ENGINEERING EVALUATION

Facility ID No. 12769
Military Ocean Terminal Concord
Port Chicago Highway, Concord, CA 94520
Application No. 32143

BACKGROUND

Military Operations Terminal Concord (MOTCO) located at Port Chicago Highway, Concord, has requested an Authority to Construct for the following equipment:

S-108 Emergency Standby Diesel Generator Set
Engine Make: Generac; Model: F4HE9685A*J; Model Year: 2022
Engine Serial #: TBD; Engine Family: NFPXL06.7DGS;
EPA Certification Number: PFPXL06.7DGS-027;
Maximum Horsepower: 279 bhp; 1.86 MMBtu/hour (13.5 gallons/hour)
Displacement: 6.7 L (409 in^3)
Generator Make: Generac; Model: SD150; Power: 150 kWe
Location: 410 Norman Avenue, Concord

S-108 meets the Environmental Protection Agency (USEPA) Tier 3 Final Off-road standard. 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.

EMISSIONS SUMMARY

Table 1:
Criteria Air Pollutant Emissions from S-108

Operating Hours (hours/ year)	**Max Rated Output** (bhp)	**Fuel Use Rate** (gallons/ hour)	**Pollutant**	**Emission Factors** (gram/bhp-hour)	**Max Daily Emissions** (lbs/day)	**Annual Emissions** (lbs/year)	**Annual Emissions** (tons/year)
50	279	13.5	NOx	2.63	**38.79**	80.88	0.040
			POC	0.13	1.92	4.00	0.002
			CO	0.82	**12.09**	25.22	0.013
			PM10	0.06	0.88	1.85	0.001
			PM2.5	0.06	0.88	1.85	0.001
			SO2	0.006	0.09	0.18	0.0001

Basis:

- The emission factors (in g/bhp-hour) for NMHC (Non-Methane Hydrocarbon), NOx (Nitrogen Oxides), CO (Carbon Monoxide), and PM (Particulate Matter) per EPA's Annual Certification Data for Small Nonroad Spark-Ignition (NRSI) Engines and Generac's Statement of Exhaust Emissions.
- For the purposes of quantifying emissions in this report, PM is assumed to be equal to PM_{10} and $PM_{2.5}$.
- SO2 emission factor from AP-42 Table 3.4-1 assuming the complete conversion of sulfur in fuel to SO2 and a maximum sulfur content of 15 ppm.

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BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

Per Regulation 2-2-301, an Authority to Construct and/or Permit to Operate for a new source shall require BACT to control emissions of an Air District BACT pollutant as defined in Regulation 2-2-210 if the source will have the potential to emit that pollutant in an amount of 10.0 or more pounds on any day, as defined in Regulation 2-2-301.1. Per Table 1, S-108 triggers BACT for NOx and CO.

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 contains BACT requirements for S-108. For NOx, BACT(2) is the CARB ATCM standard at the applicable horsepower rating. The more restrictive BACT(1) standard is not applicable to S-108 because it will be limited to operate as an emergency standby engine.

It can be seen from Table 2 that S-108 complies with BACT(2) standards for NOx. Hence, the test for BACT is met.

Table 2: BACT

BACT (2)	Emission Limits (CARB ATCM)	S-108 Emissions	Satisfies BACT (2)?
Pollutant	g/bhp-hour	g/bhp-hour	
NOx + NMHC	3.0	2.77	YES
CO	2.6	0.82	YES

CUMULATIVE INCREASE

In accordance with the Air District's Policy for Calculating Potential to Emit of Emergency Generators, Table 2 summarizes the cumulative increase in criteria pollutant emissions that will result from this application assuming S-108 will operate for 50 hours/year for reliability related testing.

Table 3: Cumulative Increase for Plant 12769

Pollutant	Existing Emissions Post 4/5/91	Application 32143	Post-Application 32143
	(tons/year)	(tons/year)	(tons/year)
NO_x	1.9664	0.040	2.006
POC	0.1188	0.002	0.1208
CO	0.4894	0.013	0.502
PM_{10}	0.0370	0.001	0.0380
$PM_{2.5}$	0.0210	0.001	0.022
SO_2	0.0440	0.0001	0.0441

OFFSETS

In accordance with the Air District's Policy for Calculating Potential to Emit (PTE) for Emergency Backup Power Generators, the Potential to Emit for S-108 was estimated assuming 150 hours of operation per year (50 hours per year for reliability-related and testing operation + 100 hours per year for emergency operation) as shown in Table 4. Detailed calculation is in Appendix A.

