

June 10, 2022

Ted Guth
Scale Microgrid Solutions Inc
51-53 S Broad ST
Ridgewood, NJ 07450

Re: Notice of Preliminary Decision - Authority to Construct
Facility Number: C-10021
Project Number: C-1221245

Dear Mr. Guth:

Enclosed for your review and comment is the District's analysis of Scale Microgrid Solutions Inc's application for an Authority to Construct for the installation of a 1,676 brake horsepower lean-burn natural-gas-fired IC engine powering an electrical generator, at 18700 E South Ave in Reedley, CA.

The notice of preliminary decision for this project has been posted on the District's website (www.valleyair.org). After addressing all comments made during the 30-day public notice period, the District intends to issue the Authority to Construct. Please submit your written comments on this project within the 30-day public comment period, as specified in the enclosed public notice.

Thank you for your cooperation in this matter. If you have any questions regarding this matter, please contact Mr. Mungi Hong of Permit Services at (559) 230-5897.

Sincerely,



Brian Clements
Director of Permit Services

BC:mh

Enclosures

cc: Courtney Graham, CARB (w/ enclosure) via email
cc: Howard Goodman, Scale Microgrid Solutions (w/ enclosure) via email

Samir Sheikh
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San Joaquin Valley Air Pollution Control District
Authority to Construct Application Review
Natural Gas-fired Full-Time IC Engine

Facility Name:	Scale Microgrid Solutions Inc	Date:	June 10, 2022
Mailing Address:	51-53 S Broad St Ridgewood, NJ 07450	Engineer:	Mungi Hong
		Lead Engineer:	Brian Clerico
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Application #:	C-10021-1-1		
Project #:	C-1221245		
Deemed Complete:	April 29, 2022		

I. Proposal

Scale Microgrid Solutions Inc has requested an Authority to Construct (ATC) permit for a new 1,676 brake horsepower (bhp) lean-burn natural gas-fired internal combustion (IC) engine/generator set with selective catalytic reduction and an oxidation catalyst for emissions control.

Under District project C-1213371, the facility was issued ATC C-10021-1-0 for the installation of this same engine/generator set and controls. However, on April 25, 2022, prior to the commencement of construction of ATC C-10021-1-0, the District received an ATC application from the facility requesting an increase in the permitted CO limit from 20 ppmv @ 15% O₂ to 270 ppmv @ 15% O₂, based on the CO emission standard from 40 CFR 60 Subpart JJJJ. Therefore, although this ATC application is logged in as a modification of ATC C-10021-1-0, since the facility has not commenced the construction of ATC C-10021-1-0, the engine/generator set in this project will be considered a new emissions unit. The following condition will be placed on the new ATC.

- This Authority to Construct (ATC) cancels and supersedes ATC C-10021-1-0. [District Rule 2201]

The engine/gen set will provide electrical power to a Trinity Fruit Company's cold storage facility¹ in the event of a utility power failure. However, the facility has proposed to operate the engine at a maximum of 8,760 hr/year and therefore the engine does not meet the definition of emergency standby engine pursuant to Section 3.15 of Rule 4702. Therefore, this engine will not be treated an emergency standby engine.

II. Applicable Rules

Rule 2201	New and Modified Stationary Source Review Rule (8/15/19)
Rule 2410	Prevention of Significant Deterioration (6/16/11)
Rule 2520	Federally Mandated Operating Permits (8/15/19)
Rule 4001	New Source Performance Standards (4/14/99)
Rule 4002	National Emissions Standards for Hazardous Air Pollutants (5/20/04)
Rule 4101	Visible Emissions (2/17/05)
Rule 4102	Nuisance (12/17/92)
Rule 4201	Particulate Matter Concentration (12/17/92)
Rule 4301	Fuel Burning Equipment (12/17/92)
Rule 4701	Internal Combustion Engines – Phase 1 (8/21/03)
Rule 4702	Internal Combustion Engines (8/19/21)
Rule 4801	Sulfur Compounds (12/17/92)
CH&SC 41700	Health Risk Assessment
CH&SC 42301.6	School Notice
Public Resources Code 21000-21177:	California Environmental Quality Act (CEQA)
California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387:	CEQA Guidelines

III. Project Location

The facility is located at 18700 E South Ave in Reedley, CA. The equipment is not located within 1,000 feet of the outer boundary of a K-12 school. Therefore, the public notification requirement of California Health and Safety Code 42301.6 is not applicable to this project.

IV. Process Description

The engine in this project will power an electrical generator in the event of an electrical outage and may be operated up to 8,760 hours per year.

V. Equipment Listing

As seen above in Section I, the engine/generator set in this project will be considered a new emissions unit.

¹ Although the engine/gen set in this project will be installed at Trinity Fruit Company, Scale Microgrid Solutions is going to be the owner/operator and responsible entity for this engine/gen set. Neither company has any air permits at this location.

C-10021-1-1: 1,676 BHP (CONTINUOUS) MITSUBISHI MODEL GS16R2PTK LEAN-BURN NATURAL GAS-FIRED IC ENGINE WITH A SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM AND AN OXIDATION CATALYST SYSTEM POWERING AN ELECTRICAL GENERATOR

VI. Emission Control Technology Evaluation

The IC engine may emit NO_x, SO_x, PM₁₀, PM_{2.5}, CO, and VOC. The engine will be equipped with the following technology:

- Turbocharger
- Intercooler/Aftercooler
- Positive Crankcase Ventilation (PCV)
- Air/Fuel Ratio or an O₂ Controller
- Lean Burn Technology
- SCR System
- Oxidation Catalyst System

The turbocharger reduces NO_x emissions from IC engines by increasing the efficiency and promoting more complete burning of the fuel.

The intercooler/aftercooler functions in conjunction with the turbocharger to reduce the inlet/outlet air temperature and lowering the peak combustion temperature, which reduces the formation of thermal NO_x.

The PCV system reduces crankcase VOC and PM₁₀ emissions by at least 90% over an uncontrolled crankcase vent.

The fuel/air ratio controller, (oxygen controller) is used to maintain the amount of oxygen in the exhaust stream to optimize catalyst function.

Lean burn technology increases the volume of air in the combustion process and therefore increases the heat capacity of the mixture. This technology also incorporates improved swirl patterns to promote thorough air/fuel mixing. This in turn lowers the combustion temperature and reduces NO_x formation.

An SCR system selectively reduces NO_x emissions by over 90% with the aid of a catalyst and a reagent (urea). In the first step, urea is injected into the exhaust gas stream upstream of a catalyst to form ammonia, (NH₃). In the second step, NO_x, NH₃, and oxygen (O₂) react on the surface of the catalyst to form molecular nitrogen (N₂) and water (H₂O).

CO and VOC emissions are reduced using an oxidation catalyst that precedes the SCR stage. The pollutant gases diffuse through the surfaces of the catalyst and react there to form water and carbon dioxide (CO₂).

VII. General Calculations

A. Assumptions

- Operating schedule is 24 hours/day, 8,760 hr/year (worst case).
- EPA F-factor (adjusted to 60 °F) is 8,578 dscf/MMBtu (40 CFR 60 Appendix B).
- Fuel heating value is 1,000 Btu/dscf (District Policy APR-1720, dated 12/20/01).
- BHP to Btu/hr conversion is 2,542.5 Btu/bhp-hr.
- Sulfur concentration is 2.85 lb-S/MMscf (District Policy APR-1720, dated 12/20/01).
- Thermal efficiency of the engine is 35%.
- NH₃ emissions in exhaust (ammonia slip) is 10 ppmv @ 15% O₂ (applicant proposed).
- Molar specific volume @ 60°F is 379.5 scf/lb-mol.

B. Emission Factors

As seen above in Section I, since the facility has not commenced the construction of ATC C-10021-1-0, the engine/generator set in this project is considered a new emissions unit.

Emission Factors				
Pollutant	lb/MMBtu	ppmv @ 15% O ₂	g/bhp-hr	Source
NO _x	-	2.5	0.030 ²	Applicant Proposed
SO _x	0.00285	-	0.009	Mass Balance Equation Below
PM ₁₀	0.010	-	0.033 ³	AP-42 (7/00) Table 3.2-2
CO	-	270	1.965 ²	40 CFR 60 Subpart JJJJ
VOC	-	10	0.042 ²	Applicant Proposed
NH ₃	-	10	0.045	Applicant Proposed – See Equation Below

The SO_x EF is calculated as follows:

$$0.00285 \frac{\text{lb} - \text{SO}_x}{\text{MMBtu}} \times \frac{1 \text{ MMBtu}}{10^6 \text{ Btu}} \times \frac{1 \text{ Btu}_{\text{in}}}{0.35 \text{ Btu}_{\text{out}}} \times \frac{2,545 \text{ Btu}}{1 \text{ bhp} - \text{hr}} \times \frac{453.6 \text{ g}}{1 \text{ lb}} = 0.009 \frac{\text{g} - \text{SO}_x}{\text{bhp} - \text{hr}}$$

The NH₃ EF is calculated as follows:

$$\frac{10 \text{ ppmv NH}_3 \text{ @ } 15\% \text{ O}_2}{10^6} \times \frac{17 \text{ lb NH}_3}{\text{lb} - \text{mole}} \times \frac{\text{lb} - \text{mole}}{379.5 \text{ ft}^3} \times \frac{8,578 \text{ ft}^3}{1 \text{ MMBtu}} \times \frac{20.9\% \text{ O}_2}{(20.9 - 15)\% \text{ O}_2} = 0.0136 \frac{\text{lb} - \text{NH}_3}{\text{MMBtu}}$$

$$0.0136 \frac{\text{lb} - \text{NH}_3}{\text{MMBtu}} \times \frac{1 \text{ MMBtu}}{10^6 \text{ Btu}} \times \frac{1 \text{ Btu}_{\text{in}}}{0.35 \text{ Btu}_{\text{out}}} \times \frac{2,545 \text{ Btu}}{1 \text{ bhp} - \text{hr}} \times \frac{453.6 \text{ g}}{1 \text{ lb}} = 0.045 \frac{\text{g} - \text{NH}_3}{\text{bhp} - \text{hr}}$$

² See Appendix E for the conversion from ppmv to g/bhp-hr.

³ PM₁₀ EF value includes both filterable (7.71x10⁻⁵ lb/MMBtu) and condensable (9.91x10⁻³ lb/MMBtu) emissions.

C. Calculations

1. Pre-Project Potential to Emit (PE1)

As seen above in Section I, since the facility has not commenced the construction of ATC C-10021-1-0, the engine/generator set in this project is considered a new emissions unit. Therefore, PE1 = 0 for all pollutants.

2. Post-Project Potential to Emit (PE2)

The daily and annual PE2 are calculated as follows:

$$\text{Daily PE2 (lb-pollutant/day)} = \text{EF (g-pollutant/bhp-hr)} \times \text{rating (bhp)} \times \text{operation (hr/day)} / 453.6 \text{ g/lb}$$

$$\text{Annual PE2 (lb-pollutant/yr)} = \text{EF (g-pollutant/bhp-hr)} \times \text{rating (bhp)} \times \text{operation (hr/yr)} / 453.6 \text{ g/lb}$$

PE2						
Pollutant	Emissions Factor (g/bhp-hr)	Rating (bhp)	Daily Hours of Operation (hr/day)	Annual Hours of Operation (hr/year)	PE2 (lb/day)	PE2 (lb/yr)
NO _x	0.030	1,676	24	8,760	2.7	971
SO _x	0.009	1,676	24	8,760	0.8	291
PM ₁₀	0.033	1,676	24	8,760	2.9	1,068
CO	1.965	1,676	24	8,760	174.3	63,602
VOC	0.042	1,676	24	8,760	3.7	1,359
NH ₃	0.045	1,676	24	8,760	4.0	1,457

3. Pre-Project Stationary Source Potential to Emit (SSPE1)

Pursuant to District Rule 2201, the SSPE1 is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of Emission Reduction Credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions (AER) that have occurred at the source, and which have not been used on-site. The SSPE1 for this facility was taken from District project C-1213371.

SSPE1 (lb/year)						
Permit Unit	NO _x	SO _x	PM ₁₀	CO	VOC	NH ₃
ATC C-10021-1-0*	971	291	1,068	4,726	1,359	1,457
SSPE1	971	291	1,068	4,726	1,359	1,457

* Since this ATC is currently valid and will be valid until ATC C-10021-1-1 is implemented, emissions from this unit will be included in the SSPE1.

4. Post-Project Stationary Source Potential to Emit (SSPE2)

Pursuant to District Rule 2201, the SSPE2 is the PE from all units with valid ATCs or PTOs at the Stationary Source and the quantity of ERCs which have been banked since September 19, 1991 for AER that have occurred at the source, and which have not been used on-site.

SSPE2 (lb/year)						
Permit Unit	NO _x	SO _x	PM ₁₀	CO	VOC	NH ₃
C-10021-1-1	971	291	1,068	63,602	1,359	1,457
SSPE2	971	291	1,068	63,602	1,359	1,457

5. Major Source Determination

Rule 2201 Major Source Determination:

Pursuant to District Rule 2201, a Major Source is a stationary source with a SSPE2 equal to or exceeding one or more of the following threshold values. For the purposes of determining major source status the following shall not be included:

- any ERCs associated with the stationary source
- Emissions from non-road IC engines (i.e. IC engines at a particular site at the facility for less than 12 months), pursuant to the Clean Air Act, Title 3, Section 302, US Codes 7602(j) and (z)
- Fugitive emissions, except for the specific source categories specified in 40 CFR 70.2

Rule 2201 Major Source Determination (lb/year)						
	NO _x	SO _x	PM ₁₀	PM _{2.5}	CO	VOC
SSPE1	971	291	1,068	1,068	4,726	1,359
SSPE2	971	291	1,068	1,068	63,602	1,359
Major Source Threshold	20,000	140,000	140,000	140,000	200,000	20,000
Major Source?	No	No	No	No	No	No

Note: PM2.5 assumed to be equal to PM10

As seen in the table above, the facility is not an existing Major Source and is not becoming a Major Source as a result of this project.

Rule 2410 Major Source Determination:

The facility or the equipment evaluated under this project is not listed as one of the categories specified in 40 CFR 52.21 (b)(1)(iii). Therefore, the PSD Major Source threshold is 250 tpy for any regulated NSR pollutant. Since the facility has not commenced the construction of ATC C-10021-1-0, the engine/generator set in this project is considered a new emissions unit. Also, there are no existing permits under this facility. Thus,

PSD Major Source Determination (tons/year)						
	NO ₂	VOC	SO ₂	CO	PM	PM ₁₀
Estimated Facility PE before Project Increase	0.5	0.7	0.1	2.4	0.5	0.5
PSD Major Source Thresholds	250	250	250	250	250	250
PSD Major Source?	No	No	No	No	No	No

As shown above, the facility is not an existing PSD major source for any regulated NSR pollutant expected to be emitted at this facility.

