ENGINEERING EVALUATION

Plant No. 15808
The Home Depot Store #8572
860 E Dunne Avenue, Morgan Hill, CA 95037
Application No. 724297

BACKGROUND

The Home Depot Store #8572 (Home Depot) has applied for an Authority to Construct/Permit to Operate for the following equipment:

S-3 Emergency Backup Diesel Engine
Tier 4 with integrated SCR
Engine Make: Volvo Penta, Model: TAD1371VE, EPA Family Name: PVPXL12.8CJA
Model Year: 2023, 388 BHP, 293 kW, 2.59 MMBtu/hour

S-3 will replace an existing Emergency Backup Diesel Engine (S-2), which has reached the end of its useful service life. S-3 will burn commercially available California low sulfur diesel fuel. The sulfur content of the diesel fuel will not exceed 0.0015% by weight.

S-3 will emit the following pollutants:
Oxides of nitrogen (NOx), Precursor organic compounds (POC), Carbon monoxide (CO), Particulate matter with aerodynamic diameter smaller than or equal to a nominal 10 microns (PM10), Particulate matter with aerodynamic diameter smaller than or equal to a nominal 2.5 microns (PM2.5), and Sulfur dioxide (SO2).

EMISSIONS

Table 1. Annual and Daily Emissions from each engine (S-3)

Pollutant	Emission Factor[(1)]	Max Daily Emissions	Annual Emissions	Annual Emissions
	(g/bhp-hour)	(pounds/day)	(pounds/year)	(tons/year)
NOx	0.16	3.36	7.01	0.004
POC	0.01	0.31	0.64	0.000
CO	0.07	1.53	3.19	0.002
PM_{10}	0.01	0.31	0.64	0.000
$PM_{2.5}$	N/A[(2)]	0.31	0.64	0.000
SO_2	N/A[(3)]	0.10	0.20	0.000

Basis:

- Annual emissions: Reliability-related activity set at 50 hours for S-3
- Maximum daily emissions: 24-hour operation
- [1]Emission factors calculated as the maximum of all EPA certified data tests for engine family PVPXL12.8CJA
- [2]$PM_{2.5} = PM_{10}$
- [3]SO_2 emission factor calculated based on the following:
    - Complete conversion of sulfur in fuel to SO_2 and a maximum sulfur content of 15 ppm.
    - Density of Ultra Low Sulfur Diesel Fuel = 7.31 lb/gal

- Fuel Consumption Rate =18.7 gal/hr
- MW(SO_2)=64.066 g/mole, MW(S)=32.065 g/mol
- $E_{SO_2} = \left(\frac{15\ lb\ S}{10E{+}06\ lb\ fuel}\right)\left(7.31\ \frac{lb\ fuel}{gal\ fuel}\right)\left(18.7\ \frac{gal\ fuel}{hr}\right)\left(\frac{64.066\ {}^{g}/_{mol}}{32.065\ {}^{g}/_{mol}}\right)\left(50\ \frac{hr}{yr}\right)$

$$E_{SO_2} = 0.10\ {}^{lb}/_{day} = 0.20\ {}^{lb}/_{yr} = 0.000\ {}^{ton}/_{yr}$$

CUMULATIVE INCREASE

Table 2 summarizes the cumulative increase in criteria pollutant emissions that will result from this application assuming S-3 will operate for 50 hours/year for reliability related testing.

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

Pollutant	Pre-application Cumulative Emissions Post 4/5/91 (tons/year)[1]	S-3 Emissions (tons/year)	Post-application Cumulative Emissions (tons/year)
NOx	0.027	0.004	0.031
POC	0.001	0.000	0.001
CO	0.003	0.002	0.005
PM_{10}	0.000	0.000	0.000
$PM_{2.5}$	0.000	0.000	0.000
SO_2	0.001	0.000	0.001

[1]Pre-application cumulative emissions for S-2 summarized in Table 2 from Application 11233 is not aligned with info in New Production System (NPS).

HEALTH RISK ASSESSMENT (HRA)

The proposed engine will emit diesel exhaust particulate matter, which is a toxic air contaminant (TAC) listed in Table 2-5-1 of Air District Regulation 2, Rule 5. Air District Regulation 2, Rule 5 specifies that diesel exhaust particulate matter (DEPM) will be used as a surrogate for all TAC emissions from diesel-fueled compression-ignition internal combustion engines, as this is the principal driver of the health risk associated with this type of equipment. All PM_{10} emissions are considered diesel particulate emissions. The PM_{10} emissions from this application are summarized in Table 1. Because the diesel particulate emissions from the project are greater than the toxic trigger level of 0.26 lb/year, a refined HRA is required. This application did not qualify for HRA streamlining because receptors are located less than 104 feet from the proposed location of the engine.

