

DRAFT



**TECHNICAL SUPPORT DOCUMENT**

**Air Discharge Permit ADP 24-3648  
Air Discharge Permit Application CO-1098**

**Preliminary Issued: June 26, 2024**

**Kelso School District - Coweeman Middle School**

**SWCAA ID - 575**

Prepared By: Wess Safford  
Air Quality Engineer  
Southwest Clean Air Agency

**TABLE OF CONTENTS**

<u>Section</u>	<u>Page</u>
1. Facility Identification	1
2. Facility Description	1
3. Current Permitting Action	1
4. Process Description	1
5. Equipment/Activity Identification	2
6. Emissions Determination	2
7. Regulations and Emission Standards	4
8. RACT/BACT/BART/LAER/PSD/CAM Determinations	6
9. Ambient Impact Analysis	6
10. Discussion of Approval Conditions	6
11. Start-up and Shutdown Provisions/Alternative Operating Scenarios/Pollution Prevention	7
12. Emission Monitoring and Testing	7
13. Facility History	8
14. Public Involvement Opportunity	8

**ABBREVIATIONS***List of Acronyms*

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

*List of Units and Measures*

acfm	Actual cubic foot per minute	ppm	Parts per million
bhp	Brake horsepower	ppmv	Parts per million by volume
dscfm	Dry Standard cubic foot per minute	ppmvd	Parts per million by volume, dry
gr/dscf	Grain per dry standard cubic foot	ppmw	Parts per million by weight
hp	Horsepower	scfm	Standard cubic foot per minute
hp-hr	Horsepower-hour	tph	Ton per hour
kW	Kilowatt	tpy	Tons per year
MMBtu	Million British thermal unit		

*List of Chemical Symbols, Formulas, and Pollutants*

CO	Carbon monoxide	PM	Particulate Matter with an aerodynamic diameter 100 µm or less
CO <sub>2</sub>	Carbon dioxide	PM <sub>10</sub>	PM with an aerodynamic diameter 10 µm or less
CO <sub>2e</sub>	Carbon dioxide equivalent	PM <sub>2.5</sub>	PM with an aerodynamic diameter 2.5 µm or less
HAP	Hazardous air pollutant listed pursuant to Section 112 of the Federal Clean Air Act	SO <sub>2</sub>	Sulfur dioxide
NO <sub>2</sub>	Nitrogen dioxide	SO <sub>x</sub>	Sulfur oxides
NO <sub>x</sub>	Nitrogen oxides	TAP	Toxic air pollutant pursuant to Chapter 173-460 WAC
O <sub>2</sub>	Oxygen	VOC	Volatile organic compound
O <sub>3</sub>	Ozone		

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: Kelso School District No. 458  
Applicant Address: 601 Crawford Street, Kelso, WA 98626

Facility Name: Kelso School District – Coweeman Middle School  
Facility Address: 2000 Allen Street, Kelso, Washington 98626

SWCAA Identification: 575

Contact Person: Paul Richie, Supervisor of Facilities

Primary Process: Elementary and Secondary Schools  
SIC/NAICS Code: 8211 / Elementary and Secondary Schools  
61111 / Elementary and Secondary Schools

Facility Classification: Natural Minor

## 2. FACILITY DESCRIPTION

Kelso School District No. 458 (Kelso Schools) is the public primary education provider for Kelso, Washington and surrounding areas.

## 3. CURRENT PERMITTING ACTION

This permitting action is in response to Air Discharge Permit application number CO-1098 (ADP Application CO-1098) dated May 9, 2024. Kelso School District - Coweeman Middle School submitted ADP Application CO-1098 requesting approval of the following:

- Replacement of an existing Burnham E-80 hot water boiler with a new Advanced Thermal Hydronics KN 30 Plus hot water boiler.

The current permitting action provides approval for boiler replacement as proposed in ADP Application CO-1098.

ADP 24-3648 will supersede those portions of ADP 22-3543 applicable to Coweeman Middle School.