6. Baseline Emissions (BE)

The BE calculation (in lb/year) is performed pollutant-by-pollutant for each unit within the project to calculate the QNEC, and if applicable, to determine the amount of offsets required.

Pursuant to District Rule 2201, BE = PE1 for:

- Any unit located at a non-Major Source,
- Any Highly-Utilized Emissions Unit, located at a Major Source,
- Any Fully-Offset Emissions Unit, located at a Major Source, or
- Any Clean Emissions Unit, located at a Major Source.

otherwise,

BE = Historic Actual Emissions (HAE), calculated pursuant to District Rule 2201.

As seen above in Section I, since the facility has not commenced the construction of ATC C-10021-1-0, the engine/generator set in this project is considered a new emissions unit. Therefore, BE = PE1 = 0 for all pollutants.

7. SB 288 Major Modification

40 CFR Part 51.165 defines a SB 288 Major Modification as any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act.

Since this facility is not a major source for any of the pollutants addressed in this project, this project does not constitute an SB 288 major modification and no further discussion is required.

8. Federal Major Modification / New Major Source

Federal Major Modification

District Rule 2201 states that a Federal Major Modification is the same as a “Major Modification” as defined in 40 CFR 51.165 and part D of Title I of the CAA.

As defined in 40 CFR 51.165, Section (a)(1)(v) and part D of Title I of the CAA, a Federal Major Modification is any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act. The significant net emission increase threshold for each criteria pollutant is included in Rule 2201.

Since this facility is not a Major Source for any pollutants, this project does not constitute a Federal Major Modification and no further discussion is required.

New Major Source

As demonstrated above, this facility is not becoming a Major Source as a result of this project, therefore, this facility is not a New Major Source pursuant to 40 CFR 51.165 a(1)(iv)(A)(3).

9. Rule 2410 – Prevention of Significant Deterioration (PSD) Applicability Determination

Rule 2410 applies to any pollutant regulated under the Clean Air Act, except those for which the District has been classified nonattainment. The pollutants which must be addressed in the PSD applicability determination for sources located in the SJV and which are emitted in this project are: (See 52.21 (b) (23) definition of significant)

- NO₂ (as a primary pollutant)
- SO₂ (as a primary pollutant)
- CO
- PM
- PM₁₀

I. Project Emissions Increase - New Major Source Determination

The post-project potentials to emit from all new and modified units are compared to the PSD major source thresholds to determine if the project constitutes a new major source subject to PSD requirements.

The facility or the equipment evaluated under this project is not listed as one of the categories specified in 40 CFR 52.21 (b)(1)(iii). The PSD Major Source threshold is 250 tpy for any regulated NSR pollutant.

PSD Major Source Determination: Potential to Emit (tons/year)						
	NO₂	VOC	SO₂	CO	PM	PM₁₀
Total PE from New and Modified Units	0.5	0.7	0.1	31.8	0.5	0.5
PSD Major Source threshold	250	250	250	250	250	250
New PSD Major Source?	No	No	No	No	No	No

As shown in the table above, the potential to emit for the project, by itself, does not exceed any PSD major source threshold. Therefore, Rule 2410 is not applicable and no further analysis is required.

10. Quarterly Net Emissions Change (QNEC)

The QNEC is calculated solely to establish emissions that are used to complete the District's PAS emissions profile screen. Detailed QNEC calculations are included in Appendix D.

VIII. Compliance Determination

Rule 2201 New and Modified Stationary Source Review Rule

A. Best Available Control Technology (BACT)

1. BACT Applicability

Pursuant to District Rule 2201, Section 4.1, BACT requirements are triggered on a pollutant-by-pollutant basis and on an emissions unit-by-emissions unit basis. Unless specifically exempted by Rule 2201, BACT shall be required for the following actions*:

- a. Any new emissions unit with a potential to emit exceeding two pounds per day,
- b. The relocation from one Stationary Source to another of an existing emissions unit with a potential to emit exceeding two pounds per day,
- c. Modifications to an existing emissions unit with a valid Permit to Operate resulting in an Adjusted Increase in Permitted Emissions (AIPE) exceeding two pounds per day, and/or
- d. Any new or modified emissions unit, in a stationary source project, which results in an SB 288 Major Modification or a Federal Major Modification, as defined by the rule.

*Except for CO emissions from a new or modified emissions unit at a Stationary Source with an SSPE2 of less than 200,000 pounds per year of CO.

a. New emissions units – PE > 2 lb/day

The engine in this project is considered a new emissions unit. As seen in Section VII.C.2 above, the engine has a PE greater than 2.0 lb/day for NO_x, PM₁₀, CO, VOC, and NH₃. BACT is triggered for NO_x, PM₁₀, and VOC only since the PEs are greater than 2 lb/day. However, BACT is not triggered for CO because the SSPE2 for CO is less than 200,000 lbs/year, as demonstrated in Section VII.C.5 above. Also, BACT is not triggered for NH₃ because it results from the use of an SCR system, which is an emissions control device that is not subject to District BACT requirements.

b. Relocation of emissions units – PE > 2 lb/day

As discussed in Section I above, there are no emissions units being relocated from one stationary source to another; therefore, BACT is not triggered.

c. Modification of emissions units – AIPE > 2 lb/day

As discussed in Section I above, the engine in this project is considered new. Therefore, BACT is not triggered.

d. SB 288/Federal Major Modification

As discussed in Sections VII.C.7 and VII.C.8 above, this project does not constitute an SB 288 and/or Federal Major Modification for any pollutant. Therefore, BACT is not triggered for any pollutant.

2. BACT Guideline

The District does not currently have an approved BACT Guideline for this source category (natural gas-fired IC engines powering non-emergency electrical generators). Therefore, a project-specific BACT analysis was performed for the proposed 1,676 bhp lean-burn natural gas-fired IC engine based on the District's review of information that was available when the application for this project was deemed complete. (See Appendix B)

3. Top-Down BACT Analysis

Per Permit Services Policies and Procedures for BACT, a Top-Down BACT analysis shall be performed as a part of the application review for each application subject to the BACT requirements pursuant to the District's NSR Rule.

Pursuant to the attached Top-Down BACT Analysis (see Appendix B), BACT has been satisfied with the following:

- NO_x: NO_x emissions ≤ 2.5 ppmv @ 15% O₂ (equivalent to 0.070 lb-NO_x/MW-hr) without heat recovery
- PM₁₀: PM₁₀ emissions ≤ 0.033 g-PM₁₀/bhp-hr
- VOC: VOC emissions ≤ 10 ppmv @ 15% O₂ (equivalent to 0.010 lb-VOC/MW-hr) without heat recovery

B. Offsets

1. Offset Applicability

Pursuant to District Rule 2201, Section 4.5, offset requirements shall be triggered on a pollutant by pollutant basis and shall be required if the SSPE2 equals or exceeds the offset threshold levels in Table 4-1 of Rule 2201.

The SSPE2 is compared to the offset thresholds in the following table.

Offset Determination (lb/year)					
	NO _x	SO _x	PM ₁₀	CO	VOC
SSPE2	971	291	1,068	63,602	1,359
Offset Thresholds	20,000	54,750	29,200	200,000	20,000
Offsets Triggered?	No	No	No	No	No

2. Quantity of District Offsets Required

As discussed above, the SSPE2 is not greater than the offset thresholds for all pollutants, therefore District offsets are not triggered. In addition, as demonstrated above, this project does not trigger Federal Major Modification or New Major Source requirements. In conclusion, offsets will not be required for this project and no further discussion is required.

C. Public Notification

1. Applicability

Pursuant to District Rule 2201, Section 5.4, public noticing is required for:

- a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications,
- b. Any new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any one pollutant,
- c. Any project which results in the offset thresholds being surpassed,
- d. Any project with an SSPE of greater than 20,000 lb/year for any pollutant, and/or
- e. Any project which results in a Title V significant permit modification

a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications

As shown in Section VII.C.5 above, this existing minor source facility is not becoming a Major Source as a result of this project. Therefore, this facility is not a New Major Source and this project does not constitute an SB 288 or a Federal Major Modification. Consequently, public noticing for this project for New Major Source, Federal Major Modification, or SB 288 Major Modification purposes is not required.

b. PE > 100 lb/day

The PE2 for this new unit is compared to the daily PE Public Notice thresholds in the following table:

PE > 100 lb/day Public Notice Thresholds			
Pollutant	PE2 (lb/day)	Public Notice Threshold	Public Notice Triggered?
NO _x	2.7	100 lb/day	No
SO _x	0.8	100 lb/day	No
PM ₁₀	2.9	100 lb/day	No
CO	174.3	100 lb/day	Yes
VOC	3.7	100 lb/day	No
NH ₃	4.0	100 lb/day	No

Therefore, public noticing for PE > 100 lb/day purposes is required.

c. Offset Threshold

Public notification is required if the pre-project Stationary Source Potential to Emit (SSPE1) is increased to a level exceeding the offset threshold levels. The following table compares the SSPE1 with the SSPE2 in order to determine if any offset thresholds have been surpassed with this project.

Offset Thresholds				
Pollutant	SSPE1 (lb/year)	SSPE2 (lb/year)	Offset Threshold	Public Notice Required?
NO _x	971	971	20,000 lb/year	No
SO _x	291	291	54,750 lb/year	No
PM ₁₀	1,068	1,068	29,200 lb/year	No
CO	4,726	63,602	200,000 lb/year	No
VOC	1,359	1,359	20,000 lb/year	No

As demonstrated above, there were no thresholds surpassed with this project; therefore, public noticing is not required for offset purposes.

d. SSIPE > 20,000 lb/year

Public notification is required for any permitting action that results in a SSIPE of more than 20,000 lb/year of any affected pollutant. According to District policy, the SSIPE = SSPE2 – SSPE1. The SSIPE is compared to the SSIPE Public Notice thresholds in the following table.

SSIPE Public Notice Thresholds					
Pollutant	SSPE2 (lb/year)	SSPE1 (lb/year)	SSIPE (lb/year)	SSIPE Public Notice Threshold	Public Notice Required?
NO _x	971	971	0	20,000 lb/year	No
SO _x	291	291	0	20,000 lb/year	No
PM ₁₀	1,068	1,068	0	20,000 lb/year	No
CO	63,602	4,726	58,876	20,000 lb/year	Yes
VOC	1,359	1,359	0	20,000 lb/year	No
NH ₃	1,457	1,457	0	20,000 lb/year	No

As demonstrated above, the SSIPE for CO were greater than 20,000 lb/year; therefore, public noticing for SSIPE purposes is required.

e. Title V Significant Permit Modification

Since this facility does not have a Title V operating permit, this change is not a Title V significant modification, and therefore public noticing is not required.

2. Public Notice Action

As discussed above, public noticing is required for this project because the PE2 for CO emissions exceeds 100 lb/day and the SSIPE for CO emissions exceeds 20,000 lb/yr. Therefore, public notice documents will be submitted to the California Air Resources Board (CARB) and a public notice will be electronically published on the District's website prior to the issuance of the ATC for this equipment.

D. Daily Emission Limits (DELs)

DELs and other enforceable conditions are required by Rule 2201 to restrict a unit's maximum daily emissions, to a level at or below the emissions associated with the maximum design capacity. The DEL must be contained in the latest ATC and contained in or enforced by the latest PTO and enforceable, in a practicable manner, on a daily basis. DELs are also required to enforce the applicability of BACT.

Proposed Rule 2201 (DEL) Conditions:

- Emissions from this IC engine shall not exceed any of the following limits: 0.030 g-NOx/bhp-hr (equivalent to 2.5 ppmv @ 15% O₂), 0.033 g-PM₁₀/bhp-hr, 1.965 g-CO/bhp-hr (equivalent to 270 ppmv @ 15% O₂), or 0.042 g-VOC/bhp-hr (equivalent to 10 ppmv @ 15% O₂). [District Rules 2201 and 4702]
- This IC engine shall be fired only on PUC-quality natural gas. [District Rules 2201, 4702, and 4801]
- Ammonia (NH₃) emissions from this engine shall not exceed 10 ppmvd @ 15% O₂. [District Rule 2201]

E. Compliance Assurance

1. Source Testing

As required by District Rule 4702, *Internal Combustion Engines*, the IC engine is subject to source testing requirements. Source testing requirements, in accordance with District Rule 4702, will be discussed in Section VIII, *District Rule 4702*, of this evaluation.

2. Monitoring

As required by District Rule 4702, *Internal Combustion Engines*, the IC engine is subject to monitoring requirements. Monitoring requirements, in accordance with District Rule 4702, will be discussed in Section VIII, *District Rule 4702*, of this evaluation.

3. Recordkeeping

As required by District Rule 4702, *Internal Combustion Engines*, the IC engine is subject to recordkeeping requirements. Recordkeeping requirements, in accordance with District Rule 4702, will be discussed in Section VIII, *District Rule 4702*, of this evaluation.

In addition, the following conditions will be placed on the ATC.

- The SCR catalyst shall be maintained and replaced in accordance with the recommendations of the catalyst manufacturer or emission control supplier. Records of catalyst maintenance and replacement shall be maintained. [District Rules 2201 and 4702]

4. Reporting

No reporting is required to demonstrate compliance with Rule 2201.

F. Ambient Air Quality Analysis (AAQA)

Section 4.14 of District Rule 2201 requires that an AAQA be conducted for the purpose of determining whether a new or modified Stationary Source will cause or make worse a violation of an air quality standard. The District's Technical Services Division conducted the required analysis. Refer to Appendix C of this document for the AAQA summary sheet.

The proposed location is in an attainment area for NO_x, CO, and SO_x. As shown by the AAQA summary sheet the proposed equipment will not cause a violation of an air quality standard for NO_x, CO, or SO_x.

The proposed location is in a non-attainment area for the state's PM₁₀ as well as federal and state PM_{2.5} thresholds. As shown by the AAQA summary sheet the proposed equipment will not cause a violation of an air quality standard for PM₁₀ and PM_{2.5}.

Rule 2410 Prevention of Significant Deterioration

As shown in Section VII.C.9 above, this project does not result in a new PSD major source or PSD major modification. No further discussion is required.

Rule 2520 Federally Mandated Operating Permits

Since this facility's potential emissions do not exceed any major source thresholds of Rule 2201, this facility is not a major source, and Rule 2520 does not apply.

