

ENGINEERING EVALUATION

NOVELLE SENIOR LIVING
3355 Almaden Expressway
San Jose, CA 95118

Facility ID #203322

Application #688356: "New" Emergency Standby Engine

I. BACKGROUND

Novelle Senior Living (Novelle) has applied to obtain an Authority to Construct (AC) and/or a Permit to Operate (PO) for the following equipment:

S-1: Emergency Standby Diesel Generator Engine
Cummins Inc. Model QSB5-G6, Model Year: 2023
Engine Serial #: TBD, 272 in³, 208 bhp, 1.411 MMBTU/hr

S-1 is an emergency diesel generator engine that will provide motive power to an emergency standby generator set. S-1 is a Tier 3 EPA certified (Certificate No: PCEXL0275AAK-025) engine.

Because the emission rate of diesel PM for S-1 is less than or equal to 0.15 g/bhp-hr (certified at 0.112 g/bhp-hr) the engine will be allowed to operate under the CARB (California Air Resource Board) ATCM (Air Toxic Contaminant Measure) for up to 50 hours/year for maintenance and testing purposes – provided it passes the District's Health Risk Assessment (HRA) which is discussed later in this report.

II. EMISSIONS SUMMARY

Table 1 lists the EPA certified emission rates for S-1.

Table 1: EPA certified emission rates for S-1		
Pollutant	EPA Certified Emission Rate	
	g/kW-hr	g/BHP-hr
NMHC	0.23	0.172
NOx	3.59	2.677
NMHC + NOx	3.8	2.834
CO	1	0.746
PM	0.15	0.112

Table 2 summarizes the annual and daily emissions from the operation of S-1 based on the EPA certification. The annual emissions are based on 50 allowable hours for maintenance and testing.

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Table 2. Annual and Daily Emissions from S-1

Pollutant	Daily Emission Rate (lbs/day)	Annual Emission Rate (lbs/year)	Annual Emission Rate (tons/yr)
NO _x	29.468	61.392	0.031
POC	1.869	3.894	0.002
CO	8.247	17.181	0.009
PM ₁₀	1.210	2.520	0.001
PM _{2.5}	1.210	2.520	0.001
SO ₂	0.061	0.126	0.000

Notes:

1. NMHC (Non-Methane Hydrocarbon) = POC (Precursor Organic Compound)
2. Particulate Matter (PM) = PM₁₀ = PM_{2.5}
3. Maximum daily operation assumed to be 24 hours.
4. The maximum annual emissions are based on reliability-related activities (50 hours) as defined in Regulation 9-8-232.
5. SO₂ (Sulfur Dioxide) emissions are based upon the Permit Handbook. The Permit Handbook suggests the use of EPA AP-42, Table 3.4-1. Assuming a sulfur content of 15 ppm, pursuant to the fuel requirements of CARB, the emission factor equates to 1.21E-05 lb SO₂/hp-hr.

Table 3 summarizes S-1's potential to emit (PTE) based on the EPA certification. The annual PTE is based on an assumed 100 hours for emergency events, plus 50 hours allowable hours for maintenance and testing.

Table 3. Potential to Emit Source Emissions

Pollutant	Hourly Emission Rate (lbs/hour)	Daily Emission Rate (lbs/day)	Annual Emission Rate (lbs/year)	Annual Emission Rate (tons/yr)
NO _x	1.228	29.468	184.176	0.092
POC	0.078	1.869	11.683	0.006
CO	0.344	8.247	51.542	0.026
PM ₁₀	0.050	1.210	7.559	0.004
PM _{2.5}	0.050	1.210	7.559	0.004
SO ₂	0.003	0.061	0.379	0.000

Notes:

1. NMHC (Non-Methane Hydrocarbon) = POC (Precursor Organic Compound)
2. Particulate Matter (PM) = PM₁₀ = PM_{2.5}

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3. Maximum daily operation assumed to be 24 hours.
4. For the PTE (Potential to Emit), the maximum annual operation will include reliability-related activities (50 hours) as defined in Regulation 9-8-232 and 100 hours for emergency events.
5. SO₂ (Sulfur Dioxide) emissions are based upon the Permit Handbook. The Permit Handbook suggests the use of EPA AP-42, Table 3.4-1. Assuming a sulfur content of 15 ppm, pursuant to the fuel requirements of CARB, the emission factor equates to 1.21E-05 lb SO₂/hp-hr.

