

## ENGINEERING EVALUATION

Facility ID 202879  
CLPF GRP Uptown Menlo Park  
141 Jefferson Drive, Menlo Park, CA 94025  
Application No. 670403

### Background

On behalf of CLPF GRP Uptown Menlo Park, ProActive Consulting Group is applying for an Authority to Construct for the following equipment:

- S-1 Emergency Standby Diesel Engine (Building A – 172 Constitution Dr)**  
**Make: Mercedes-Benz, Model: OM924LA, Model Year: 2022**  
**EPA Engine Family: NDTAL07.2RJC**  
**197 bhp, 1.25 MMBTU/hr**  
**Permit Condition No. 100072, 100073, and 100102**  
**Abated by A-1, Diesel Particulate Filter**
- A-1 Diesel Particulate Filter (DPF)**  
**Make: Johnson Matthey, Model: JM-CRT(+)-1-N-CS-BIEO-6/6-LP**  
**CARB Executive Order: DE-08-009-11**
- S-2 Emergency Standby Diesel Engine (Building B – 141 Jefferson Dr)**  
**Make: Mercedes-Benz, Model: OM924LA, Model Year: 2022**  
**EPA Engine Family: NDTAL07.2RJC**  
**197 bhp, 1.25 MMBTU/hr**  
**Permit Condition No. 100072, 100073, and 100102**  
**Abated by A-2, Diesel Particulate Filter**
- A-2 Diesel Particulate Filter (DPF)**  
**Make: Johnson Matthey, Model: JM-CRT(+)-1-N-CS-BIEO-6/6-LP**  
**CARB Executive Order: DE-08-009-11**

The criteria pollutants are nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), precursor organic compounds (POC) from unburned diesel fuel, sulfur dioxide (SO<sub>2</sub>) and particulate matter (PM<sub>10</sub>). All these pollutants are briefly discussed on the District's web site at [www.baaqmd.gov](http://www.baaqmd.gov).

S-1 and S-2 are identical engines that meet the Environmental Protection Agency and California Air Resources Board (EPA/CARB) Tier 3 Off-road standard and will be equipped with CARB-verified Diesel Particulate Filter to reduce emissions of Diesel Particulate Matter. The engine will burn commercially available California low sulfur diesel fuel. The sulfur content of the diesel fuel will not exceed 0.0015% by weight.

This evaluation report will discuss compliance of the proposed project with all applicable rules and regulations.

**Emissions**

**Table 1. Annual and Daily Emissions from EPA/CARB Certified Data from S-1**

<b>Pollutant</b>	<b>Unabated Emission Factor (g/bhp-hr)</b>	<b>Abated Emission Factor (g/bhp-hr)</b>	<b>Max Daily Emissions (lb/day)</b>	<b>Annual Emissions (lb/yr)</b>	<b>Annual Emissions (tons/yr)</b>
NO <sub>x</sub>	2.41	2.41	25.09	52.28	0.026
POC	0.052	0.052	0.54	1.13	5.66E-04
CO	1.04	1.04	10.88	22.66	0.011
PM <sub>10</sub> /PM <sub>2.5</sub> <sup>1,3</sup>	0.097	0.015	0.15	0.316	1.58E-04
SO <sub>2</sub>	N/A <sup>2</sup>	N/A <sup>2</sup>	0.057	0.12	5.96E-05

**Table 2. Annual and Daily Emissions from EPA/CARB Certified Data from S-2**

<b>Pollutant</b>	<b>Unabated Emission Factor (g/bhp-hr)</b>	<b>Abated Emission Factor (g/bhp-hr)</b>	<b>Max Daily Emissions (lb/day)</b>	<b>Annual Emissions (lb/yr)</b>	<b>Annual Emissions (tons/yr)</b>
NO <sub>x</sub>	2.41	2.41	25.09	52.28	0.026
POC	0.052	0.052	0.54	1.13	5.66E-04
CO	1.04	1.04	10.88	22.66	0.011
PM <sub>10</sub> /PM <sub>2.5</sub> <sup>1,3</sup>	0.097	0.015	0.15	0.316	1.58E-04
SO <sub>2</sub>	N/A <sup>2</sup>	N/A <sup>2</sup>	0.057	0.12	5.96E-05

Basis:

- Annual emissions: Reliability-related activity 50 hours for S-1 & S-2
- Max daily emissions: 24-hour operation
- Emissions from EPA Engine Family NDTAL07.2RJC for S-1 & S-2
- <sup>1</sup> Conservative Assumption: All PM emissions are PM<sub>2.5</sub>
- <sup>2</sup> SO<sub>2</sub> emission factor from AP-42 Table 3.4-1, SO<sub>2</sub> (15 ppm) = 0.00809\*0.0015 lb SO<sub>2</sub>/bhp-hr
- <sup>3</sup> Per CARB Executive Order DE-08-009-11, PM emissions are reduced by 85%

**Plant Cumulative Increase**

Table 3 below summarizes the cumulative increase in criteria pollutant emissions that will result from this application.

