TECHNICAL SUPPORT DOCUMENT

Air Discharge Permit 22-3547
Air Discharge Permit Application CL-3201

Issued: November 16, 2022

Vancouver School District – Skyview High School

SWCAA ID – 1001

Prepared By: Danny Phipps
Air Quality Engineer I
Southwest Clean Air Agency

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ABBREVIATIONS

List of Acronyms

ADP ..... Air Discharge Permit
AP-42 ..... Compilation of Emission Factors, AP-42, 5th Edition, Volume 1, Stationary Point and Area Sources – published by EPA
ASIL..... Acceptable Source Impact Level
BACT..... Best available control technology
CAM ..... Compliance Assurance Monitoring
CAS#..... Chemical Abstracts Service registry number
CFR..... Code of Federal Regulations
EPA..... U.S. Environmental Protection Agency
EU ..... Emission Unit
mfr..... Manufacturer
NESHAP..... National Emission Standards for Hazardous Air Pollutants
NSPS..... New Source Performance Standard
PSD..... Prevention of Significant Deterioration
RCW ..... Revised Code of Washington
SDS ..... Safety Data Sheet
SQER ..... Small Quantity Emission Rate listed in WAC 173-460
Standard..... Standard conditions at a temperature of 68°F (20°C) and a pressure of 29.92 in Hg (760 mm Hg)
SWCAA..... Southwest Clean Air Agency
T-BACT..... Best Available Control Technology for toxic air pollutants
WAC..... Washington Administrative Code

List of Units and Measures

µg/m³..... Micrograms per cubic meter
µm..... Micrometer (10^{-6} meter)
acfm ..... Actual cubic foot per minute
bhp ..... Brake horsepower
dscfm..... Dry Standard cubic foot per minute
g/dscm..... Grams per dry Standard cubic meter
gr/dscf ..... Grain per dry standard cubic foot
hp ..... Horsepower
hp-hr..... Horsepower-hour
kW..... Kilowatt
MMBtu .....Million British thermal unit
MMcf.....Million cubic feet
ppm.....Parts per million
ppmv.....Parts per million by volume
ppmvd.....Parts per million by volume, dry
ppmw.....Parts per million by weight
psig .....Pounds per square inch, gauge
rpm.....Revolution per minute
scfm .....Standard cubic foot per minute
tph.....Ton per hour
tpy.....Tons per year

List of Chemical Symbols, Formulas, and Pollutants

CO ..... Carbon monoxide

CO_2..... Carbon dioxide

CO_2e..... Carbon dioxide equivalent

HAP ..... Hazardous air pollutant listed pursuant to Section 112 of the Federal Clean Air Act

NO_2 ..... Nitrogen dioxide

NO_x ..... Nitrogen oxides

O_2 ..... Oxygen

PM..... Particulate Matter with an aerodynamic diameter 100 µm or less

PM_{10}.....PM with an aerodynamic diameter 10 µm or less

$PM_{2.5}$ .....PM with an aerodynamic diameter 2.5 µm or less

SO_2.....Sulfur dioxide

SO_x.....Sulfur oxides

TAP.....Toxic air pollutant pursuant to Chapter 173-460 WAC

VOC.....Volatile organic compound

Terms not otherwise defined have the meaning assigned to them in the referenced regulations or the dictionary definition, as appropriate.

1. FACILITY IDENTIFICATION

Applicant Name:	Vancouver School District #37
Applicant Address:	2901 Falk Road, Vancouver 98661
Facility Name:	Skyview High School
Facility Address:	1300 NW 139th Street, Vancouver, WA 98685
SWCAA Identification:	1001
Contact Person:	Jason Ackley
Primary Process:	High School
SIC/NAICS Code:	8211: Educational Services 611110: Elementary and Secondary Schools
Facility Classification:	Natural Minor

2. FACILITY DESCRIPTION

Vancouver School District is a public primary education provider for Clark County, Washington. This permitting action is for the existing Skyview High School. The school opened in 1997 and serves approximately 1,850 students.