## 4. PROCESS DESCRIPTION

- 4.a. Space Heating. A single package boiler is used to provide hot water to a hydronic system for the purposes of space heating. The boiler typically operates less than one quarter of the year.
- 4.b. Domestic Hot Water. Multiple hot water heaters are used to provide domestic hot water at the facility.

## 5. EQUIPMENT/ACTIVITY IDENTIFICATION

- 5.a. Coweeman Middle School – Natural Gas-fired Equipment (modified). The following natural gas-fired equipment is installed at Coweeman Middle School:

Unit	Make	Model	Serial #	Year Built	Heat Input (MMBtu/hr)
<del>Boiler 1 – Coweeman – Burnham</del>	<del>Burnham Industrial</del>	<del>E-80</del>	<del>9010551</del>	<del>1991</del>	<del>3.348</del>
Boiler 1 – Coweeman – ATH 46°8'37.06"N 122°53'18.69"W	Advanced Thermal Hydronics	KN 30+	TBD	2024	3.000
Water heater 1 – Coweeman 46°8'37.01"N 122°53'18.70"W	A. O. Smith	BTR 275A 118	1117M002107	2011	0.275
Water heater 2 – Coweeman 46°8'36.94"N 122°53'18.71"W	A. O. Smith	BTR 275A 118	1323M001796	2013	0.275
Water heater 3 – Coweeman 46°8'36.89"N 122°53'18.71"W	A. O. Smith	BTR 270A 880	LF90-0009622-880	1989	0.270

*ADP Application CO-1098. Kelso Schools proposes to replace the existing Burnham boiler at Coweeman Middle School with a new Advanced Thermal Hydronics boiler of similar size and configuration. The new boiler is a low emission model capable of maintaining NO<sub>x</sub> emissions below 30 ppmv @ 3% O<sub>2</sub> during normal operation.*

- 5.b. Equipment/Activity Summary.

ID No.	Equipment/Activity	Control Equipment/Measure
1	Coweeman Middle School Natural Gas-fired Equipment	Low Sulfur Fuel (natural gas), Low Emission Burners

## 6. EMISSIONS DETERMINATION

Emissions to the ambient atmosphere from the hot water boiler and water heaters proposed in ADP Application CO-1098 consist of nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), volatile organic compounds (VOC), particulate matter (PM), sulfur dioxide (SO<sub>2</sub>), toxic air pollutants (TAPs), and hazardous air pollutants (HAPs).

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:

- Continuous emissions monitoring system (CEMS) data;
- 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;
- Source emissions test data (other test method); and
- Emission factors or methodology provided in this TSD.

- 6.a. Boiler 1 - ATH. Potential emissions from boiler operation are calculated from a heat input of 3,000 MMBtu/hr, 8,760 hr/yr, and applicable emission factors. Emission factors for NO<sub>x</sub> and CO correspond to 30 ppmv and 50 ppmv at 3% O<sub>2</sub>, respectively. All other emission factors are taken from EPA AP-42 §1.4 "Natural Gas Combustion" (3/98). All PM is assumed to be PM<sub>2.5</sub>. Annual emissions will be calculated based on actual fuel consumption using the same methodology.

Heat Input Rating =	3.000	MMBtu/hr		
Fuel Consumption =	26,280	MMBtu/yr		
	Emission Factor		Emissions	
Pollutant	(lb/MMBtu)	(lb/hr)	(lb/yr)	(tpy)
NO <sub>x</sub>	0.0364	0.11	957	0.48
CO	0.0370	0.11	972	0.49
VOC	0.0054	0.02	142	0.07
SO <sub>x</sub> as SO <sub>2</sub>	5.88E-04	1.8E-03	15	0.008
PM (total)	0.0075	0.02	196	0.10
PM <sub>10</sub>	0.0075	0.02	196	0.10
PM <sub>2.5</sub>	0.0075	0.02	196	0.10
Benzene	2.06E-06	6.2E-06	5.4E-02	2.7E-05
Formaldehyde	7.35E-05	2.2E-04	1.9E+00	9.7E-04
CO <sub>2</sub> e	117	351.0	3,074,760	1537.38

- 6.b. Water Heaters 1-3. Potential emissions from water heater operation are calculated from a combined heat input of 0.82 MMBtu/hr, 8,760 hr/yr, and emission factors from EPA AP-42 §1.4 "Natural Gas Combustion" (3/98). All PM is assumed to be PM<sub>2.5</sub>. Annual emissions will be calculated based on actual fuel consumption using the same methodology.