**Table 3. Plant Cumulative Emissions Increase, Post 4/5/91**

<b>Pollutant</b>	<b>Existing Emissions Post 4/5/91 (tons/yr)</b>	<b>Application Emissions (tons/yr)</b>	<b>Cumulative Emissions (tons/yr)</b>
NO <sub>x</sub>	0.000	0.052	0.052
POC	0.000	0.001	0.001
CO	0.000	0.023	0.023
PM <sub>10</sub> /PM <sub>2.5</sub>	0.000	0.000	0.000
SO <sub>2</sub>	0.000	0.000	0.000

**Health Risk Assessment (HRA)**

HRA was required. The total annual diesel particulate emissions from the project is 0.63 lbs/year, which is greater than the toxic trigger level of 0.26 lb/year. All PM<sub>10</sub> emissions are considered diesel particulate emissions. The PM<sub>10</sub> emissions from this application are summarized in Tables 1 and 2. There were no other related projects permitted in the last three years.

**Table 4. HRA Results for S-1 & S-2 operating at 50 hours per year**

<b>Receptor</b>	<b>Cancer Risk</b>	<b>Chronic Non-Cancer Hazard Index</b>
Resident	0.52 in a million	0.00014
Worker	0.20 in a million	0.00016
Student	negligible	negligible

The results from the health risk screening analysis indicate that the maximum project cancer risk (resident) is estimated at 0.52 in a million, and the maximum project chronic hazard index (worker) is estimated at 0.00016. The cancer risk and chronic hazard index for students is considered negligible because, due to the proximity of the sources to school grounds, state regulations prohibit non-emergency operation of the engines between 7:30 a.m. and 3:30 p.m. on days when school is in session. This limitation will be reflected in the permit conditions for S-1 and S-2.

In accordance with the District's Regulation 2, Rule 5, the HRA results deem the project is in compliance with project risk requirements as recommended, limiting reliability-related activity hours for each engine by permit condition to 50 hours per year. See HRA report.

**TBACT**

In accordance with the District's Regulation 2-5-301, these sources do not require TBACT because each estimated source cancer risk does not exceed 1.0 in a million.

## **Project Risk Limits**

Since the proposed engines, operating at 50 hours/year for reliability related testing, do not trigger TBACT, and the estimated project cancer risk does not exceed 10 in a million and the chronic and acute hazard indices does not exceed 1.0, this project complies with the District's Regulation 2-5-302 project risk requirements.

## **Best Available Control Technology (BACT)**

In accordance with Regulation 2-2-301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, NO<sub>x</sub>, CO, SO<sub>2</sub>, or PM<sub>10</sub>.

BACT for these sources is presented in the current BAAQMD BACT/TBACT Workbook for IC Engine – Compression Ignition: Stationary Emergency, non-Agricultural, non-direct drive fire pump, Document #96.1.3, Revision 8. dated 12/22/2020. For NO<sub>x</sub>, CO, POC and PM<sub>10</sub>, BACT(2) is the CARB ATCM standard for the respective pollutant at the applicable horsepower rating. For SO<sub>2</sub>, BACT(2) is using fuel with sulfur content not to exceed 0.0015%, or 15 ppm. The more restrictive BACT(1) standards are not applicable to these engines because it will be limited to operation as emergency standby engines.

S-1 and S-2 satisfy the current BACT(2) standards for the following pollutants which exceed 10 lb/day in Tables 1 and 2:

<b>Pollutant</b>	<b>Emission Factor</b>	<b>BACT(2) Standard</b>
NO <sub>x</sub>	2.41 g/bhp-hr	2.85 g/bhp-hr
CO	1.04 g/bhp-hr	2.60 g/bhp-hr

## **Offsets**

Per Regulation 2-2-302, offsets must be provided if, after a new or modified source is constructed, a facility that has the potential to emit (PTE) more than 10 tons/yr of POC or NO<sub>x</sub>. The PTE for emergency-use engines will include the hours allowed for test and maintenance, as well as an assumed 100 hours per year for emergencies. Based on the emission calculations in Table 5, offsets are not required for this application.