Rule 4001 New Source Performance Standards (NSPS)

This rule incorporates NSPS from Part 60, Chapter 1, Title 40, Code of Federal Regulations (CFR); and applies to all new sources of air pollution and modifications of existing sources of air pollution listed in 40 CFR Part 60.

40 CFR 60 Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

The applicant has requested to increase the CO limits to 270 ppmv @ 15% O₂ based on Table 1 of this subpart as seen below:

Table 1 to Subpart JJJJ of Part 60					
Engine Type and Fuel	Maximum Engine Power	Manufacturer Date	Emission Standards		
			Ppmv at 15% O ₂		
			NOx	CO	VOC
Non-Emergency SI Natural Gas and Non-Emergency SI Lean Burn LPG (except lean burn 500≤HP<1,350)	HP≥500	7/1/2007	160	540	86
	HP≥500	7/1/2010	82	270	60

The District has not been delegated the authority to implement Subpart JJJJ requirements for non-Major Sources; therefore, no requirements shall be included on the permit.

Rule 4002 National Emission Standards for Hazardous Air Pollutants (NESHAPs)

This rule incorporates NESHAPs from Part 61, Chapter I, Subchapter C, Title 40, CFR and the NESHAPs from Part 63, Chapter I, Subchapter C, Title 40, CFR; and applies to all sources of hazardous air pollution listed in 40 CFR Part 61 or 40 CFR Part 63.

40 CFR 63 Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Emissions (RICE)

The District has not been delegated the authority to implement NESHAP regulations for Area Source requirements for non-Major Sources; therefore, no requirements shall be included on the permit.

Rule 4101 Visible Emissions

Rule 4101 states that no person shall discharge into the atmosphere emissions of any air contaminant aggregating more than 3 minutes in any hour which is as dark as or darker than Ringelmann 1 (or 20% opacity). As the IC engine is fired solely on natural gas, visible emissions are not expected to exceed Ringelmann 1 or 20% opacity. Therefore, the following condition will be placed on the ATC.

- {15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]

Rule 4102 Nuisance

Rule 4102 prohibits discharge of air contaminants which could cause injury, detriment, nuisance or annoyance to the public. Public nuisance conditions are not expected as a result of these operations, provided the equipment is well maintained. Therefore, the following condition will be placed on the ATC.

- {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

California Health & Safety Code 41700 (Health Risk Assessment)

District Policy APR 1905 – *Risk Management Policy for Permitting New and Modified Sources* specifies that for an increase in emissions associated with a proposed new source or modification, the District perform an analysis to determine the possible impact to the nearest resident or worksite.

District policy APR 1905 also specifies that the increase in emissions associated with a proposed new source or modification of an existing source shall not result in an increase in cancer risk greater than the District's significance level (20 in a million) and shall not result in acute and/or chronic risk indices greater than 1.

Although the engine in this project is considered a new emissions unit, this engine was proposed by the facility with a lower CO limit of 20 ppmv @ 15% O₂ in District project C-1213371. As seen in Appendix F, District project C-1213371 was approved with Toxic Best Available Control Technology (T-BACT), which was required because of emissions of formaldehyde (VOC), and was satisfied with BACT for VOC.

Since there are no changes in HRA parameters, except CO emissions, and an RMR is not required for a project with an increase in CO emissions, the RMR results from District project C-1220414 remain valid for the engine in this project. Therefore, no further analysis is required, and compliance with District Rule 4102 requirements is expected.

See Appendix C: Health Risk Assessment Summary

The following permit condition is required to ensure compliance with the assumptions made for the risk management review:

- {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]

Rule 4201 Particulate Matter Concentration

Section 3.1 prohibits discharge of dust, fumes, or total particulate matter into the atmosphere from any single source operation in excess of 0.1 grain per dry standard cubic foot.

For the following calculation, PM₁₀ is conservatively assumed to be 50% of PM, per Section 4.11 of Rule 2201.

$$\begin{aligned}
 PM \text{ Concentration} &= \frac{0.066 \text{ g} - PM}{bhp - hr} \times \frac{bhp - hr}{2,545 \text{ Btu}} \times \frac{10^6 \text{ Btu}}{9,100 \text{ dscf}} \times \frac{0.30 \text{ Btu}_{out}}{\text{Btu}_{in}} \times \frac{15.43 \text{ grain}}{g} \\
 &= \frac{0.013 \text{ grain} - PM}{\text{dscf}} < \frac{0.1 \text{ grain} - PM}{\text{dscf}}
 \end{aligned}$$

Since 0.013 grain-PM/dscf is \leq to 0.1 grain per dscf, compliance with Rule 4201 is expected. Therefore, the following condition will be placed on the ATC.

- {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

Rule 4301 Fuel Burning Equipment

Pursuant to section 2.0, the provisions of this rule apply to any piece of fuel burning equipment. Section 3.1 defines fuel burning equipment as “any furnace, boiler, apparatus, stack, and all appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer”.

IC engines produce power mechanically, not by indirect heat transfer; therefore, the IC engine in this project does not meet the definition of fuel burning equipment and the requirements of this rule do not apply. No further discussion is required.

Rule 4701 Internal Combustion Engines – Phase 1

The purpose of this rule is to limit the emissions of nitrogen oxides (NO_x), carbon monoxide (CO), and volatile organic compounds (VOC) from internal combustion engines. Except as provided in Section 4.0, the provisions of this rule apply to any internal combustion engine, rated greater than 50 bhp, that requires a PTO.

The engine in this project is also subject to District Rule 4702, *Internal Combustion Engines*. Since emissions limits of District Rule 4702 and all other requirements are equivalent or more stringent than District Rule 4701 requirements for IC engines, compliance with District Rule 4702 requirements will satisfy requirements of District Rule 4701.

Rule 4702 Internal Combustion Engines

Purpose (Section 1.0)

The purpose of this rule is to limit the emissions of nitrogen oxides (NO_x), carbon monoxide (CO), and volatile organic compounds (VOC), and sulfur oxides (SO_x) from internal combustion engines.

Applicability (Section 2.0)

This rule applies to any internal combustion engine with a rated brake horsepower 25 and greater.

Requirements (Section 5.0)

On and after the compliance schedule specified in Section 7.5, the operator of a spark-ignited engine > 50 bhp that is used in non-agricultural operation (AO) shall comply with all the applicable requirements of the rule and one of the following, on an engine-by-engine basis:

- 5.2.2.1 On and after the compliance schedule specified in Section 7.5, the operator of a spark-ignited engine that is used exclusively in non-AO shall comply with Sections 5.2.2.1.1 through 5.2.2.1.3 on an engine-by-engine basis:
 - 5.2.2.1.1 NO_x, CO, and VOC emission limits pursuant to Table 2 and Table 3, as applicable;
 - 5.2.2.1.2 SO_x control requirements of Section 5.7, pursuant to the deadlines specified in Section 7.5; and
 - 5.2.2.1.3 Monitoring requirements of Section 5.11, pursuant to the deadlines specified in Section 7.5.
- 5.2.2.2 In lieu of complying with the NO_x emission limit requirement of Section 5.2.2.1.1, an operator may pay an annual fee to the District, as specified in Section 5.6, pursuant to Section 7.6. This compliance option will sunset after December 31, 2023, where after an operator must comply with the NO_x emissions limit requirements in Table 2 and Table 3, per the compliance schedule included in Section 7.5.
 - 5.2.2.2.1 Engines in the fee payment program shall have actual emissions not greater than the applicable limits in Table 1 during the entire time the engine is part of the fee payment program.
- 5.2.2.3 In lieu of complying with the NO_x, CO, and VOC limits of Table 2 and Table 3 on an engine-by-engine basis, an operator may elect to implement an alternative emission control plan pursuant to Section 8.0. An operator electing this option shall not be eligible to participate in the fee payment option outlined in Section 5.2.2.2 and Section 5.6.

Table 2			
Engine Type	NOx Limit (ppmv)	CO Limit (ppmv)	VOC Limit (ppmv)
1. Lean-Burn Engines			
a. Two-Stroke, Gaseous Fueled, >50 bhp and < 100 bhp	75	2000	750
b. Limited Use	65	2000	750
c. Lean-Burn Engine used for gas compression	65 ppmv or 93% reduction	2000	750
d. Waste Gas Fueled (≥50% total monthly heat input from waste gas based on hhv)	65 ppmv or 90% reduction	2000	750
e. Lean-Burn Engine, not listed above	11	2000	750

Table 3			
Engine Type	NOx Limit (ppmv)	CO Limit (ppmv)	VOC Limit (ppmv)
2. Lean-Burn Engines			
a. Limited Use	11	2000	90
b. Lean-Burn Engine used for gas compression	40	2000	90
c. Waste Gas Fueled (≥50% total monthly heat input from waste gas based on hhv)	40	2000	90
d. Lean-Burn Engine, not listed above	11	2000	90

Compliance with the emissions limits in Table 2 is required at time of permit issuance. The emissions limits in Table 3 are identical to, or more stringent than the limits in Table 2. Full compliance with the emission limits in Table 3 is required by December 21, 2023.

Proposed NOx and VOC emissions rates for the engine in this project are 2.5 ppmv and 10 ppmv @ 15% O₂, respectively. In addition, the facility has proposed a CO emission limit of 270 ppmv @ 15% O₂, based on 40 CFR 60 Subpart JJJ. Therefore, compliance with the emission limits Section 5.2 Table 3 of District Rule 4702 is expected.

A permit condition listing the emissions limits will be listed on the permits as shown in the DEL section above.

Section 5.3 states all continuous emission monitoring systems (CEMS) emissions measurements shall be averaged over a period of 15 consecutive minutes. Any 15-consecutive-minute block average CEMS measurement exceeding the applicable emission limits of this rule shall constitute a violation of this rule. The engine in this project will not be equipped with CEMS; therefore, this section is not applicable.

Sections 5.4 and 5.5 apply if percent emission reductions are used to comply with the NOx emissions limits of Section 5.2. As seen above, the engine in this project will comply with the NOx emission limits in Section 5.2. Therefore, this section is not applicable.

Section 5.6 requires an operator pay a total annual fee to the District based on the total NOx emissions from those engines that will be subject to Section 5.2.2.2. As seen above, the engine in this project will comply with the NOx emission limits. Therefore, this section is not applicable.

Section 5.7 states on and after the compliance schedules specified in Section 7.0, operator of spark-ignited engines and compression-ignited engines shall comply with one of the following:

- Operate the engine exclusively on PUC-quality natural gas, commercial propane, butane, or liquefied petroleum gas, or a combination of such gases; or
- Limit gaseous fuel sulfur content to no more than five (5) grains of total sulfur per one hundred (100) standard cubic feet; or
- Use California Reformulated Gasoline for gasoline-fired spark-ignited engines; or
- Use California Reformulated Diesel for compression-ignited engines; or
- Operate the engine on liquid fuel that contains no more than 15 ppm sulfur, as determined by the test method specified in Section 6.4.6; or
- Install and properly operate an emission control system that reduces SO₂ emissions by at least 95% by weight as determined by the test method specified in Section 6.4.6.

As mentioned in Section VII, the IC engine in this project will be fired on PUC-quality natural gas. Therefore, the SOx emission control requirements of this section are satisfied. The following condition will be placed on the ATC to ensure compliance with this requirement.

- This IC engine shall be fired only on PUC-quality natural gas. [District Rules 2201, 4702, and 4801]

Section 5.8 states on and after the compliance schedule specified in Section 5.2.4 and 7.0, operators of engines subject to this rule shall limit emissions of particulate matter through compliance with the following requirements:

- Spark-ignited engines shall comply with the requirements of Section 5.7.
- Compression-ignited engines shall comply with the applicable CARB/EPA Tier certification standard per Table 6.

As seen above in Section 5.7 of this rule, the engine in this project complies with the requirements of Section 5.7; therefore, the engine meets the PM emissions control requirements, and no further discussion is required.

Section 5.9 states the operator of a non-AO spark-ignited engine subject to the requirements of Section 5.2 or any engine subject to the requirements of Section 8.0 shall comply with the requirements specified in Section 5.9.1 through Section 5.9.11.

- 5.9.1 For each engine with a rated brake horsepower of 1,000 bhp or greater and which is allowed by Permit-to-Operate or Permit-Exempt Equipment Registration condition to operate more than 2,000 hours per calendar year, or with an external emission control device, either install, operate, and maintain continuous monitoring equipment for NOx, CO, and oxygen, as identified in Rule 1080 (Stack Monitoring), or install, operate, and maintain APCO-approved alternate monitoring. The monitoring system may be a continuous emissions monitoring system (CEMS), a parametric emissions monitoring

system (PEMS), or an alternative monitoring system approved by the APCO. APCO-approved alternate monitoring shall consist of one or more of the following:

- 5.9.1.1 Periodic NO_x and CO emission concentrations,
- 5.9.1.2 Engine exhaust oxygen concentration,
- 5.9.1.3 Air-to-fuel ratio,
- 5.9.1.4 Flow rate of reducing agents added to engine exhaust,
- 5.9.1.5 Catalyst inlet and exhaust temperature,
- 5.9.1.6 Catalyst inlet and exhaust oxygen concentration, or
- 5.9.1.7 Other operational characteristics.

The engine in this project is rated at equal to or greater than 1,000 bhp, permitted to operate more than 2,000 hours per year, and is equipped with an external emission control device. Therefore, this section is applicable. The applicant has proposed a pre-approved alternate emissions monitoring plan that specifies that the permittee monitor catalyst inlet and outlet temperatures, ammonia injection rate, and NO_x, CO, and O₂ concentrations as specified in District Policy SSP-1810 (2/15/17). Therefore, the following condition will be placed on the permits to assure compliance with this section.

- The permittee shall monitor and record the catalyst inlet and outlet temperatures and ammonia injection rate at least once per week. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last week. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 4701 and 4702]
- The minimum acceptable catalyst temperature differential and ammonia injection rate shall be established by source testing this unit. [District Rules 4701 and 4702]
- If either the catalyst temperature differential or ammonia injection rate is lower than the normal range/level, the permittee shall return the temperature differential and/or ammonia injection rate to the normal range/level as soon as possible, but no longer than 8 hours after detection. If the catalyst temperature differential rate or ammonia injection rate is not returned to the normal range/level within 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a source test within 60 days of the first exceedance, to demonstrate compliance with the applicable emission limits at the new temperature differential or ammonia injection rate. A District-approved portable analyzer may be used in lieu of a source test to demonstrate compliance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 4701 and 4702]

- The permittee shall maintain records of: (1) the date and time of temperature and ammonia injection rate measurements, (2) the measured temperatures and ammonia injection rate, and (3) a description of any corrective action taken to maintain the temperature differential and/or the ammonia injection rate within the acceptable range. [District Rules 4701 and 4702]
 - The permittee shall monitor and record the stack concentration of NO_x, CO, and O₂ at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications [In-stack O₂ monitors may be allowed if approved by the APCO.] Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]
 - If the NO_x, CO, or NH₃ concentrations corrected to 15% O₂, as measured by the portable analyzer or the District-approved ammonia monitoring equipment, exceed the respective permitted emissions concentration(s), the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours of operation after detection. If the portable analyzer or ammonia monitoring equipment readings continue to exceed the permitted emissions concentration(s) after 8 hours of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 2201 and 4702]
 - All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 4701 and 4702]
 - The permittee shall maintain records of: (1) the date and time of NO_x, CO, and O₂ measurements, (2) the O₂ concentration in percent and the measured NO_x and CO concentrations corrected to 15% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 4701 and 4702]
- 5.9.2 For each engine not subject to Section 5.9.1, monitor operational characteristics recommended by the engine manufacturer or emission control system supplier, and approved by the APCO.

