



TECHNICAL SUPPORT DOCUMENT

**EVERGREEN SCHOOL DISTRICT – WY’EAST MIDDLE SCHOOL
SWCAA ID: 418**

Air Discharge Permit 22-3507

Air Discharge Permit Application CL-3184

Issued: April 19, 2022

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Abbreviations

ADP	Air Discharge Permit
AP-42	<u>Compilation of Emission Factors, AP-42, Fifth Edition, Volume 1, Stationary Point and Area Sources – published by the US Environmental Protection Agency</u>
BACT	Best available control technology
BART	Best Available Retrofit Technology
Btu	British thermal unit
CFR	Code of Federal Regulations
CO	Carbon monoxide
EPA	U.S. Environmental Protection Agency
gr/dscf	Grains per dry standard cubic foot (68 °F, 1 atmosphere)
HAP	Hazardous air pollutant listed pursuant to Section 112 of the Federal Clean Air Act
LAER	Lowest achievable emission rate
lb/hr	Pounds per hour
lb/MMBtu	Pounds per million British thermal units
lb/MMscf	Pounds per million standard cubic feet of fuel
lb/yr	Pounds per year
MMBtu/hr	Millions of British thermal units per hour
MMscf	Millions of standard cubic feet
NO _x	Nitrogen oxides
PM	Particulate matter with an aerodynamic diameter less than 100 micrometers (includes both filterable particulate matter measured by EPA Method 5 and condensable particulate matter measured by EPA Method 202)
PM ₁₀	Particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (includes both filterable particulate matter measured by EPA Method 201 or 201A and condensable particulate matter measured by EPA Method 202)
PM _{2.5}	Particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers (includes both filterable particulate matter measured by EPA Method 201 or 201A and condensable particulate matter measured by EPA Method 202)
ppmvd @ X	Parts per million, dry volume basis, corrected to X% O ₂
PSD	Prevention of Significant Deterioration
RACT	Reasonably Available Control Technology
RCW	Revised Code of Washington
SQER	Small Quantity Emission Rate listed in WAC 173-460
SO ₂	Sulfur dioxide
SWCAA	Southwest Clean Air Agency
TAP	Toxic air pollutant pursuant to Chapter 173-460 WAC
T-BACT	Best Available Control Technology for toxic air pollutants
tpy	Tons per year
VOC	Volatile organic compound
WAC	Washington Administrative Code

1. FACILITY IDENTIFICATION

Applicant Name: Evergreen Public Schools
Applicant Address: PO Box 8910, Vancouver, Washington 98668

Facility Name: Wy’East Middle School
Facility Address: 1112 SE 136th Avenue, Vancouver, WA 98683
Contact Person: Ms. Susan Steinbrenner
SWCAA Identification: 418

Primary Process: Elementary and Secondary Schools
SIC / NAICS Code: 8211 / 61111
Facility Designation: Natural minor

2. FACILITY DESCRIPTION

Evergreen School District is a public primary education provider for Clark County, Washington. The district operates multiple facilities which are registered with SWCAA under a single identification number. The facility addressed by this permitting action is Wy’East Middle School rebuilt in 2022.

3. CURRENT PERMITTING ACTION

This permitting action is in response to Air Discharge Permit application number CL-3184 (ADP Application CL-3184) received March 3, 2022. ADP Application CL-3184 requests approval to install the following equipment at the Wy’East Middle School:

- Two Advanced Thermal Hydronics model KN 16+ (1.6 MMBtu/hr) natural gas-fired hot water boilers for building heating;
- Two Rheem natural gas-fired hot water heaters (< 0.4 MMBtu/hr each) to provide domestic hot water;
- One 247 bhp Caterpillar emergency diesel engine.

4. PROCESS DESCRIPTION

- 4.a Space Heating. Two Advanced Thermal Hydronics model KN 16+ (1.6 MMBtu/hr) natural gas-fired hot water boilers will be used to provide building heat.
- 4.b Hot Water Production. Two Rheem natural gas-fired hot water heaters will be used to provide domestic hot water.
- 4.c Emergency Power. One Caterpillar diesel-fired emergency generator engine will be used to provide emergency electrical power to the school in the event of a utility power outage.

