

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION <i>Large Coating, Printing and Chemical Operations Team</i> APPLICATION PROCESSING AND CALCULATIONS	PAGE	1 of 7
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	REVIEWED BY	
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**PERMIT TO CONSTRUCT EVALUATION
DIESEL I. C. ENGINE (FIRE)**

Applicant's Name	THE BOEING CO., C-17 PROGRAM
Company I.D.	800038
Mailing Address	2401 E. WARDLOW ROAD, LONG BEACH, CA 90807
Equipment Address	SAME AS ABOVE

EQUIPMENT DESCRIPTION

Application No. 519805 (New construction Replacing Previous ICE, D242, A/N 345367, F20420)(D568)

INTERNAL COMBUSTION ENGINE, CUMMINS, MODEL NO. CFP9E-F20, DIESEL-FUELED, FOUR CYCLE, SIX CYLINDERS, LEAN BURN, TURBOCHARGED, AFTERCOOLED, 282 BHP, DRIVING AN FAIRBANKS MORSE FIRE PUMP, MODEL 1824BF.

Application No. 519804

TITLE V/RECLAIM MINOR REVISION

HISTORY

The Boring Co. (C-17 Program) submitted the above application to permit a new diesel powered internal combustion engine (ICE) which will operate a fire-water pump in emergencies. The ICE is an EPA certified engine under certificate no. ACEXL0540AAB.

This Tire 3 compliant Cummins unit will be a functionally identical replacement for an existing fire pump with A/N 345367 with reductions in criteria emissions. This engine is an emergency power generator, thus it is exempt from Rule 1110.2 requirements. Emergency power engine is also exempt from modeling requirements, as well as R1401 requirements. This I. C. engine complies with the current BACT requirements. Offsets are not required since emissions are below 0.5 lb/day.

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The applicant currently operates a number of equipment under RECLAIM I. D. No. 800038 at this Long Beach location. The company manufactures aircraft at this site. Each equipment has different conditions.

The district data did not show any notices of violation or notices to comply issued against this facility in the last two years. Also, there were no complaints for visible emissions or odor nuisance in the district database in the last two years.

The facility is located within an industrial area. It is not located within 1000 feet from any school and there will not be any emission or MICR increases exceeding the threshold levels under this project. Hence, this application will not require a public notification per Rule 212.

This facility is a Title V facility. A Title V renewal permit was issued to this facility on January 20, 2008. The proposed project is considered a “minor permit revision” to the Title V renewal permit, as described in Regulation XXX evaluation.

PROCESS DESCRIPTION

This engine/generator set will supply mechanical energy to an electrical power generator, which will supply power to a fire pump in emergencies. The engine will be exercised 1 hour per day, 1 day per week, 50 weeks per year. During the emergencies, the engine may be operated 24 hours per day, 7 days a week. However, it will be operated less than 200 hours per year. This engine is turbocharged and aftercooled to increase the power of the engine. The turbocharging introduces more fuel in the cylinder with high pressure air. The aftercooling (through heat exchanger) lowers the temperature of the intake air. Decreasing the temperature increases the density, thereby allowing more air into the cylinder. This is a four cycle engine which generally emits fewer pollutants than the two stroke engine, due to a higher percentage combustion rate of the fuel.

OPERATING HOURS

Average: 1 hour/day, 1 day/week, 50 weeks/year
Maximum : 1 hour/day, 1 day/week, 50 weeks/year

EMISSION CALCULATIONS

The majority of the emissions are from the combustion of the fuel (in this case Diesel). Criteria air pollutants from engine exhaust are NO_x, ROG, CO, SO_x, and PM. NO_x formation depends on the temperature and pressure during the combustion. SO_x depends on the sulfur content of the fuel.

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ROG, CO, and PM are primarily the result of incomplete combustion. Data of the emissions were supplied by the manufacturer during the EPA certification process. The copies of the data are in the file.

