleaver-Brooks / Clearfire CFC-700-1000
Serial Number:	1601010010198
Built:	November 2012
Installed:	April 2014
Heat Input Rating:	1.00 MMBtu/hr with 5:1 turndown
Fuel:	Natural gas
Stack Description:	6" diameter stack exhausting ~22' above grade, ~6' above roof level

Emissions.

Cleaver-Brooks information indicates that the boilers can achieve < 20 ppmvd @ 3% O₂ NO_x and < 10 ppmvd @ 3% O₂ CO. One reference indicates that higher NO_x (up to 30 ppmvd @ 3% O₂) may occur at 5:1 turndown.

Potential Emissions

Cleaver-Brooks Clearfire CFC-700-1000						
Heat Rate		1.000 MMBtu/hr				
Natural Gas Heat Value =		1,020 Btu/scf for AP-42 emission factors				
Natural Gas Heat Value =		1,028 Btu/scf for 40 CFR 98 GHG emission factors				
Fuel Consumption =		8.588 MMscf/yr				
Pollutant	ppmvd @ 3% O ₂	Emission Factor		lb/hr	tpy	Emission Factor Source
		lb/MMBtu	lb/MMscf			
NO _x	30	0.0364	37.1	3.6E-02	0.16	BACT
CO	50	0.0370	37.7	3.7E-02	0.16	BACT
VOC		0.0054	5.5	5.4E-03	0.024	AP-42 Sec. 1.4 (7/98)
SO _x as SO ₂		0.0006	0.6	5.9E-04	0.003	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	7.5E-03	0.033	AP-42 Sec. 1.4 (7/98)
PM ₁₀		0.0075	7.6	7.5E-03	0.033	AP-42 Sec. 1.4 (7/98)
PM _{2.5}		0.0075	7.6	7.5E-03	0.033	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	2.1E-06	9.0E-06	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	7.4E-05	3.2E-04	AP-42 Sec. 1.4 (7/98)
Greenhouse Gases	kg/MMBtu	GWP	CO ₂ e	CO ₂ e	tpy, CO ₂ e	
			lb/MMBtu	lb/MMscf		
CO ₂	53.02	1	116.89	120,162	512	40 CFR 98
CH ₄	0.001	21	0.046	47.59	0.2	40 CFR 98
N ₂ O	0.0001	310	0.068	70.26	0.3	40 CFR 98
Total GHG - CO₂e	53.0211		117.004	120,280	512	