DRAFT ENGINEERING EVALUATION REPORT
CHANNING HOUSE
PLANT #425
APPLICATION #686246

BACKGROUND

Channing House (Applicant) is a retirement community located at 850 Webster Street in Palo Alto, California. The Applicant is applying for an Authority to Construct and Permit to Operate one (1) new emergency backup power generator. The proposed source requires an Authority to Construct and Permit to Operate per BAAQMD Regulation 2-1-301 and Regulation 2-1-302, respectively. The source is identified as follows:

S-9: Stationary Emergency Diesel Engine-Generator Set
Make: Caterpillar; Model: C9, Model Year: 2023
EPA Engine Family: PCPXL08.8NZS
480 bhp, 22.4 MMBtu/hr

The new source is located within 1,000 feet of a K-12 school and therefore this application is subject to the public notice requirements of BAAQMD Regulation 2-1-412.

EMISSIONS SUMMARY

Criteria pollutant emissions from discretionary operation of the proposed diesel engine are outlined below.

Annual Emissions:

Source	Hrs/year	Output rating for full-load, standby operation (Bhp)	Engine Displacement	Rating, Constant Speed (RPM)	EPA Engine Family
S-9	50	480	8.8 L ÷ 6 = 1.5 L/cylinder	1800	PCPXL08.8NZS

Table 1A. Emission Factor Assumptions

Pollutant	Emission Factor[1] (g/kW-hr)	Emission Factor[2] (g/bhp-hr)
NOx	3.42	2.55
CO	1.3	0.97
POC	0.24	0.18
PM_{10}	0.14	0.10

References:

1. *US EPA Annual Certification Database for Vehicles, Engines, and Equipment: Nonroad Compression Ignition Engines, NRCI Certification Data (Model Years: 2011-Present.xlsx), Certification Level Steady-State Discrete Modal Test Results. https://www.epa.gov/compliance-and-fuel-economy-data/annual-certification-data-vehicles-engines-and-equipment*
2. *Assume 1.341 hp/kw conversion factor.*

All emission factors other than SO_2 are EPA-certified factors. The emission factor for SO_2 is taken from Chapter 3, Table 3.4-1 of the EPA's AP-42, Compilation of Air Pollutant Emission Factors and is based on full conversion of fuel sulfur to SO_2. This factor is considered applicable to any diesel engine based on the California limit of 0.0015 wt% sulfur. The emission factor is as follows:

SO_2: 8.09E-3 (% S in fuel oil) lb/hp-hr = 8.09E-3 (0.0015% S) (454 g/lb)
= **0.006 g/hp-hr**

Table 1B. Calculated Annual Discretionary Emissions

NOx	=	(	2.55	g/hp-hr)	(	480	hp)	(	50	hr/yr)	(lb/454g)	=	134.802	lb/yr	=	0.067 TPY
CO	=	(	0.97	g/hp-hr)	(	480	hp)	(	50	hr/yr)	(lb/454g)	=	51.278	lb/yr	=	0.026 TPY
POC	=	(	0.18	g/hp-hr)	(	480	hp)	(	50	hr/yr)	(lb/454g)	=	9.515	lb/yr	=	0.005 TPY
PM_{10}	=	(	0.100	g/hp-hr)	(	480	hp)	(	50	hr/yr)	(lb/454g)	=	5.286	lb/yr	=	0.003 TPY
SO_2	=	(	0.028	g/hp-hr)	(	480	hp)	(	50	hr/yr)	(lb/454g)	=	1.480	lb/yr	=	0.001 TPY

Maximum Daily Emissions:

Daily emissions are calculated to establish whether a source triggers the requirement for Best Available Control Technology (BACT) (10.0 lb/highest day total source emissions for any BACT pollutant). A full 24-hour day is assumed since no daily limits are imposed on intermittent and unexpected operations. The table below shows the calculated maximum daily emissions for the engine proposed in this application.

Table 1C. Calculated Daily Emissions

NOx	=	(	2.55	g/hp-hr)	(	480	hp)	(	24	hr/day)	(lb/454g)	=	64.705	lb/day
CO	=	(	0.97	g/hp-hr)	(	480	hp)	(	24	hr/day)	(lb/454g)	=	24.613	lb/day
POC	=	(	0.18	g/hp-hr)	(	480	hp)	(	24	hr/day)	(lb/454g)	=	4.567	lb/day
PM_{10}	=	(	0.100	g/hp-hr)	(	480	hp)	(	24	hr/day)	(lb/454g)	=	2.537	lb/day
SO_2	=	(	0.028	g/hp-hr)	(	480	hp)	(	24	hr/day)	(lb/454g)	=	0.710	lb/day

PLANT CUMULATIVE INCREASE

Cumulative Increase is defined as the sum of all emissions increases from new and modified sources permitted at a facility since the applicable cumulative increase baseline date, which is April 5, 1991, for POC, NOx, SO_2, PM_{10}, and CO, and August 31, 2016, for $PM_{2.5}$. The cumulative increase for the facility is summarized in the table below.