**Table 5. Potential to Emit for Facility ID 202879**

<b>Pollutant</b>	<b>Existing Annual PTE Emissions (ton/yr)</b>	<b>Application Annual PTE (ton/yr)</b>	<b>Facility Annual PTE (ton/yr)</b>	<b>Offset Requirement (ton/yr)</b>	<b>Offset Required?</b>
POC	0.000	0.003	0.003	10	N
NO <sub>x</sub>	0.000	0.157	0.157	10	N
PM <sub>10</sub> /PM <sub>2.5</sub>	0.000	0.001	0.001	100	N
SO <sub>2</sub>	0.000	0.000	0.000	100	N
CO	0.000	0.068	0.068	-	N

Since the facility permitted levels are below the offset trigger levels specified in Regulation 2-2, offsets are not required.

### **Statement of Compliance**

The owner/operator is expected to comply with all applicable requirements. Key requirements are listed below:

**Airborne Toxic Control Measure for Stationary Compression Ignition Engines**  
ATCM, 5/19/2011, section 93115, title 17, CA Code of Regulations

#### **District Rules**

Regulation 6-1-303 (*Ringelmann No. 2 Limitation*)

Regulation 9-1-301 (*Limitations on Ground Level Concentrations of SO<sub>2</sub>*)

Regulation 9-8 (*NO<sub>x</sub> and CO from Stationary Internal Combustion Engines*)

Section 9-8-110.5 – Limited exemption for emergency standby engines

Section 9-8-330 – Hours of operation for emergency standby engines

Section 9-8-502 – Recordkeeping

#### **California Environmental Quality Act (CEQA)**

This project is ministerial under the District Regulation 2-1-311 (Permit Handbook Chapter 2.3) and is therefore not subject to CEQA review.

#### **New Source Performance Standards (NSPS)**

40 CFR 60, Subpart IIII (*Stationary Compression Ignition Internal Combustion Engines*)

#### **National Emissions Standards for Hazardous Air Pollutants (NESHAP)**

40 CFR 63, Subpart ZZZZ (*Stationary Reciprocating Internal Combustion Engines (RICE)*)

#### **Prevention of Significant Deterioration (PSD)**

This application is not part of a PSD project as defined in Regulation 2-2.

#### **Public Notification (Regulation 2-1-412)**

This project is not located in an overburdened community (OBC), but is subject to a public notice because the proposed sources will be located within 1,000 feet from the TIDE Academy at 150 Jefferson Dr, Menlo Park, CA 94025. A public notice will be sent to all parents/guardians of the above mentioned school and all addresses within 1,000 feet of the facility. There will be a 30-day public comment period.

## **Permit Conditions**

### **Permit Condition #100072 Applies to S-1 & S-2**

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]

### **Permit Condition #100073 Applies to S-1 & S-2**

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]

### **Permit Condition #100102 Applies to S-1 & S-2**

1. The owner/operator shall abate the particulate emissions from the emergency diesel engine by the Diesel Oxidation Catalyst/Particulate Filter at all times the engine is in operation. [Basis: Toxics, "ATCM for Stationary Compression Ignition Engines" Section 93115.6(a)(3) or 93115.6(b)(3), title 17, CA Code of Regulations]

2. The owner/operator shall comply with requirements for CARB Executive Order DE-14-005-07. [Basis: CARB Executive Order DE-08-009-11, "ATCM for Stationary Compression Ignition Engines" Section 93115.13(f), title 17, CA Code of Regulations, Toxics, Sections 2700 through 2711 of title 13, CA Code of Regulations]

*End of Conditions*

### **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/Permit to Operate for the equipment listed below. However, the proposed sources will be located within 1,000 feet of at least one school, which triggers the public notification requirements of District Regulation 2-1-412. After the comments are received 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/Permit to Operate for the following sources:

- S-1 Emergency Standby Diesel Engine (Building A – 172 Constitution Dr)**  
**Make: Mercedes-Benz, Model: OM924LA, Model Year: 2022**  
**EPA Engine Family: NDTAL07.2RJC**  
**197 bhp, 1.25 MMBTU/hr**  
**Permit Condition No. 100072, 100073, and 100102**  
**Abated by A-1, Diesel Particulate Filter**
- A-1 Diesel Particulate Filter (DPF)**  
**Make: Johnson Matthey, Model: JM-CRT(+)-1-N-CS-BIEO-6/6-LP**  
**CARB Executive Order: DE-08-009-11**
- S-2 Emergency Standby Diesel Engine (Building B – 141 Jefferson Dr)**  
**Make: Mercedes-Benz, Model: OM924LA, Model Year: 2022**  
**EPA Engine Family: NDTAL07.2RJC**  
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**CARB Executive Order: DE-08-009-11**