Since the engine in this project is subject to Section 5.9.1, this section is not applicable.

5.9.3 For each engine with an alternative monitoring system, submit to, and receive approval from the APCO, adequate verification of the alternative monitoring system's acceptability. This would include data demonstrating the system's accuracy under typical operating conditions for the specific application and any other information or data deemed necessary in assessing the acceptability of the alternative monitoring system.

The applicant has proposed a pre-approved monitoring system for the engine in this project; therefore, no further discussion is required.

5.9.4 For each engine with an APCO approved CEMS, operate the CEMS in compliance with the requirements of 40 Code of Federal Regulations (CFR) Part 51, 40 CFR Parts 60.7 and 60.13 (except subsection h), 40 CFR Appendix B (Performance Specifications), 40 CFR Appendix F (Quality Assurance Procedures), and applicable provisions of Rule 1080 (Stack Monitoring).

The engine in this project will not be equipped with CEMS; therefore, the requirements of this section are not applicable.

5.9.5 For each engine, have the data gathering and retrieval capabilities of an installed monitoring system described in Section 5.9 approved by the APCO.

The applicant has proposed a pre-approved monitoring system for the engine in this project; therefore, no further discussion is required.

5.9.6 For each engine, install and operate a functional nonresettable elapsed time meter.

5.9.6.1 In lieu of installing a nonresettable elapsed time meter, the operator may use an alternative device, method, or technique, in determining operating time provided that the alternative is approved by the APCO and EPA and is allowed by a Permit-to-Operate or Permit-Exempt Equipment Registration condition.

5.9.6.2 The operator shall properly maintain and operate the nonresettable elapsed time meter or alternative device in accordance with the manufacturer's instructions.

The following condition will be placed on the ATC.

- {3404} This engine shall be equipped with an operational non-resettable elapsed time meter or other APCO approved alternative. [District Rule 4702]

Sections 5.9.7 and 5.9.8 apply if each engine is subject to Section 6.5 of this rule. The facility has proposed a pre-approved monitoring plan and the requirements of these sections are satisfied by the pre-approved monitoring plan. Therefore, no further discussion is required.

- 5.9.9 For each engine, use a portable analyzer to take NO_x and CO emission readings and oxygen concentration readings to verify compliance with the emission requirements of Section 5.2 or Section 8.0 during each calendar quarter in which a source test is not performed and the engine is operated.
- 5.9.9.1 If an engine is operated less than 120 calendar days per calendar year, take one NO_x and CO emission reading and oxygen concentration reading during the calendar year in which a source test is not performed and the engine is operated.
 - 5.9.9.2 All emission readings shall be taken with the engine operating either at conditions representative of normal operations or conditions specified in the Permit-to-Operate or Permit-Exempt Equipment Registration.
 - 5.9.9.3 The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO.
 - 5.9.9.4 All NO_x and CO emissions readings shall be reported to the APCO in a manner approved by the APCO.
 - 5.9.9.5 NO_x and CO emission readings taken pursuant to this section shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings evenly spaced out over the 15 consecutive-minute period.

The following conditions will be included on the ATC:

- The permittee shall monitor and record the catalyst inlet and outlet temperatures and ammonia injection rate at least once per week. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last week. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 4701 and 4702]
- The minimum acceptable catalyst temperature differential and ammonia injection rate shall be established by source testing this unit. [District Rules 4701 and 4702]
- If either the catalyst temperature differential or ammonia injection rate is lower than the normal range/level, the permittee shall return the temperature differential and/or ammonia injection rate to the normal range/level as soon as possible, but no longer than 8 hours after detection. If the catalyst temperature differential rate or ammonia injection rate is not returned to the normal range/level within 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a source test within 60 days of the first exceedance, to demonstrate compliance with the applicable emission limits at the new temperature differential or ammonia injection rate. A District-approved portable analyzer may be used in lieu of a source test to demonstrate compliance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the

performing the notification and testing required by this condition. [District Rules 4701 and 4702]

- The permittee shall maintain records of: (1) the date and time of temperature and ammonia injection rate measurements, (2) the measured temperatures and ammonia injection rate, and (3) a description of any corrective action taken to maintain the temperature differential and/or the ammonia injection rate within the acceptable range. [District Rules 4701 and 4702]
- The permittee shall monitor and record the stack concentration of NO_x, CO, and O₂ at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications [In-stack O₂ monitors may be allowed if approved by the APCO.] Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]
- If the NO_x, CO, or NH₃ concentrations corrected to 15% O₂, as measured by the portable analyzer or the District-approved ammonia monitoring equipment, exceed the respective permitted emissions concentration(s), the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours of operation after detection. If the portable analyzer or ammonia monitoring equipment readings continue to exceed the permitted emissions concentration(s) after 8 hours of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 2201 and 4702]
- All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 4701 and 4702]
- The permittee shall maintain records of: (1) the date and time of NO_x, CO, and O₂ measurements, (2) the O₂ concentration in percent and the measured NO_x and CO concentrations corrected to 15% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 4701 and 4702]

5.9.10 The APCO shall not approve an alternative monitoring system unless it is documented that continued operation within ranges of specified emissions-related performance indicators or operational characteristics provides a reasonable assurance of compliance with applicable emission limits. The operator shall source test over the proposed range of surrogate operating parameters to demonstrate compliance with the applicable emission standards.

The applicant has proposed a pre-approved alternate emissions monitoring plan that requires periodic NO_x, CO, and O₂ emissions concentrations. Therefore, this section is satisfied.

Section 5.9.11 contains requirements for engines utilizing an Alternate Emission Control Plan (AECPP). The engine in this project is not subject to AECPP; therefore, the requirements of Section 5.9.11 are not applicable.

Section 5.10 applies to the operator of engines subject to Sections 5.10.1.1 through 5.10.1.2. As seen above, the engine in this project is a non-AO spark-ignited engine; therefore, this section is not applicable.

Section 5.11 states on and after the compliance schedules specified in Section 7.0, an operator of an engine shall comply with the following requirements:

- 5.11.1 An operator of an engine complying with Sections 5.7.2, 5.7.5, or Section 5.7.7 shall perform an annual fuel sulfur analysis in accordance with the test methods in Section 6.4. The operator shall keep the records of the fuel analysis and shall provide it to the District upon request,
- 5.11.2 An operator of an engine complying with Section 5.7.6 by installing and operating a control device with at least 95% by weight SO_x reduction efficiency shall submit for approval by the APCO the proposed key system operating parameters and frequency of the monitoring and recording not later than July 1, 2013, and
- 5.11.3 An operator of an engine complying with Section 5.7.6 shall perform an annual source test unless a more frequent sampling and reporting period is included in the Permit-to-Operate. Source tests shall be performed in accordance with the test methods in Section 6.4.

Since the engine is complying with this rule by compliance with Section 5.7.1, this section is not applicable.

Section 5.12 contains requirements for engines that are not required to have a Permit to Operate pursuant to California Health and Safety Code Section 42301.16. The engine in this project is required to have a PTO; therefore, this section is not applicable.

Administrative Requirements (Section 6.0)

Section 6.1 states the operator of an engine subject to the requirements of Section 5.2 Table 3 Categories 1a, 1b, 1c, 2a, 2b, and 2c, and Table 5 of this rule shall submit to the APCO an APCO-approvable emission control plan of all actions to be taken to satisfy the emission requirements of Section 5.2 and the compliance schedules of Section 7.0. If there is no change to the previously-approved emission control plan, the operator shall submit a letter to the District indicating that the previously approved plan is still valid.

The engine in this project is not subject to the requirements of Section 5.2 Table 3 Categories 1a, 1b, 1c, 2a, 2b, or 2c, or Table 5 of this rule. Therefore, this section is not applicable.

Section 6.2.1 requires that the operator of an engine subject to the requirements of Section 5.2 shall maintain an engine operating log to demonstrate compliance with this rule. This information shall be retained for a period of at least five years, shall be readily available, and be made available to the APCO upon request. The engine operating log shall include, on a monthly basis, the following information:

- 6.2.1.1 Total hours of operation,
- 6.2.1.2 Type of fuel used,
- 6.2.1.3 Maintenance or modifications performed,
- 6.2.1.4 Monitoring data,
- 6.2.1.5 Compliance source test results, and
- 6.2.1.6 Any other information necessary to demonstrate compliance with this rule.
- 6.2.1.7 For an engine subject to Section 8.0, the quantity (cubic feet of gas or gallons of liquid) of fuel used on a daily basis.

The following conditions will be included on the ATC:

- The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: the total hours of operation, the type of fuel used, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. [District Rules 2201 and 4702]
- The permittee shall monitor and record the catalyst inlet and outlet temperatures and ammonia injection rate at least once per week. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last week. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 4701 and 4702]
- The permittee shall maintain records of: (1) the date and time of temperature and ammonia injection rate measurements, (2) the measured temperatures and ammonia injection rate, and (3) a description of any corrective action taken to maintain the temperature differential and/or the ammonia injection rate within the acceptable range. [District Rules 4701 and 4702]

- The permittee shall monitor and record the stack concentration of NO_x, CO, and O₂ at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications [In-stack O₂ monitors may be allowed if approved by the APCO.] Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]
- The permittee shall maintain records of: (1) the date and time of NO_x, CO, and O₂ measurements, (2) the O₂ concentration in percent and the measured NO_x and CO concentrations corrected to 15% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 4701 and 4702]

Section 6.2.2 requires that the data collected pursuant to the requirements of Section 5.9 and Section 5.10 shall be maintained for at least five years, shall be readily available, and made available to the APCO upon request. The following condition will be placed on the ATC.

- All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. All records may be maintained and submitted in an electronic format approved by the District. [District Rules 1070 and 4702]

Section 6.2.3 contains requirements for operators that claim an exemption under Section 4.2 or Section 4.3. There are no applicable exemption criteria for the engine in this project; therefore, Section 6.2.3 is not applicable.

Section 6.3 requires that the operator of an engine subject to the emission limits in Section 5.2 or the requirements of Section 8.0, shall comply with compliance testing requirements. Section 6.3.1 specifies that the requirements of Section 6.3.2 through Section 6.3.4 shall apply to the following engines:

- 6.3.1 All spark-ignited engines and compression-ignited engines that have been retro-fitted with a NO_x exhaust control, except certified spark-ignited engines, those certified per Section 9.0, and certified compression-ignited engines, shall comply with Sections 6.3.2 through 6.3.4.

Section 6.3.2 requires demonstration of compliance with applicable limits, ppmv or percent reduction, in accordance with the test methods in Section 6.4, as specified below:

- 6.3.2.1 By the applicable date specified in Section 5.2, and at least once every 24 months thereafter, except for an engine subject to Section 6.3.2.2.
- 6.3.2.2 By the applicable date specified in Section 5.2 and at least once every 60 months thereafter, for an agricultural spark-ignited engine that has been retro-fitted with a catalytic emission control device.

6.3.2.3 A portable NO_x analyzer may be used to show initial compliance with the applicable limits/standards in Section 5.2 for agricultural spark-ignited engines, provided the criteria specified in Sections 6.3.2.3.1 to 6.3.2.3.5 are met, and a source test is conducted in accordance with Section 6.3.2 within 12 months from the required compliance date.

The following conditions will be included on the ATC permit for the IC engine:

- Source testing to measure NO_x, CO, VOC, and ammonia (NH₃) emissions from this unit shall be conducted within 60 days of initial start-up. [District Rules 1081, 2201, and 4702]
- Source testing to measure NO_x, CO, and ammonia (NH₃) emissions from this unit shall be conducted at least once every 24 months. [District Rules 1081, 2201, and 4702]

In addition, the following conditions will be placed on the ATC.

- {109} Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081]
- The results of each source test shall be submitted to the District within 60 days after completion of the source test. [District Rule 1081]
- The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NO_x, CO, and O₂ analyzer during District inspections. The sampling ports shall be located in accordance with the California Air Resources Board (CARB) document titled Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]

Section 6.3.3 requires the operator to conduct emissions source testing with the engine operating either at conditions representative of normal operations or conditions specified in the Permit-to-Operate or Permit-Exempt Equipment Registration. For emissions source testing performed pursuant to Section 6.3.2 for the purpose of determining compliance with an applicable standard or numerical limitation, the arithmetic average of three (3) 30-consecutive-minute test runs shall apply. If two (2) of three (3) runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. VOC shall be reported as methane. VOC, NO_x, and CO concentrations shall be reported in ppmv, corrected to 15 percent oxygen. For engines that comply with a percent reduction limit, the percent reduction of NO_x emissions shall also be reported.

The following conditions will be included on the ATC.

- {3791} Emissions source testing shall be conducted with the engine operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. [District Rule 4702]
- For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. VOC emissions shall be reported as methane. NO_x, CO, VOC, and NH₃ concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702]

Section 6.3.4 requires that in addition to other information, the source test protocol shall describe which critical parameters will be measured and how the appropriate range for these parameters shall be established. The range for these parameters shall be incorporated into the I&M plan.

Section 6.3.5 states engines that are limited by Permit-to-Operate or Permit-Exempt Equipment Registration condition to be fueled exclusively with PUC quality natural gas shall not be subject to the reoccurring source test requirements of Section 6.3.2 for VOC emissions. Section 6.3.2 does not apply to the engine in this project; therefore, no further discussion is required.

Section 6.3.6 specifies requirements for spark-ignited engines for testing a unit or units that represent a specified group of units, in lieu of compliance with the applicable requirements of Section 6.3.2. The engine in this project is not subject to requirements of Section 6.3.2; therefore, this section is not applicable.