Table 2. Calculated Plant Cumulative Increase (tons/year)

Pollutant	Current	Application Increase	New Total
NOx	0.011	0.067	0.078
CO	0.006	0.026	0.032
POC	0.001	0.005	0.006
PM_{10}	0.001	0.003	0.004
$PM_{2.5}$	0.000	0.003	0.003
SO_2	0.000	0.001	0.001

STATEMENT OF COMPLIANCE

Regulation 2 - Permits, Rule 1 – General Requirements

CEQA (Sections 2-1-310 and 2-1-426)

These sections outline requirements related to the California Environmental Quality Act (CEQA).

> The BAAQMD has determined that this permit action is exempt from CEQA because it constitutes an addition to an existing structure that will not result in an increase of more than (i) 50% of the floor area of the structure before the addition or (ii) 2,500 square feet (CEQA Guidelines § 15301(e)(i)).

Public Notice (Section 2-1-412)

A new or modified source located (i) within 1,000 feet of the outer boundary of a K-12 school site which results in the increase in emissions of a toxic air contaminant in Table 2-5-1 of *Regulation 2, Rule 5 New Source Review of Toxic Air Contaminants* or (ii) within an Overburdened Community as defined in Regulation 2-1-243 that requires a Health Risk Assessment pursuant to Regulation 2-5-401 shall prepare and distribute a public notice in accordance with subsections 412.1 and 412.2 of *Regulation 2, Rule 1 General Requirements*.

> This application proposes a new source of TACs that will be located within 1,000 feet of Addison Elementary School. The facility is not located in an overburdened community. A public notice is required.

Regulation 2 - Permits, Rule 2 – New Source Review

In accordance with District Policy[1], the potential to emit for emergency engines is estimated based on 150 hr/yr operation (50 hr/yr non-emergency/discretionary operation, plus 100 hr/yr for emergency purposes).

The assumption of 100 hours per year of emergency operation is used to determine the applicability of certain District permitting regulations, such as New Source Review and Title V Major Facility Review. The District Policy is not used to determine the quantity of emission offsets required for a project that triggers New Source Review or for PSD. It is also not applicable for purposes of the Toxics New Source Review requirements of District Reg. 2-5 (per Regulation 2-5-111).

Therefore, the potential to emit for the emergency engines in this application is based on 150 hr/yr/engine operation (50 hr/yr non-emergency plus 100 hr/yr emergency operation).

The table below shows the calculated facility-wide potential to emit based on District Policy. The appendix to this application shows the back-up calculation for current PTE.

Table 3. Facility-Wide Potential to Emit
(Per BAAQMD Policy: Calculating PTE for Emergency Backup Power Generators[1])

Pollutant	Current	Application Increase	New Total
NOx	0.109	0.202	0.311
CO	0.064	0.077	0.141
POC	0.006	0.014	0.020
PM_{10}	0.006	0.008	0.014
SO_2	0.000	0.002	0.002

Best Available Control Technology Requirement (Section 2-2-301)

Any new source is required to use Best Available Control Technology (BACT) to control emissions of any BAAQMD BACT pollutants [precursor organic compounds (POC), non-precursor organic compounds (NPOC), oxides of nitrogen (NO_x), sulfur dioxide (SO_2), PM_{10}, $PM_{2.5}$, and/or carbon monoxide (CO)] that have the potential to emit 10.0 or more pounds on any day.

Based on the emission calculations presented in Table 1C, BACT is triggered for NO_x and CO since the maximum daily emissions for the new source are each greater than 10.0 lb/day for each of these pollutants.

BACT is defined as the most stringent emissions limitation, control device, or control technique that (i) has been achieved in practice at other similar sources and/or (ii) is technologically feasible and cost-effective. See Reg. 2-2-202. To determine what level of control constitutes BACT for the emergency backup diesel engine, the BAAQMD

[1] BAAQMD Policy: Calculating Potential to Emit for Emergency Backup Power Generators. Approval date June 3, 2019. (Referred to as "District Policy" in this engineering evaluation).

reviewed available control technologies that can be effective at controlling NOx and CO from this source.