5. EQUIPMENT/ACTIVITY IDENTIFICATION

- 5.a Boiler 1. Boiler 1 will provide hot water to the hydronic heating system. Equipment details are listed below.

Location: Mechanical room
Boiler Make / Model: Advanced Thermal Hydronics / KN16+
Serial Number: 10218441
Installed: 10/2021
Heat Input Rating: 1.6 MMBtu/hr
Fuel: Natural gas
Stack Description ~8" diameter stack, 3' above roof level, and 33' above ground level

5.b Boiler 2. Boiler 2 will provide hot water to the hydronic heating system. Equipment details are listed below.

Location:	Mechanical room
Boiler Make / Model:	Advanced Thermal Hydronics / KN16+
Serial Number:	10218442
Installed:	10/2021
Heat Input Rating:	1.6 MMBtu/hr
Fuel:	Natural gas
Stack Description	~8" diameter stack, 3' above roof level, and 33' above ground level

5.c Hot Water Heater (GWH-1). Hot Water Heater 1 will provide hot water to the facility. This unit complies with SCAQMD low NOx requirements for the year manufactured. Equipment details are listed below.

Location:	Mechanical room
Boiler Make / Model:	Rheem / GHE80SU-130A
Serial Number:	A382111050
Manufactured:	9/21/2021
Heat Input Rating:	0.13 MMBtu/hr
Fuel:	Natural gas
Stack Description	3' above roof level, and 33' above ground level

5.d Hot Water Heater (GWH-2). Hot Water Heater 2 will provide hot water to the facility. This unit complies with SCAQMD low NOx requirements for the year manufactured. Equipment details are listed below.

Location:	Mechanical room
Boiler Make / Model:	Rheem / GHE80SU-130A
Serial Number:	A382111051
Manufactured:	9/21/2021
Heat Input Rating:	0.13 MMBtu/hr
Fuel:	Natural gas
Stack Description	3' above roof level, and 33' above ground level

5.e Emergency Generator Diesel Engine. The emergency engine will be used to drive an emergency electrical generator. Equipment details are listed below.

Engine Make / Model:	Caterpillar / C7.1 in-line 6, 4-cycle diesel
Fuel:	Diesel
Fuel Consumption:	11.3 gallons per hour at full standby load
Horsepower Rating:	247 bhp at full standby load
Manufactured:	12/2021
Engine Certification:	EPA Tier 3
Generator Set Make / Model:	Caterpillar / D150GC
Generator Set Output:	150 kW
Generator Serial Number:	CATOD150KT9900173
Stack Description:	Emitted directly at site of generator ~ 8' above ground level. Exhaust flow of 1102 cfm and 825 °F.

5.f Equipment/Activity Summary.

ID No.	Generating Equipment/Activity	Control Equipment
1	Boiler 1 (ATH / KN 16+, 1.6 MMBtu/hr)	Low Emissions Burner, Low Sulfur Fuel (natural gas)
2	Boiler 2 (ATH / KN 16+, 1.6 MMBtu/hr)	Low Emissions Burner, Low Sulfur Fuel (natural gas)
3	Hot Water Heaters (units less than 0.4 MMBtu/hr each)(e.g. 1 and 2 (Rheem / GHE80SU-130A, 0.13 MMBtu/he each))	Low Emission Burner, Low Sulfur Fuel (natural gas)
4	Emergency Generator Diesel Engine (Caterpillar, 247 bhp)	EPA Tier 3 Certified, Ultra-Low Sulfur Fuel (<15 ppm S diesel)

6. EMISSIONS DETERMINATION

Emissions to the ambient atmosphere from the equipment identified in Air Discharge Permit Application CL-3184 consist of nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), particulate matter (PM), sulfur dioxide (SO₂), toxic air pollutants (TAPs), and hazardous air pollutants (HAPs) from the combustion of natural gas and diesel.

6.a **Boiler 1.** Potential annual emissions from the combustion of natural gas by this boiler were calculated with the assumption that the boiler could operate at full rated capacity for 8,760 hours per year.