3. CURRENT PERMITTING ACTION

This permitting action is in response to Air Discharge Permit (ADP) application number CL-3201 dated June 23, 2022. Vancouver Public Schools submitted ADP application CL-3201 requesting approval for the following:

- Four new Lochinvar model FBN2001 (1.999 MMBtu/hr) natural gas-fired hot water boilers
- One existing Lochinvar model CFN0400 (0.399 MMBtu/hr) natural gas-fired hot water heater
- Two new Lochinvar model AWH0800N (0.800 MMBtu/hr) natural gas-fired hot water heaters
- One existing 80 KW Kohler Generator is driven by a 144 BHP Ford model LSG-8751-6005-A natural gas engine

This is the initial permitting action for this facility.

4. PROCESS DESCRIPTION

4.a Boilers. Four Lochinvar natural gas fired boilers provide steam for heating.

4.b Water Heaters. Three Lochinvar natural gas fired water heaters are used to provide domestic hot water.

4.c Emergency Power Generation. One natural gas engine driven generator is used to generate emergency electrical power at the school campus.

5. EQUIPMENT/ACTIVITY IDENTIFICATION

5.a Boilers (B-1, B-2, B-3 and B-4). Four Lochinvar model FBN2001 natural gas fired boilers with a rated heat input of 1.999 MMBtu/hr each. Exhaust gases for each boiler are discharged to ambient air through an 8" diameter stack at approximately 37' above ground level. The stacks exhaust approximately 3' above the roof.

Location:	Southeast corner of the complex
Boiler Manufacturer:	Lochinvar
Model Number:	FBN2001
Serial Numbers:	Not available
Heat Rate:	1.999 MMBtu/hr
Installation Date	June 2022
40 CFR 60 Subpart Dc:	Not applicable
40 CFR 63 Subpart JJJJJJ:	Not Applicable

5.b Water Heaters (GWH-1, GWH-2, and GWH-3). One Lochinvar model CFN0400 natural gas fired water heater with a rated heat input of 0.399 MMBtu/hr. In addition, there are two Lochinvar model AWH0800N water heaters with a rated heat input of 0.800 MMBtu/hr. Exhaust gases for each boiler are discharged to ambient air through a 6" diameter stack at approximately 37' above ground level. The stacks exhaust approximately 3' above the roof.

Location:	Southeast corner of the complex
Water Heater Manufacturer:	Lochinvar
Model Number:	CFN0400 (1), AWH0800N (2)
Serial Numbers:	not available
Heat Rate:	0.399 MMBtu/hr (1), 0.800 MMBtu/hr (2)

5.c Emergency Generator Engine. One Kohler model 80RZ272 generator. The unit is powered by a Ford model LSG-8751-6005-A natural gas engine rated at 144 horsepower.

Engine Make:	Ford
Engine Model:	LSG-8751-6005-A
Engine Serial Number:	19087 S-17-RC

Manufacture Date:	Unknown. Similar engines were built in the late 90s. It is likely it was built around the time the school opened in 1997.
Certification:	None
Generator Rating:	80 kW
Generator Make:	Kohler
Generator Model:	80RZ272
Generator Serial Number:	371601
Exhaust Flow Rate:	2,606 dscfm
Stack Height:	5′ from ground
Stack Diameter:	Not Available
Stack Temperature:	1250°F (estimated from similar model)

5.d. Equipment/Activity Summary.

ID No.	Equipment/Activity	Control Equipment/Measure
1	Boiler 1 (Lochinvar model FBN 2001)	Low Emission Burner Ultralow Sulfur Fuel (natural gas)
2	Boiler 2 (Lochinvar model FBN 2001)	Low Emission Burner Ultralow Sulfur Fuel (natural gas)
3	Boiler 3 (Lochinvar model FBN 2001)	Low Emission Burner Ultralow Sulfur Fuel (natural gas)
4	Boiler 4 (Lochinvar model FBN 2001)	Low Emission Burner Ultralow Sulfur Fuel (natural gas)
5	Water Heater 1 (Lochinvar model CFN0400)	Low Emission Burner Ultralow Sulfur Fuel (natural gas)
6	Water Heater 2 (Lochinvar model AWH0800N)	Low Emission Burner Ultralow Sulfur Fuel (natural gas)
7	Water Heater 3 (Lochinvar model AWH0800N)	Low Emission Burner Ultralow Sulfur Fuel (natural gas)
8	Emergency Generator Engine (Ford LSG-8751-6005-A)	Ultralow Sulfur Fuel (natural gas)