Control Technology Review
Several control technologies can reduce NOx and CO emissions from emergency backup diesel engines. These technologies have been divided into three categories: Clean Fuels, Combustion Technologies, and Post-Combustion Technologies.

Clean Fuel Technology
The use of diesel fuel with a low nitrogen content reduces the amount of NOx formed during combustion. The less nitrogen available in the fuel, the less can be converted to NOx upon combustion. Diesel fuel producers are not required to remove nitrogen from the fuel specifically for NOx reduction purposes. But they are required to remove sulfur to comply with regulatory mandates, and the hydro-treating technique they use to remove the sulfur also removes most of the nitrogen. As a result, using ultra-low-sulfur diesel fuel will provide benefits in reducing NOx emissions as well as reducing sulfur dioxide emissions. Ultra-low sulfur diesel is required to be used by the California Air Resources Board (CARB) and is therefore achieved in practice for this engine.

Combustion Technologies
NOx and CO emissions can be minimized by optimizing the engine's combustion process using techniques such as injection timing retard, preignition chamber combustion, air-to-fuel ratio adjustments, and derating. These combustion characteristics are determined by the design of the engine, which is dictated by the manufacturer and cannot be controlled by the end user. The end user can reduce emissions by using the cleanest engine available, however. Engines are certified to meet progressively more stringent emissions performance standards using EPA's "Tier" system, with higher-tier engines representing more stringent levels of emissions control. For the size of engine that will be used for this project, the most stringent level of emissions control that can be achieved using combustion controls is Tier 3.[2] The use of Tier 3 engines is achieved in practice.

Post-Combustion Technologies
Currently, the most effective and prevalent post combustion technologies used to abate NOx and CO rely on the use of catalysts. For NOx reduction, catalytic technology can come in the form of a selective catalytic reduction unit, lean-NOx catalyst, or NOx adsorber. For CO, reduction is typically achieved through an oxidation catalyst. For each of these technologies, the catalyst is used to lower the heat of reaction that is required for the breakdown and/or conversion of the target pollutants. With emergency standby generators, the catalyst would not reach its effective temperature during short-duration

[2] EPA's diesel emission tiers range from Tier 0 through Tier 4. For diesel engines in this size range, Tier 3 standards are achieved in practice without catalytic control devices. The next most stringent set of standards for this size category after Tier 3 is Tier 4, which requires catalytic control devices. See California Air Resources Board, Non-Road Diesel Engine Certification Tier Chart, available at: https://ww2.arb.ca.gov/resources/documents/non-road-diesel-engine-certification-tier-chart. The most stringent tier that can be achieved with combustion controls only is therefore Tier 3 for this size category.

operations associated with periodic testing and maintenance, which is primarily how this engine will be operated.

BACT Analysis

The first step in the BACT analysis is to determine what level of emissions control has been achieved in practice for the sources at issue. When considering post-combustion technologies that have been achieved in practice for smaller emergency backup engines like these, the BAAQMD consulted BACT clearinghouses and guidelines published by US EPA, CARB, and other Air Districts. We are unaware of any engines in this size range that are operating under any more stringent standards than Tier 3 that would qualify as achieved in practice BACT under our BAAQMD program. Because this engine is certified to achieve Tier 3 standards without post-combustion control, post-combustion catalytic control technologies are not considered BACT for this engine.

The second step in the BACT analysis is to determine whether there is any more stringent level of control, beyond what has been achieved in practice, that is technologically feasible and cost-effective for the source under review. The BAAQMD therefore considered whether catalytic control devices would be technologically feasible and cost-effective for this engine.

Catalytic control devices only become effective when engines are operated for longer periods in the case of a power outage. Emergency operation will be infrequent, however, and it is not expected to last for a significant amount of time when it does occur. As a result, the emission reduction benefit from having a catalytic control device would be less than optimal and would not be cost-effective under the BAAQMD's BACT regulations given the costs involved. Studies that have evaluated the additional costs and emission reduction benefits that would be involved in implementing catalytic control technologies on emergency backup engines have shown that the cost would be in the range of $68,000 to $682,000 per ton of emission reduction benefit.[3] This cost per ton greatly exceeds the BAAQMD's BACT cost-effectiveness threshold of $17,500 per ton. Catalytic control devices are therefore not considered technologically feasible and cost-effective for this source.

From the analysis of the various technologies that could be implemented to reduce NOx, the BAAQMD has concluded that the use of ultra-low sulfur diesel fuel and an EPA Tier 3 certified engine are achieved-in-practice control technologies. These control technologies are therefore required as BACT for this engine. This engine is certified to meet the EPA Tier 3 emissions standards, and the applicant will be required by CARB regulations to use ultra-low-sulfur diesel fuel. Therefore, this engine complies with the BACT requirements under Regulation 2-2-301 for all applicable pollutants.