<u>HRA Results</u>

Results from this HRA indicate that the project cancer risk is estimated at **0.33 in a million**, the project chronic hazard index (HI) is estimated at **0.00010**, and the project acute HI is estimated at **0.0039**. In accordance with the District's Regulation 2-5-301, this source does not require TBACT because the estimated source risk does not exceed a cancer risk of 1.0 in a million and/or chronic hazard index 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 proposed project complies with the District's Regulation 2-5-302 project risk requirements, for projects located in an Overburdened Community, as defined in Regulation 2-1-243.

It can be seen from Table 1 that the DEPM emission rate for S-3 is 0.01 g/bhp-hour. The engine meets TBACT because the above DEPM rate is equal to or below the TBACT standard of 0.015 g/bhp-hour in BACT/TBACT Document # 96.1.3 dated December 2, 2024.

BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

In accordance with Air District Regulation 2-2-301, an authority to construct and/or permit to operate for a new source shall require BACT to control emissions of a District BACT pollutant (POC, NPOC, NOx, CO SO_2, PM_{10}, or $PM_{2.5}$) 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 2-1-217. Per Table 1, S-3 does not trigger BACT for any pollutant.

OFFSETS

In accordance with the Air District's Policy for Calculating Potential to Emit (PTE) of Emergency Generators, the Potential to Emit for S-3 was estimated assuming 150 hours of operation/year as shown in Table 5.

Table 5. Offsets

Pollutant	Pre-Application PTE (tons/year)	S-3 PTE (tons/year)	Facility PTE (tons/year)	Offset Triggers	Offsets Required (Yes/No)
NOx	0.157	0.011	0.168	>10	No
POC	0.007	0.001	0.008	>10	No
CO	0.014	0.005	0.019	N/A	N/A
PM_{10}	0.003	0.001	0.004	>100	No
$PM_{2.5}$	0.003	0.001	0.004	>100	No
SO_2	0.005	0.000	0.005	>100	No

It can be seen from Table 5 that the facility's PTE after S-3 is permitted is below the Air District Regulation 2, Rule 2 offset trigger levels. Therefore, offsets are not required.

STATEMENT OF COMPLIANCE

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

Regulation 6-1 (*Particulate Matter – General Requirements*)

S-3 is subject to Regulation 6, Rule 1. Opacity and visible emissions from S-3 is limited by Regulation 6-1-303.2 (engine used solely as a standby source of motive power) to an opacity of No. 2 on the Ringelmann chart.

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-3 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-3 will comply with 0.15 gr/dscf in Section 6-1-310.1, as shown below:
PM10 emission rate = 0.01 pounds/hr (0.31 pounds/day from Table 1 ÷ 24 hr/day);
DSCFM for 388 BHP = 712[1];
Outlet grain loading rate = 0.002 gr/dscf (0.01 x 7000 ÷ 712 x 60)

Sections 6-1-310.2 and 6-1-311.2 don't apply, since the PTE of engines to emit TSP is significantly lower than 1,000 kg/hr. Also, the above sections apply to processes that handle or process materials (not DICE).
S-3's compliance with Regulation 6, Rule 1 will be confirmed by the District's Compliance & Enforcement staff during their routine inspections.

Regulation 9-1-301 (*Limitations on Ground Level Concentrations*)
S-3 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-3 are negligible, Home Depot is not required to conduct ground level monitoring.

Regulation 9-1-304 – *Fuel Burning* (*Liquid and Solid Fuels*)
Section 9-1-304 states "A person shall not burn any liquid fuel having a sulfur content in excess of 0.5% by weight". The California Air Resources Board (CARB) requires all diesel engines to burn Ultra Low Sulfur Diesel with a sulfur content of 15 ppm by weight or less (≤ 0.0015% by wt.), which is less than 0.5% by wt. requirement in Section 9-1-304. Permit condition 100528 will require S-3 to exclusively burn CARB diesel. Therefore, S-3 will comply with 9-1-304.

Regulation 9-8 (*Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines*)

S-3 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-3 is exempt from the requirements of Sections 9-8-301 through 305, 501, and 503 per Reg. 9-8-110.5 (Emergency Standby Engines). S-3 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 per engine. S-3 is also subject to and is expected to comply with monitoring and record keeping requirements of Regulations 9-8-502.1 and 9-8-530, which are incorporated into the proposed permit conditions.

[1] 1,872 acfm @ 725 F and assuming 15% water vapor in exhaust

Airborne Toxic Control Measure (ATCM) for Emergency Standby Diesel-Fueled CI Engines (>50 bhp)

The Air District is charged with enforcing the requirements of California's Air Toxic Control Measure for Stationary Compression Ignition Engines in Title 17, California Code of Regulations, Sections 93115 *et seq*. (ATCM)

Subsection 93115.6(a)(3)(A)(1)(a) requires S-3 to meet the emission standards specified in Table 6 below. (These emissions standards expressed as g/bhp-hour are essentially the same as EPA's Tier 3 standards, which are expressed as g/kW-hour.[2]) This generator will have emission rates that comply with these requirements as shown in Table 6.

