

**DRAFT
ENGINEERING EVALUATION
Facebook, Inc.
PLANT NO. 20668
APPLICATION NO: 28460**

BACKGROUND

Facebook, Inc., of Menlo Park California is applying for an Authority to Construct and/or Permit to Operate two Standby Emergency Diesel Engine Generators (S-13 & S-14).

S-13 Stationary Standby Generator Set: Diesel Engine; Make: Cummins; Model: 750 DQCB; Model Year; 2016; Rated Horsepower: 1220 HP

S-14 Stationary Standby Generator Set: Diesel Engine; Make: Cummins; Model: 500 DFEK; Model Year; 2016; Rated Horsepower: 755 HP

The standby generators will be located at One Facebook Way, Building 21 Menlo Park, CA 94025.

EMISSIONS SUMMARY

Annual Emissions:

The Manufacturer's Exhaust Emission Compliance Statement emission factors for S-13 (1220 HP - diesel engine) are listed below.

Pollutant	Emission Factors (g/bhp-hr)
NO _x	3.70
CO	0.30
POC	0.20
PM10	0.09
SO ₂	0.0055

The Manufacturer's Exhaust Emission Compliance Statement emission factors for S-14 (755 HP - diesel engine) are listed below.

Pollutant	Emission Factors (g/bhp-hr)
NO _x	3.70
CO	0.40
POC	0.20
PM10	0.08
SO ₂	0.0055

**The emission factor for SO₂ is from Chapter 3, Table 3.4-1 of the EPA Document AP-42, Compilation of Air Pollutant Emission Factors.*

$$SO_2 \quad 8.09E-3 \text{ (\% S in fuel oil) lb/hp-hr} = 8.09E-3 \text{ (0.0015\% S) (454 g/lb)} = 0.0055 \text{ g/hp-hr}$$

S-13

NO_x = (3.7 g/hp-hr) (1220 hp) (50 hr/yr) (lb/454g) = 497.1 lb/yr = 0.249 TPY
 CO = (0.30 g/hp-hr) (1220 hp) (50 hr/yr) (lb/454g) = 40.3 lb/yr = 0.020 TPY
 POC = (0.20 g/hp-hr) (1220 hp) (50 hr/yr) (lb/454g) = 26.8 lb/yr = 0.013 TPY
 PM₁₀ = (0.09 g/hp-hr) (1220 hp) (50 hr/yr) (lb/454g) = 12.09 lb/yr = 0.006 TPY
 SO₂ = (0.0055g/hp-hr) (1220 hp) (50 hr/yr) (lb/454g) = 0.738 lb/yr = 0.000 TPY

S-14

NO_x = (3.7 g/hp-hr) (755 hp) (50 hr/yr) (lb/454g) = 307.6 lb/yr = 0.153 TPY
 CO = (0.40 g/hp-hr) (755 hp) (50 hr/yr) (lb/454g) = 33.2 lb/yr = 0.016 TPY
 POC = (0.20 g/hp-hr) (755 hp) (50 hr/yr) (lb/454g) = 16.6 lb/yr = 0.008 TPY
 PM₁₀ = (0.08 g/hp-hr) (755 hp) (50 hr/yr) (lb/454g) = 6.65 lb/yr = 0.003 TPY
 SO₂ = (0.0055g/hp-hr) (755 hp) (50 hr/yr) (lb/454g) = 0.457 lb/yr = 0.000 TPY

Maximum Daily Emissions:

A full 24-hour day will be assumed since no daily limits are imposed on intermittent and unexpected operations.

For S-13

NO_x = (3.7 g/hp-hr) (1220 hp) (24 hr/day) (lb/454g) = 238.6 lb/day
 CO = (0.30 g/hp-hr) (1220 hp) (24 hr/day) (lb/454g) = 19.3 lb/day
 POC = (0.20 g/hp-hr) (1220 hp) (24 hr/day) (lb/454g) = 12.8 lb/day
 PM₁₀ = (0.09 g/hp-hr) (1220 hp) (24 hr/day) (lb/454g) = 5.80 lb/day
 SO₂ = (0.0055 g/hp-hr) (1220 hp) (24 hr/day) (lb/454g) = 0.354 lb/day

For S-14

NO_x = (3.7 g/hp-hr) (755 hp) (24 hr/day) (lb/454g) = 147.6 lb/day
 CO = (0.40 g/hp-hr) (755 hp) (24 hr/day) (lb/454g) = 15.9 lb/day
 POC = (0.20 g/hp-hr) (755 hp) (24 hr/day) (lb/454g) = 7.9 lb/day
 PM₁₀ = (0.08 g/hp-hr) (755 hp) (24 hr/day) (lb/454g) = 3.2 lb/day
 SO₂ = (0.0055 g/hp-hr) (755 hp) (24 hr/day) (lb/454g) = 0.219 lb/day

Plant Cumulative Increase: (tons/year)

Pollutant	Existing	New S-13	New S-14	Total
NO _x	0.461	0.249	0.153	0.863
CO	0.050	0.020	0.016	0.086
POC	0.024	0.013	0.008	0.045
PM ₁₀	0.003	0.006	0.003	0.012
SO ₂	0.000	0.000	0.000	0.000

Toxic Risk Screening:

The toxic emissions of diesel particulate do exceed the District Risk Screening Trigger, as shown in Table (1) below, and a Risk Screening Analysis is necessary.