Boiler 1						
Heat Rate =	1.600 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 =	13.741 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	0.058	0.26	BACT
CO	50	0.0370	37.7	0.059	0.26	BACT
VOC		0.0054	5.5	0.0086	0.038	AP-42 Sec. 1.4 (7/98)
SO _x as SO ₂		0.00059	0.6	0.00094	0.0041	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.0119	0.052	AP-42 Sec. 1.4 (7/98)
PM ₁₀		0.0075	7.6	0.0119	0.052	AP-42 Sec. 1.4 (7/98)
PM _{2.5}		0.0075	7.6	0.0119	0.052	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	3.3E-06	1.4E-05	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	1.2E-04	5.2E-04	AP-42 Sec. 1.4 (7/98)
Greenhouse Gases	kg/MMBtu	GWP	CO ₂ e lb/MMBtu	CO ₂ e lb/MMscf	tpy, CO ₂ e	Emission Factor Source
CO ₂	53.06	1	116.98	120,019	819.8	40 CFR 98
CH ₄	0.001	25	0.055	56.55	0.4	40 CFR 98
N ₂ O	0.0001	298	0.066	67.41	0.5	40 CFR 98
Total GHG - CO ₂ e			117.098	120,143	820.6	

Annual emissions must be calculated using the emission factors identified above unless new emission factors are developed through source testing.

6.b **Boiler 2.** Potential annual emissions from the combustion of natural gas by this boiler were calculated with the assumption that the boiler could operate at full rated capacity for 8,760 hours per year.

Boiler 2						
Heat Rate =	1.600 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 =	13.741 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	0.058	0.26	BACT
CO	50	0.0370	37.7	0.059	0.26	BACT
VOC		0.0054	5.5	0.0086	0.038	AP-42 Sec. 1.4 (7/98)
SO _x as SO ₂		0.00059	0.6	0.00094	0.0041	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.0119	0.052	AP-42 Sec. 1.4 (7/98)
PM ₁₀		0.0075	7.6	0.0119	0.052	AP-42 Sec. 1.4 (7/98)
PM _{2.5}		0.0075	7.6	0.0119	0.052	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	3.3E-06	1.4E-05	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	1.2E-04	5.2E-04	AP-42 Sec. 1.4 (7/98)
Greenhouse Gases	kg/MMBtu	GWP	CO ₂ e lb/MMBtu	CO ₂ e lb/MMscf	tpy, CO ₂ e	Emission Factor Source
CO ₂	53.06	1	116.98	120,019	819.8	40 CFR 98
CH ₄	0.001	25	0.055	56.55	0.4	40 CFR 98
N ₂ O	0.0001	298	0.066	67.41	0.5	40 CFR 98
Total GHG - CO ₂ e			117.098	120,143	820.6	

Annual emissions must be calculated using the emission factors identified above unless new emission factors are developed through source testing.

6.c Hot Water Heater 1. Potential annual emissions from the combustion of natural gas by this hot water heater were calculated with the assumption that the boiler could operate at full rated capacity for 8,760 hours per year.

Water Heater 1						
Heat Rate =	0.130 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 =	1.116 MMscf/yr					
Pollutant	ppmvd @ 3% O ₂	Emission Factor		lb/hr	tpy	Emission Factor Source
		lb/MMBtu	lb/MMscf			
NO _x	20	0.0243	24.8	0.0032	0.014	SWCAA 400-070 (13)
CO		0.0824	84.0	0.011	0.047	AP-42 Sec. 1.4 (7/98)
VOC		0.0054	5.5	0.0007	0.0031	AP-42 Sec. 1.4 (7/98)
SO _x as SO ₂		0.00059	0.6	0.00008	0.00033	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.0010	0.0042	AP-42 Sec. 1.4 (7/98)
PM ₁₀		0.0075	7.6	0.0010	0.0042	AP-42 Sec. 1.4 (7/98)
PM _{2.5}		0.0075	7.6	0.0010	0.0042	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	2.7E-07	1.2E-06	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	9.6E-06	4.2E-05	AP-42 Sec. 1.4 (7/98)
Greenhouse Gases	kg/MMBtu	GWP	CO ₂ e lb/MMBtu	CO ₂ e lb/MMscf	tpy, CO ₂ e	Emission Factor Source
CO ₂	53.06	1	116.98	120,019	66.6	40 CFR 98
CH ₄	0.001	25	0.055	56.55	0.0	40 CFR 98
N ₂ O	0.0001	298	0.066	67.41	0.0	40 CFR 98
Total GHG - CO ₂ e			117.098	120,143	66.7	

Annual emissions must be calculated using the emission factors identified above unless new emission factors are developed through source testing.

