
May 6, 2020

Mr. Joseph Price
Washington State University Vancouver
14204 NE Salmon Creek Avenue
Vancouver, WA 98686

Subject: Notification of Boiler Installation at Washington State University Vancouver – SUN - 236

Dear Mr. Price:

The Southwest Clean Air Agency (SWCAA) received your Small Unit Notification (SUN) on April 2, 2020 for installation and operation of a new boiler in the Engineering and Life Sciences Building at Washington State University's Vancouver campus. For administrative and tracking purposes SWCAA has assigned tracking number SUN-236 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) Lochinvar model FBN2001, natural gas fired condensing boiler with a rated heat input capacity of 1.999 MMBtu/hr. The boiler will be identified as "Science Boiler #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(5)(b) "**Small gas fired boilers/heaters**". A copy of the relevant SWCAA 400-072 section is attached for your information. SWCAA 400-072(5)(b)(v) requires that emissions from the unit be tested within 60 days of initial operation and annually thereafter. Because there are other boilers on the Washington State University Vancouver campus that require testing, SWCAA hereby approves the utilization of the currently approved testing schedule for the other boilers at the Washington State University Vancouver campus for all subsequent testing of the new boiler. The currently approved testing schedule for the other boilers at the Washington State University Vancouver campus requires that boiler testing be conducted by the end of February 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, 16-19-009 filed 9/8/16, effective 10/9/16; 17-11-078 filed 5/18/17, effective 6/18/17; 20-06-003 filed 2/19/20, effective 3/21/20]

(5) 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, 1-hr avg). EPA test methods from 40 CFR 60 (as in effect on the date cited in SWCAA 400-025) shall be used to determine compliance.
- (iii) **General requirements.**
 - (A) Each boiler/heater shall only be fired on natural gas, propane, or LPG.
- (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 promptly after 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 than the end of the month in which the original monitoring was conducted. 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) The owner or operator of an affected emission unit shall provide written notification of initial operation to SWCAA within 10 days of occurrence.
- (B) All air quality related complaints received by the owner or operator shall be reported to the Agency within 3 business days of receipt.
- (C) 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.
- (D) 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-236
Washington State University - Vancouver
May 6, 2020**

One Lochinvar Crest series condensing boiler, model FBN2001, will be installed to replace two AERCO 1.000 MMBtu/hr boilers (serial numbers G990706 and G990710) for hydronic heating in the Science Building (formerly referred to as the Engineering and Life Sciences Building). In addition, two new water heaters will be installed to replace the two existing water heaters.

New Boiler Information

Boiler Identification: Science Boiler #2
Replaces: (2) AERCO 1.000 MMBtu/hr boilers, S/Ns G990706 and G990710
Boiler Make/Model: Lochinvar / FBN2001
Boiler Description: Down-fired, firetube, forced draft, condensing boiler with pre-mix surface combustion burner. This boiler meets SCAQMD Rule 1146.2 standards
Turndown Ratio: 25:1
Serial Number: To be determined
Installed: Scheduled for 2020
Built: To be determined
Heat Input Rating: 1.999 MMBtu/hr
Fuel: Natural gas
Stack Description: Discharging vertically through the roof with 8" diameter stack, ~6' above roof, ~60' above ground level. It is not known at this time whether the stack will be capped.

New Water Heater Information

Boiler Identification: Science Water Heater #1
Replaces: Lochinvar model RWN199PM, S/N L994467, 0.199 MMBtu/hr
Boiler Make/Model: BOCK / PT199N
Boiler Description: Forced draft, condensing boiler with pre-mix woven metal burner. This boiler meets SCAQMD Rule 1146.2 standards
Turndown Ratio: ~ 3.3:1 (Heat input ranges from 60,000 Btu/hr to 199,000 Btu/hr)
Serial Number: 1613098T
Installed: Scheduled for 2020
Built: To be determined
Heat Input Rating: 0.199 MMBtu/hr
Fuel: Natural gas
Stack Description: Not provided

Boiler Identification: Science Water Heater #2
Replaces: Lochinvar model PFN0600PM, S/N 994453, 0.500 MMBtu/hr
Boiler Make/Model: BOCK / OT250N
Boiler Description: Forced draft, condensing boiler with pre-mix woven metal burner. This boiler meets SCAQMD Rule 1146.2 standards
Turndown Ratio: ~ 3.3:1 (Heat input ranges from 76,000 Btu/hr to 250,000 Btu/hr)
Serial Number: To be determined
Installed: Scheduled for 2020
Built: To be determined
Heat Input Rating: 0.250 MMBtu/hr
Fuel: Natural gas
Stack Description: Not provided

Potential Emissions

Washington State University - Vancouver - Science Boiler #2						
Heat Rate =				1.999	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 =				17.168	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	0.073	0.32	SWCAA 400-072
CO	50	0.0370	37.7	0.074	0.32	SWCAA 400-072
VOC		0.0054	5.5	0.0108	0.047	AP-42 Sec. 1.4 (7/98)
SO _x as SO ₂		0.00059	0.6	0.00118	0.0052	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.0149	0.065	AP-42 Sec. 1.4 (7/98)
PM ₁₀		0.0075	7.6	0.0149	0.065	AP-42 Sec. 1.4 (7/98)
PM _{2.5}		0.0075	7.6	0.0149	0.065	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	4.1E-06	1.8E-05	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	1.5E-04	6.4E-04	AP-42 Sec. 1.4 (7/98)
Greenhouse			CO ₂ e	CO ₂ e		
Gases	kg/MMBtu	GWP	lb/MMBtu	lb/MMscf	tpy, CO ₂ e	Emission Factor Source
CO ₂	53.06	1	116.98	120,019	1,024.2	40 CFR 98
CH ₄	0.001	25	0.055	56.55	0.5	40 CFR 98
N ₂ O	0.0001	298	0.066	67.41	0.6	40 CFR 98
Total GHG	53.0611		117.098	120,143	1,025.3	