DRAFT ENGINEERING EVALUATION
City of Milpitas
1325 E. Calaveras Blvd., Milpitas, CA 95035
Application: 29982
Plant: 17141

BACKGROUND

The City of Milpitas has applied to obtain an Authority to Construct to for the following equipment:

S-2 Stationary Emergency Diesel Generator, Caterpillar, C13 ACERT In-line 6, Model Year 2017, 531 bhp

EMISSIONS CALCULATIONS

The primary pollutants from internal combustion (IC) engines are oxides of nitrogen (NO_x), hydrocarbon and other organic compounds (POC), carbon monoxide (CO), sulfur dioxide (SO_2), and particulate (PM). In calculating these emissions, emission factor data from the manufacturer is used. The SO_2 emission factor is 0.001515 lb/MMBtu from EPA AP-42, Table 3.4-1, which is based on full conversion of fuel sulfur to SO2 and which is therefore applicable to any diesel engine (sulfur content will be assumed to be the California limit of 0.0015 wt% sulfur).

Per Air District policy, Calculating Potential to Emit for Emergency Backup Power Generators, emissions resulting from emergency use of 100 hours per year must be accounted for when determining the Potential to Emit (PTE). This is in addition to the permitted limit for reliability-related and testing operations of 50 hours per year. The assumption of 100 hours per year of emergency operation will be used to determine the applicability of District permitting regulations, such as New Source Review and Title V Major Facility Review. It will not be used to determine the amount of emissions offsets required for a project. This policy also does not apply for purposes of Toxics New Source Review requirements of Regulation 2, Rule 5.

Hours for PTE: 150 hour/year
Diesel Heat Capacity: 3.49 MMBtu/hour
Fuel Consumption Rate: 24.9 gal/hour
Brake Horsepower: 531 bhp

Table 1. Criteria Emissions from S-2

Pollutant	Emission Factor g/hp-hr	Annual Emissions lb/yr	Annual Emissions TPY	Daily Emissions lb/day
NOx	2.66	155.56	0.078	74.67
CO	2.00	116.96	0.058	56.14
POC	0.14	8.19	0.004	3.93
Diesel Exhaust Particulate Matter	0.12	7.02	0.004	3.37

Table 2. SO_2 emissions from S-2

Pollutant	Emission Factor lb/MMBtu	Annual Emissions lb/yr	Annual Emissions TPY	Daily Emissions lb/day
SO_2	0.001515	0.26	0.000	0.13

PLANT CUMULATIVE INCREASE

The City of Milpitas (Plant #17141) is an existing facility with one other source, S-1. Per Regulation 2, Rule 2, Section 607, the cumulative increase in emissions is the increase in the potential to emit for a source minus any contemporaneous onsite emission reductions. The facility does not have any contemporaneous onsite emission reductions in this application. Table 3 shows the plant cumulative increase given the potential to emit of S-2.

Per Application #12989, S-1 has been in operation since 1990 and was thus installed before 5/17/2000, when Regulation 1 and Regulation 2-1 were modified to require engines greater than 50 hp to require a Permit to Operate. Therefore, S-1 was permitted as a Loss-Of-Exemption source not subject to Regulations 2-1-301 or 2-1-302.

Table 3. Post 4/5/91 plant cumulative increase

Criteria Pollutant	Post 4/5/91 Existing Emissions	Emissions Increase from Application 29982	Total
	TPY	TPY	TPY
NO_x	0.000	0.078	0.078
CO	0.000	0.058	0.058
$PM_{2.5}$	0.000	0.004	0.004
PM_{10}	0.000	0.004	0.004
SO_2	0.000	0.000	0.000
POC	0.000	0.004	0.004

OFFSETS

Emission offset requirements for POC and NO_x are outlined in Regulation 2, Rule 2, Section 302. POC and NO_x offsets are required for new or modified sources at a facility that emits or will be permitted to emit 10 tons per year or more of that pollutant. The potential to emit based on 150 hours of operation are far below the threshold. Offsets for POC or NO_x will not be required.

The offset requirements for $PM_{2.5}$, PM_{10}, and SO_x are specified in Regulation 2, Rule 2, Section 303. Per Section 303, $PM_{2.5}$, PM_{10}, and SO_x emission offsets are required for any new or modified source that is a major facility for $PM_{2.5}$, PM_{10} or SO_x emissions. The potential to emit based on 150 hours of operation are far below the threshold. Offsets for $PM_{2.5}$, PM_{10}, or SO_x will not be required.

TOXIC RISK SCREENING ANALYSIS

Hours for Toxics: 50 hour/year
Diesel Heat Capacity: 3.49 MMBtu/hour
Fuel Consumption Rate: 24.9 gal/hour
Brake Horsepower: 531 bhp

Table 4. Toxic air emissions

Pollutant	Emission Factor	Annual Emissions	Annual Emissions	Daily Emissions	Chronic Trigger Level
	g/hp-hr	lb/yr	TPY	lb/day	lb/yr
Diesel Exhaust Particulate Matter	0.12	7.02	0.004	3.37	0.34

Toxic air emissions of diesel exhaust particulate matter exceed the trigger levels listed in Regulation 2, Rule 5. Therefore, the addition of S-2 triggers a health risk screening analysis.

S-2 meets the Best Available Control Technology for toxics (TBACT) since the diesel particulate emissions are less than 0.15 g/bhp-hr. For an engine that meets the TBACT requirement, it must also pass the toxic risk screening level of less than ten in a million.

Based on 50 hours per year of operation, the emergency generator passed the Health Risk Assessment (HRA) conducted August 23, 2019 by the Air District's Toxic Evaluation Section. The source poses no significant toxic risk, since the increased cancer risk to the maximally exposed receptor is 2.9 in a million with a hazard index of 0.00077.