Table 4: PTE for Plant 12769

Pollutant	PTE of Pre-Application Engine(s) (tons/year)	PTE of engine evaluated under Application 32143 (tons/year)	Facility PTE Post-Applications (tons/year)	Offset Triggers	Offsets Required (Yes/No)
NO_x	5.709	0.121	5.830	>10	No
POC	0.361	0.006	0.367	>10	No
CO	1.435	0.038	1.473	N/A	N/A
PM_{10}	0.135	0.003	0.138	>100	No
SO_2	0.1273	0.0003	0.128	>100	No

It can be seen from Table 3 that the facility's PTE after S-108 is permitted is below the Regulation 2-2 offset trigger levels. Therefore, offsets are not required.

HEALTH RISK ASSESSMENT (HRA)

In accordance with the District's Policy for Calculating Potential to Emit for Emergency Generators, an HRA is required because diesel exhaust particulate matter (diesel PM) emissions from S-108 estimated at 1.85 pounds/year, assuming the engine operates for 50 hours/year for reliability-related testing is greater than the Regulation 2, Rule 5 chronic toxic trigger level of 0.26 pounds/year for the above Toxic Air Contaminant (TAC).

A health risk assessment (HRA) was completed for the above referenced permit application. The HRA estimates the health risk resulting from toxic air contaminant (TAC) emissions from nonemergency operation of one new standby generator diesel engine (S-108) at this facility. Since four other diesel engines were permitted for this facility within the past five years, their emissions were included as part of this project. Multiple engines from related applications are identified below:

Application	Source	Source Description	Project throughput (hrs/yr)	TAC Emissions (lbs/year)
A#32143	S-108	279 hp standby diesel engine	50	1.85 lbs DPM
Related: A#31203	S-104	89 hp standby diesel engine	50	1.04 lbs DPM
Related: A#31481	S-105	198 hp standby diesel engine	50	2.62 lbs DPM
Related: A#31496	S-106 and S-107	2x 2,937 hp standby diesel engines	50	12.94 lbs DPM and 43.72 lb NH3

Results from the HRA indicate that the project cancer risk is 0.38 in a million, the project chronic hazard index (HI) is 0.00010, and the project acute HI is 0.00094. In accordance with the District's Regulation 2-5-301, the new source (S-108) does not require TBACT because the estimated source risk does not exceed 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 in an Overburdened Community (OBC), as defined in Regulation 2-1-243.

Project Risk

Receptor	NAD 83 UTM Coordinates (meters)		Cancer Risk (in a million)	Chronic HI	Acute HI
	Easting (x)	Northing (y)			
Resident	585,650	4,208,675	0.38	0.00010	NA
Worker (WAF=4.2)	585,468	4,208,583	0.029	0.000023	NA
PMI (1-hour)	589,323	4,209,992	NA	NA	0.00094

Student risk values were not calculated because there are no K-12 schools within 1,000 feet of the sources.

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

District Rules

Regulation 1: "General Provisions and Definitions"
S-108 is subject to Regulation 1, Section 301, which prohibits discharge of air contaminants resulting in public nuisance. S-108 is not expected to be a source of public nuisance.

Regulation 2, Rule 1: "Permits – General Requirements"

California Environmental Quality Act (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 Notification:
The public notification requirements of Regulation 2-1-412 apply to projects which result in an increase in toxic air contaminant or hazardous air contaminant emission at facilities within 1,000 feet of the boundary of a K-12 school or are located within an overburdened community (OBC) and require an HRA. There are no K-12 schools within 1,000 feet of Military Operations Terminal Concord, but the site is located within an OBC and this project required an HRA. Therefore, the OBC public notice requirements apply to the operation of S-108.

Regulation 2, Rule 2: "Permits – New Source Review"
Prevention of Significant Deterioration (PSD):
The annual emission increases in criteria pollutants from S-108 are not significant and are less than the respective criteria pollutant thresholds listed in Regulation 2-2-227.2. Therefore, S-108 is not subject to PSD.