[3] See Sacramento Metropolitan Air Quality Management District BACT Determination No. 281 (June 4, 2021), available at: http://www.airquality.org/StationarySources/Documents/IC%20Engine%20Compression%20Standby%20Diesel%20Fired%20BACT%20281.pdf; California Air Resources Board, Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Proposed Amendments to the Airborne Toxic control Measure for Stationary Compression Ignition Engines (Sept. 2010), available at www.arb.ca.gov/regact/2010/atcm2010/atcmisor.pdf.

According to the emission data submitted to EPA for this engine's family, the NOx and CO emission rates are below the applicable BACT emission limits.

Table 4. BACT Analysis Summary

BACT Pollutant Triggered	BACT Limit Tier 3 for Engines ≥ 175 HP; <600 HP (g/bhp-hr)	S-9 Emission Rate (g/bhp-hr)
NOx	2.85 *	2.55
CO	2.6	0.97

**BACT Emission Limits Based on CARB ATCM, Maximum Engine Power: ≥ 175 HP; <600 HP; assume 95% NOx and 5% NMHC (POC) allocation for the combined NMHC+NOx emissions standard value.*

Offset Requirements, POC and NO_x (Section 2-2-302)

This section establishes emission offset requirements for POC and NO_x at facilities that will have the potential to emit more than 10 tons per year of POC or NO_x. If the facility will have the potential to emit more than 10 tons per year but less than 35 tons per year of NO_x or POC after the new or modified source is constructed, offsets must be provided at a 1:1 ratio for any un-offset cumulative increase in emissions at the facility. These offsets shall be provided by the District's Small Facility Banking Account (SFBA) unless the applicant owns offsets. If the facility will have the potential to emit more than 35 tons per year of NOx or POC after the new or modified source is constructed, offsets must be provided by the facility at a 1.15:1 ratio for any un-offset cumulative increase in emissions at the facility.

> The facility has the potential to emit 0.311 tons per year (tpy) of NO_x and 0.020 tpy of POC based on District Policy (Table 3). Therefore, the offset requirements of *Regulation 2-2-302* are not triggered.

Offset Requirement, $PM_{2.5}$, PM_{10} and Sulfur Dioxide (Section 2-2-303)

This section establishes emission offset requirements for $PM_{2.5}$, PM_{10} and Sulfur Dioxide from new or modified sources located at facility with the potential to emit 100 tons per year of $PM_{2.5}$, PM_{10} or Sulfur Dioxide.

> Since the potential to emit $PM_{2.5}$, PM_{10} and Sulfur Dioxide at the facility where this engine operates are each below 100 tons per year, the application is not subject to the offset requirements of *Regulation 2-2-303*.

Prevention of Significant Deterioration (PSD) (Sections 2-2-304 through 307)

These sections establish standards for PSD BACT requirements, PSD source impact analysis requirements, and PSD additional impacts analysis requirements.

> This facility will not emit 100 tons or more per year of any PSD pollutant and, therefore, is not a major PSD facility and is not subject to any of the PSD requirements in Regulations 2-2-304 through 2-2-307 per Regulation 2-2-224.

NAAQS Protection Requirement (Section 2-2-308)

Per Regulation 2-2-308, if a project will result in a significant net increase in emissions of CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, or lead, the applicant must demonstrate that the emissions will

not cause or contribute to any exceedance of the National Ambient Air Quality Standards for these pollutants.
> This project will not involve any significant net emissions increases, as defined in Regulation 2-2-227.2.

Publication of Notice and Opportunity for Public Comment (Section 2-2-404)
If an application involves a major facility, a PSD project, or an increase in CO, NOx, SO_2, PM_{10}, $PM_{2.5}$, VOC, or lead in an amount that is significant as defined in Regulation 2-2-227.2, the BAAQMD must prepare and distribute a public notice and provide an opportunity for public comment in accordance with Regulation 2-2-404 (Publication of Notice and Opportunity for Public Comment).
> This application does not involve a major facility or PSD project, and it will not increase emissions above any of the significance levels defined in Regulation 2-2-227.2.

