

ENGINEERING EVALUATION

Fairfield Industrial Center
2725 Low Court
Fairfield, CA 94534
Facility ID: 203017
Application No. 677006

Background

Fairfield Industrial Center is applying for an Authority to Construct/Permit to Operate for the following equipment:

S-1 Emergency Standby Diesel Fire Pump
Make: John Deere, Model: JU6H-UFADP0-D, Model Year: 2022
220 bhp, 1.33 MMBtu/hr

The Diesel Fire Pump will be used for emergency water pumping for fire suppression system which is critical facility/life safety system for Fairfield Industrial Center. The Diesel Fire pump will be able to operate unrestricted during emergency use events. The engine will be limited to a maximum of 34 hours per year for maintenance and testing. The criteria pollutants associated with the source are nitrogen oxides (NO_x), carbon monoxide (CO), precursor organic compounds (POC), sulfur dioxide (SO₂), and particulate matter (PM).

S-1 meets the Environmental Protection Agency (EPA NSPS) Tier 3 Off-road standard and NSPS Stationary (40 CFR Part 60 Sub Part III). 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

Basis:

- Annual emissions: Reliability-related activity 34 hours for S-1
- Max daily emissions: 24-hour operation
- ¹ SO₂ emission factor from AP-42 Table 3.4-1,

$$\begin{aligned}
 \text{SO}_2 \text{ Emission Factor } \left(\frac{\text{g of SO}_2}{\text{bhp} - \text{hr}} \right) &= \left[\{8.09 * 10^{-3} * 0.0015\} \frac{\text{lb}}{\text{bhp} - \text{hr}} \right] * 454 \frac{\text{g}}{\text{lb}} \\
 &= 0.006 \frac{\text{g of SO}_2}{\text{bhp} - \text{hr}}
 \end{aligned}$$

- Assume PM_{2.5} emission factor is equal to PM₁₀ emission factor

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

Pollutant	Emission Factor (g/bhp-hr)	Max Daily Emissions (lb/day)	Annual Emissions (lb/yr)	Annual Emissions (tons/yr)
NO _x	2.83	32.9	46.6	0.023
POC	0.12	1.4	2.0	0.001
CO	1.20	14.0	19.8	0.010
PM ₁₀	0.13	1.5	2.1	0.001
PM _{2.5}	0.13	1.5	2.1	0.001
SO ₂	0.006	0.1	0.1	0.0001

Cumulative Increase

Table 2 summarizes the cumulative increase in criteria pollutant emissions that will result from this application.

Table 2. Plant Cumulative Emissions Increase, Post 4/5/91

Pollutant	Existing Emissions Post 4/5/91 (tons/yr)	Application Emissions (tons/yr)	Cumulative Emissions (tons/yr)
NO _x	0.000	0.023	0.023
POC	0.000	0.001	0.001
CO	0.000	0.010	0.010
PM ₁₀	0.000	0.001	0.001
PM _{2.5}	0.000	0.001	0.001
SO ₂	0.000	0.0001	0.0001

Health Risk Assessment (HRA)

At a maximum rate of 2.1 lb/year, the diesel particulate emissions (PM₁₀) from the project are greater than the toxic trigger level of 0.26 lb/year. All PM₁₀ emissions are considered diesel particulate emissions. There were no other related projects permitted in the last three years.

Using the EPA certified PM emission factor for the engine, a 34 hour per year limit for reliability-related activities, and assuming PM is in the form of diesel exhaust PM, the following annual emission rate for diesel exhaust PM was calculated.

$$\frac{0.13 \text{ g PM}}{\text{hp-hr}} \times 220 \text{ hp} \times \frac{\text{lb}}{454 \text{ g}} \times \frac{34 \text{ hr}}{\text{yr}} = 2.1 \text{ lb PM/yr}$$

Pursuant to Regulation 2-5-110, the application is subject to the provisions of the rule since the increase in diesel exhaust PM emissions from the project is above the trigger level listed in Table 2-5-1 of the regulation 2-5-110 (0.26 lb/yr).

S-1 is subject to the District’s HRA streamlining policy for stationary diesel-fuel combustion engines used for backup power or fire pumps. The included HRA streamlining policy checklist shows that a refined HRA is required for this permit application. The project is presumed to be in compliance with project risk requirements as recommended, limiting reliability-related activity hours by permit condition.

The HRA estimates the health risk resulting from toxic air contaminant (TAC) emissions from the non-emergency operation of a new Emergency Fire Pump Diesel Engine (S-1) at this site. Results from the HRA indicate that the project cancer risk is **0.20 in a million**, and the project chronic hazard index (HI) is **0.00016**. In accordance with District Regulation 2-5-301, the proposed new source does not require TBACT because the estimated source risk is less than a cancer risk of 1.0 in a million and/or a chronic HI of 0.20. Since the estimated project cancer risk does not exceed 6.0 in a million and hazard indices do not exceed 1.0, this project complies with the District’s Regulation 2-5-302 project risk requirements, for projects located within an Overburdened Community as defined in Regulation 2-1-243. This HRA represents an analysis of all sources of TACs at this facility. Therefore, these project HRA results also represent site-wide HRA results for purposes of the Air Toxics “Hot Spots” Act (AB 2588).

Best Available Control Technology (BACT)

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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_x, CO, SO₂, or PM₁₀.

Based on the emission calculations above, the owner/operator of S-1 is subject to BACT for the following pollutants: NO_x and CO. The BACT/TBACT Workbook does not address direct-drive emergency standby fire pump engines. Since CARB Stationary Diesel ATCM requirements are at least as stringent as current BACT determinations and applicable NSPS, it is proposed that BACT for direct-drive emergency standby fire pump engines be compliance with the CARB Stationary Diesel ATCM, Title 17, California Code of Regulation section 93115.6(4), New Direct-Drive Emergency Standby Fire Pump Engines.

This engine complies with the proposed BACT.

Table 3. Emission Standard for New Stationary Emergency Standby Diesel- Fueled CI Engines g/bhp-hr (g/kW-hr)

CARB, Title 17 ATCM, California Code of Regulations Section 93115.6				
Maximum Engine Power	Models Year(s)	NO _x	PM	CO
175 ≤ HP ≤ 300	2008 and earlier 2009+	2.85 g/bhp-hr	0.15 g/bhp-hr	2.6 g/hp-hr

Offsets

Since the facility permitted levels are below the offset triggers 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 SO₂*)
- Regulation 9-8 (*NO_x 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 exempted 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*)

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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.

School Notification (Regulation 2-1-412)

This project is over 1,000 feet from the nearest K-12 school and is therefore not subject to the public notification requirements.

Overburdened Community (Regulation 2-1-412)

This project is located within the Overburdened Community (OBC) as defined in Regulation 2-1-243 and is therefore subject to the public notification requirements.

Permit Conditions

Condition no. 22851

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1. Operating for reliability-related activities is limited to no more than 34 hours per year per engine which is the number of hours necessary to comply with the testing requirements of the National Fire Protection Association (NFPA) 25. This emergency fire pump is subject to the current National Fire Protection Association (NFPA) 25 - "Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems."

[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations]

2. 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: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(B)(3)]

3. 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: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection(e)(4)(G)(1)]

4. 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: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(4)(I), (or, Regulation 2-6-501)]

5. 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: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)(1)] or (e)(2)(B)(2)]

End of Conditions

Recommendation

I recommend that the Air District issue a Permit to Operate for the following:

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Prepared by: Thuya Maw
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