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Regulation 6-1 (Particulate Matter – General Requirements)

S-108 is subject to Regulation 6, Rule 1. Opacity and visible emissions from S-108 are limited by Regulations 6-1-303.1 (internal combustion engines of less than 25 liters (1500 in3) displacement) and 6-1-303.2 (engine used solely as a standby source of motive power) to Ringelmann 2. S-108 has a displacement of 6.7 L (409 in^3).

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-108 is not expected to produce visible emissions or fallout in violation of this regulation and will be assumed to be in compliance with Regulation 6-1-305.

S-108's compliance with Regulation 6, Rule 1 will be confirmed by the District's Compliance & Enforcement staff during their routine inspections.

Regulation 8, Rule 1, "Organic Compounds – General Provisions"
All internal combustion engines are exempt from Regulation 8 per Section 8-1-110.2. Therefore, S-108 is exempt from all Regulation 8 rules.

Regulation 9-1-301 (*Limitations on Ground Level Concentrations*)
S-108 is subject to and is expected to comply with the applicable SO_2 limitations in Regulation 9, Rule 1 ("Inorganic Gaseous Pollutants – Sulfur Dioxide"). Because SO_2 emissions from S-108 are negligible, it is unlikely the APCO will require Military Operations Terminal Concord to conduct ground level monitoring. S-108 will comply with the 0.5% by weight sulfur in fuel requirement of Regulation 9-1-304 because diesel sold in California and used in S-108 will contain ≤ 15 ppmw (0.0015%) sulfur.

Regulation 9-8 (*Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines*)
S-108 will be operated as an emergency standby engine and is therefore not subject to the emission rate limits in Regulation 9, Rule 8 ("Inorganic Gaseous Pollutants – NOx and CO from Stationary Internal Combustion Engines"). S-108 is exempt from the requirements of Sections 9-8-301 through 305, 501, and 503 per Regulation 9-8-110.5 (Emergency Standby Engines). S-108 is subject to and is expected to comply with 9-8-330.3 (Emergency Standby Engines, Hours of Operation) since non-emergency hours of operation will be limited in the permit conditions to 50 hours per year. S-108 is also subject to and is expected to comply with monitoring and recordkeeping requirements of Regulations 9-8-502.1 and 9-8-530, which are incorporated into the proposed permit conditions.

Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines, Section 93115, Title 17, CA Code of Regulations
S-108 is subject to the California Air Resources Board ATCM for stationary compression ignition engines since it is a compression ignition (diesel-fueled) engine with a rating greater than 50 brake horsepower and does not meet any of the exemptions in Section 93115.3. S-108 is considered a new stationary compression ignition engine because it will be installed after January 1, 2005.

Section 93115.5, Fuel Restrictions: This engine is subject to the fuel use restriction in Section 93115.5(a)**.** Compliance with this requirement is expected, as the owner/operator will be limited by the permit conditions to exclusively use CARB diesel fuel.

Section 93115.6, Emission Standards: The applicable emission standards for stationary diesel engines are in Section 93115.6(a), which requires that S-108 meet the applicable emission

standards as specified in ATCM Table 1 - Emission Standards for New Stationary Emergency Standby Diesel-Fueled CI Engines. For these engines, the applicable limits are: 0.15 g/bhp-hour for PM, 4.8 g/bhp-hour for NMHC+NOx, and 2.6 g/bhp-hour for CO. Per emission rates summarized in Table 1 of this evaluation, S-108 complies with applicable limits in the ATCM.

Section 93115.10, Recordkeeping, Reporting, and Monitoring Requirements: Section 93115.10(f) requirements have been codified in the proposed permit conditions.

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-108, that were manufactured after April 1, 2006. Per §60.4205(b), S-108 is subject to the Tier 3 emissions standards in 40 CFR 1039, Appendix I for all pollutants.

Applicable emission standards found in Table 3 of Appendix I of 40 CFR 1039 that apply to S-108 (150 kWe) are: NMHC + NOx = 4.0 gram/kW-hour (2.98 gram/bhp-hour); CO = 3.5 gram/kW-hour (2.61 gram/bhp-hour); and PM = 0.20 gram/kW-hour (0.15 gram/bhp-hour).

Emission rates for the above pollutants summarized in Table 1 in this evaluation shows that S-108 complies with the emission standards in NSPS IIII.