Table 6. Engine Emission Rates vs. ATCM Emission Standards (g/bhp-hour)

Pollutant	Emissions Rate S-3	ATCM Emission Standards
PM	0.01	0.15
NMHC + NO_x (NMHC: Non-methane hydrocarbon)	0.17	3.0
CO	0.07	2.6

Subsection 93115.6(a)(3)(A)(1)(b) requires that the generator be certified to meet EPA Tier 2 or Tier 3 emission standards as required under the NSPS discussed below. The generator meets EPA Tier 4 final standards.

Subsection 93115.6(a)(3)(A)(1)(c) limits the non-emergency operation of the engine to 50 hours/year for maintenance and testing. Permit Condition 100073 will limit non-emergency operation of S-3 to 50 hours/year and hence will comply with this subsection.

[2] The conversion factor for converting engine output in horsepower to kilowatts is 1.341 hp/kw. Applying this conversion factor to the ATCM standards shows that they are essentially identical to EPA's Tier 3 standards.

California Environmental Quality Act (*CEQA*)
This project includes one emergency standby diesel engine that may operate during limited testing and maintenance and during emergency-use events. S-3 may be employed to prevent or reduce damage to life, health, and property at an existing facility.

The 2024 California Environmental Quality Act (CEQA) Statues and Guidelines lists classes of projects in Section 15300, which have been determined not to have a significant effect on the environment and which shall, therefore, be exempt from the provisions of CEQA.

Section 15301 lists Class 1 projects that involve negligible or no expansion of use. This includes additions to existing structures provided that the addition will not result in an increase of more than 50 percent of the floor area of the structures before the addition, or 2,500 square feet, whichever is less, as listed in Section 15301(e)(1). The floor area in this situation is the facility, which equates to approximately 342,817 square feet. 50% of this would be 171,408.5 square feet.

The proposed enclosure for the generator is going to be approximately 25 feet long and 12 feet wide for a total area of 300 square feet. Since the combined footprint of the emergency engine is not expected to exceed 50 percent of the floor area of the existing structure, or 2,500 square feet, this project is categorically exempt from the provisions of CEQA per Regulation 2-1-312.6 and no further CEQA analysis is required.

Additionally, the applicant has completed Form Appendix H (Environmental Information Form) in accordance with Regulation 2-1-426 and it has been reviewed by the Air District, as required for categorical CEQA exemptions. In making the determination that this application is categorically exempt: 1) the Air District reviewed the CEQA-related information from the applicant indicating that there is no potential for a significant adverse environmental impact from the project; 2) a formal health risk assessment 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.

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

Applicable emission standards found in Appendix I of 40 CFR 1039 that apply to S-3 are:
NMHC + NOx = 4.0 gram/kW-hour (3.0 gram/bhp-hour);
CO = 3.5 gram/kW-hour (2.6 gram/bhp-hour); and
PM = 0.20 gram/kW-hour (0.15 gram/bhp-hour).

Emission rates for the above pollutants summarized in Tables 1 and 6 in this evaluation shows that S-3 will comply with the emission standards in NSPS IIII.

Per §60.4207(b), S-3 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-3 will comply with the diesel fuel requirements in NSPS IIII.

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

S-3 is subject to 40 CFR 63, Subpart ZZZZ (MACT ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines because the engine will be constructed (~installed) on/after June 12, 2006. Per §63.6590(c)(1), "new" sources such as S-3 are required to meet the requirements in MACT ZZZZ by meeting the requirements in NSPS IIII. As previously discussed, S-3 complies with NSPS IIII and therefore, will comply with MACT ZZZZ as well.

Prevention of Significant Deterioration (*PSD*)

PSD does not apply to this application.

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

S-3 is not located within 1,000 feet of the outer boundary of a K-12 school site. However, S-3 is located in an Overburdened Community and the application required an HRA. Therefore, public noticing will be required per Air District Regulation 2-1-412.

PERMIT CONDITIONS

Permit Condition 100072 for S-3

1. 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: 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/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, 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 for S-3

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]

Permit Condition 100528 for S-3

1. The owner/operator shall fire each engine exclusively with CARB diesel fuel having a sulfur content no more than 15 parts per million by weight.

   [Basis: Cumulative Increase, § 93115.4]

End of Conditions

RECOMMENDATION

The Air District has evaluated the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable Air District, state, and federal air quality-related regulations, including the health risks resulting from toxic air contaminant emissions. The preliminary recommendation is to issue a permit for this project. After considering all comments received, the Air District will make a final determination.

I recommend that the Air District initiate the public comment period and consider any comments received prior to taking any final action on issuance of an Authority to Construct for the following source:

S-3 Emergency Backup Diesel Engine
Tier 4 with integrated SCR
Engine Make: Volvo Penta, Model: TAD1371VE, EPA Family Name: PVPXL12.8CJA
Model Year: 2023, 388 BHP, 293 kW, 2.59 MMBtu/hour

_____ Date: _____

Chris Thompson
AQ Engineer