6. EMISSIONS DETERMINATION

Unless otherwise specified by SWCAA, actual emissions must be determined using the specified input parameter listed for each emission unit and the following hierarchy of methodologies:

(a) Continuous emissions monitoring system (CEMS) data;
(b) Source emissions test data (EPA reference method). When source emissions test data conflicts with CEMS data for the time period of a source test, source test data must be used;
(c) Source emissions test data (other test method); and
(d) Emission factors or methodology provided in this TSD.

6.a. Boiler 1. Potential annual emissions (PTE) 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 =	1.999	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/MMBtu	Emission Factor lb/MMscf	lb/hr	tpy	Emission Factor Source
NO_X	30	0.0364	37.1	0.073	0.32	BACT
CO	50	0.0370	37.7	0.074	0.32	BACT
VOC		0.0054	5.5	0.011	0.047	AP-42 Sec. 1.4 (7/98)
SO_X as SO_2		0.00059	0.6	0.0012	0.0052	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.015	0.065	AP-42 Sec. 1.4 (7/98)
PM_{10}		0.0075	7.6	0.015	0.065	AP-42 Sec. 1.4 (7/98)
$PM_{2.5}$		0.0075	7.6	0.015	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 Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/MMscf	tpy, CO_2e	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_2O	0.0001	298	0.066	67.41	0.6	40 CFR 98
Total GHG - CO_2e			117.098	120,143	1,025.3	

Emissions must be calculated by multiplying the fuel usage by the emission factors above unless new emission factors are developed through source emissions testing, or an alternative methodology is specified or approved by SWCAA.

6.b. Boiler 2. Potential annual emissions (PTE) 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 =	1.999	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/MMBtu	Emission Factor lb/MMscf	lb/hr	tpy	Emission Factor Source
NO_X	30	0.0364	37.1	0.073	0.32	BACT
CO	50	0.0370	37.7	0.074	0.32	BACT
VOC		0.0054	5.5	0.011	0.047	AP-42 Sec. 1.4 (7/98)
SO_X as SO_2		0.00059	0.6	0.0012	0.0052	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.015	0.065	AP-42 Sec. 1.4 (7/98)
PM_{10}		0.0075	7.6	0.015	0.065	AP-42 Sec. 1.4 (7/98)
$PM_{2.5}$		0.0075	7.6	0.015	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 Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/MMscf	tpy, CO_2e	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_2O	0.0001	298	0.066	67.41	0.6	40 CFR 98
Total GHG - CO_2e			117.098	120,143	1,025.3	

Emissions must be calculated by multiplying the fuel usage by the emission factors above unless new emission factors are developed through source emissions testing, or an alternative methodology is specified or approved by SWCAA.

6.c. Boiler 3. Potential annual emissions (PTE) 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 3

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/MMBtu	Emission Factor lb/MMscf	lb/hr	tpy	Emission Factor Source
NO_X	30	0.0364	37.1	0.073	0.32	BACT
CO	50	0.0370	37.7	0.074	0.32	BACT
VOC		0.0054	5.5	0.011	0.047	AP-42 Sec. 1.4 (7/98)
SO_X as SO_2		0.00059	0.6	0.0012	0.0052	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.015	0.065	AP-42 Sec. 1.4 (7/98)
PM_{10}		0.0075	7.6	0.015	0.065	AP-42 Sec. 1.4 (7/98)
$PM_{2.5}$		0.0075	7.6	0.015	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 Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/MMscf	tpy, CO_2e	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_2O	0.0001	298	0.066	67.41	0.6	40 CFR 98
Total GHG - CO_2e			117.098	120,143	1,025.3	

Emissions must be calculated by multiplying the fuel usage by the emission factors above unless new emission factors are developed through source emissions testing, or an alternative methodology is specified or approved by SWCAA.