OPERATING INFORMATION

Hours of operation (HRS/DAY)	1.0
Engine Horsepower (BHP)	282
Engine Speed (RPM)	1760
Exhaust Flow rate	1813
Temperature (Deg. F)	1030

EMISSION FACTORS

POLLUTANTS	GM/BHP-HR	LB/HR
ROG/TOG	0.123	0.08
NOx	2.2	1.37
CO	1.417	0.88
SOx	0.0071*	0.004
PM/PM10	0.118	0.07

* District default factors from Annual Emission Inventories Guidelines

EMISSION CALCULATIONS

Pollutant	Average/Maximum Hourly Emissions @ 1 hr/day usage limit (lbs/hr)	Average * Annual Emissions (lbs)	30-day ** Average Emissions (lbs/day)
ROG/TOG	0.08	4.0	0
NOx	1.37	68.5	0
CO	0.88	44.0	0
SOx	0.004	0.2	0
PM/PM10	0.07	3.5	0

* Based on an operating limit of 50 hrs/year.

** Based on annual emissions & an operating schedule of 12 months/year and 30 days/month. (lbs/hr x 50/12/30)

DSCFM for 1813 ACFM = 805

$$\begin{aligned} \text{Particulate concentration} &= \text{lbs/hr PM} \times 7000 / \text{dscfm} \times 60 \text{ min/hr} \\ &= 0.07 \times 7000 / 805 \times 60 = 0.01 \text{ grains/dscf} \end{aligned}$$

This complies with Rule 404 requirements.

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RULES/REGULATION EVALUATION

▣ **RULE 212, PUBLIC NOTIFICATION**

v **SECTION 212(c)(1):**

This section requires a public notice for all new or modified permit units that may emit air contaminants located within 1,000 feet from the outer boundary of a school. This source is not located within 1,000 feet from the outer boundary of a school. Therefore, public notice will not be required by this section.

v **SECTION 212(c)(2):**

This section requires a public notice for all new or modified facilities which have on-site emission increases exceeding any of the daily maximums as specified in subdivision (g). This ICE is replacing an existing old ICE with reductions in the criteria pollutants. As shown in the following table, the emission increases are below the daily maximum limits specified by Rule 219(g). Therefore, this application will not be subject to this section.

LB/DAY	CO	NOX	PM ₁₀	ROG	SOX	Pb
MAX. LIMIT	220	40	30	30	60	3
INCREASES	0	0	0	0	0	0

v **SECTION 212(c)(3):**

The Tier 2 assessment indicated a cancer risk of 0.0778 in a million for the residential receptor and 0.463 in a million for a commercial receptor due to toxic emissions from the natural gas combustion. Therefore, public notice will not be required by this section.

❖ **SECTION 212(g):**

This section requires a public notice for all new or modified sources which have on-site emission increases exceeding any of the daily maximums as specified by Rule 212 (g). As shown in the following table, the emission increases are below the daily maximum limits specified by Rule 212(g). Therefore, this application will not be subject to this section.

LB/DAY	CO	NOX	PM ₁₀	ROG	SOX	Pb
MAX. LIMIT	220	40	30	30	60	3
INCREASES	0.88	1.37	0.07	0.08	0.004	0

▣ **RULES 401 & 402, VISIBLE EMISSIONS & NUISANCE**

No visible emissions are expected with proper operation and maintenance of the equipment.

▣ **RULES 404 & 405, PARTICULATE MATTER CONCENTRATION & WEIGHT**

With negligible PM emissions, compliance of the rule is expected.

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▣ **RULE 1110.2, EMISSIONS FROM GASEOUS AND LIQUID FUELED STATIONARY INTERNAL COMBUSTION ENGINES**

The operator will maintain monthly engine operating log to comply with sub-paragraph (f)(2) requirements. Otherwise this engine is exempt from other requirements of subparagraph (d) per (h)(4) and (h)(5).