S-108 is subject to the smoke standards of 40 CFR 1039 (per 40 CFR 60.4202(b)(2)):

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

The opacity standards in 40 CFR 89.113, it appears, apply to mobile (and not stationary) non-road CI engines. Therefore, S-108 is not subject to the above standards. Instead, S-108 is subject to the opacity standards in Regulation 6, Rule 1, which is discussed above.

Per §60.4207(b), S-108 is subject to the following diesel fuel requirements in 40 CFR 80.510(c):

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

Diesel fuel sold in California meets the above standards. Therefore, S-108 will comply with the diesel fuel requirements in NSPS IIII.

National Emissions Standards for Hazardous Air Pollutants (NESHAP)
40 CFR 63, Subpart ZZZZ (MACT ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines applies to stationary reciprocating internal combustion engines located at a major or area source of Hazardous Air Pollutant (HAP) emissions. S-108 is located at an area source of HAP emissions. According to 40 CFR 63.6590(c)(1), a new or reconstructed stationary RICE located at an area source meets the requirements of this part by meeting the requirements of 40 CFR 60 Subpart IIII, for compression ignition engines. 40 CFR 60 Subpart IIII (NSPS) requirements have been met as discussed in the NSPS section above.

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PERMIT CONDITIONS

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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]

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1. 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]

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 an Overburdened Community, 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-108 Emergency Standby Diesel Generator Set
Engine Make: Generac; Model: F4HE9685A*J; Model Year: 2022
Engine Serial #: TBD; Engine Family: NFPXL06.7DGS;
EPA Certification Number: PFPXL06.7DGS-027;
Maximum Horsepower: 279 bhp; 1.86 MMBtu/hour (13.5 gallons/hour)
Displacement: 6.7 L (409 in^3)
Generator Make: Generac; Model: SD150; Power: 150 kWe
Location: 410 Norman Avenue, Concord

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Eric Grulke
Air Quality Engineer

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Appendix A

S#	bhp	permitted hours/year	emergency hours/year	total hours/year	NOx (tpy)	POC (tpy)	CO (tpy)	PM10 (tpy)	SO2 (tpy)	A#	Comments
1	230	52	100	152	5.85E-04	1.46E-05	5.85E-05	1.46E-05	1.46E-05	5822	Emissions based on 52 hr/yr x 152/52
2	99	50	100	150	0.068	0.004	0.012	0.002	3.02E-03	13646	Emissions based on 50 hr/yr x 3
3	150	50	100	150	0.066	3.21E-03	0.028	2.48E-03	1.35E-04	20648	Emissions based on 50 hr/yr x 3
4	33	12	100	112	0.057	4.56E-03	0.012	4.07E-03	3.79E-03	26291	Emissions based on AP-42 Table 3.3-1
5	55	50	100	150	0.028	0.001	0.188	0.000	1.50E-05	28288	Emissions based on 50 hr/yr x 3
95	105	100	100	200	0.059	0.012	0.059	0.000	4.62E-05	7457	Abated, based on 100 hr/yr x 2
96	2155	50	100	150	2.337	0.108	0.372	0.048	5.70E-02	11172	Emissions based on 50 hr/yr x 3
97	2155	50	100	150	2.337	0.108	0.372	0.048	5.70E-02	15085	Emissions based on 50 hr/yr x 3
98	59	50	100	150	0.045	0.002	0.010	0.001	5.36E-07	17611	Emissions based on 50 hr/yr x 3
99	96	50	100	150	0.045	0.002	0.008	0.002	8.70E-05	22786	Emissions based on 50 hr/yr x 3
103	133	50	100	150	0.054	0.003	0.026	0.003	1.20E-04	23655	Emissions based on 50 hr/yr x 3
104	86	50	100	150	0.038	0.002	0.037	0.002	6.00E-05	31203	Old S-1 from P#201436, 50 hr/yr x 3
105	198	50	100	150	0.088	0.004	0.020	0.004	0.000165	31481	Emissions based on 50 hr/yr x 3
106	2937	50	100	150	0.243	0.053	0.146	0.010	0.002911	31496	Emissions based on 50 hr/yr x 3
107	2937	50	100	150	0.243	0.053	0.146	0.010	0.002911	31496	Emissions based on 50 hr/yr x 3
TOTALS:					5.709	0.361	1.435	0.135	0.1273		

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