6.d. Boiler 4. Potential annual emissions (PTE) 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 4

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/MMBtu	Emission Factor lb/MMscf	lb/hr	tpy	Emission Factor Source
NO_X	30	0.0364	37.1	0.073	0.32	BACT
CO	50	0.0370	37.7	0.074	0.32	BACT
VOC		0.0054	5.5	0.011	0.047	AP-42 Sec. 1.4 (7/98)
SO_X as SO_2		0.00059	0.6	0.0012	0.0052	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.015	0.065	AP-42 Sec. 1.4 (7/98)
PM_{10}		0.0075	7.6	0.015	0.065	AP-42 Sec. 1.4 (7/98)
$PM_{2.5}$		0.0075	7.6	0.015	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 Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/MMscf	tpy, CO_2e	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_2O	0.0001	298	0.066	67.41	0.6	40 CFR 98
Total GHG - CO_2e			117.098	120,143	1,025.3	

Emissions must be calculated by multiplying the fuel usage by the emission factors above unless new emission factors are developed through source emissions testing, or an alternative methodology is specified or approved by SWCAA.

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

Water Heater 1

Heat Rate =	0.399	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 =	3.427	MMscf/yr

Pollutant	ppmvd @ 3% O_2	Emission Factor lb/MMBtu	Emission Factor lb/MMscf	lb/hr	tpy	Emission Factor Source
NO_X	20	0.0243	24.8	0.010	0.042	SWCAA 400-070
CO	111.4	0.0823	84.0	0.033	0.14	AP-42 Sec. 1.4 (7/98)
VOC		0.0054	5.5	0.0022	0.0094	AP-42 Sec. 1.4 (7/98)
SO_X as SO_2		0.00059	0.6	0.00023	0.0010	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.0030	0.013	AP-42 Sec. 1.4 (7/98)
PM_{10}		0.0075	7.6	0.0030	0.013	AP-42 Sec. 1.4 (7/98)
$PM_{2.5}$		0.0075	7.6	0.0030	0.013	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	8.2E-07	3.6E-06	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	2.9E-05	1.3E-04	AP-42 Sec. 1.4 (7/98)

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/MMscf	tpy, CO_2e	Emission Factor Source
CO_2	53.06	1	116.98	120,019	204.4	40 CFR 98
CH_4	0.001	25	0.055	56.55	0.1	40 CFR 98
N_2O	0.0001	298	0.066	67.41	0.1	40 CFR 98
Total GHG - CO_2e			117.098	120,143	204.6	

Emissions must be calculated by multiplying the fuel usage by the emission factors above unless new emission factors are developed through source emissions testing, or an alternative methodology is specified or approved by SWCAA.

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

Water Heater 2

Heat Rate =	0.800	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 =	6.871	MMscf/yr

Pollutant	ppmvd @ 3% O_2	Emission Factor lb/MMBtu	Emission Factor lb/MMscf	lb/hr	tpy	Emission Factor Source
NO_X	30	0.0364	37.1	0.029	0.13	BACT
CO	50	0.0370	37.7	0.030	0.13	BACT
VOC		0.0054	5.5	0.0043	0.019	AP-42 Sec. 1.4 (7/98)
SO_X as SO_2		0.00059	0.6	0.00047	0.0021	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.0060	0.026	AP-42 Sec. 1.4 (7/98)
PM_{10}		0.0075	7.6	0.0060	0.026	AP-42 Sec. 1.4 (7/98)
$PM_{2.5}$		0.0075	7.6	0.0060	0.026	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	1.6E-06	7.2E-06	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	5.9E-05	2.6E-04	AP-42 Sec. 1.4 (7/98)

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/MMscf	tpy, CO_2e	Emission Factor Source
CO_2	53.06	1	116.98	120,019	409.9	40 CFR 98
CH_4	0.001	25	0.055	56.55	0.2	40 CFR 98
N_2O	0.0001	298	0.066	67.41	0.2	40 CFR 98
Total GHG - CO_2e			117.098	120,143	410.3	

Emissions must be calculated by multiplying the fuel usage by the emission factors above unless new emission factors are developed through source emissions testing, or an alternative methodology is specified or approved by SWCAA.