REGULATION XIII

▣ **RULE 1303(a), BEST AVAILABLE CONTROL TECHNOLOGY (BACT)**

This equipment complied with the U.S. EPA Tier 3 BACT requirements with following emission levels.

Pollutants	BACT Required	BACT Achieved
ROG + NOx	3.0 gram/bhp-hr	2.323 gram/bhp-hr
PM10	0.15 gram/bhp-hr	0.118 gram/bhp-hr
CO	2.6 gram/bhp-hr	1.417 gram/bhp-hr

▣ **RULE 1303(b)(1), MODELING**

Since the proposed I.C. Engine is classified as “emergency engine”, it is exempt from this rule requirements under Rule 1304(a)(4).

▣ **RULE 1303 (b)(2), EMISSION OFFSETS**

Emissions are less than 0.5 lb/day. Offsets are not required.

▣ **RULE 1401, NEW SOURCE REVIEW OF CARCINOGENIC AIR CONTAMINANTS**

The emissions are exempt due to emergency equipment exemption under Rule 1401(g)(1)(F).

▣ **RULE 1470, REQUIREMENTS FOR STATIONARY DIESEL-FUELED INTERNAL COMBUSTION AND OTHER COMPRESSION IGNITION ENGINES**

This Tire 3 compliant ICE and no school is located within 1000 feet from this ICE. It will be used for less than 50 hours per year for maintenance and testing. Thus it is expected to comply with these rule requirements.

⊙ **RULE 2005, NEW SOURCE REVIEW FOR RECLAIM**

(c)(1)(A) Best Available Control Technology

This equipment complied with the U.S. EPA Tier 3 BACT requirements with following emission levels.

Pollutants	BACT Required	BACT Achieved
ROG + NOx	3.0 gram/bhp-hr	2.3 gram/bhp-hr

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(c)(1)(B) Modeling

Modeling is not required since there will be reduction in NOx emissions under this replacement project.

(c)(2) Offsets

The Boeing Co. holds sufficient RTCs to offset the NOx emissions.

(g)(4)

A modeling analysis for plum visibility is not required since there will not be net emission increase of NOx from the proposed project.

REGULATION XXX

The proposed project is considered as a “minor permit revision” to the current Title V permit for this facility since there is not an emission increase of pollutants subject to Reg. XIII or hazardous air pollutants. Rule 3000(b)(12) defines a “minor permit revision” as any Title V permit revision that does not result in any of the following:

- Emission increase of RECLAIM pollutants over the facility starting Allocation plus nontradeable Allocations, or a higher Allocation amount which has previously undergone a significant permit revision process,
- Emission increase in hazardous air pollutants (HAPs) or pollutants subject to Reg. XIII, or
- Installation of a new permit unit or the modification or reconstruction of an existing permit unit subject to a New Source Performance Standard (NSPS) per 40 CFR Part 60 or a National Emission Standard for HAPs per 40 CFR Part 61 or Part 63.

Rule 3003(j) specifies that all proposed Title V permit revisions shall be submitted to EPA for review. This is the second permit revision of the Title V permit renewal requested by the facility. The cumulative emission increases resulting from this proposed permit revision are summarized as follows:

Revision	HAP	VOC	NOx	PM₁₀	SOx	CO
1 st Permit Revision, Replacement of ICE (A/N 506013)	0	0	0	0	0	0
2 nd Permit Revision, Replacement of ICE (A/N 519805)	0	0	0	0	0	0
Cumulative Total	0	0	0	0	0	0
Maximum Daily	30	30	40	30	60	220

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CONCLUSIONS/RECOMMENDATIONS

The proposed project is expected to comply with all applicable District Rules and Regulations. Since the proposed project is considered as a “minor permit revision”, it is exempt from the public participation requirements under Rule 3006 (b). A proposed permit incorporating this permit revision will be submitted to EPA for a 45-day review pursuant to Rule 3003(j). If EPA does not have any objections within the review period, a revised Title V permit will be issued to this facility.