Regulation 2- Permits, Rule 5 New Source Review of Toxic Air Contaminants
This rule requires that any new or modified source of toxic air contaminant (TAC) emissions subject to Authority to Construct or Permit to Operate requirements shall be evaluated for potential public exposure and health risk and meet the applicable standards and administrative requirements, as specified in Sections 300 and 400, respectively.
> The proposed engine will emit diesel exhaust particulate matter, which is a TAC under BAAQMD Regulations. BAAQMD Regulation 2, Rule 5 specifies that diesel exhaust particulate matter will be used as a surrogate for all TAC emissions from diesel-fueled compression-ignition internal combustion engines, as this is the principal driver of the health risk associated with this type of equipment. The calculated emissions increase of diesel exhaust particulate matter associated with the project is summarized in the table below. The project does not include any related NSR applications for new or modified sources permitted within the previous five-year period (per BAAQMD Reg 2-5-216).

Table 5. Project Diesel Exhaust Particulate Matter Emissions

Source	PM Emission Factor (g/bhp-hr)	Horsepower	Annual Usage (hours/year)	Diesel PM Emissions (lb/year)
S-9 (A/N 686246)	0.10	480	50	5.29
			Total	**5.29**
			HRA Trigger (Chronic)	***0.26***

Regulation 2-5-402 requires a Health Risk Assessment (HRA) if TAC emissions exceed the screening thresholds set forth in Table 2-5-1 in Regulation 2, Rule 5. For this project, the emissions of diesel particulate matter exceed the Table 2-5-1 screening threshold for chronic risk.

The BAAQMD therefore performed a refined HRA[4] to evaluate the potential chronic, carcinogenic and non-carcinogenic health risks from diesel emissions from this project.

[4] This project does not qualify for the HRA Streamlining Policy because the engine will be less than 100 feet from the nearest receptor and the emissions will exceed 0.26 pounds per year. Therefore, a refined HRA was required.

The HRA evaluated risks to students, workers, and to residents in the vicinity of the project. The evaluation assumed that the engine would operate up to the maximum 50 hours per year allowed for testing and maintenance purposes. Emissions from emergency operations were not included because they are exempt from Regulation 2, Rule 5 under Section 2-5-111.

Results from the HRA indicate a maximum project cancer risk of **6.7 in a million** and the maximum chronic hazard index is **0.0018**. In accordance with the District's Regulation 2-5-301, this source requires TBACT because the cancer risk exceeds 1.0 in a million. Compliance with EPA Tier 3 emission standards for diesel particulate matter is achieved in practice and has been identified as TBACT for this project. The proposed engine is expected to comply with this TBACT determination.

This project is not located in an overburdened community (OBC), as defined by Regulation 2-1-243; therefore, the project must comply with a project cancer risk limit of 10 in a million. Since the estimated project cancer risk does not exceed 10 in a million and project hazard indices do not exceed 1.0, this project complies with the District's Regulation 2-5-302 project risk requirements.

Compliance with Regulation 2-5 is therefore satisfied.

Regulation 2- Permits, Rule 6 Major Facility Review

Regulation 2 Rule 6 implements the operating permit requirements of Title V of the federal Clean Air Act as amended in 1990. The rule applies to major facilities, Phase II acid rain facilities, subject solid waste incinerator facilities and any facility in a source category designated by the Administrator of the EPA in a rulemaking as requiring a Title V permit. The rule also provides a means by which facilities can avoid the Title V or other requirements by limiting their potential to emit. A major facility is defined in Section 2-6-212 as one that has the potential to emit 100 tons per year of any regulation air pollutant as defined in Section 2-6-222, or that has the potential to emit 10 tons per year of a single hazardous air pollutant or 25 tons per year or more of a combination of hazardous air pollutants.

> The project's potential to emit criteria pollutants was calculated in accordance with District Policy and presented previously in Table 3; all emissions are below 100 tons per year per pollutant threshold for a major facility.

In addition, the potential to emit toxics was calculated in accordance with Regulation 2 Rule 5 and presented previously in Table 5; emissions are well below 10 tons per year single HAP threshold for a major facility.

The facility is not a Phase II Acid Rain Facility (Section 2-6-217) or a subject solid waste incinerator facility (Section 2-6-229), or a facility defined in a source category defined by EPA requiring a Title V permit. Therefore, Title V requirements, as implemented by Regulation 2, Rule 6 are not triggered.

Regulation 6 - Particulate Matter, Rule 1 - General Requirements

Ringelmann No. 1 Limitation (Section 6-1-301)

Except as provided in Sections 6-1-303, 6-1-304 and 6-1-306, a person shall not emit from any source for a period or periods aggregating more than three minutes in any hour, a visible emission which is as dark or darker than No. 1 on the Ringelmann Chart, or of such opacity as to obscure an observer's view to an equivalent or greater degree.

> Since the engine is expected to emit a low amounts of PM_{10}, it is expected to comply with *Regulation 6-1-301* pending a regular inspection.