Section 6.4 requires that the compliance with the requirements of Section 5.2 shall be determined, as required, in accordance with the following test procedures or any other method approved by EPA and the APCO:

- 6.4.1 Oxides of nitrogen - EPA Method 7E, or ARB Method 100.
- 6.4.2 Carbon monoxide - EPA Method 10, or ARB Method 100.
- 6.4.3 Stack gas oxygen - EPA Method 3 or 3A, or ARB Method 100.
- 6.4.4 Volatile organic compounds - EPA Method 25A or 25B, or ARB Method 100. Methane and ethane, which are exempt compounds, shall be excluded from the result of the test.
- 6.4.5 Operating horsepower determination - any method approved by EPA and the APCO.
- 6.4.6 SO_x Test Methods
 - 6.4.6.1 Oxides of sulfur – EPA Method 6C, EPA Method 8, or ARB Method 100.
 - 6.4.6.2 Determination of total sulfur as hydrogen sulfide (H₂S) content – EPA Method 11 or EPA Method 15, as appropriate.
 - 6.4.6.3 Sulfur content of liquid fuel – American Society for Testing and Materials (ASTM) D 6920-03 or ASTM D 5453-99.
 - 6.4.6.4 The SO_x emission control system efficiency shall be determined using the following:

$$\% \text{ Control Efficiency} = [(C_{\text{SO}_2, \text{inlet}} - C_{\text{SO}_2, \text{outlet}}) / C_{\text{SO}_2, \text{inlet}}] \times 100$$

Where:

$C_{SO_2, \text{inlet}}$ = concentration of SO_x (expressed as SO_2) at the inlet side of the SO_x emission control system, in lb/Dscf

$C_{SO_2, \text{outlet}}$ = concentration of SO_x (expressed as SO_2) at the outlet side of the SO_x emission control system, in lb/Dscf

6.4.7 The Higher Heating Value (hhv) of the fuel shall be determined by one of the following test methods:

6.4.7.1 ASTM D 240-02 or ASTM D 3282-88 for liquid hydrocarbon fuels.

6.4.7.2 ASTM D 1826-94 or ASTM 1945-96 in conjunction with ASTM D 3588-89 for gaseous fuel.

The following conditions will be included on the ATC.

- The following methods shall be used for source testing: NO_x (ppmv) - EPA Method 7E; CO (ppmv) - EPA Method 10; VOC (ppmv) - EPA Method 18, or 25A or 25B; stack gas oxygen - EPA Method 3 or 3A; stack gas velocity/volumetric flowrate - EPA Method 2 or EPA Method 19; stack gas moisture content - EPA Method 4; NH_3 - BAAQMD ST-1B or SCAQMD Method 207-1. Alternative test methods as approved by EPA and the District may be used to address the source testing requirements of this permit. [District Rules 1081, 2201, and 4702]
- The Higher Heating Value (HHV) of the fuel gas shall be determined using ASTM D1826, ASTM 1945 in conjunction with ASTM D3588, or an alternative method approved by EPA and the District. [District Rules 2201 and 4702]

Section 6.5 states the operator of an engine that is subject to the requirements of Section 5.2 or the requirements of Section 8.0 shall submit to the APCO for approval, an I&M plan that specifies all actions to be taken to satisfy the requirements of Sections 6.5.1 through Section 6.5.9 and the requirements of Section 5.9.

Section 6.5.1 specifies that the requirements of Section 6.5.2 through Section 6.5.9 shall apply to all engines, except certified spark-ignited engines, those certified per Section 9.0, and certified compression-ignited engines.

The natural gas-fired IC engine in this project is not a certified IC engine and has not been certified per Section 9.0. Therefore, the requirements of Sections 6.5.2 through 6.5.9 are applicable to the engine.

Section 6.5.2 requires procedures requiring the operator to establish ranges for control equipment parameters, engine operating parameters, and engine exhaust oxygen concentrations that source testing has shown result in pollutant concentrations within the rule limits.

Section 6.5.3 requires procedures for monthly inspections as approved by the APCO. The applicable control equipment parameters and engine operating parameters will be inspected and monitored monthly in conformance with a regular inspection schedule in the I&M plan.

Section 6.5.4 requires procedures for the corrective actions on the noncompliant parameter(s) that the operator will take when an engine is found to be operating outside the acceptable range for control equipment parameters, engine operating parameters, and engine exhaust NO_x, CO, VOC, or oxygen concentrations.

Section 6.5.5 requires procedures for the operator to notify the APCO when an engine is found to be operating outside the acceptable range for control equipment parameters, engine operating parameters, and engine exhaust NO_x, CO, VOC, or oxygen concentrations.

Section 6.5.6 requires procedures for and corrective maintenance performed for the purpose of maintaining an engine in proper operating condition. The applicant has proposed that the engine will be operated and maintained per the specifications of the manufacturer or emissions control system supplier.

Section 6.5.7 requires procedures and a schedule for using a portable emissions analyzer to take NO_x and CO emission readings pursuant to Section 5.9.9. The applicant has proposed that the alternate monitoring program will ensure compliance with this section of the rule.

Section 6.5.8 requires procedures for collecting and recording required data and other information in a form approved by the APCO including, but not limited to, data collected through the I&M plan and the monitoring systems described in Sections 5.9.1 and 5.9.2. Data collected through the I&M plan shall have retrieval capabilities as approved by the APCO.

NO_x Emissions:

In order to satisfy the I&M requirements for NO_x emissions, the applicant has proposed to perform the following:

1. The applicant will take periodic NO_x emission concentration measurements with a portable analyzer at least once every month.
2. To ensure that NO_x emissions concentrations are not being exceeded between periodic NO_x portable analyzer measurements, the applicant is proposing to determine a correlation between the SCR system's reagent injection rate and NO_x emissions. The appropriate ranges for each operating load will be established during initial source testing and will be monitored at least once per month.

Therefore, the following conditions will be placed on ATC.

- The permittee shall monitor and record the stack concentration of NO_x, CO, and O₂ at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications [In-stack O₂ monitors may be allowed if approved by the APCO.] Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]

- The permittee shall monitor and record the stack concentration of NH₃ at least once every month in which a source test is not performed. NH₃ monitoring shall be conducted utilizing District approved gas-detection tubes or a District approved equivalent method. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rule 2201]
- If the NO_x, CO, or NH₃ concentrations corrected to 15% O₂, as measured by the portable analyzer or the District-approved ammonia monitoring equipment, exceed the respective permitted emissions concentration(s), the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours of operation after detection. If the portable analyzer or ammonia monitoring equipment readings continue to exceed the permitted emissions concentration(s) after 8 hours of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 2201 and 4702]

CO and VOC Emissions:

In order to satisfy the I&M requirements for CO and VOC emissions, the applicant has proposed to perform the following:

1. The applicant will take periodic CO emission concentration measurements with a portable analyzer at least once every month. Per the catalyst manufacturer, if the oxidation catalyst is controlling CO emissions, it should also be achieving the desired removal efficiency for VOC emissions. Therefore, monthly emission concentration measurements with a portable analyzer for VOC emissions will not be required.
2. To ensure that CO and VOC emissions concentrations are not being exceeded between periodic CO emission concentration measurements, the applicant is proposing to determine a correlation between the catalyst control system inlet exhaust temperature and back pressure. The appropriate ranges for each operating load will be established during initial source testing and will be monitored at least once per month.

Therefore, the following conditions will be placed ATC.

- The permittee shall monitor and record the stack concentration of NO_x, CO, and O₂ at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications [In-stack O₂ monitors may be allowed if approved by the APCO.] Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month. Records

must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]

- If the NO_x, CO, or NH₃ concentrations corrected to 15% O₂, as measured by the portable analyzer or the District-approved ammonia monitoring equipment, exceed the respective permitted emissions concentration(s), the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours of operation after detection. If the portable analyzer or ammonia monitoring equipment readings continue to exceed the permitted emissions concentration(s) after 8 hours of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 2201 and 4702]

Section 6.5.9 specifies procedures for revising the I&M plan. The I&M plan shall be updated to reflect any change in operation. The I&M plan shall be updated prior to any planned change in operation. An engine operator that changes significant I&M plan elements must notify the District no later than seven days after the change and must submit an updated I&M plan to the APCO no later than 14 days after the change for approval. The date and time of the change to the I&M plan shall be recorded in the engine operating log. For new engines and modifications to existing engines, the I&M plan shall be submitted to and approved by the APCO prior to issuance of the Permit-to-Operate or Permit-Exempt Equipment Registration. The operator of an engine may request a change to the I&M plan at any time. The applicant has proposed to comply with the I&M plan modification requirements per this section of the rule.

The following condition will be included on the ATC permit.

- {3212} The permittee shall update the I&M plan for this engine prior to any planned change in operation. The permittee must notify the District no later than seven days after changing the I&M plan and must submit an updated I&M plan to the APCO for approval no later than 14 days after the change. The date and time of the change to the I&M plan shall be recorded in the engine's operating log. For modifications, the revised I&M plan shall be submitted to and approved by the APCO prior to issuance of the Permit to Operate. The permittee may request a change to the I&M plan at any time. [District Rule 4702]

Compliance Schedules (Section 7.0)

Section 7.5.2 states an operator with non-AO spark-ignited engines at a stationary source subject to Table 3 or Section 8.0 emission limits, SO_x control requirements of Section 5.7, and the SO_x monitoring requirements of Section 5.11 shall comply with the schedule specified in Table 8.

The engine in this project will be required to comply with the applicable sections of District Rule 4702 upon initial startup of the equipment; therefore, compliance with this section is expected.

Alternative Emission Control Plan (AECp) (Section 8.0)

Section 8.0 specifies requirements for use of an AECp. An AECp will not be used for the engine in this project; therefore, Section 8.0 is not applicable.

Exhaust Control System Certification Requirements (Section 9.0)

Section 9.0 specifies requirements for certification of exhaust control systems for compliance with District Rule 4702. Certification under this section for the exhaust control systems for the engine is not currently being proposed; therefore, this section of the Rule is not applicable at this time.

Conclusion

As shown above, the engine will satisfy all the requirements of Rule 4702. Therefore, the engine will be in compliance as of the date of initial operation and the following conditions will be added to each permit to ensure continued compliance.

- {4261} This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier. [District Rule 4702]
- {3203} This engine shall be operated within the ranges that the source testing has shown result in pollution concentrations within the emissions limits as specified on this permit. [District Rule 4702]

Rule 4801 Sulfur Compounds

Rule 4801 requires that sulfur compound emissions (as SO₂) shall not exceed 0.2% by volume. Using the ideal gas equation, the sulfur compound emissions are calculated as follows:

$$\text{Volume SO}_2 = (n \times R \times T) \div P$$

n = moles SO₂

T (standard temperature) = 60 °F or 520 °R

$$R \text{ (universal gas constant)} = \frac{10.73 \text{ psi} \cdot \text{ft}^3}{\text{lb} \cdot \text{mol} \cdot \text{°R}}$$

$$2.85 \frac{\text{lb-S}}{\text{MMscf-gas}} \times \frac{1 \text{ scf-gas}}{1,000 \text{ Btu}} \times \frac{1 \text{ MMBtu}}{8,578 \text{ scf}} \times \frac{1 \text{ lb-mol}}{64 \text{ lb-S}} \times \frac{10.73 \text{ psi} \cdot \text{ft}^3}{\text{lb-mol} \cdot \text{°R}} \times \frac{520 \text{ °R}}{14.7 \text{ psi}} \times 1,000,000 = 1.97 \text{ ppmv}$$

Since 1.97 ppmv is ≤ 2,000 ppmv, the engine is expected to comply with Rule 4801. Therefore, the following condition will be listed on the ATC to ensure compliance:

- This IC engine shall be fired only on PUC-quality natural gas. [District Rules 2201, 4702, and 4801]

California Health & Safety Code 42301.6 (School Notice)

The District has verified that this site is not located within 1,000 feet of a school. Therefore, pursuant to California Health and Safety Code 42301.6, a school notice is not required.

California Environmental Quality Act (CEQA)

CEQA requires each public agency to adopt objectives, criteria, and specific procedures consistent with CEQA Statutes and the CEQA Guidelines for administering its responsibilities under CEQA, including the orderly evaluation of projects and preparation of environmental documents. The District adopted its *Environmental Review Guidelines* (ERG) in 2001. The basic purposes of CEQA are to:

- Inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities;
- Identify the ways that environmental damage can be avoided or significantly reduced;
- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible; and
- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

Greenhouse Gas (GHG) Significance Determination

District is a Lead Agency & GHG emissions increases are from the combustion of fossil fuel other than jet fuels

It is determined that no other agency has prepared or will prepare an environmental review document for the project. Thus the District is the Lead Agency for this project.

On December 17, 2009, the District's Governing Board adopted a policy, APR 2005, *Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency*, for addressing GHG emission impacts when the District is Lead Agency under CEQA and approved the District's guidance document for use by other agencies when addressing GHG impacts as lead agencies under CEQA. Under this policy, the District's determination of significance of project-specific GHG emissions is founded on the principal that projects with GHG emission reductions consistent with AB 32 emission reduction targets are considered to have a less than significant impact on global climate change. Consistent with District Policy 2005, projects complying with an approved GHG emission reduction plan or GHG mitigation program, which avoids or substantially reduces GHG emissions within the geographic area in which the project is located, would be determined to have a less than significant individual and cumulative impact for GHG emission.

The California Air Resources Board (ARB) adopted a Cap-and-Trade regulation as part one of the strategies identified for AB 32. This Cap-and-Trade regulation is a statewide plan, supported by a CEQA compliant environmental review document, aimed at reducing or mitigating GHG emissions from targeted industries. Facilities subject to the Cap-and-Trade regulation are subject to an industry-wide cap on overall GHG emissions. Any growth in emissions must be accounted for under that cap such that a corresponding and equivalent reduction in emissions must occur to allow any increase. Further, the cap decreases over time, resulting in an overall decrease in GHG emissions.

Under District policy APR 2025, *CEQA Determinations of Significance for Projects Subject to ARB's GHG Cap-and-Trade Regulation*, the District finds that the Cap-and-Trade is a regulation plan approved by ARB, consistent with AB32 emission reduction targets, and supported by a CEQA compliant environmental review document. As such, consistent with District Policy 2005, projects complying with Cap-and-Trade requirements are determined to have a less than significant individual and cumulative impact for GHG emissions.

The GHG emissions increases associated with this project result from the combustion of fossil fuel(s), other than jet fuel, delivered from suppliers subject to the Cap-and-Trade regulation. Therefore, as discussed above, consistent with District Policies APR 2005 and APR 2025, the District concludes that the GHG emissions increases associated with this project would have a less than significant individual and cumulative impact on global climate change.