6.g. Water Heater 3. Potential annual emissions (PTE) from the combustion of natural gas by this water heater were calculated with the assumption that the water heater could operate at full rated capacity for 8,760 hours per year.

Water Heater 3

Heat Rate =	0.800	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 =	6.871	MMscf/yr

Pollutant	ppmvd @ 3% O_2	Emission Factor lb/MMBtu	Emission Factor lb/MMscf	lb/hr	tpy	Emission Factor Source
NO_X	30	0.0364	37.1	0.029	0.13	BACT
CO	50	0.0370	37.7	0.030	0.13	BACT
VOC		0.0054	5.5	0.0043	0.019	AP-42 Sec. 1.4 (7/98)
SO_X as SO_2		0.00059	0.6	0.00047	0.0021	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.0060	0.026	AP-42 Sec. 1.4 (7/98)
PM_{10}		0.0075	7.6	0.0060	0.026	AP-42 Sec. 1.4 (7/98)
$PM_{2.5}$		0.0075	7.6	0.0060	0.026	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	1.6E-06	7.2E-06	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	5.9E-05	2.6E-04	AP-42 Sec. 1.4 (7/98)

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/MMscf	tpy, CO_2e	Emission Factor Source
CO_2	53.06	1	116.98	120,019	409.9	40 CFR 98
CH_4	0.001	25	0.055	56.55	0.2	40 CFR 98
N_2O	0.0001	298	0.066	67.41	0.2	40 CFR 98
Total GHG - CO_2e			117.098	120,143	410.3	

Emissions must be calculated by multiplying the fuel usage by the emission factors above unless new emission factors are developed through source emissions testing, or an alternative methodology is specified or approved by SWCAA.

6.h. Emergency Generator Engine. Potential annual emissions from the combustion of natural gas were calculated with the assumption that the equipment will operate at full load for up to 200 hours per year.

Emergency Generator Engine

Hours of operation =	200	hours
Rated horsepower =	144	bhp (estimated)
Max fuel consumption =	0.37	MMBtu/hr natural gas (estimated)
Natural Gas Heat Value =	1,028	Btu/scf for 40 CFR 98 GHG emission factors

Pollutant	Emission Factor lb/MMBtu	Emission Factor g/bhp-hr	lb/hr	lb/yr	tpy	Source
NO_X	4.08		1.49	299	0.15	AP-42 Sec 3.2 (7/00)
CO	0.317		0.12	23	0.012	AP-42 Sec 3.2 (7/00)
VOC	0.118		0.043	8.6	0.0043	AP-42 Sec 3.2 (7/00)
SO_X as SO_2	0.00058824		0.00022	0.043	0.000022	AP-42 Sec 3.2 (7/00)
PM	0.0099871		0.0037	0.73	0.00037	AP-42 Sec 3.2 (7/00)
PM_{10}	0.0099871		0.0037	0.73	0.00037	AP-42 Sec 3.2 (7/00)
$PM_{2.5}$	0.0099871		0.0037	0.73	0.00037	AP-42 Sec 3.2 (7/00)
Acetaldehyde	0.00836		3.1E-03	6.1E-01	3.1E-04	AP-42 Sec 3.2 (7/00)
Acrolein	0.00514		1.9E-03	3.8E-01	1.9E-04	AP-42 Sec 3.2 (7/00)
Benzene	0.00044		1.6E-04	3.2E-02	1.6E-05	AP-42 Sec 3.2 (7/00)
Ethylbenzene	0.0000397		1.5E-05	2.9E-03	1.5E-06	AP-42 Sec 3.2 (7/00)
Methanol	0.0025		9.2E-04	1.8E-01	9.2E-05	AP-42 Sec 3.2 (7/00)
Toluene	0.000408		1.5E-04	3.0E-02	1.5E-05	AP-42 Sec 3.2 (7/00)
Xylene	0.000184		6.7E-05	1.3E-02	6.7E-06	AP-42 Sec 3.2 (7/00)

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/MMscf	tpy, CO_2e	Emission Factor Source
CO_2	53.02	1	116.89	120,162	4	40 CFR 98
CH_4	0.001	25	0.055	56.66	0.002	40 CFR 98
N_2O	0.0001	298	0.066	67.54	0.002	40 CFR 98
Total GHG - CO_2e	53.0211		117.010	120,286	4	

Emissions must be calculated by multiplying the hours of operation by the emission factors above unless new emission factors are developed through source emissions testing, or an alternative methodology is specified or approved by SWCAA.