Table 1. Calculated incremental increase in diesel exhaust particulate matter for S-13&S-14

Source:	PM ₁₀ Emission Factor (g/HP-hr)	HP	Annual Usage (Hours/year) ¹	Diesel Exhaust Particulate Emissions (lb/year):	Trigger Level (lb/yr)	Risk Screen Required? (Yes/No)
S-13	0.09	1220	50	12.09	0.26	Yes
S-14	0.08	755	50	6.56	0.26	Yes

The Risk Screening Analysis included the following engines that were permitted within the last three years:

Source:	PM ₁₀ Emission Factor (g/HP-hr)	HP	Annual Usage (Hours/year) ²	Diesel Exhaust Particulate Emissions (lb/year):
S-10	0.08	755	50	6.7
S-11	0.08	755	50	6.7
S-12	0.08	755	50	6.7

Per the attached 04/18/2017 memo, results from the health risk screening analysis, the analysis estimates the incremental health risk resulting from toxic air contaminant (TAC) emissions from operation of five standby generator diesel engines at this facility. Results from the health risk screening analysis indicate the maximum project cancer risk is estimated at 4.7 in a million, and the maximum project chronic hazard index is estimated at 0.0020. In accordance with the District's Regulation 2, Rule 5, the sources are in compliance with TBACT and project risk requirements.

STATEMENT OF COMPLIANCE

The owner/operator of **S-13 and S-14** shall comply with Reg. 6, Rule 1 Particulate Matter – General Requirements and Reg. 9-1-301 (Inorganic Gaseous Pollutants: Sulfur Dioxide for Limitations on Ground Level Concentrations). Since this engine meets TBACT for PM10 (<0.15 g/hp-hr), it is expected to comply with Reg. 6, Rule 1 Particulate Matter - General Requirements. Ultra-low sulfur diesel (15 PPM sulfur) will be used to meet the sulfur limitation of 0.5wt% in Reg. 9-1-304 as well as to minimize PM10 emissions. Because **S-13 and S-14 are** emergency standby generators, Reg. 9-8-110 (Inorganic Gaseous Pollutants: Nitrogen Oxides from Stationary Internal Combustion Engines) exempts the requirements for emission limits of Sections 9-8-301, 302, and 502. Allowable operating hours and the

corresponding record keeping in Reg. 9-8-330 and 530 will be included in the Permit Conditions below. This diesel engine is subject to the Stationary Diesel Airborne Toxics Control Measure (ATCM) and is considered a new stationary emergency standby diesel engine since it will be installed after January 1, 2005 and is larger than 50 HP. The requirements of the ATCM will be included in the permit conditions.

The project is considered ministerial under the District's CEQA regulation 2-1-311 and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emissions factors and therefore is not discretionary as defined by CEQA. (Permit Handbook Chapter 2.3)

The project is within 1000 feet from the nearest school and therefore is subject to the public notification requirements of Reg. 2-1-412.

Best Available Control Technology:

In accordance with Regulation 2, Rule 2, Section 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-13 is subject to BACT for the following pollutants: NO_x, CO, and POC.** S-14 is subject to BACT for the following pollutants: NO_x, and CO. BACT 1 levels do not apply for 'engines used exclusively for emergency use during involuntary loss of power' as per Reference b, Document 96.1.2 of the BAAQMD BACT Guidelines for IC Engines. Hence, the owner/operator has to meet BACT 2 limits presented below.

POLLUTANT	BACT 1. Technologically Feasible/ Cost Effective 2. Achieved in Practice 3. TBACT	TYPICAL TECHNOLOGY
NO _x	n/s^c 2. CARB ATCM standard ^{a,f} for NO _x at applicable horsepower rating(see attached Table 1).	1. n/s^c 2. Any engine or technology certified or verified to achieve the applicable standard. ^{a,b}
CO	n/s^c 2. CARB ATCM standard ^{a,f} for CO at applicable horsepower rating(see attached Table 1).	1. n/s^c 2. Any engine or technology certified or verified to achieve the applicable standard. ^{a,b}
POC	n/s^c 2. CARB ATCM standard ^{a,f} for CO at applicable horsepower rating(see attached Table 1).	1. n/s^c 2. Any engine or technology certified or verified to achieve the applicable standard. ^{a,b}

References

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| <ul style="list-style-type: none"> a. b. c. | <p>a. ATCM standard (listed below): Where NMHC + NO_x is listed (with no individual standards for NO_x or NMHC) as the standard, the portions may be considered 95% NO_x 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.</p> <p>b. Deleted (no longer applies).</p> <p>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.</p> |
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Maximum Engine Power	PM	NMHC+NOx	CO
37 < KW < 56 (50 < HP < 75)	0.20 (0.15)	4.7 (3.5)	5.0 (3.7)
56 < KW < 75 (75 < HP < 100)	0.20 (0.15)	4.7 (3.5)	5.0 (3.7)
75 < KW < 130 (100 < HP < 175)	0.20 (0.15)	4.0 (3.0)	5.0 (3.7)
130 < KW < 225 (175 < HP < 300)	0.20 (0.15)	4.0 (3.0)	3.5 (2.6)
225 < KW < 450 (300 < HP < 600)	0.20 (0.15)	4.0 (3.0)	3.5 (2.6)
450 < KW < 560 (600 < HP < 750)	0.20 (0.15)	4.0 (3.0)	3.5 (2.6)
KW > 560 (HP > 750)	0.20 (0.15)	6.4 (4.8)	3.5 (2.6)

The NOx, CO and POC emission limits set by BACT 2 are met, as shown in Table (2).