- 6 d. Hot Water Heater 2. Potential annual emissions from the combustion of natural gas by this hot water heater were calculated with the assumption that the boiler could operate at full rated capacity for 8,760 hours per year.

Water Heater 2						
Heat Rate =	0.130 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 =	1.116 MMscf/yr					
Pollutant	ppmvd @ 3% O ₂	Emission Factor		lb/hr	tpy	Emission Factor Source
		lb/MMBtu	lb/MMscf			
NO _x	20	0.0243	24.8	0.0032	0.014	SWCAA 400-070 (13)
CO		0.0824	84.0	0.011	0.047	AP-42 Sec. 1.4 (7/98)
VOC		0.0054	5.5	0.0007	0.0031	AP-42 Sec. 1.4 (7/98)
SO _x as SO ₂		0.00059	0.6	0.00008	0.00033	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.0010	0.0042	AP-42 Sec. 1.4 (7/98)
PM ₁₀		0.0075	7.6	0.0010	0.0042	AP-42 Sec. 1.4 (7/98)
PM _{2.5}		0.0075	7.6	0.0010	0.0042	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	2.7E-07	1.2E-06	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	9.6E-06	4.2E-05	AP-42 Sec. 1.4 (7/98)
Greenhouse Gases	kg/MMBtu	GWP	CO ₂ e lb/MMBtu	CO ₂ e lb/MMscf	tpy, CO ₂ e	Emission Factor Source
CO ₂	53.06	1	116.98	120,019	66.6	40 CFR 98
CH ₄	0.001	25	0.055	56.55	0.0	40 CFR 98
N ₂ O	0.0001	298	0.066	67.41	0.0	40 CFR 98
Total GHG - CO ₂ e			117.098	120,143	66.7	

Annual emissions must be calculated using the emission factors identified above unless new emission factors are developed through source testing.

6.e Emergency Generator Diesel Engine. Potential annual emissions from the combustion of ultra-low sulfur diesel by the Emergency Generator Diesel Engine were calculated with the assumption that the engine will operate at full rated capacity for 200 hours per year.

Emergency Generator Diesel Engine - Caterpillar						
Annual Operation =	200 hours					
Power Output =	247.0 horsepower					
Diesel Density =	7.206 pounds per gallon					
Fuel Sulfur Content =	0.0015 % by weight					
Fuel Consumption Rate =	11.3 gal/hr (estimated assuming 7,000 Btu/hp-hr)					
Fuel Heat Content =	0.138 MMBtu/gal (for use with GHG factors from 40 CFR 98)					
	Emission					
	Factor	Emissions	Emissions			
Pollutant	g/hp*hr	lb/hr	tpy	Emission Factor	Source	
NO _x	2.610	1.42	0.142	SCAQMD		
CO	0.75000	0.41	0.041	SCAQMD		
VOC	0.14	0.076	0.0076	SCAQMD		
SO _x as SO ₂		0.0024	0.00024	Mass Balance		
PM	0.1	0.054	0.0054	SCAQMD		
PM ₁₀	0.1	0.054	0.0054	SCAQMD		
PM _{2.5}	0.1	0.054	0.0054	SCAQMD		
				CO ₂ e	CO ₂ e	Emission Factor
Greenhouse Gases	kg/MMBtu	GWP	lb/MMBtu	lb/gallon	tpy, CO ₂ e	Source
CO ₂	73.96	1	163.054	22.501	25.43	40 CFR 98
CH ₄	0.003	25	0.165	0.023	0.03	40 CFR 98
N ₂ O	0.0006	298	0.394	0.054	0.06	40 CFR 98
Total GHG - CO ₂ e			163.613	22.579	25.51	

Annual emissions must be calculated using the emission factors identified above unless new emission factors are developed through source testing.

6.f Facilitywide Potential Emissions (PTE) Summary.