6.i. Emissions Summary

Air Pollutant	Potential to Emit (tpy)
NO_x	1.72
CO	1.71
VOC	0.24
SO_2	0.03
PM	0.33
PM_{10}	0.33
$PM_{2.5}$	0.33
CO_2/CO_2e	5,123

7. REGULATIONS AND EMISSION STANDARDS

Regulations have been established for the control of emissions of air pollutants to the ambient air. Regulations applicable to the proposed facility 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 following regulations, codes, or requirements. These items establish maximum emissions limits that could be allowed and are not to be exceeded for new or existing facilities. More stringent limits are established in this Permit consistent with implementation of Best Available Control Technology (BACT):

7.a. 40 CFR 60 Subpart Dc "Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units" applies to any steam generating unit with a heat input greater than or equal to 10 MMBtu/hr, but less than or equal to 100 MMBtu/hr constructed, modified, or reconstructed after June 9, 1989. All steam generating units on site have a heat input less than 10 MMBtu/hr, therefore this regulation does not apply.

7.b. 40 CFR 60 Subpart JJJJ [§60.4200 *et seq*] "Standards of Performance for Stationary Ignition Internal Combustion Engines" applies to each spark ignition internal combustion engine (ICE) that commences construction after July 12, 2006.

It is not known when the emergency engine was constructed, however it was likely constructed prior to July 12, 2006.

7.c. 40 CFR 63 Subpart ZZZZ [§63.6580 *et seq*] "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 located at major and area sources of HAP emissions. The existing Emergency Generator Engine is located at an area source of

HAP and used in emergency situations; therefore, this regulation applies to the existing engine.

For existing emergency engines at an area source, the owner or operator is required to:

- Change oil and filter every 500 hours of operation or annually, whichever comes first except as allowed by 40 CFR 63.6625(i) [Table 2d(4)(a)];
- Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first [Table 2d(4)(b)];
- Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary [Table 2d(4)(c)];
- Install a non-resettable hour meter if one is not already installed. [§ 63.6625(f)]
- Report each instance in which the owner did not meet each operating limitation [§ 63.6640(b)];
- Limit operation of the engine to emergency use and maintenance checks and readiness testing. Operation for maintenance checks and readiness testing may be conducted only to the extent that the tests are recommended by Federal, State or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Operation for maintenance checks and readiness testing is limited to 100 hours per year [§ 63.6640(f)(2)(i)];
- Record the occurrence and duration of each malfunction of operation (i.e., process equipment) [§ 63.6655(a)(2)];
- Record maintenance conducted on the engine in order to demonstrate that the engine was operated and maintained according to the applicable maintenance plan [§ 63.6655(e)]; and
- Record the hours of operation of the engine by use of a non-resettable hour meter. The owner or operator must document how many hours are spent for emergency operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation [§ 63.6655(f)].

There may be other requirements under the Subpart that apply to the facility that are not specified above. SWCAA has not yet taken delegation of this regulation; therefore, at this time, EPA is the Administrator of this regulation and the facility must communicate directly with EPA regarding compliance demonstrations and/or reporting required by this rule.

For purposes of this Subpart, "diesel fuel" also includes any non-distillate fuel with comparable physical and chemical properties (e.g., biodiesel) that is suitable for use in compression ignition engines per §63.6675.

7.d. <u>40 CFR 63 Subpart JJJJJJ [§63.11193 et seq] "National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources"</u> establishes national emission limitations and operating limitations for HAP emitted from boilers fired on specific fuels at area sources.

The facility is an area source of HAP and all of the boilers are classified as gas boilers, therefore this regulation does not apply.

7.e. 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.f. 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 ADP for installation and establishment of an air contaminant source.

7.g. WAC 173-460 "Controls for New Sources of Toxic Air Pollutants" requires BACT for toxic air pollutants (T-BACT), identification and quantification of emissions of toxic air pollutants and demonstration of protection of human health and safety.