Opacity Limitation (Section 6-1-302)

Except as provided in Sections 6-1-303, 6-1-304 and 6-1-306, a person shall not emit from any source for a period or periods aggregating more than three minutes in any hour an emission equal to or greater than 20% opacity as perceived by an opacity-sensing device, where such device is required by BAAQMD regulations.

> Since the engine is expected to emit low amounts of PM_{10}, it is expected to comply with *Regulation 6-1-302* pending a regular inspection.

Visible Particles (Section 6-1-305)

A person shall not emit particles which are large enough to be visible as individual particles at the emission point or of such size and nature as to be visible individually as incandescent particles.

> Since the engine is expected to emit low amounts of PM_{10}, it is not expected to produce visible emissions or fallout in violation of this regulation and will be assumed to comply with *Regulation 6-1-305* pending a regular inspection.

Particulate Weight Limitation (Section 6-1-310)

A person shall not emit from any source particulate matter in excess of 0.15 grains/dscf of exhaust gas volume.

> The PM emission rate for the proposed engine is 0.10 grams/bhp-hr, which results in an outlet grain loading of about 0.013 grains/dscf based on the engine set's specifications (480 bhp, 2460.9 acfm exhaust flow, & 927.2° F emissions stack temperature). The PM emission rates for the project are much less than the 0.15 grains/dscf limit and comply with *Regulation 6-1-310.1*. Note that the TSP concentration limits set forth in Regulation 6-1-301.2 do not apply because the PTE for PM per source is below the 1000 kg per year applicability threshold.

Regulation 9 – Inorganic Gaseous Pollutants, Rule 1 Sulfur Dioxide

The proposed engine is subject to the following sections of Regulation 9, Rule 1 and will comply with all sections by burning Ultra Low Sulfur Diesel with a sulfur content of 15 ppm, which results in less than 1 ppmv of SO_2 in the exhaust gas.

Limitations on Ground Level Concentrations (Section 9-1-301)

Sulfur Dioxide emissions shall not result in ground level concentrations in excess of 0.5 ppm continuously for 3 consecutive minutes or 0.25 ppm averaged over 60 consecutive minutes, or 0.05 ppm averaged over 24 hours.

General Emission Limitation (Section 9-1-302)

A gas stream containing Sulfur Dioxide shall not contain sulfur dioxide in excess of 300 ppm (dry).

Fuel Burning (Liquid and Solid Fuels) (Section 9-1-304)

The sulfur content of liquid fuel burned shall not exceed 0.5% by weight.

Regulation 9 – Inorganic Gaseous Pollutants, Rule 8 NO_x and CO from Stationary Internal Combustion Engines

Exemptions (Section 9-8-110)

Section 110.5 exempts emergency standby engines from the requirements of Sections 9-8-301 through 305, 501 and 503.

Emergency Standby Engines, Hours of Operation (Section 9-8-330)

The engine is subject to the requirements of *Regulation 9-8-330*, which limits reliability related operation of the engines to 50 hours per year per engine.

> Permit Conditions for S-9 will include an operating limit that complies with this standard.

Monitoring and Records (Section 9-8-500)

The engine is subject to the reporting requirements of Sections 502 and 530.

> Permit Conditions for S-9 will include reporting requirements that meet this standard.

Regulation 10 – Standards of Performance for New Stationary Sources

New Source Performance Standards (NSPS)

Any new or modified source is required to comply with *Regulation 10, Standard of Performance for New Stationary Sources* – which is Title 40, Part 60 of the Code of Federal Regulation incorporated by reference. According to §60.4200(a)(1), the provisions of 40 CFR Part 60 Subpart IIII *Standards of Performance for Stationary Compression Ignition (CI) Internal Combustion Engines (ICE)* are applicable to (1) manufacturers of stationary CI ICEs with a displacement of less than 30 L/cylinder where the model year is 2007 or later for non-fire pump engines, and (2) owners and operators of stationary CI ICE that commence construction after July 11, 2005 and are manufactured after April 1, 2006 (and are not fire pump engines).

§60.4205 specifies the emission standards that must be met by owners/operators of stationary CI ICE emergency engines. Per §60.4205(b), owners/operators of 2007 model

year and later emergency stationary CI ICE with a displacement of less than 30 L/cylinder that are not fire pump engines must comply with the emission standards for new nonroad CI engines in §60.4202 for all pollutants (for the same model year and maximum engine power for their 2007 model year and later emergency stationary CI ICE).