Pollutant	Annual Emissions (tons)
Nitrogen oxides	0.68
Carbon monoxide	0.65
Volatile organic compounds	0.09
Sulfur oxides as sulfur dioxide	0.01
Particulate matter	0.12
PM ₁₀	0.12
PM _{2.5}	0.12
Toxic Air Pollutants	1.15 x 10 ⁻³
Hazardous Air Pollutants	1.15 x 10 ⁻³
CO _{2e}	1,800

7. REGULATIONS AND EMISSION STANDARDS

Regulations that have been used to evaluate the acceptability of the proposed facility and establish emission limits and control requirements include, but are not limited to, the regulations, codes, or requirements listed below.

7.a Title 40 Code of Federal Regulations (CFR) Part 60.4200 et seq. "Subpart III - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines" requires that new diesel engines meet specific emission standards at the point of manufacture and during operation. In addition, maximum fuel sulfur contents are specified and minimum maintenance standards are established. The emergency generator engine is an affected source because it was manufactured after the relevant applicability date of April 1, 2006. For affected emergency engines, the following is required:

- (1) Owners or operators must comply with the emission standards as specified in §60.4205, for all pollutants. [40 CFR 60.4205]
- (2) For engines with less than 30 liters of displacement per cylinder, owners or operators must use diesel fuel with a maximum sulfur content of 15 ppm and a minimum cetane index of 40 or a maximum aromatic content of 35 percent. [40 CFR 60.4207(b)]
- (3) Owners or operators must operate and maintain each stationary CI internal combustion engine and control device according to the manufacturer's written instructions. In addition, owners and operators may only change those settings that are permitted by the manufacturer; and [40 CFR 60.4211(a)]
- (4) Emergency engines may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE beyond 100 hours per calendar year. [40 CFR 60.4211(f)(2)(i)]

7.b 40 CFR 63.6580 et seq. "Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines" establishes national emission limitations and operating limitations for HAP emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. Diesel engines installed at area sources before June 12, 2006, are "existing" for the purposes of this rule. Existing diesel engines at institutional sources (which includes schools) are not subject to this subpart. New diesel engines at institutional sources are not exempt from this regulation. A "new" stationary RICE at an area source must comply with Subpart ZZZZ by meeting the requirements of 40 CFR 60 Subpart III for compression ignition engines or 40 CFR 60 Subpart JJJ for spark ignition engines. The emergency generator engine will be installed after June 12, 2006, and is therefore a new source and is subject to this regulation. SWCAA does not have minor source delegation for this regulation and has chosen not to

independently implement the associated requirements. Requirements from this regulation have not been included in the Air Discharge Permit.

