



## Southwest Clean Air Agency

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May 20, 2015

Mr. Mark Northington  
Maintenance Supervisor  
Evergreen School District No. 114  
PO Box 8910  
Vancouver, WA 98668-8910

Subject: Notification of Boiler Replacement at Evergreen High School – (SUN-084)

Dear Mr. Northington:

The Southwest Clean Air Agency (SWCAA) received your Small Unit Notification (SUN) on April 23, 2015 for installation and operation of a new domestic hot water boiler at Evergreen High School. The new boiler replaces one AO Smith model LSWT1000 (boiler ID 41948-10W, also referred to as Domestic Hot Water Boiler #2). For administrative and tracking purposes SWCAA has assigned tracking number SUN-084 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) AO Smith model VWH1000N, natural gas fired boiler with a rated heat input capacity of 0.999999 MMBtu/hr. The boiler is identified as Water Heater #2.

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. Because you also have other boilers at your facility that require testing, SWCAA hereby approves the utilization of your currently approved testing schedule for all subsequent testing of the new boiler. Your currently approved schedule requires that boiler and heater testing be conducted by the end of March each year.

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



## 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<sub>x</sub> and CO emissions at, or below, 30 ppmv and 50 ppmv, respectively (corrected to 3% O<sub>2</sub>, 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<sub>x</sub> or 50 ppmvd

CO, corrected to 3% O<sub>2</sub>, the owner or operator shall either perform 60 minutes of additional monitoring to more accurately quantify CO and NO<sub>x</sub> 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<sub>x</sub> or 50 ppmvd CO, corrected to 3% O<sub>2</sub>.

(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 15<sup>th</sup> 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-084  
Evergreen School District – Evergreen High School**

Evergreen High School – Replacement Boiler

One AO Smith model VWH1000N boiler has been installed to replace one AO Smith model LSWT1000 (S/N E-06 12463, boiler ID 41948-10W, referred to as Water Heater #2) used for domestic water heating at Evergreen High School.

**New Boiler Information**

Boiler Identification:	Water Heater #2
Location:	Evergreen High School, 3004 NE 124 <sup>th</sup> Ave., Vancouver, WA 98682
Make / Model:	AO Smith / VWH1000N
Serial Number:	A14L00259742
Built:	2013
Installed:	2015
Heat Input Rating:	0.999999 MMBtu/hr with 4:1 turndown
Fuel:	Natural gas
Stack Description:	~9' above grade, 8" diameter

## Potential Emissions

AO Smith VWH1000N / Water Heater #2						
Heat Rate =		0.999999 MMBtu/hr				
Natural Gas Heat Value =		1,020 Btu/scf for AP-42 emission factors				
Natural Gas Heat Value =		1,026 Btu/scf for 40 CFR 98 GHG emission factors				
Fuel Consumption =		8.588 MMscf/yr				
Pollutant	ppmvd @ 3% O <sub>2</sub>	Emission Factor		lb/hr	tpy	Emission Factor Source
NO <sub>x</sub>	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 <sub>x</sub> as SO <sub>2</sub>		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 <sub>10</sub>		0.0075	7.6	7.5E-03	0.033	AP-42 Sec. 1.4 (7/98)
PM <sub>2.5</sub>		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		CO <sub>2</sub> e		CO <sub>2</sub> e		
Gases	kg/MMBtu	GWP	lb/MMBtu	lb/MMscf	tpy, CO <sub>2</sub> e	Emission Factor Source
CO <sub>2</sub>	53.06	1	116.98	120,019	512	40 CFR 98
CH <sub>4</sub>	0.001	25	0.055	56.55	0.2	40 CFR 98
N <sub>2</sub> O	0.0001	298	0.066	67.41	0.3	40 CFR 98
Total GHG	53.0611		117.098	120,143	513	