> *§60.4202* specifies emergency engine emissions standards for manufacturers of stationary CI ICEs. Per §60.4202(a)(2), manufacturers must certify their 2007 model year and later CI ICEs with a maximum engine power greater than 50 HP and less than or equal to 3,000 HP and displacement of less than 10 liters per cylinder that are not fire pump engines to the certification emission standards for new nonroad CI engines for engines of the same model year and maximum engine power in 40 CFR Part 1039, Appendix I for all pollutants. The proposed engine S-9 satisfies the emission standards contained in 40 CFR Part 1039, Appendix I, Table 3, as summarized below.

Table 6. Engine Emission Rates vs. 40 CFR 1039, Appendix I Emission Standards

Pollutant	40 CFR 1039, Appendix I Emission Standard (g/kW-hr)	S-9 Emission Rate (g/kW-hr)
NMHC + NO_X	4.0	3.66
CO	3.5	1.3
PM	0.20	0.14

The engine is exempt from the smoke emission standards of 40 CFR 1039.105 because the engine is constant speed (exemption 1039.105(a)(2)).

§60.4206 requires that the owner/operator of a stationary CI ICE meet the applicable emission standards specified in §60.4205 over the entire life of the engine.

> The owner/operator is expected to comply with this requirement.

§60.4207 specifies fuel requirements that must be met for owners/operators of a stationary CI ICE engine subject to Subpart IIII. Effective October 1, 2010, engines with a displacement less than 30 L/cylinder that use diesel fuel must the requirements of 40 CFR 80.510(b) for nonroad diesel fuel. 40 CFR 80.510(b) specifies standards of 15 ppm maximum sulfur content for nonroad diesel fuel and a cetane index of 40 or aromatic content of 35%.

> The owner/operator is expected to comply with this requirement because CARB allows only ultra-low sulfur diesel to be used for stationary engines in California.

§60.4209 specifies the monitoring requirements for owner/operators of stationary CI ICEs: emergency engines not meeting emission standards must be equipped with a non-resettable hour meter prior to startup, and DPFs (if equipped) must be installed with a backpressure monitor that notifies the owner/operator when high backpressure limit is approached. In addition, monitoring requirements of §60.4211 must be met (see next subsection, below).

> S-9 meets the standards applicable to emergency engines and will be equipped with a non-resettable hour meter prior to startup of the engine (even though they are not

specifically required to do so per this section). An engine DPF will not be equipped. Standard permit conditions will be imposed to ensure compliance with these requirements.

§60.4211 requires (a) owners/operators operate and maintain the engine and control device according to manufacturer's emission-related written instructions, change only those emission-related settings that are permitting by the manufacturer, and meet the requirements of 40 CFR 89, 94, and/or 1068 if applicable. In addition, §60.4211(c) requires owner/operators of 2007 model year and later CI ICEs complying with §60.4205(b) standards to purchase a certified engine, installed and configured according to the manufacturer's emission-related specifications. Lastly, §60.4211(f) specifies emergency engine operation for non-emergency purposes are limited to 50 hours per year (up to 100 hours per year for certain situations) and emergency use is unlimited.

> The owner/operator is expected to comply with the compliance requirements outlined in §60.4211. The proposed engine is part of certified EPA Engine Family PCPXL08.8NZS. Due to the CARB ATCM limiting non-emergency use to 50 hours per year, the 100 hours per year provision does not apply.

§60.4214 specifies notification, reporting and recordkeeping requirements for owners/operators of CI ICEs.

> The proposed engine S-9 is not subject to initial notification requirements of §60.4214(b) because it is an emergency engine and meets the standards applicable to non-emergency engines in the applicable model year.

§60.4218 specifies the general provisions in 40 CFR 60.1 to 60.19 applicable.

> The owner/operator is expected to comply with these provisions.

Regulation 11 – National Emission Standards for Hazardous Air Pollutants

National Emission Standards for Hazardous Air Pollutants (NESHAP)

There are no subparts under 40 CFR Part 61 that apply to ICEs. Therefore, this regulation does not apply to the proposed source in this application.

40 CFR Part 63 Subpart ZZZZ establishes NESHAPs for Stationary Reciprocating Internal Combustion Engines (RICEs). Both area and major sources of RICEs are subject to Subpart ZZZZ. The facility constitutes an area source of HAPs because the potential to emit any single/combined HAP are below the 10/25 tons per year threshold for major sources. The proposed source S-9 is a new stationary RICE CI at an area source subject to (and compliant with) regulations under 40 CFR Part 60 Subpart IIII. Therefore, per 40 CFR 63.6590(c)(1), no further requirements apply for the proposed engine under Subpart ZZZZ.