- 7.c Revised Code of Washington (RCW) 70A.15.2040 empowers any activated air pollution control authority to prepare and develop a comprehensive plan or plans for the prevention, abatement and control of air pollution within its jurisdiction. An air pollution control authority may issue such orders as may be necessary to effectuate the purposes of the Washington Clean Air Act [RCW 70A.15] and enforce the same by all appropriate administrative and judicial proceedings subject to the rights of appeal as provided in Chapter 62, Laws of 1970 ex. sess.
- 7.d RCW 70A.15.2210 provides for the inclusion of conditions of operation as are reasonably necessary to assure the maintenance of compliance with the applicable ordinances, resolutions, rules and regulations when issuing an Air Discharge Permit for installation and establishment of an air contaminant source.
- 7.e Washington Administrative Code (WAC) 173-460 "Controls for New Sources of Toxic Air Pollutants" (as in effect August 21, 1998) requires Best Available Control Technology for toxic air pollutants (T-BACT), identification and quantification of emissions of toxic air pollutants and demonstration of protection of human health and safety.
- 7.f WAC 173-476 "Ambient Air Quality Standards" establishes ambient air quality standards for PM₁₀, PM_{2.5}, lead, sulfur dioxide, nitrogen dioxide, ozone, and carbon monoxide in the ambient air, which shall not be exceeded.
- 7.g SWCAA 400-040 "General Standards for Maximum Emissions" requires all new and existing sources and emission units to meet certain performance standards with respect to Reasonably Available Control Technology (RACT), visible emissions, fallout, fugitive emissions, odors, emissions detrimental to persons or property, sulfur dioxide, concealment and masking, and fugitive dust.
- 7.h SWCAA 400-040(1) "Visible Emissions" requires that no emission of an air contaminant from any emissions unit shall exceed twenty percent opacity for more than three minutes in any one hour at the emission point, or within a reasonable distance of the emission point.
- 7.i SWCAA 400-040(2) "Fallout" requires that no emission of particulate matter from any source shall be deposited beyond the property under direct control of the owner(s) or operator(s) of the source in sufficient quantity to interfere unreasonably with the use and enjoyment of the property upon which the material is deposited.
- 7.j SWCAA 400-040(3) "Fugitive Emissions" requires that reasonable precautions be taken to prevent the fugitive release of air contaminants to the atmosphere.
- 7.k SWCAA 400-040(4) "Odors" requires any source which generates odors that may unreasonably interfere with any other property owner's use and enjoyment of their property to use recognized good practice and procedures to reduce these odors to a reasonable minimum.
- 7.l SWCAA 400-050 "Emission Standards for Combustion and Incineration Units" requires that all provisions of SWCAA 400-040 be met and that no person shall cause or permit the emission of particulate matter from any combustion or incineration unit in excess of 0.23 grams per dry cubic meter (0.1 grains per dry standard cubic foot) of exhaust gas at standard conditions.
- 7.m SWCAA 400-060 "Emission Standards for General Process Units" requires that all new and existing sources not emit particulate matter in excess of 0.1 grains per dry standard cubic foot of exhaust gas.
- 7.n SWCAA 400-070(13) "General Requirements for Certain Source Categories: Natural Gas-Fired Water Heaters."

- (a) **Applicability.** The requirements of this section apply to all natural gas-fired water heaters with a rated heat input less than 400,000 Btu/hr. For the purposes of this subsection, the term "water heater" means a closed vessel in which water is heated by combustion of gaseous fuel and is withdrawn for use external to the vessel at pressures not exceeding 160 psig, including the apparatus by which heat is generated and all controls and devices necessary to prevent water temperatures from exceeding 210°F.
 - (b) **Requirements.**
 - (i) On or after January 1, 2010, no person shall offer for sale, or install, a water heater that emits NO_x at levels in excess of 55 ppmv at 3% O₂, dry (0.067 lb per million Btu of heat input).
 - (ii) On or after January 1, 2013, no person shall offer for sale, or install, a water heater that emits NO_x at levels in excess of 20 ppmv at 3% O₂, dry (0.024 lb per million Btu of heat input).
- 7.o SWCAA 400-109 "Air Discharge Permit Applications" requires that an air discharge permit application be submitted for all new installations, modifications, changes, or alterations to process and emission control equipment consistent with the definition of "new source". Sources wishing to modify existing permit terms may submit an Air Discharge Permit application to request such changes. An air discharge permit must be issued, or written confirmation of exempt status must be received, before beginning any actual construction, or implementing any other modification, change, or alteration of existing equipment, processes, or permits.
- 7.p SWCAA 400-110 "New Source Review" requires that an Air Discharge Permit be issued by SWCAA prior to establishment of the new source, emission unit, or modification.
- 7.q SWCAA 400-111 "Requirements for Sources in a Maintenance Plan Area" requires that no approval to construct or alter an air contaminant source shall be granted unless it is evidenced that:
- (1) The equipment or technology is designed and will be installed to operate without causing a violation of the applicable emission standards;
 - (2) Emissions will be minimized to the extent that the new source will not exceed emission levels or other requirements provided in the maintenance plan;
 - (3) Best Available Control Technology will be employed for all air contaminants to be emitted by the proposed equipment;
 - (4) The proposed equipment will not cause any ambient air quality standard to be exceeded; and
 - (5) If the proposed equipment or facility will emit any toxic air pollutant regulated under WAC 173-460, the proposed equipment and control measures will meet all the requirements of that Chapter.