III. CUMULATIVE INCREASE

Novelle is a new facility. Table 4 summarizes the cumulative increase in criteria pollutant emissions that will result from the operation of S-1. The cumulative increase is based on 50 allowable hours for maintenance and testing.

Table 4: Cumulative Increase in Emissions			
Pollutant	Increase in Emissions At Plant Since April 5, 1991 (TPY)	Increase in Emissions Associated with This Application (TPY)	Total Emissions (Post 4/5/91 + Increase) (TPY)
NOx	0.000	0.031	0.031
POC	0.000	0.002	0.002
CO	0.000	0.009	0.009
PM ₁₀	0.000	0.001	0.001
PM _{2.5}	0.000 ¹	0.001	0.001
SO ₂	0.000	0.000	0.000

Notes:

For the cumulative increase, the maximum annual operation (50 hours) will only include reliability-related activities as defined in Regulation 9-8-232.

IV. HEALTH RISK ASSESSMENT (HRA)

Pursuant to Regulation 2-5-110, a project is subject to the provisions of this rule if the increase in toxic air contaminants (TAC) emissions from new or modified sources exceed trigger levels listed in Table 2-5-1 of Regulation 2-5. There are no other applications within the 5-year lookback period.

Diesel exhaust particulate matter source emissions from this project and the Regulation 2-5 threshold review is provided in Table 5.

Table 5. Regulation 2-5 Threshold Review						
Pollutant	Hourly Emission Rate (lbs./hour)	Acute Threshold (lbs./hour)	Exceeds Acute Threshold? (Yes/No)	Annual Emission Rate (lbs./year)	Chronic Threshold (lbs./year)	Exceeds Chronic Threshold? (Yes/No)
Diesel Exhaust Particulate Matter	5.0E-02	-----	NA	2.52E+00	2.6E-01	Yes

¹ Post 08/31/2016.

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The project exceeds the listed Table 2-5-1 chronic trigger level for diesel exhaust particulate matter. The project is subject to the requirements of this regulation. The hours used for emergencies are not included pursuant to Regulation 2-5-111.

The project does not qualify for HRA streamlining since an off-site worker receptor location is less than 100 feet from S-1 and the diesel PM emissions from S-1 exceed 0.26 lbs/year. Hence, a refined HRA is warranted.

Results from the HRA indicate that the project cancer risk is estimated at 1.0 in a million, and the project chronic hazard index (HI) is estimated at 0.00043. In accordance with the District's Regulation 2-5-301, this source does not require TBACT because the estimated source risk does not exceed a cancer risk of 1.0 in a million, and/or chronic hazard index of 0.20. Since the estimated project cancer risk does not exceed 10 in a million and hazard indices do not exceed 1.0, this proposed project complies with the District's Regulation 2-5-302 project risk requirements, for projects not located in an Overburdened Community, as defined in Regulation 2-1-243.

V. BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

In accordance with Regulation 2-2-301, BACT is required for any new or modified source with a PTE of 10 pounds or more per highest day of POC, non-precursor organic compounds (NPOC), NO_x, PM₁₀, PM_{2.5}, SO₂, or CO.

It can be seen from Table 2 above that S-1 triggers BACT for NO_x. BACT requirements for S-1 are contained in the District's BACT/TBACT Workbook (Document #: 96.1.3 dated 12/22/2020).

Table 6 below summarizes S-1's EPA certified emission rates and compares them to emission rates found in Table 1 of BACT Document #: 96.1.3.

Table 6: Comparison of emission rates to check if S-1 meets BACT		
Pollutant	S-1's EPA certified emission rates g/kW-hr (g/bhp-hr)	District's BACT 2 limits based on CARB ATCM emission rates g/kW-hr (g/bhp-hr)
NMHC + NO _x	3.8 (2.834)	4.0 (3.0)

Per information summarized in Table 6, S-1 meets, the emission standard for NMHC + NO_x in "Table 1: BACT 2 Emission Limits Based on CARB ATCM". Therefore, the test for BACT is met.

VI. OFFSETS

The Novelle Senior Living facility is a new facility. Therefore, the pre-Application #688356 cumulative increase in emissions at Novelle Senior Living is zero.