The facility emits TAPs; therefore, this regulation applies to the facility.

7.h. WAC 173-476 "Ambient Air Quality Standards" establishes ambient air quality standards for PM_{10}, $PM_{2.5}$, lead, SO_2, NO_x, ozone, and CO in the ambient air, which must not be exceeded. The facility emits PM_{10}, $PM_{2.5}$, SO_x, NO_x, and CO; therefore, certain sections of this regulation apply. The facility does not emit lead; therefore, the lead regulation section does not apply.

7.i. 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, SO_2, concealment and masking, and fugitive dust. This regulation applies to the facility.

7.j. SWCAA 400-040(1) "Visible Emissions" requires that emissions of an air contaminant from any emissions unit must not 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. This regulation applies to the facility.

7.k. SWCAA 400-040(3) "Fugitive Emissions" requires that reasonable precautions be taken to prevent the fugitive release of air contaminants to the atmosphere. This regulation applies to the facility.

7.l. 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. This source must be managed properly to maintain compliance with this regulation. This regulation applies to the facility.

7.m. SWCAA 400-040(6) "Sulfur Dioxide" requires that no person is allowed to emit a gas containing in excess of 1,000 ppmd of SO_2, corrected to 7% O_2 or 12% CO_2 as required by the applicable emission standard for combustion sources.

The facility emits SO_2; therefore, this regulation applies to the facility.

7.n. SWCAA 400-050 "Emission Standards for Combustion and Incineration Units" requires that all provisions of SWCAA 400-040 be met and that no person is allowed to cause or permit the emission of PM from any combustion or incineration unit in excess of 0.23 g/Nm^3_{dry} (0.1 gr/dscf) of exhaust gas at standard conditions.

The facility has combustion units; therefore, this regulation applies to the facility.

7.o. SWCAA 400-060 "Emission Standards for General Process Units" requires that all new and existing general process units do not emit PM in excess of 0.23 g/Nm^3_{dry} (0.1 gr/dscf) of exhaust gas. The facility has general process units; therefore, this regulation applies to the facility.

7.p. 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% O_2, 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% O_2, dry (0.024 lb per million Btu of heat input).

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 will 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) BACT 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.

The facility is located in a maintenance plan area; therefore, this regulation applies to the facility.

8. BACT/CAM DETERMINATIONS

The proposed equipment and control systems incorporate BACT for the types and amounts of air contaminants emitted by the processes as described below:

8.a. BACT Determination – Boilers. The proposed use of low-sulfur fuel (natural gas), proper combustion controls, and limiting NO_X and CO emissions to 30 ppmvd @ 3% O_2, and 50 ppmvd @ 3% O_2 respectively has been determined to meet the requirements of BACT for the types and quantities of emissions from boilers B-1, B-2, B-3, and B-4 and Water heaters 2 and 3.

A BACT determination was not completed for the existing generator and water heater, as they were installed prior to the permitting action.

8.b. 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.c. 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 (Title V) permit.

9. AMBIENT IMPACT ANALYSIS

9.a. Criteria Air Pollutant Review. Emissions of NO_x, CO, PM, VOC (as a precursor to O_3), and SO_2 are emitted at levels where no adverse ambient air quality impact is anticipated.

9.b Toxic Air Pollutant Review.
The existing equipment and new equipment as proposed in ADP application CL-3201 will not affect the type or quantity of TAP emissions.

Conclusions

9.c. Operation of Skyview High School and associated combustion equipment, as proposed in ADP application CL-3201, will not cause the ambient air quality requirements of 40 CFR 50 "National Primary and Secondary Ambient Air Quality Standards" to be violated.

9.d. Operation of Skyview High School and associated combustion equipment, as proposed in ADP application CL-3201, will not cause the requirements of WAC 173-460 "Controls for New Sources of Toxic Air Pollutants" or WAC 173-476 "Ambient Air Quality Standards" to be violated.

9.e. Operation of Skyview High School and associated combustion equipment, as proposed in ADP application CL-3201, will not violate emission standards for sources as established under SWCAA General Regulations Sections 400-040 "General Standards for Maximum Emissions," 400-050 "Emission Standards for Combustion and Incineration Units," and 400-060 "Emission Standards for General Process Units."