8. RACT/BACT/BART/LAER/PSD/CAM DETERMINATIONS

The proposed equipment and control systems incorporate Best Available Control Technology (BACT) for the types and amounts of air contaminants emitted by the processes as described below:

- 8.a BACT Determination – Boilers. The Advanced Thermal Hydronics model KN 16+ boilers have a heat input capacity of 1.6 MMBtu/hr. Based on the availability and prevalence of relatively low-emission units in this size range, SWCAA has determined that a NO_x emission concentration of no more than 30 ppmvd @ 3% O₂, and a CO emission concentration of no more than 50 ppmvd @ 3% O₂ meets the requirements of BACT.
- 8.b BACT Determination – Water Heaters. The water heaters have heating values of 0.13 MMBtu/hr. These units meet the requirements of SWCAA 400-070 (13). The use of low sulfur fuel (natural gas) has been determined to meet the requirement of BACT at the Permittee's facilities for equipment with a heat input of less than 0.4 MMBtu/hr.
- 8.c BACT Determination – Emergency Generator Diesel Engine. Available control measures for new diesel engines include engine design, the use of ultra-low sulfur fuel and add-on control equipment such as selective catalytic reduction (SCR) units and oxidation catalysts. SWCAA has determined that SCR is not feasible for this unit based on a combination of size, cost and practicality (most operation will be short-term and intermittent).

SWCAA has determined that an oxidation catalyst is not a cost-effective control for CO, VOC, and PM for small emergency engines.

The use of modern diesel-fired engine design meeting the relevant EPA emission standard for the new engine as applicable, the use of ultra-low sulfur diesel fuel ($\leq 0.0015\%$ sulfur by weight), limitation of visible emissions to 5% opacity or less, and limitation of engine operation has been determined to meet the requirements of BACT for the types and quantities of air contaminants emitted. The use of ultra-low sulfur fuel is also required by 40 CFR 60 Subpart IIII for "new" engines.

- 8.d Prevention of Significant Deterioration (PSD) Applicability Determination. This permitting action will not result in a potential increase in emissions equal to or greater than the PSD thresholds. Therefore, PSD review is not applicable to this action.
- 8.e Compliance Assurance Monitoring (CAM) Applicability Determination. CAM is not applicable to any emission unit at this facility because it is not a major source and is not required to obtain a Part 70 permit.

9. AMBIENT IMPACT ANALYSIS

Toxic air pollutant emissions will not exceed the applicable Small Quantity Emission Rates (SQER) listed in WAC 173-460, therefore toxic impacts are presumed to be below regulatory significance. Potential emissions of criteria air pollutants (nitrogen oxides, carbon monoxide, sulfur dioxide, particulate matter) and volatile organic compounds are all at or below 1.0 tons per year at the Wy’East Middle School campus. At these emission rates, no adverse ambient air quality impact is anticipated.

Conclusions

- 9.a Installation of the new natural gas-fired boilers, water heaters, and an emergency generator diesel engine as proposed in ADP Application CL-3184 will not cause the ambient air quality standards established by Title 40 Code of Federal Regulations Part 50 (40 CFR 50) "National Primary and Secondary Ambient Air Quality Standards" to be violated.
- 9.b The new natural gas-fired boilers, water heaters, and an emergency generator diesel engine proposed in ADP Application CL-3184, if properly installed and maintained, can be operated without causing a violation of the applicable emission standards, which include the limits established under SWCAA 400-040 "General Standards for Maximum Emissions."
- 9.c Operation of the equipment as proposed in ADP Application CL-3184 will not cause the requirements of WAC 173-460 "Controls for New Sources of Toxic Air Pollutants" (in effect August 21, 1998) or WAC 173-476 "Ambient Air Quality Standards" to be violated.

10. DISCUSSION OF APPROVAL CONDITIONS

SWCAA has made a final determination to issue Air Discharge Permit 22-3507 in response to ADP Application CL-3184. Air Discharge Permit 22-3507 contains approval requirements deemed necessary to assure compliance with applicable regulations and emission standards as discussed below.

- 10.a General Basis. Approval conditions for equipment affected by this permitting action incorporate the operating schemes proposed by the permittee in the Air Discharge Permit application.
- 10.b Emission Limits. Visible emissions from the natural gas-fired emission units were limited to 0% opacity. Visible emissions from the diesel-fired engine were limited to 5% opacity. Visible emissions should not exceed these levels if the emission units are operating properly.