Table (2)

Pollutant	Engine Emission Factors (g/hp-hr)	Emission Factor Limits as set by BACT 2 (g/hp-hr)	Have the limits been met?
NOx +POC	3.7	4.8	YES
CO (S-13)	0.30	2.6	YES
CO(S-14)	0.40	2.6	YES

Therefore, S-13 and S-14 are determined to be in compliance with the BACT 2 limits for NOx+POC and CO.

Offsets: Offsets must be provided for any new or modified source at a facility that emits more than 10 tons/yr of POC or NOx. Based on the emission calculations above, offsets are not required for this application.

New Source Performance Standards (NSPS): The engines are subject to 40 CFR 60, Subpart III, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines because they were manufactured after April 1, 2006, as required by Section 60.4200(a)(2)(i).

The engine S-13 has a total displacement of **23.2 liters**. The engine S-14 has a total displacement of 15 liters. Each cylinder has a volume of less than 10 liters. The engines are 2016 engines. Section 60.4205(b) require the engines to comply with the standards in Section 60.4202 for all pollutants for the same model year and maximum engine power. Section 60.4202(a)(ii) require that engines over 50 hp must meet the EPA standards in 40 CFR 89.112 and 40 CFR 89.113. For engines above 750 hp, below 3000 hp, and that have a displacement less than 10 liters per cylinder, the requirement is to comply with the certification standards in 40 CFR 89.112 and 89.113 for all pollutants.

For engines above 750 hp, the standards are:

- NO_x + NMHC: 4.8 g/hp-hr
- CO: 2.6 g/hp-hr
- PM: 0.15 g/hp-hr

According to the Manufacturer's Exhaust Emission Compliance Statement, the engines will comply with the all standards.

Sections 60.4206 and 60.4211(a) require that the owner/operator operate and maintain the engine according to the manufacturer's written instructions, or procedures developed by the owner or operator that are approved by the engine manufacturer, over the entire life of the engine.

Section 60.4207(a) requires that by October 1, 2007, the owner/operator must use fuel that complies with 40 CFR 80.510(a). This means that the fuel must have a sulfur content of 500 parts per million (ppm) maximum, a cetane index of 40 or a maximum aromatic content of 35 volume percent.

Section 60.4207(b) requires that by October 1, 2010, the owner/operator must use fuel that complies with 40 CFR 80.510(b). This means that the fuel must have a sulfur content of 15 parts per million (ppm) maximum, and the same cetane index or aromatic content.

Section 60.4209(a) requires a non-resettable hour meter. This requirement is already in the standard permit conditions.

The engines will comply with the requirements of Section 60.4211(c) because it has been certified in accordance with 40 CFR Part 89.

The engines will comply with the requirement in Section 60.4211(e) to run for less than 100 hours per year for maintenance checks and readiness testing, and the prohibition of running for any reason other than emergency operation, maintenance, and testing because they are limited by permit condition to 50 hours per year for reliability testing and otherwise may only operate for emergencies.

The owner/operator is not required to perform tests in accordance with Section 60.4212 or 60.4213.

Section 60.4214 states that owner/operators do not have to submit an initial notification to EPA for emergency engines.

Because the engines do not have diesel particulate filters, they are not subject to Section 60.4214(c).

The owner/operator is required to comply with certain sections of 40 CFR 60, Subpart A, General Provisions.

National Emission Standards for Hazardous Air Pollutants (NESHAP): The engines are subject to 40 CFR 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. The engines comply with the NESHAPS by complying with NSPS, Subpart IIII, per Section 63.6590 (C) (1) of the NESHAPS.

Prevention of Significant Deterioration (PSD) does not apply.

PERMIT CONDITIONS

Application 28460: Facebook, Inc.: Plant 20668:
Conditions for S-13 and S-14:

PC 22850

1. The owner/operator shall not exceed 50 hours per year per engine for reliability-related testing.

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

2. The owner/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)(A)(3) or (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/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)]

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 located within 1000 feet of a 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 for the following source:

S-13 Stationary Standby Generator Set: Diesel Engine; Make: Cummins; Model: 750 DQCB; Model Year; 2016; Rated Horsepower: 1220 HP

S-14 Stationary Standby Generator Set: Diesel Engine; Make: Cummins; Model: 500 DFEK; Model Year; 2016; Rated Horsepower: 755 HP

EXEMPTIONS

None.

By: _____ Date: 04-28-17

Sheryl Wallace
Air Quality Permit Technician