Heat Input Rating =	0.820	MMBtu/hr		
Fuel Consumption =	7,183	MMBtu/yr		
	Emission Factor		Emissions	
Pollutant	(lb/MMBtu)	(lb/hr)	(lb/yr)	(tpy)
NO <sub>x</sub>	0.0980	0.08	704	0.35
CO	0.0820	0.07	589	0.29
VOC	0.0054	0.00	39	0.02
SO <sub>x</sub> as SO <sub>2</sub>	5.88E-04	4.8E-04	4	0.002
PM (total)	0.0075	0.01	54	0.03
PM <sub>10</sub>	0.0075	0.01	54	0.03
PM <sub>2.5</sub>	0.0075	0.01	54	0.03
Benzene	2.06E-06	1.7E-06	1.5E-02	7.4E-06
Formaldehyde	7.35E-05	6.0E-05	5.3E-01	2.6E-04
CO <sub>2</sub> e	117	95.9	840,434	420.22

- 6.c. Emissions Summary/Facility-wide Potential to Emit. Facility-wide potential to emit as calculated in the sections above is summarized below.

<u>Pollutant</u>	<u>Potential Emissions (tpy)</u>	<u>Project Increase (tpy)</u>
NO <sub>x</sub>	0.83	-0.05
CO	0.78	-0.05
VOC	0.090	-0.01
SO <sub>2</sub>	0.010	-0.001
Lead	0.0	0.0
PM	0.12	-0.01
PM <sub>10</sub>	0.12	-0.01
PM <sub>2.5</sub>	0.12	-0.01
TAP	1.3E-3	
HAP	1.3E-3	
CO <sub>2e</sub>	1,959	-178

<u>Pollutant</u>	<u>CAS Number</u>	<u>Category</u>	<u>Facility-wide Emissions</u>	<u>Project Increase</u>	<u>WAC 173-460 SQER</u>
			<u>lb/yr</u>	<u>lb/yr</u>	<u>lb/yr</u>
Benzene	71-43-2	HAP/TAP	0.069	-0.006	20
Formaldehyde	50-00-0	HAP/TAP	2.5	-0.3	20

## 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 Part 63 (40 CFR 63) Subpart JJJJJ "National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources" establishes performance standards and requirements for industrial, commercial, and institutional boilers operating at an area source of hazardous air pollutants. The boiler cited in this permit meets the definition of a "gas-fired boiler" and is not subject to Subpart JJJJJ.
- 7.b. 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 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.c. 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.d. Washington Administrative Code (WAC) 173-460 "Controls for New Sources of Toxic Air Pollutants" 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.e. WAC 173-476 "Ambient Air Quality Standards" establishes ambient air quality standards for PM<sub>10</sub>, PM<sub>2.5</sub>, lead, sulfur dioxide, nitrogen dioxide, ozone, and carbon monoxide in the ambient air, which shall not be exceeded.
- 7.f. 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.g. 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.h. SWCAA 400-060 "Emission Standards for General Process Units" prohibits particulate matter emissions from all new and existing process units in excess of 0.1 grains per dry standard cubic foot of exhaust gas.
- 7.i. 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<sub>x</sub> at levels in excess of 55 ppmv at 3% O<sub>2</sub>, 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<sub>x</sub> at levels in excess of 20 ppmv at 3% O<sub>2</sub>, dry (0.024 lb per million Btu of heat input).
- 7.j. 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.k. SWCAA 400-110 "New Source Review" requires that SWCAA issue an Air Discharge Permit in response to an Air Discharge Permit application prior to establishment of the new source, emission unit, or modification.
- 7.l. SWCAA 400-113 "Requirements for New Sources in Attainment or Nonclassifiable Areas" 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) Best Available Control Technology will be employed for all air contaminants to be emitted by the proposed equipment;
  - (3) The proposed equipment will not cause any ambient air quality standard to be exceeded; and
  - (4) 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:

### New BACT Determinations

- 8.a. BACT Determination – Boiler 1. The proposed use of low sulfur fuel (natural gas), low emission burner design ( $\leq 30$  ppm NO<sub>x</sub> @ 3% O<sub>2</sub>), and regular combustion tuning has been determined to meet the requirements of BACT for hot water boilers at this facility.