Per Reg. 2-2-302, the facility PTE for POC emissions and NO_x emissions are each less than 10 TPY (Table 2). Therefore, the increase in POC and NO_x emissions associated with this

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application doesn't have to be offset. Per Reg. 2-2-303, the facility PM_{2.5} emissions, PM₁₀ emissions, and SO₂ emissions don't have to be offset since this facility is not a Major Facility.

VII. NEW SOURCE PERFORMANCE STANDARDS (NSPS)

40 CFR 60, Subpart IIII (NSPS IIII), Standards of Performance for Stationary Compression Ignition Internal Combustion Engines applies to non-fire pump engines such as S-1 that were manufactured after April 1, 2006. Pursuant to §60.4205(b), owners or operators of 2007 model year and later stationary emergency diesel engine-generator sets with a displacement of less than 30 liters must comply with §60.4202. In accordance with §60.4202(a)(2), the emission standards must meet those established in 40 CFR Part 1039, Appendix I and the smoke standards established in 40 CFR 1039.105.

Emission standards found in Table 3² of 40 CFR Part 1039, Appendix I that apply to S-1 are: NMHC + NO_x = 4.0 g/kW-hr; CO = 3.5 g/kW-hr; and PM = 0.20 g/kW-hr.

It can be seen from Table 1 that S-1 complies with the emission standards in NSPS IIII. 40 CFR 1039.105 (b) sets forth the following smoke opacity standards for engines:

- 20% during the acceleration mode;
- 15% during the lugging mode; and
- 50% during the peaks in either the acceleration or lugging modes.

S-1 is expected to meet these smoke opacity standards.

Per §60.4207(b), S-1 is subject to the following diesel fuel requirements in 40 CFR 1090.305:

- Sulfur content ≤ 15 ppm maximum
- Minimum Cetane index = 40 or maximum aromatic content of 35% by volume

Diesel fuel sold in California meets the above standards. Therefore, S-1 complies with the diesel fuel requirements in NSPS IIII.

VIII. NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP)

S-1 is subject to 40 CFR 63, Subpart ZZZZ (MACT ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines because the engine will be constructed (~installed) on/after June 12, 2006. Per §63.6590(c)(1), "new" sources such as S-1 are required to meet the requirements in MACT ZZZZ by meeting the requirements in NSPS IIII. As previously discussed, S-1 complies with NSPS IIII, and therefore, complies with MACT ZZZZ as well.

IX. CALIFORNIA AIR RESOURCES BOARD (CARB) STATIONARY DIESEL ENGINE ATCM

The May 19, 2011 amendments to the CARB's Airborne Toxic Control Measure (ATCM) harmonized the emission standards and certification requirements for new stationary emergency standby diesel engines greater than 50 BHP with the federal New Source Performance Standards for Stationary CI Internal Combustion Engines contained in 40 CFR § 60.4202. S-1 is an EPA certified diesel engine. Table 7 compares S-1's EPA certified emission rates to the applicable emission standards contained in Table 1 of the ATCM for 2008+ model year engines.

² Tier 3 Model Year 2023 engines.

Table 7: Comparison of emission rates EPA certification vs. CARB ATCM 175 ≤ HP < 300 (130 ≤ kW < 225)		
Pollutant	S-1's EPA certified emission rates g/kW-hr (g/bhp-hr)	CARB ATCM emission rates g/kW-hr (g/bhp-hr)
NMHC + NOx	3.8 (2.834)	4.0 (3.0)
CO	1 (0.746)	3.5 (2.6)
PM	0.15 (0.112)	0.20 (0.15)

It can be seen from Table 7 that S-1 complies with the applicable emission standards in CARB's ATCM.

X. STATEMENT OF COMPLIANCE

Because S-1 is an emergency standby diesel engine, it is not subject to the emission rate limits in Regulation 9, Rule 8. Specifically, S-1 is exempt from the requirements of Sections 9-8-301 through 305, 501 and 503 per Regulation 9-8-110.5. However, S-1 is subject to and is expected to comply with 9-8-330.3 because its non-emergency hours of operation will be limited by permit conditions discussed later in this evaluation report to 50 hours per year. The monitoring and record-keeping requirements of Regulation 9-8-502.1 and Regulation 9-8-530 are also incorporated into the proposed permit conditions.