10. DISCUSSION OF APPROVAL CONDITIONS

SWCAA has made a determination to issue ADP 22-3547 in response to ADP application CL-3201. ADP 22-3547 contains approval requirements deemed necessary to assure compliance with applicable regulations and emission standards as discussed below.

10.a. Supersession of Previous Permits.

This is the initial permitting action for the facility.

10.b. Emission Limits. Emission limits for the boilers are based on previous BACT determinations for boilers of similar size and use.

10.c. Operational Limits and Requirements.

Emergency Generator. Approval conditions are based on limited service (100 hr/yr) for maintenance and testing. Requirements for this unit include the use of low sulfur fuel (natural gas). Visible emission limits have been established consistent with proper operation of the engine.

Boilers and Water Heaters. Approval conditions for the boilers and water heaters listed in this application incorporate expected operational performance and the operating schemes proposed by the permit applicant at the time of installation. All of the proposed boilers and water heaters are low emission models. Emission concentrations of NO_X and CO have been limited to levels representative of BACT. Visible emissions from the boilers are limited to 0% opacity consistent with proper operation. Annual emission monitoring requirements have been established to assure proper operation on an ongoing basis.

10.d. Monitoring and Recordkeeping Requirements. ADP 22-3547 establishes monitoring and recordkeeping requirements sufficient to document compliance with applicable emission limits, ensure proper operation of approved equipment and provide for compliance with generally applicable requirements.

10.e. Monitoring, Recordkeeping, and Reporting Requirements. Sufficient reporting and recordkeeping was established to document compliance with the established emission

limits, provide for general requirements (upset reporting, annual emission inventory submission), and assist in the compliance assessment during on-site inspections. Records of maintenance activities and the results of periodic inspections conducted by facility personnel are required because they are valuable tools for regulatory inspectors and plant personnel. In addition, these records can be used to determine appropriate operating and maintenance requirements in a future permitting action.

10.f. Reporting Requirements. ADP 22-3547 establishes general reporting requirements for annual air emissions, upset conditions and excess emissions. Specific reporting requirements are established for fuel consumption. Reports are to be submitted on an annual basis.

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 must 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 will include appropriate emission limitations, operating parameters, or other criteria to regulate performance of the source during start-up or shutdown.

To SWCAA's knowledge, this facility can comply with all applicable standards during startup and shutdown.

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 were identified by either the permittee or SWCAA separate or in addition to those measures required under BACT considerations. Therefore, none were included in the approval conditions.

12. EMISSION MONITORING

12.a. Emission Monitoring Requirements – Boiler and Water heaters. The boiler and water heaters with a heat input greater than 0.4 MMBtu/hr are required to be monitored annually to verify compliance with the emission limits specified in the ADP. Corrective action is required to be taken if the boiler is found to not be meeting the emission limit.

13. FACILITY HISTORY

13.a. General History. The facility has not been permitted in the past.

13.b. Previous Permitting Actions. The following past permitting actions have been taken by SWCAA for this facility:

There are no previously issued ADPs for this facility.

13.c. Compliance History. A search of source records on file at SWCAA did not identify any previous or outstanding compliance issues over the past five (5) years for this school.

14. PUBLIC INVOLVEMENT OPPORTUNITY

14.a. Public Notice for ADP Application. Public notice for ADP application CL-3201 was published on the SWCAA website for a minimum of fifteen (15) days beginning on June 30, 2022.

14.b. Public/Applicant Comment for ADP Application CL-3201. SWCAA did not receive specific comments, a comment period request, or any other inquiry from the public or the applicant regarding ADP application CL-3201. Therefore, no public comment period was provided for this permitting action.

14.c. State Environmental Policy Act. This project is exempt from SEPA requirements pursuant to WAC 197-11-800(3) since it only involves repair and/or maintenance of existing structures, equipment or facilities, and will not involve material expansions or changes in use. SWCAA issued a Determination of SEPA Exempt (SWCAA 22-034) concurrent with issuance of ADP 22-3547.