District CEQA Findings

The District is the Lead Agency for this project because there is no other agency with broader statutory authority over this project. The District performed an Engineering Evaluation (this document) for the proposed project and determined that the activity will occur at an existing facility and the project involves negligible expansion of the existing or former use. Furthermore, the District determined that the activity will not have a significant effect on the environment. Therefore, the District finds that the activity is categorically exempt from the provisions of CEQA pursuant to CEQA Guideline § 15301 (Existing Facilities), and finds that the project is exempt per the common sense exemption that CEQA applies only to projects which have the potential for causing a significant effect on the environment (CEQA Guidelines §15061(b)(3)).

Indemnification Agreement/Letter of Credit Determination

According to District Policy APR 2010 (CEQA Implementation Policy), when the District is the Lead or Responsible Agency for CEQA purposes, an indemnification agreement and/or a letter of credit may be required. The decision to require an indemnity agreement and/or a letter of credit is based on a case-by-case analysis of a particular project's potential for litigation risk, which in turn may be based on a project's potential to generate public concern, its potential for significant impacts, and the project proponent's ability to pay for the costs of litigation without a letter of credit, among other factors.

The criteria pollutant emissions and toxic air contaminant emissions associated with the proposed project are not significant, and there is minimal potential for public concern for this particular type of facility/operation. Therefore, an Indemnification Agreement and/or a Letter of Credit will not be required for this project in the absence of expressed public concern.

IX. Recommendation

Compliance with all applicable rules and regulations is expected. Pending a successful NSR Public Noticing period, issue ATC C-10021-1-1 subject to the permit conditions on the attached draft ATC in Appendix A.

X. Billing Information

Annual Permit Fees			
Permit Number	Fee Schedule	Fee Description	Annual Fee
C-10021-1-1	3020-10-F	1,676 bhp lean-burn IC engine	\$900

Appendixes

- A: Draft ATC
- B: BACT Analysis
- C: HRA Summary
- D: Quarterly Net Emissions Change
- E: Conversion from ppmv to g/bhp-hr
- F: HRA Summary for District Project C-1213371

APPENDIX A
Draft ATC

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

ISSUANCE DATE: DRAFT
DRAFT

PERMIT NO: C-10021-1-1

LEGAL OWNER OR OPERATOR: SCALE MICROGRID SOLUTIONS INC
MAILING ADDRESS: 18700 E SOUTH AVE
REEDLEY, CA 93654

LOCATION: 18700 E SOUTH AVE
REEDLEY, CA 93654

EQUIPMENT DESCRIPTION:

1,676 BHP (CONTINUOUS) MITSUBISHI MODEL GS16R2PTK LEAN-BURN NATURAL GAS-FIRED IC ENGINE WITH A SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM AND AN OXIDATION CATALYST SYSTEM POWERING AN ELECTRICAL GENERATOR

CONDITIONS

1. This Authority to Construct (ATC) cancels and supersedes ATC C-10021-1-0. [District Rule 2201]
2. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
3. {15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
4. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
5. {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
6. {3404} This engine shall be equipped with an operational non-resettable elapsed time meter or other APCO approved alternative. [District Rule 4702]
7. {4261} This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier. [District Rule 4702]
8. {3203} This engine shall be operated within the ranges that the source testing has shown result in pollution concentrations within the emissions limits as specified on this permit. [District Rule 4702]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Samir Sheikh, Executive Director / APCO

Brian Clements, Director of Permit Services

C-10021-1-1: May 26 2022 4:46PM - HONGM : Joint Inspection NOT Required

9. The SCR catalyst shall be maintained and replaced in accordance with the recommendations of the catalyst manufacturer or emission control supplier. Records of catalyst maintenance and replacement shall be maintained. [District Rules 2201 and 4702]
10. Emissions from this IC engine shall not exceed any of the following limits: 0.030 g-NO_x/bhp-hr (equivalent to 2.5 ppmv @ 15% O₂), 0.033 g-PM₁₀/bhp-hr, 1.965 g-CO/bhp-hr (equivalent to 270 ppmv @ 15% O₂), or 0.042 g-VOC/bhp-hr (equivalent to 10 ppmv @ 15% O₂). [District Rules 2201 and 4702]
11. Ammonia (NH₃) emissions from this engine shall not exceed 10 ppmvd @ 15% O₂. [District Rule 2201]
12. This IC engine shall be fired only on PUC-quality natural gas. [District Rules 2201, 4702, and 4801]
13. Source testing to measure NO_x, CO, VOC, and ammonia (NH₃) emissions from this unit shall be conducted within 60 days of initial start-up. [District Rules 1081, 2201, and 4702]
14. Source testing to measure NO_x, CO, and ammonia (NH₃) emissions from this unit shall be conducted at least once every 24 months. [District Rules 1081, 2201, and 4702]
15. {3791} Emissions source testing shall be conducted with the engine operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. [District Rule 4702]
16. The results of each source test shall be submitted to the District within 60 days after completion of the source test. [District Rule 1081]
17. {109} Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081]
18. For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. VOC emissions shall be reported as methane. NO_x, CO, VOC, and NH₃ concentrations shall be reported in ppmv, corrected to 15% oxygen. [District Rule 4702]
19. The following methods shall be used for source testing: NO_x (ppmv) - EPA Method 7E; CO (ppmv) - EPA Method 10; VOC (ppmv) - EPA Method 18, or 25A or 25B; stack gas oxygen - EPA Method 3 or 3A; stack gas velocity/volumetric flowrate - EPA Method 2 or EPA Method 19; stack gas moisture content - EPA Method 4; NH₃ - BAAQMD ST-1B or SCAQMD Method 207-1. Alternative test methods as approved by EPA and the District may be used to address the source testing requirements of this permit. [District Rules 1081, 2201, and 4702]
20. The Higher Heating Value (HHV) of the fuel gas shall be determined using ASTM D1826, ASTM 1945 in conjunction with ASTM D3588, or an alternative method approved by EPA and the District. [District Rules 2201 and 4702]
21. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NO_x, CO, and O₂ analyzer during District inspections. The sampling ports shall be located in accordance with the California Air Resources Board (CARB) document titled Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]
22. The permittee shall monitor and record the catalyst inlet and outlet temperatures and ammonia injection rate at least once per week. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last week. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 4701 and 4702]
23. The minimum acceptable catalyst temperature differential and ammonia injection rate shall be established by source testing this unit. [District Rules 4701 and 4702]

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CONDITIONS CONTINUE ON NEXT PAGE

24. If either the catalyst temperature differential or ammonia injection rate is lower than the normal range/level, the permittee shall return the temperature differential and/or ammonia injection rate to the normal range/level as soon as possible, but no longer than 8 hours after detection. If the catalyst temperature differential rate or ammonia injection rate is not returned to the normal range/level within 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a source test within 60 days of the first exceedance, to demonstrate compliance with the applicable emission limits at the new temperature differential or ammonia injection rate. A District-approved portable analyzer may be used in lieu of a source test to demonstrate compliance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 4701 and 4702]
25. The permittee shall maintain records of: (1) the date and time of temperature and ammonia injection rate measurements, (2) the measured temperatures and ammonia injection rate, and (3) a description of any corrective action taken to maintain the temperature differential and/or the ammonia injection rate within the acceptable range. [District Rules 4701 and 4702]
26. The permittee shall monitor and record the stack concentration of NO_x, CO, and O₂ at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications [In-stack O₂ monitors may be allowed if approved by the APCO.] Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]
27. The permittee shall monitor and record the stack concentration of NH₃ at least once every month in which a source test is not performed. NH₃ monitoring shall be conducted utilizing District approved gas-detection tubes or a District approved equivalent method. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rule 2201]
28. If the NO_x, CO, or NH₃ concentrations corrected to 15% O₂, as measured by the portable analyzer or the District-approved ammonia monitoring equipment, exceed the respective permitted emissions concentration(s), the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 8 hours of operation after detection. If the portable analyzer or ammonia monitoring equipment readings continue to exceed the permitted emissions concentration(s) after 8 hours of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 2201 and 4702]
29. All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 4701 and 4702]
30. {3212} The permittee shall update the I&M plan for this engine prior to any planned change in operation. The permittee must notify the District no later than seven days after changing the I&M plan and must submit an updated I&M plan to the APCO for approval no later than 14 days after the change. The date and time of the change to the I&M plan shall be recorded in the engine's operating log. For modifications, the revised I&M plan shall be submitted to and approved by the APCO prior to issuance of the Permit to Operate. The permittee may request a change to the I&M plan at any time. [District Rule 4702]

31. The permittee shall maintain records of: (1) the date and time of NO_x, CO, and O₂ measurements, (2) the O₂ concentration in percent and the measured NO_x and CO concentrations corrected to 15% O₂, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 4701 and 4702]
32. The permittee shall maintain an engine operating log to demonstrate compliance. The engine operating log shall include, on a monthly basis, the following information: the total hours of operation, the type of fuel used, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance. [District Rules 2201 and 4702]
33. All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. All records may be maintained and submitted in an electronic format approved by the District. [District Rules 1070 and 4702]

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APPENDIX B
BACT Analysis

Top-Down BACT Analysis

Previous District BACT Guideline 3.3.12 – Non-Agricultural Fossil Fuel-Fired IC Engines > 50 bhp, which was rescinded on March 7, 2019, listed the BACT requirements for full-time fossil fuel-fired IC engines. Since there is no existing District BACT guideline that applies to the natural gas-fired IC engine in this project, a project-specific BACT analysis will be performed in accordance the District BACT policy to determine the BACT requirements for the engine.

1. NO_x emissions

a. Step 1 - Identify All Possible Control Technologies

The USA Environmental Protection Agency (USEPA) RACT/BACT/LAER, the California Air Resources Board (CARB) BACT Clearinghouse, the South Coast Air Quality Management District (SCAQMD), the Bay Area Air Quality Management District (BAAQMD), and the Sacramento Metropolitan Air Quality Management District (SMAQMD) BACT Guidelines were reviewed to determine potential control technologies for this class and category of operation. The District also reviewed the applicable IC engine rules from BAAQMD, SCAQMD, and SMAQMD. The following table summarizes the results of the review of these BACT guidelines and air district rules:

BACT Guideline Source	Equipment Rating	NO _x Control Technology/Requirement
SCAQMD BACT Guidelines Part B - IC Engine, Stationary, Non-Emergency, Electrical Generators (2-5-2021)	147 bhp and 385 bhp	0.07 lb-NO _x /MW-hr (Tecogen Ultra Emissions Retrofit Kit control system, comprised of Three-Way Catalyst with Air/Fuel Ratio Controller and Oxidation Catalyst)
SCAQMD BACT Guidelines Part D IC Engine, Stationary, Non-Emergency, Electrical Generators (2-5-2018)	> 50 bhp	Compliance with SCAQMD Rule 1110.2 (2-2-2018)
SCAQMD Rule 1110.2	New non-emergency Electrical Generators > 2/1/2008	NO _x Emission Standard: 0.070 lb-NO _x /MW-hr *When determining compliance with the lb/MW-hr NO _x requirement, engines with heat recovery may include one megawatt-hour (MW-hr) for each 3.4 million Btus of useful heat recovered (MW _{th} -hr) in addition to each MW-hr of net electricity produced (MW _e -hr)
Sacramento Metropolitan AQMD BACT Determination 143 (Expired)	> 50 bhp	5 ppmvd @ 15% O ₂
Sacramento Metropolitan AQMD BACT Guidelines	N/A	Clearinghouse does not include any BACT Guidelines applicable to this source category.
Sacramento Metropolitan AQMD Rule 412	> 50 bhp	<u>Rich Burn</u> 25 ppmv @ 15% O ₂ <u>Lean Burn</u> 125 ppmv @ 15% O ₂

BACT Guideline Source	Equipment Rating	NO _x Control Technology/Requirement
Bay Area AQMD BACT Workbook Spark Ignition – Natural Gas Fired (Lean Burn)	≥ 50 bhp	<u>Achieved in Practice</u> 0.15 g/bhp-hr (12 ppmv @ 15% O ₂) <u>Technologically Feasible</u> 0.07 g/bhp-hr (6 ppmv @ 15% O ₂)
Bay Area AQMD BACT Workbook Spark Ignition, Natural Gas-Fired (Rich Burn)	≥ 50 bhp	<u>Achieved in Practice</u> 0.15 g/bhp-hr (9 ppmv @ 15% O ₂) <u>Technologically Feasible</u> 0.071 g/bhp-hr (4 ppmv @ 15% O ₂)
Bay Area AQMD BACT Workbook Internal Combustion Engine Stationary prime, Non-Agricultural (Compression Ignited)	> 50 bhp	Latest Tier Standard (Achieved in Practice) 85% reduction of current Tier Standard (Technologically Feasible)
Bay Area AQMD Regulation 9, Rule 8	> 50 bhp	<u>Lean Burn Engines</u> 70 ppmv @ 15% O ₂ <u>Rich Burn Engines</u> 70 ppmv @ 15% O ₂ <u>Compression Ignited Engines</u> 51 to 175 bhp: 180 ppmv @ 15% O ₂ > 175 bhp: 110 ppmv @ 15% O ₂
Santa Barbara APCD (From CARB BACT Clearinghouse) ICE: 881 BHP Lean Burn IC Engine used for Cogeneration (2015)	N/A	5 ppmv @ 15% O ₂ ; 0.063 g/bhp-hr (0.154 lb/MW-hr)
EPA New Source Performance Standards (NSPS) 40 CFR Part 60 Subpart IIII	N/A	Tier 4 Final for compression ignition IC engines (0.3 g-NO _x /bhp-hr – 0.5 g-NO _x /bhp-hr)
EPA New Source Performance Standards (NSPS) 40 CFR Part 60 Subpart JJJJ	N/A	1.0 g-NO _x /bhp-hr
EPA National Emission Standards for Hazardous Air Pollutants (NESHAPS) 40 CFR Part 63 Subpart ZZZZ	N/A	No Standard

Additionally, the District performed a detailed industry survey and review of IC engines permitted within the District that are used for electric power generation. The following survey is divided into two subcategories:

- **First Table:** IC engines with heat recovery
- **Second Table:** IC engines without heat recovery

For cogeneration units with a heat recovery system, the quantity of heat recovered was determined either from the manufacturer's data provided in the original permitting action, or from information that was provided by the facility for previous analyses.

As part of the industry survey, the District reviewed up to three recent emissions source tests to gather the NO_x emissions data for each engine. The following tables summarize the Districts review of NO_x emissions from permitted engines used for power generation.