S-1 is subject to and is expected to comply with the SO₂ limitations of 9-1-301 and 9-1-304. Specifically, per Section 501 of Regulation 9, Rule 1, area monitoring to demonstrate compliance with the ground level SO₂ concentration requirements 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 of Regulation 9-1-301 is at the APCO's discretion. Because S-1 will not emit large quantities of SO₂ emissions (estimated at 0.00019 TPY) it is unlikely that the APCO will require Novelle to conduct ground level monitoring. Regulation 9-1-304 limits the sulfur content in liquid fuel burnt at S-1 to not exceed 0.5% by weight. S-1 will comply with the above requirement because they will burn California Low Sulfur diesel fuel which has 0.0015% by weight sulfur.

Like all combustion sources, S-1 is subject to Regulation 6, Rule 1. Regulation 6-1-303.1 limits opacity and Regulation 6-1-303.1 limits visible emissions from internal combustion engines of less than 25 liters (1500 in³) displacement, or from any engine used solely as a standby source of motive power to Ringelmann 2. S-1 will be solely used as a standby source of motive power and is therefore, not expected to produce visible emissions or result in fallout that would have opacities in excess of 40%. S-1 compliance with the above opacity limit will be confirmed by the District's Compliance & Enforcement staff during their routine inspections.

Regulation 6-1-305 prohibits emission of particles from any operation in sufficient number to cause annoyance to any other person where the particles 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. S-1 is not expected to produce visible emissions or

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fallout in violation of this regulation and will be assumed to be in compliance with Regulation 6-1-305.

CEQA

This permit application is categorically exempt from CEQA because the project has no potential for causing a significant adverse environmental impact, or the application is categorically exempt from CEQA under CEQA Guidelines Section 15301 for Class 1 - Existing facilities with no or negligible expansion of existing use. In making the determination that this application is categorically exempt: 1) the Air District reviewed the CEQA-related Information from the applicant (Regulation 2-1-426-1) indicating that there is no potential for a significant adverse environmental impact from the project; 2) a formal health risk assessment was either not required or was approved by the Air District; and 3) the Air District determined there are no unusual circumstances, or that the cumulative impacts from successive projects of the same type in the same place do not result in significant adverse environmental impacts.

In addition, the applicant has included in its permit application CEQA-related information (CEQA Appendix H) that demonstrates with certainty that the project has no potential for resulting in any significant environmental impacts.

Public Notice (Regulation 2-1-412) is required if an application for an authority to construct or permit to operate for (i) a new or modified source located within 1000 feet of the outer boundary of a K-12 school site and which results in the increase in emissions of any substance into the ambient air which has been identified by the California Air Resources Board or the APCO as a toxic air contaminant or a hazardous air contaminant or which is on the list required to be prepared pursuant to subdivision (a) of Section 25532 or Section 44321 subsections (a) to (f) inclusive of the Health and Safety Code, or (ii) a new or modified source located within an Overburdened Community (OBC) as defined in Regulation 2-1-243 and for which a HRA is required pursuant to Regulation 2-5-401.

This facility is not located in an OBC.

This facility is located within 1,000 feet from the following schools, and therefore this application is subject to the public notification requirements of Regulation 2-1-412:

Calvary Christian Academy
1175 Hillsdale Avenue
San Jose, CA 95118

One World Montessori School
1170 Foxworthy Avenue
San Jose, CA 95118

The operation of S-1 does not trigger a Prevention of Significant Deterioration (PSD) review.

Application #688356 does not result in any increase in emissions that is a "major modification" as per Regulation 2-1-234.2.

XI. PERMIT CONDITIONS

S-1 will be subject to the following permit conditions:

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.

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"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]

End of Conditions

XII. RECOMMENDATION

The Air 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 Air 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 located within two K-12 schools, which triggers the public notification requirements of District Regulation 2-1-412. After the comments are received and reviewed, the Air District will make a final determination on the permit.

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

S-1: Emergency Standby Diesel Generator Engine
Cummins Inc. Model QSB5-G6, Model Year: 2023
Engine Serial #: TBD, 272 in³, 208 bhp, 1.411 MMBTU/hr

**Prepared by: Krishnan Balakrishnan, Senior Air Quality Engineer
Date: February 8, 2024**