Prepared by: Cameron Fee, Air Quality Engineer I



**BAY AREA AIR QUALITY MANAGEMENT DISTRICT  
Best Available Control Technology (BACT) Guideline**

**Source Category**

<b>Source:</b>	IC Engine-Compression Ignition: Stationary Emergency, non- Agricultural, non-direct drive fire pump	<b>Revision:</b>	8
		<b>Document #:</b>	96.1.3
<b>Class:</b>	➤ 50 BHP and < 1000 BHP Output	<b>Date:</b>	12/22/2020*

**Determination**

<b>Pollutant</b>	<b>BACT</b> 1. Technologically Feasible/ Cost Effective 2. Achieved in Practice 3. TBACT	<b>TYPICAL TECHNOLOGY</b>
<b>POC (NMHC)</b>	1. n/s <sup>c</sup> 2. CARB ATCM standard <sup>a</sup> for POC at applicable horsepower rating (see attached Table 1).	1. n/s <sup>c</sup> 2. Any engine certified or verified to achieve the applicable standard. <sup>a</sup>
<b>NOx</b>	1. n/s <sup>c</sup> 2. CARB ATCM standard <sup>a</sup> for NOx at applicable horsepower rating (see attached Table 1).	1. n/s <sup>c</sup> 2. Any engine certified or verified to achieve the applicable standard. <sup>a</sup>
<b>SO<sub>2</sub></b>	1. n/s <sup>c</sup> 2. Fuel sulfur content not to exceed 0.0015% (wt) or 15 ppm (wt).	1. n/s <sup>c</sup> 2. CARB Diesel Fuel (Ultra Low Sulfur Diesel)
<b>CO</b>	1. n/s <sup>c</sup> 2. CARB ATCM standard <sup>a</sup> for CO at the applicable horsepower rating (see attached Table 1).	1. n/s <sup>c</sup> 2. Any engine certified or verified to achieve the applicable standard. <sup>a</sup>
<b>PM<sub>10</sub></b>	1. n/s <sup>c</sup> 2. 0.15 g/bhp-hr  3. 0.15 g/bhp-hr	1. n/s <sup>c</sup> 2. Any engine or technology demonstrated, certified or verified to achieve the applicable standard. 3. Any engine or technology demonstrated, certified or verified to achieve the applicable standard.
<b>NPOC</b>	1. n/s 2. n/s	1. n/s 2. n/s

\* Applies to open permit applications with a complete date on or after 1/1/2020.

**References**

- |    |   |
|----|---|
| a. | ATCM standard (listed below): Where NMHC + NOx is listed (with no individual standards for NOx or NMHC) as the standard, the portions may be considered 95% NOx and 5% NMHC. For the purposes of determining BACT NMHC = POC. Any engine which has been certified or demonstrated to meet the current year tier standard may be considered compliant with the certified emission standard for that pollutant. |
| b. | Deleted (no longer applies).  |
| c. | Cost- effectiveness analysis must be based on lesser of 50 hr/yr or non-emergency operation as limited by District health risk screen analysis.   |

Table 1: BACT 2 Emission Limits based on CARB ATCM

<b>Emissions Standards for Stationary Emergency Standby Diesel-Fueled CI Engines <math>\geq</math>50 BHP g/Kw-hr (g/bhp-hr)</b>			
<b>Maximum Engine Power</b>	<b>PM</b>	<b>NMHC+NOx</b>	<b>CO</b>
37 $\leq$ KW < 56 (50 $\leq$ HP < 75)	0.20 (0.15)	4.7 (3.5)	5.0 (3.7)
56 $\leq$ KW < 75 (75 $\leq$ HP < 100)	0.20 (0.15)	4.7 (3.5)	5.0 (3.7)
75 $\leq$ KW < 130 (100 $\leq$ HP < 175)	0.20 (0.15)	4.0 (3.0)	5.0 (3.7)
130 $\leq$ KW < 225 (175 $\leq$ HP < 300)	0.20 (0.15)	4.0 (3.0)	3.5 (2.6)
225 $\leq$ KW < 450 (300 $\leq$ HP < 600)	0.20 (0.15)	4.0 (3.0)	3.5 (2.6)
450 $\leq$ KW $\leq$ 560 (600 $\leq$ HP < 750)	0.20 (0.15)	4.0 (3.0)	3.5 (2.6)
560 < KW < 750 ( 750 < HP < 1000)	0.20 (0.15)	6.4 (4.8)	3.5 (2.6)