NOTE:

For each table below:

- Green Highlight IC Engine Achieves 0.070 lb-NO_x/MW-hr or less
- Red Highlight IC Engine Does not Achieve 0.070 lb-NO_x/MW-hr

NO _x Data for Engines Used for Power Generation With a Heat Recovery System								
Facility and Permit Unit	bhp Rating	Generator Rating (kW)	Permitted NO _x Limit (ppmv at 15% O ₂)	Heat Recovered-Design Value (MMBtu/hr)	lb-NO _x /MW-hr (based on permitted NO _x limit, with heat recovery)	NO _x Source Test data (ppmv at 15% O ₂)		lb-NO _x /MW-hr (based on highest NO _x source test result, with heat recovery)
						Year	Result	
Atwater High N-1306-2-2	86	60	5	0.44	0.095	2013	1.23	0.018
						2015	1	
						2017	0.1	
Ripon Unified N-686-3-0	122	60	5	0.366	0.084	2014	0.07	0.045
						2016	2.6	
Sanger Unified C-3563-11-1	86	60	5	0.44	0.074	2013	1.6	0.024
						2015	1.6	
						2017	1.6	
Sanger Unified C-3563-12-1	86	60	5	0.44	0.074	2013	1.4	0.030
						2015	0.4	
						2017	2.0	
Sanger Unified C-7162-3-0	122	60	5	0.366	0.084	2012	0.7	0.024
						2014	0.01	
						2016	1.37	
Sanger Unified C-7162-4-0	122	60	5	0.366	0.084	2012	0.01	0.029
						2014	0.07	
						2016	1.68	
Dynatect Ro-Lab Inc. N-704-10-0	108	75	5	0.49	0.078	2014	0.6	0.049
						2016	0.6	
						2018	3.27	
Dynatect Ro-Lab Inc N-704-11-0	108	75	5	0.49	0.078	2014	0.1	0.002
						2016	0.02	
						2018	0.0	
Valley Chrome Plating C-1318-7-1	108	75	5	0.49	0.078	2013	0.2	0.006
						2015	0.2	
						2017	0.4	
Merced Community College N-2903-3-1	122	85	25	0.518	0.392	2013	6.7	0.105
						2015	2.4	
						2017	1.53	
Merced Community College N-2903-4-1	122	85	25	0.518	0.392	2013	7.5	0.118
						2015	0.18	
						2017	2.27	
Yosemite Union High School C-1801-4-2	122	90	11	0.499	0.173	2012	7.4	0.117
						2014	0.1	
						2016	1.2	
Yosemite Union High School	122	90	11	0.499	0.173	2013	4.0	0.063
						2015	4.0	

NO _x Data for Engines Used for Power Generation With a Heat Recovery System								
Facility and Permit Unit	bhp Rating	Generator Rating (kW)	Permitted NO _x Limit (ppmv at 15% O ₂)	Heat Recovered-Design Value (MMBtu/hr)	lb-NO _x /MW-hr (based on permitted NO _x limit, with heat recovery)	NO _x Source Test data (ppmv at 15% O ₂)		lb-NO _x /MW-hr (based on highest NO _x source test result, with heat recovery)
						Year	Result	
C-1801-5-1						2017	2.4	
Pacific Choice Brands C-906-9-1	197	140	5	0.67	0.08	2011	0.3	0.088*
						2013	0.5	
						2016	5.4 ⁴	
						2014	0.3	
Super Store Industries N-3232-5-1	379	280	9	0.31824	0.241	2016	1.65	0.053
						2018	1.98	
						2014	0.54	
Super Store Industries N-3232-6-1	379	280	9	0.31824	0.241	2016	1.59	0.054
						2018	2.01	
						2014	1.57	
Super Store Industries N-3232-7-1	379	280	9	0.31824	0.241	2016	3.01	0.080
						2018	2.31	
						2014	2.99	
Super Store Industries N-3232-8-1	379	280	9	0.31824	0.241	2016	1.04	0.080
						2018	1.3	
						2014	2	
Calamco Cogen N-7082-3-0	566	375	6	0.578	0.209	2016	3.3	0.115
						2018	1.4	
						2011	1.35	
County of Tulare S-1609-4-1	1,049	759	9	2.0	0.101	2012	5	0.056
						2013	4.26	
						2010	1.9	
Western Co-Gen C-4161-1-3	1,529	1,140	9	2.41	0.122	2011	5.2	0.070
						2012	2.6	
						2013	1.7	
Western Co-Gen C-4161-2-3	1,529	1,140	9	2.41	0.122	2014	0.6	0.062
						2015	4.6	
						2013	3.7	
Fresno County Maintenance C-1629-6-1	1,737	1,250	5	2.57	0.103	2014	3	0.076
						2015	2.7	
						2016	2	
Hilmar Cheese Turlock N-9141-3-1	3,681	2,652	5	8.542	0.082	2018	2.7	0.044
						2016	2	
Hilmar Cheese Turlock N-9141-4-1	3,681	2,652	5	8.542	0.082	2018	3.1	0.051
						2016	2	
Super Store Industries N-3232-7-1	379	280	9	0.31824	0.241	2014	1.57	0.080
						2016	3.01	
						2018	2.31	
Super Store Industries N-3232-8-1	379	280	9	0.31824	0.241	2014	2.99	0.080
						2016	1.04	
						2018	1.3	
Calamco Cogen N-7082-3-0	566	375	6	0.578	0.209	2014	2	0.115
						2016	3.3	
						2018	1.4	
County of Tulare S-1609-4-1	1,049	759	9	2.0	0.101	2011	1.35	0.056
						2012	5	
						2013	4.26	
Western Co-Gen	1,529	1,140	9	2.41	0.122	2010	1.9	0.070

⁴ Unit C-906-9-1 failed its 2016 source test for NO_x

NO _x Data for Engines Used for Power Generation With a Heat Recovery System								
Facility and Permit Unit	bhp Rating	Generator Rating (kW)	Permitted NO _x Limit (ppmv at 15% O ₂)	Heat Recovered-Design Value (MMBtu/hr)	lb-NO _x /MW-hr (based on permitted NO _x limit, with heat recovery)	NO _x Source Test data (ppmv at 15% O ₂)		lb-NO _x /MW-hr (based on highest NO _x source test result, with heat recovery)
						Year	Result	
C-4161-1-3						2011	5.2	
						2012	2.6	
Western Co-Gen C-4161-2-3	1,529	1,140	9	2.41	0.122	2013	1.7	0.062
						2014	0.6	
						2015	4.6	
Fresno County Maintenance C-1629-6-1	1,737	1,250	5	2.57	0.103	2013	3.7	0.076
						2014	3	
						2015	2.7	
Hilmar Cheese Turlock N-9141-3-1	3,681	2,652	5	8.542	0.082	2016	2	0.044
						2018	2.7	
Hilmar Cheese Turlock N-9141-4-1	3,681	2,652	5	8.542	0.082	2016	2	0.051
						2018	3.1	

NO _x Data for Engines Used for Power Generation Without a Heat Recovery System							
Facility and Permit Unit	bhp Rating	Generator Rating (kW)	Permitted NO _x Limit (ppmv at 15% O ₂)	lb-NO _x /MW-hr (based on permitted limit)	NO _x Source Test data (ppmv at 15% O ₂)		lb-NO _x /MW-hr (based on highest source test result)
					Year	Result	
California Power Holdings C-3775-1-9	4,157	3,100	9	0.207	2013	5.26	0.170
					2015	7.4	
					2017	4.7	
California Power Holdings C-3775-2-9	4,157	3,100	9	0.207	2013	2.56	0.103
					2015	2.1	
					2017	4.5	
California Power Holdings C-3775-3-9	4,157	3,100	9	0.207	2013	6.34	0.146
					2015	3.4	
					2017	4.4	
California Power Holdings C-3775-4-9	4,157	3,100	9	0.207	2013	7.12	0.165
					2015	5.7	
					2017	7.2	
California Power Holdings C-3775-5-9	4,157	3,100	9	0.207	2013	7.3	0.168
					2015	3.7	
					2017	6.6	
California Power Holdings C-3775-6-9	4,157	3,100	9	0.207	2013	4.85	0.154
					2015	6.7	
					2017	6.3	
California Power Holdings C-3775-7-9	4,157	3,100	9	0.207	2013	6.88	0.205
					2015	4.9	
					2017	8.9	
California Power Holdings C-3775-8-9	4,157	3,100	9	0.207	2013	6.64	0.186
					2015	8.1	
					2017	5.1	
California Power Holdings C-3775-9-9	4,157	3,100	9	0.207	2013	5.01	0.156
					2015	6.8	
					2017	6.7	
California Power Holdings C-3775-10-9	4,157	3,100	9	0.207	2013	6.15	0.198
					2015	7.4	
					2017	8.6	

NO _x Data for Engines Used for Power Generation Without a Heat Recovery System							
Facility and Permit Unit	bhp Rating	Generator Rating (kW)	Permitted NO _x Limit (ppmv at 15% O ₂)	lb-NO _x /MW-hr (based on permitted limit)	NO _x Source Test data (ppmv at 15% O ₂)		lb-NO _x /MW-hr (based on highest source test result)
					Year	Result	
California Power Holdings C-3775-11-9	4,157	3,100	9	0.207	2013	5.64	0.140
					2015	2.3	
					2017	6.1	
California Power Holdings C-3775-12-9	4,157	3,100	9	0.207	2013	5.91	0.136
					2015	2.1	
					2017	3.8	
California Power Holdings C-3775-13-9	4,157	3,100	9	0.207	2013	5.17	0.140
					2015	4.3	
					2017	6.1	
California Power Holdings C-3775-14-9	4,157	3,100	9	0.207	2013	6.33	0.145
					2015	2.7	
					2017	3.2	
California Power Holdings C-3775-15-9	4,157	3,100	9	0.207	2013	5.46	0.184
					2015	8	
					2017	4.3	
California Power Holdings C-3775-16-9	4,157	3,100	9	0.207	2013	4.89	0.112
					2015	4.4	
					2017	4.3	
Modesto Irrigation District N-3233-6-3	11,667	8,440	5	0.157	2016	3.4	0.110
					2017	3.5	
					2018	3.2	
Modesto Irrigation District N-3233-7-3	11,667	8,440	5	0.157	2016	3.2	0.110
					2017	1.6	
					2018	3.5	
Modesto Irrigation District N-3233-8-3	11,667	8,440	5	0.157	2016	2.7	0.110
					2017	3.5	
					2018	2.6	
Modesto Irrigation District N-3233-9-3	11,667	8,440	5	0.157	2016	3.4	0.113
					2017	3.3	
					2018	3.6	
Modesto Irrigation District N-3233-10-3	11,667	8,440	5	0.157	2016	3.4	0.110
					2017	3.4	
					2018	3.5	
Modesto Irrigation District N-3233-11-3	11,667	8,440	5	0.157	2016	3.5	0.113
					2017	1.8	
					2018	3.6	

Based on an extensive review of California air district rules and BACT guidelines, and a survey of source tests for IC engines permitted in the District, the following NO_x control options were identified:

NO_x Control Option #1: 5 ppmvd NO_x @ 15% O₂ or 0.07 g-NO_x/bhp-hr

This option is based upon the District's previous Achieved-in Practice BACT Guideline requirements and has been achieved by multiple units within the District.

NO_x Control Option #2: 0.070 lb-NO_x/MW-hr

This option is based on South Coast AQMD Rule 1110.2 and the SCAQMD BACT requirements for IC engines installed after February 1, 2008 that are used for non-emergency electrical generation. The emission level of this NO_x option is equivalent to the NO_x emission level required by the California Air Resources Board's Distributed Generation Certification Regulation for this type of equipment, which applies to units that do not require permits from California air Districts. Several units operating within the District have source tested at levels that achieve the 0.070 lb-NO_x/MW-hr limit.

South Coast AQMD Rule 1110.2 allows operators of IC engines used to generate both heat and electric power to demonstrate compliance with the NO_x emissions standard of 0.070 lb/MW-hr by taking credit for the recovered thermal energy of one MW-hr for each 3.4 million Btus of heat recovered.

Based on data obtained for the permitted IC engines operating within SJVAPCD, the 0.070 lb-NO_x/MW-hr limit is approximately equivalent to:

- 4 ppmvd NO_x @ 15% O₂ for units with heat recovery
- 2.5 ppmvd NO_x @ 15% O₂ for units without heat recovery

Furthermore, South Coast Rule 1110.2 indicates that 2.5 ppmvd NO_x @ 15% O₂ complies with the 0.070 lb-NO_x/MW-hr limit for units without heat recovery.

NO_x Control Option #3: 2 ppmvd NO_x @ 15% O₂ Natural Gas-Fired Turbine

This option was listed as Alternate Basic Equipment in the District's previous BACT Guideline 3.3.12, but is generally only applicable to projects that produce more than 3 MW of electricity, as discussed below.

NO_x Control Option #4: Electric Motor (except for engines that will be used to generate electricity)

This option was listed as Alternate Basic Equipment in the District's previous BACT Guideline 3.3.12, but is not applicable for engines used to generate electricity.

b. Step 2 - Eliminate technologically infeasible options

NO_x Control Option #3: 2 ppmvd NO_x @ 15% O₂ Natural Gas-Fired Turbine (Alternate Basic Equipment)

Option 3, Natural Gas-Fired Turbine with 2 ppmvd NO_x @ 15% O₂, was determined to be infeasible for the proposed project because the proposed project would require a natural gas-fired turbine rated approximately 1,200 kWe and natural gas-fired turbines rated less than 3 MW typically are not capable of consistently complying with a NO_x emission limit of 2 ppmv @ 15% O₂, but are generally permitted or certified to comply with higher NO_x emission rates. In addition, the available information indicates that the principal suppliers of gas turbines are not currently actively marketing gas turbines for used for electrical generation rated less than 3 MW because

this size range is generally covered by other generation technologies such as reciprocating IC engines and microturbines.

Because the proposed project would require a gas turbine rated less than 3 MW, which would not be able to consistently comply with a NO_x emission limit of 2 ppmv @ 15% O₂, a natural gas-fired turbine with NO_x emissions of 2 ppmv @ 15% O₂ is not considered feasible for this particular project and will be eliminated from consideration. However, the NO_x emission limit that the applicant has proposed for the natural gas-fired engine, 0.030 g-NO_x/bhp-hr (equivalent to 2.5 ppmvd NO_x @ 15% O₂), is expected to be no greater than the NO_x emission limit that would be achieved by a comparably sized gas turbine.