The short-term NO_x and CO emission limits for Boilers 1 and 2 were established at levels identified in Section 8 as meeting the requirements of BACT. Annual emission limits were based on the boilers operating for 8,760 hours per year at full rated load using the emission factors supplied in Section 6 of this document.

- 10.c Operating Limits and Requirements. Because emissions from the Emergency Generator Diesel Engine were reviewed only for the scenario where the unit is fired on ultra-low sulfur No. 2 diesel, operation of the unit on other, potentially dirtier, fuels was prohibited. The permit allows the use of No. 2 diesel or better." In this case, "or better" includes road-grade diesel fuel with a lower sulfur content, biodiesel, and mixtures of biodiesel and road-grade diesel.
- 10.d Monitoring and Recordkeeping. Sufficient monitoring and recordkeeping were established to document compliance with the annual emission limits and provide for general requirements (e.g. upset reporting, annual emission inventory submission).
- 10.e Emission Monitoring and Testing Requirements. See Section 12.
- 10.f Reporting. Specific reporting deadlines were established for each reporting requirement. The submittal date refers to the earlier of the date the report is delivered to SWCAA or the postmarked date if sent through the US Post Office.

Upset conditions with the potential to cause excess emissions must be reported immediately in order to qualify for relief from penalty in accordance with SWCAA 400-107 for unavoidable exceedances. In addition, prompt reporting allows for prompt and accurate investigation into the cause of the event and the prevention of similar future incidents.

The permit requires reporting of the annual air emissions inventory and reporting of the data necessary to develop the emission inventory (fuel consumption for each boiler and hours of operation of the emergency generator engine).

11. START-UP AND SHUTDOWN/ALTERNATIVE OPERATING SCENARIOS/POLLUTION PREVENTION

- 11.a Start-up and Shutdown Provisions. Pursuant to SWCAA 400-081 "Start-up and Shutdown," technology-based emission standards and control technology determinations shall take into consideration the physical and operational ability of a source to comply with the applicable standards during start-up or shutdown. Where it is determined that a source is not capable of achieving continuous compliance with an emission standard during start-up or shutdown, SWCAA shall include appropriate emission limitations, operating parameters, or other criteria to regulate performance of the source during start-up or shutdown.

The Emergency Generator Diesel Engine may exhibit excess opacity upon start-up. Accordingly, the opacity limits are not applicable during the start-up periods defined in the permit. The general limitation from SWCAA 400 of 20% opacity continues to apply during start-up.

- 11.b Alternate Operating Scenarios. SWCAA conducted a review of alternate operating scenarios applicable to equipment affected by this permitting action. The permittee did not propose or identify any applicable alternate operating scenarios. Therefore, none were included in the approval conditions.
- 11.c Pollution Prevention Measures. SWCAA conducted a review of possible pollution prevention measures for the facility. No pollution prevention measures other than the control measures identified in the permit were identified by either the permittee or SWCAA. Therefore, none were included in the approval conditions.

12. EMISSION MONITORING AND TESTING

Emissions monitoring of the new boilers with a combustion analyzer or equivalent is required at least annually. In SWCAA's experience, this monitoring is relatively inexpensive compared to the quantity of emissions that can be prevented by this procedure. It is unlikely that emissions will degrade rapidly enough that more frequent monitoring is necessary to maintain proper operation. Potential emissions from these boilers are too small to warrant imposing more sophisticated source emissions testing procedures.

13. FACILITY HISTORY

This is a new school building that was completed in March of 2022.

14. PUBLIC INVOLVEMENT

- 14.a Public Notice for Air Discharge Permit Application CL-3184. Public notice for Air Discharge Permit Application CL-3184 was published on the SWCAA internet website for a minimum of 15 days beginning on March 18, 2022.
- 14.b Public/Applicant Comment for Air Discharge Permit Application CL-3184 SWCAA did not receive formal comments, a comment period request, or any other inquiry from the public or the applicant regarding this Air Discharge Permit application. Therefore, no public comment period was provided for this permitting action.
- 14.c State Environmental Policy Act. On November 20, 2019, the Evergreen School District issued a Determination of Nonsignificance for construction of the Wy’East Middle School.