The increased cancer risk to the Worker is 1.3 in a million with a hazard index of 0.00098. There is no increased cancer risk to students since state regulations prohibit the non-emergency operation of the engine between 7:30 a.m. and 3:30 p.m. on days when school is in session. These cancer risks are below the ten in a million limit and a maximum hazard index of 1.0 and is acceptable in accordance with Regulation 2, Rule 5.

BACT

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, SO_2, $PM_{2.5}$, or PM_{10}. Based on the emissions calculations above, BACT is triggered for NO_x and CO.

BACT for this source is presented in the current BAAQMD BACT/TBACT Workbook for IC Engine – Compression Ignition: Stationary Emergency, non-Agricultural, non-direct drive fire pump, Document #96.1.3, Revision 7 dated 12/22/2010. S-2 will comply with BACT (2) for NOx and CO because the emissions factors for these pollutants listed in Table 1 do not exceed BACT (2) emissions limits (shown in Table 4 below). The NOx standard is in included in the "NOx + POC" standard. BACT (1) has not been determined.

Table 5. BACT 2 emissions limits based on CARB ATCM

Horsepower Range	NOx (g/bhp-hr)	CO (g/bhp-hr)
$300 \leq HP < 600$	2.85	2.6

NEW SOURCE PERFORMANCE STANDARDS (NSPS)

The engine is subject to 40 CFR 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines because it was manufactured after April 1, 2006 and is not a fire pump engine, as required by Section 60.4200(a)(2)(i).

The engine has a total displacement of 12.5 liters and has 6 cylinders, so each cylinder has a volume of less than 30 liters. Section 60.4205(b) requires these engines to comply with the emission standards in Section 60.4202, which refers to 40 CFR 89.112 and 40 CFR 89.113 for all pollutants. For engines greater than 225 kW and smaller than 450 kW, these standards are:

NMHC+NOx: 4.0 g/kW-hr
CO: 3.5 g/kW-hr
PM: 0.20 g/kW-hr
20% opacity during acceleration mode
15% opacity during lugging mode
50% opacity during peaks in acceleration or lugging mode

According to the manufacturer specifications the limits are:

NMHC+NOx: 3.7 g/kW-hr
CO: 2.7 g/kW-hr
PM: 0.16 g/kW-hr

Therefore, the engine will comply with the 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. The owner/operator is expected to comply with this requirement.

Section 60.4207(a) requires that 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, cetane index of 40 or a maximum aromatic content of 35 volume percent. The owner/operator is expected to comply with this requirement because CARB diesel is required to be used in California.

Section 60.4207(b) requires that 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 as above. The owner/operator is expected to comply with this requirement because CARB diesel is required to be used in California.

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

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

The engine 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 engine does not have a diesel particulate filter, the owner/operator is 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. The owner/operator is expected to comply with this requirement.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

This engine is subject to 40 CFR 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines and complies by meeting the requirements of NSPS Subpart IIII.

Airborne Toxics Control Measure (ATCM)

The diesel engine is subject to the California Air Resources Board (CARB) Stationary Diesel Airborne Toxics Control Measure (ATCM) because it is a new stationary emergency standby diesel engine, installed after January 1, 2005 and is larger than 50 hp. The requirements of the ATCM will be included in the permit conditions.

STATEMENT OF COMPLIANCE

Regulation 2, Rule 1: California Environmental Quality Act (CEQA) Requirements

The proposed engine (S-2) is ministerial under Regulation 2-1-311. Therefore, this project is not subject to CEQA review. The engineering review for this project requires only that Permit Handbook Chapter 2.3.1 is followed.

Regulation 2, Rule 1: School Public Notice Requirements

The facility is located within 1,000 feet from a K-12 school and, therefore, is subject to the public notification requirements of Regulation 2-1-412. Calaveras Hills High School located at 1331 E Calaveras Blvd., Milpitas, CA is located 467 feet from the proposed location of S-2.

Regulation 6, Rule 1: Particulate Matter – General Requirements

Section 6-1-303.1 (Ringelmann No. 2 Limitations) limits opacity from internal combustion engines to Ringelmann 2. This engine 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.

Regulation 9, Rule 1: Inorganic Gaseous Pollutants – Sulfur Dioxide

Section 9-1-302 limits sulfur dioxide emissions to no more than 300 ppmv, dry, in the exhaust. Since diesel fuel with 0.0015% by weight sulfur is mandated for use in California, compliance with the SO_2 exhaust limit is expected.

Regulation 9, Rule 8: Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines

The source will be operated as an emergency standby engine and therefore, is not subject to the emission rate limits in Regulation 9, Rule 8 (NOx and CO from Stationary Internal Combustion Engines).

The source is exempt from the requirements of Sections 9-8-301 through 305, 501 and 503 per Reg. 9-8-110.5 (Exemptions).

Section 9-8-330 limits the operation of emergency standby engines to 50 hours for reliability-related activities. The source is limited to 50 hours of operation for reliability-related activities in the permit conditions.

Section 9-8-530 outlines monitoring and record keeping requirements for emergency standby engines. These monitoring and recordkeeping requirements are outlined in the permit conditions for S-2.

PERMIT CONDITIONS

COND# 22850 ----------

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

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: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

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: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

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, 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]

End of Conditions

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 2-1-412.6. 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-2 Stationary Emergency Diesel Generator, Caterpillar, C13 ACERT In-line 6, Model Year 2017, 531 bhp

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Simrun Dhoot
Senior Air Quality Engineer