### Other Determinations

- 8.b. Prevention of Significant Deterioration (PSD) Applicability Determination. The potential to emit of this facility is less than applicable PSD applicability thresholds. Likewise, 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 permit.

## 9. AMBIENT IMPACT ANALYSIS

- 9.a. TAP Small Quantity Review. The new equipment and modifications proposed in ADP Application CO-1098 will reduce the potential quantity of TAP emissions from approved equipment. Previously approved BACT measures at the facility will limit emissions of Class A and B toxic air pollutants to below the applicable Small Quantity Emission Rates (SQER) or Acceptable Source Impact Level (ASILs) specified in WAC 173-460.

### **Conclusions**

- 9.b. Boiler replacement, as proposed in ADP Application CO-1098, will not cause the ambient air quality requirements of Title 40 Code of Federal Regulations (CFR) Part 50 "National Primary and Secondary Ambient Air Quality Standards" to be violated.
- 9.c. Boiler replacement, as proposed in ADP Application CO-1098, 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.d. Boiler replacement, as proposed in ADP Application CO-1098, will not cause a violation of 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 24-3648 in response to ADP Application CO-1098. ADP 24-3648 contains approval requirements deemed necessary to assure compliance with applicable regulations and emission standards as discussed below.

- 10.a. Supersession of Previous Permits. ADP 24-3648 supersedes those portions of ADP 22-3543 applicable to Coweeman Middle School.

- 10.b. General Basis. Permit requirements for equipment affected by this permitting action incorporate the operating schemes proposed by the applicant in ADP Application CO-1098. Permit requirements established by this action are intended to implement BACT, minimize emissions, and assure compliance with applicable requirements on a continuous basis. Emission limits for approved equipment are based on the maximum potential emissions calculated in Section 6 of this Technical Support Document.
- 10.c. Monitoring and Recordkeeping Requirements. ADP 24-3648 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. Specific requirements are established for fuel consumption.
- 10.d. Reporting Requirements. ADP 24-3648 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.
- 10.e. Boilers and Water Heaters. Annual emission limits for approved fuel burning equipment are established at the quantity of emissions anticipated from operation of each emissions unit for 8,760 hours per year at full rated load using the emission factors supplied in Section 6. Visible emissions from the natural gas-fired emission units were limited to 0% opacity.

## 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 applicant did not identify any start-up and shutdown periods during which affected equipment is not capable of achieving continuous compliance with applicable technology determinations or approval conditions. 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 permit requirements.
- 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 permit requirements.

## 12. EMISSION MONITORING AND TESTING

- 12.a. Emission Monitoring – Boiler 1. Emission monitoring of Boiler 1 with a combustion analyzer or equivalent is required on a continuing 12-month cycle. All emission monitoring shall be conducted in accordance with ADP 24-3648, Appendix A.

### 13. FACILITY HISTORY

- 13.a. Previous Permitting Actions. SWCAA has previously permitted this facility in conjunction with other school district facilities. This is the first stand-alone permit issued for the facility.
- 13.b. Compliance History. A search of source records on file at SWCAA did not identify any outstanding compliance issues at this facility.

### 14. PUBLIC INVOLVEMENT OPPORTUNITY

- 14.a. Public Notice for ADP Application CO-1098. Public notice for ADP Application CO-1098 was published on the SWCAA internet website for a minimum of (15) days beginning on May 22, 2024.
- 14.b. Public/Applicant Comment for ADP Application CO-1098. A (30) day public comment period will be provided for this permitting action pursuant to SWCAA 400-171(3). SWCAA will provide a response to all comments received during the comment period.
- 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 24-022) concurrent with issuance of ADP 24-3648.