Other Regulations

The BAAQMD is charged with enforcing the requirements of California's Air Toxic Control Measure for Stationary Compression Ignition Engines *Title 17, California Code of Regulations, Section 93115* for the purpose of reducing diesel particulate matter (PM) and

criteria pollutant emissions from stationary diesel-fueled compression ignition (CI) engines.

Airborne Toxic Control Measure (ATCM) for Emergency Standby Diesel-Fueled CI Engines (>50 bhp)

Subsection 93115.6(a)(3) sets forth Emission Standards for new stationary emergency standby diesel fueled compression ignition engines with maximum engine power greater than 50 HP.
> S-9 is subject to and meets the requirement of this section of the ATCM as shown in the table below:

Table 7. Engine Emission Rates vs. ATCM Emission Standards

Pollutant	ATCM Emission Standards (g/bhp-hr)	S-9 Emission Rate (g/bhp-hr)
PM	**0.15**	0.10
NMHC + NO_x	**3.0**	2.7
CO	**2.6**	0.97

Subsection 93115(a)(3)(A)(1)(b) requires that new stationary emergency standby diesel-fueled engines (>50 bhp) be certified to the emission standards as specified in *40 CFR, Part 60, Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*.
> S-9 has been certified to meet EPA Tier 3 standards. S-9 meets 40 CFR Part 60 Subpart IIII. Therefore, the engine complies with this section of the ATCM.

Subsection 93115(a)(3)(A)(1)(c) limits the non-emergency operation of 50 hours/year for maintenance and testing.
> Permit Conditions for S-9 will limit non-emergency operation to 50 hours/year/engine and as such, will comply with this section of the ATCM.

PUBLIC COMMENTS RECEIVED

Standard BAAQMD permitting procedures stipulate that all complete applications undergo a 10-Day Public Participation Period (PPP). During this time, members of the public may submit comments on application materials. During the 10-day PPP for this application, no comments were received on the application materials.

PERMIT CONDITIONS

S-9 will be subject to Permit Condition Numbers 100072 and 100073.

Condition No. 100072

1. The owner or operator shall operate each emergency standby engine only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, state or Federal emission limit, or for reliability-related activities (maintenance and other testing, but excluding emission testing). Operating while mitigating emergency conditions or while emission testing to show compliance with District, state or Federal emission limits is not limited.
   [Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]
2. The owner/operator shall operate each emergency standby engine only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine is installed, operated and properly maintained.
   [Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]
3. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 36 months from the date of entry (60 months if the facility has been issued a Title V Major Facility Review Permit or a Synthetic Minor Operating Permit). Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.
   a. Hours of operation for reliability-related activities (maintenance and testing).
   b. Hours of operation for emission testing to show compliance with emission limits.
   c. Hours of operation (emergency).
   d. For each emergency, the nature of the emergency condition.
   e. Fuel usage for each engine(s).

   [Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]
4. At School and Near-School Operation: If the emergency standby engine is located on school grounds or within 500 feet of any school grounds, the following requirements shall apply: The owner or operator shall not operate each stationary emergency standby diesel-fueled engine for non-emergency use, including maintenance and testing, during the following periods:
   a. Whenever there is a school sponsored activity (if the engine is located on school grounds)
   b. Between 7:30 a.m. and 3:30 p.m. on days when school is in session.

   "School" or "School Grounds" means any public or private school used for the purposes of the education of more than 12 children in kindergarten or any of grades

1 to 12, inclusive, but does not include any private school in which education is primarily conducted in a private home(s). "School" or "School Grounds" includes any building or structure, playground, athletic field, or other areas of school property but does not include unimproved school property.
[Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

Condition No. 100073

The owner/operator shall not exceed the following limits per year per engine for reliability-related activities:

50 Hours of Diesel fuel (Diesel fuel)
[Basis: Cumulative Increase; Regulation 2-5; Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

RECOMMENDATION

The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue an Authority to Construct for the equipment listed below. However, the proposed source will be a new source of TAC within 1,000 feet of a K-12 school, which triggers the public notification requirements of Regulation 2-1-412. After the comments are received from the public and reviewed, the District will make a final determination on the permit.

I recommend that the District initiate a public notice and consider any comments received prior to taking any final action on issuance of an Authority to Construct and/or a Permit to Operate for the following equipment:

S-9: Stationary Emergency Diesel Engine-Generator Set
Make: Caterpillar; Model: C9, Model Year: 2023
EPA Engine Family: PCPXL08.8NZS
480 bhp, 22.4 MMBtu/hr

By: Daniel Oliver Date: 01/08/2024
Daniel Oliver
Senior Air Quality Engineer