NO_x Control Option #4: Electric Motor (except for engines that will be used to generate electricity) (Alternate Basic Equipment)

Option 4, Electric Motor, is not feasible for the project since the engine will be used to generate electric power; therefore, this option will be eliminated from consideration.

c. Step 3 - Rank remaining options by control effectiveness

- 1) 0.070 lb-NO_x/MW-hr* (approximately 2.5 ppmvd NO_x @ 15% O₂ for units without heat recovery and 4 ppmv NO_x @ 15% O₂ for units with heat recovery) (based on SCAQMD Rule 1110.2 - Achieved in Practice)

*When determining compliance with the lb/MW-hr NO_x requirement, engines with heat recovery may include up to one megawatt-hour (MW-hr) for each 3.4 million Btus of useful heat recovered (MW_{th-hr}) in addition to each MW-hr of net electricity produced (MW_{e-hr})

- 2) 0.070 g-NO_x/bhp-hr or 5 ppmvd NO_x @ 15% O₂ (Achieved in Practice)

d. Step 4 - Cost Effectiveness Analysis

The applicant has proposed the highest ranked control option identified above and this option has been determined to be achieved in practice. Therefore, a cost effectiveness analysis is not required.

e. Step 5 - Select BACT

Pursuant to the above BACT Analysis, BACT for NO_x emissions from the natural gas-fired engine in this project is NO_x emissions ≤ 2.5 ppmv @ 15% O₂ (equivalent to 0.070 lb-NO_x/MW-hr) without heat recovery. The applicant has proposed an IC engine with 2.5 ppmv @ 15% O₂ for NO_x emissions. Therefore, the BACT requirements for NO_x will be satisfied.

2. PM₁₀ emissions

a. Step 1 - Identify All Possible Control Technologies

The District's most recent previous BACT guideline full-time fossil fuel-fired IC engines, District BACT Guideline 3.3.12, listed the following BACT requirements for PM₁₀ from full-time fossil fuel-fired IC engines.

Previous SJVAPCD BACT Guideline 3.3.12 for Fossil Fuel-Fired IC Engines PM ₁₀ Emission Requirements		
Achieved in Practice	Technologically Feasible	Alternate Basic Equipment
1. For Compression Ignited Engines: 0.01 g-PM ₁₀ /bhp-hr 2. For Spark Ignited Engines: 0.06 g/bhp-hr (Total PM ₁₀)*	--	Electric Motor (except for engines that will be used to generate electricity)

* This total PM₁₀ emission limit is based on EPA Method 5 (front half and back half) testing, which typically yields results as much as four times higher than when using the ISO 8178 Test Method. The ISO 8178 Test Method only reports filterable (i.e. front half) emissions.

In addition, the USA Environmental Protection Agency (USEPA) RACT/BACT/LAER, the California Air Resources Board (CARB) BACT Clearinghouse, and the South Coast Air Quality Management District (SCAQMD), the Bay Area Air Quality Management District (BAAQMD), and the Sacramento Metropolitan Air Quality Management District (SMAQMD) BACT Guidelines were reviewed to determine potential control technologies for this class and category of operation. The District also reviewed the applicable IC engine rules from BAAQMD, SCAQMD, and SMAQMD. The following table summarizes the results of the review of these BACT guidelines and air district rules:

BACT Requirement Source	Equipment Rating	PM ₁₀ Control Technology/Requirement
SCAQMD BACT Guidelines Part D IC Engine, Stationary, Non-Emergency, Electrical Generators (2-2-2018)	> 50 bhp	Utilization of a Clean Fuel in accordance with SCAQMD Policy in Part C Of SCAQMD BACT Guidelines (e.g. natural gas, liquid petroleum gas (LPG), hydrogen, and electricity) (12-02-2016) Compliance with SCAQMD Rule 1470 (12-02-2016) for stationary diesel IC engines (CARB diesel fuel and 0.01 g-PM ₁₀ /bhp-hr)
SCAQMD Rule 1110.2	New non-emergency Electrical Generators > 2/1/2008	No PM ₁₀ requirement listed
Sacramento Metropolitan AQMD Rule 412	> 50 bhp	No PM ₁₀ requirement listed
Bay Area AQMD BACT Workbook Spark Ignition – Natural Gas Fired (Lean Burn)	≥ 50 bhp	Use of natural gas fuel

BACT Requirement Source	Equipment Rating	PM ₁₀ Control Technology/Requirement
Bay Area AQMD BACT Workbook Spark Ignition, Natural Gas-Fired (Rich Burn)	≥ 50 bhp	Use of natural gas fuel
Bay Area AQMD BACT Workbook Internal Combustion Engine Stationary prime, Non-Agricultural (Compression Ignited)	> 50 bhp	0.01 g/bhp-hr
Bay Area AQMD Regulation 9, Rule 8	> 50 bhp	No PM ₁₀ requirement listed
Santa Barbara APCD (From CARB BACT Clearinghouse) ICE: 881 BHP Lean Burn IC Engine used for Cogeneration (2015)	N/A	No PM ₁₀ requirement listed
EPA New Source Performance Standards (NSPS) 40 CFR Part 60 Subpart IIII	N/A	Tier 4 Final for compression ignition IC engines (0.015 g-PM ₁₀ /bhp-hr – 0.022 g-PM ₁₀ /bhp-hr)
EPA New Source Performance Standards (NSPS) 40 CFR Part 60 Subpart JJJJ	N/A	No Standard
EPA National Emission Standards for Hazardous Air Pollutants (NESHAPS) 40 CFR Part 63 Subpart ZZZZ	N/A	No Standard

Additionally, the District reviewed information regarding PM₁₀ emission factors for IC engines permitted within the District. However, because source testing of PM emissions has generally not been required for combustion of natural gas, there are very few source tests that confirm the permitted PM₁₀ emission factors for natural gas-fired reciprocating IC engines. The PM₁₀ emission factors used for permitting of natural gas-fired reciprocating IC engines in the District have typically been based on AP-42, Section 3.2 Natural Gas-fired Reciprocating Engines, assuming a 35% engine efficiency. The District also uses emission factors based on AP-42 for permitting natural gas-fired emergency IC engines in the Guideline for Expedited Application Review (GEAR) - 11.4 NG-Natural Gas-Fired Emergency/Emergency Standby IC Engines. The PM₁₀ emission factors for natural gas-fired reciprocating IC engines based on AP-42, Section 3.2 Natural Gas-fired Reciprocating Engines (July 2000) are calculated below.

PM₁₀ Emission Factor for 4-Stroke Lean-Burn Engines Based on AP-42

PM₁₀ (filterable): 7.71×10^{-5}

PM (condensable): 9.91×10^{-3}

Total PM₁₀: $7.71 \times 10^{-5} + 9.91 \times 10^{-3} = 9.9871 \times 10^{-3}$

$$0.0099871 \frac{\text{lb PM}_{10}}{\text{MMBtu}} \times \frac{1 \text{ MMBtu}}{10^6 \text{ Btu}} \times \frac{1 \text{ Btu}_{\text{in}}}{0.35 \text{ Btu}_{\text{out}}} \times \frac{2,545 \text{ Btu}}{1 \text{ bhp} - \text{hr}} \times \frac{453.59 \text{ g}}{1 \text{ lb}} = 0.033 \frac{\text{g PM}_{10}}{\text{bhp} - \text{hr}}$$

PM₁₀ Emission Factor for 4-Stroke Rich-Burn Engines Based on AP-42

PM₁₀ (filterable): 9.50 x 10⁻³

PM (condensable): 9.91 x 10⁻³

Total PM₁₀: 9.50 x 10⁻³ + 9.91 x 10⁻³ = 1.941 x 10⁻²

$$0.01941 \frac{\text{lb PM}_{10}}{\text{MMBtu}} \times \frac{1 \text{ MMBtu}}{10^6 \text{ Btu}} \times \frac{1 \text{ Btu}_{\text{in}}}{0.35 \text{ Btu}_{\text{out}}} \times \frac{2,545 \text{ Btu}}{1 \text{ bhp} - \text{hr}} \times \frac{453.59 \text{ g}}{1 \text{ lb}} = 0.064 \frac{\text{g PM}_{10}}{\text{bhp} - \text{hr}}$$

Examples of PM₁₀ emission limits in District ATC permits and Permits to Operate (PTOs) for non-emergency natural gas-fired IC engines are shown in the following table.

Examples of PM₁₀ Permit Limits for Non-Emergency Natural Gas-Fired IC Engines		
Facility Name and Permit Number	Permit Limit for PM₁₀	Basis
Lakeside Pipeline LLC ATC C-9441-2-1	0.06 g/bhp-hr	Project-Specific BACT Analysis
Lakeside Pipeline LLC ATC C-9441-3-1	0.06 g/bhp-hr	Project-Specific BACT Analysis
Biorem Energy, LLC ATC C-9639-2-0	0.033 g/bhp-hr	AP-42
Biorem Energy, LLC ATC C-9639-3-0	0.033 g/bhp-hr	AP-42
Biorem Energy, LLC ATC C-9639-4-0	0.033 g/bhp-hr	AP-42
West Hills Community College District, PTO C-7970-1-1	0.063 g/bhp-hr	AP-42
West Hills Community College District, PTO C-7970-2-1	0.063 g/bhp-hr	AP-42
E & J Gallo Winery PTO N-1237-605-3	0.033 g/bhp-hr	AP-42
E & J Gallo Winery PTO N-1237-606-2	0.033 g/bhp-hr	AP-42
JP Oil Co Inc PTO S-8561-4-0	0.033 g/bhp-hr	AP-42

Based on the above data, the following PM₁₀ control options were identified for compression-ignited and spark-ignited IC engines:

PM₁₀ Control Option #1

- For Compression Ignited Engines: 0.01 g-PM₁₀/bhp-hr;
- For Lean-Burn Spark-Ignited Engines: 0.033 g-PM₁₀/bhp-hr
- For Rich-Burn Spark-Ignited Engines: 0.06 g-PM₁₀/bhp-hr

This option is based upon the District's previous Achieved-in-Practice BACT Guideline requirements and multiple units within the District have been permitted with these limits.

PM₁₀ Control Option #2: Electric Motor (except for engines that will be used to generate electricity)

This option was listed as Alternate Basic Equipment in the District's previous BACT Guideline 3.3.12, but is not applicable for engines used to generate electricity.

b. Step 2 - Eliminate technologically infeasible options

PM₁₀ Control Option #2: Electric Motor (except for engines that will be used to generate electricity) (Alternate Basic Equipment)

Option 2, Electric Motor, is not feasible for the project since the engine will be used to generate electric power; therefore, this option will be eliminated from consideration.

c. Step 3 - Rank remaining options by control effectiveness

1) Use of an engine meeting the following limits (Achieved in Practice):

- For Compression Ignited Engines: 0.01 g-PM₁₀/bhp-hr
- For Lean-Burn Spark-Ignited Engines: 0.033 g-PM₁₀/bhp-hr
- For Rich-Burn Spark-Ignited Engines: 0.06 g-PM₁₀/bhp-hr

d. Step 4 - Cost Effectiveness Analysis

The applicant has proposed the highest ranked control option identified above and this option has been determined to be achieved in practice. Therefore, this option is required and a cost effectiveness analysis is not needed.

e. Step 5 - Select BACT

Pursuant to the above BACT Analysis, BACT for PM₁₀ emissions from the engine in this project is PM₁₀ emissions ≤ 0.033 g-PM₁₀/bhp-hr. The applicant has proposed an IC engine with PM₁₀ emissions ≤ 0.033 g-PM₁₀/bhp-hr. Therefore, the BACT requirements for PM₁₀ will be satisfied.

3. BACT Analysis for VOC Emissions:

a. Step 1 - List all control technologies

The District's most recent previous BACT guideline full-time fossil fuel-fired IC engines, District BACT Guideline 3.3.12, listed the following BACT requirements for VOC from full-time fossil fuel-fired IC engines.

Previous SJVAPCD BACT Guideline 3.3.12 for Fossil Fuel-Fired IC Engines VOC Emission Requirements		
Achieved in Practice	Technologically Feasible	Alternate Basic Equipment
1. For all Compression Ignited engines: Use of an engine meeting the latest Tier standard 2. For all Spark Ignited engines: 25 ppmvd @ 15% O ₂ or 0.15 g/bhp-hr	1. For all Compression Ignited Engines: 50 percent reduction of latest Tier standard for VOC emissions using a catalytic oxidation system 2. For Rich Burn Spark Ignited engines: 12 ppmvd @ 15% O ₂ or 0.069 g/bhp-hr	Electric Motor (except for engines that will be used to generate electricity)

In addition, the USA Environmental Protection Agency (USEPA) RACT/BACT/LAER, the California Air Resources Board (CARB) BACT Clearinghouse, and the South Coast Air Quality Management District (SCAQMD), the Bay Area Air Quality Management District (BAAQMD), and the Sacramento Metropolitan Air Quality Management District (SMAQMD) BACT Guidelines were reviewed to determine potential control technologies for this class and category of operation. The District also reviewed the applicable IC engine rules from BAAQMD, SCAQMD, and SMAQMD. The following table summarizes the results of the review of these BACT guidelines and air district rules:

BACT Guideline Source	Equipment Rating	VOC Control Technology/Requirement
SCAQMD BACT Guidelines Part B - IC Engine, Stationary, Non-Emergency, Electrical Generators (2-5-2021)	147 bhp and 385 bhp	0.1 lb-VOC/MW-hr (Tecogen Ultera Emissions Retrofit Kit control system, comprised of Three-Way Catalyst with Air/Fuel Ratio Controller and Oxidation Catalyst)
SCAQMD BACT Guidelines Part D IC Engine, Stationary, Non-Emergency, Electrical Generators (2-2-2018)	> 50 bhp	Compliance with SCAQMD Rule 1110.2 (12-02-2016)
SCAQMD Rule 1110.2	New non-emergency Electrical Generators > 2/1/2008	VOC Emission Standard: 0.10 lb-VOC/MW-hr *When determining compliance with the lb/MW-hr VOC requirement, engines with heat recovery may include one megawatt-hour (MW-hr) for each 3.4 million Btus of useful heat recovered (MW _{th} -hr) in addition to each MW-hr of net electricity produced (MW _e -hr)
Sacramento Metropolitan AQMD BACT Determination 143 (Expired)	> 50 bhp	25 ppmvd @ 15% O ₂
Sacramento Metropolitan AQMD Rule 412	> 50 bhp	750 ppmv @ 15% O ₂

BACT Guideline Source	Equipment Rating	VOC Control Technology/Requirement
Bay Area AQMD BACT Workbook Spark Ignition – Natural Gas Fired (Lean Burn)	≥ 50 bhp	<u>Achieved in Practice</u> 0.15 g/bhp-hr (32 ppmv @ 15% O ₂)
Bay Area AQMD BACT Workbook Spark Ignition, Natural Gas-Fired (Rich Burn)	≥ 50 bhp	<u>Achieved in Practice</u> 0.15 g/bhp-hr (25 ppmv @ 15% O ₂) <u>Technologically Feasible</u> 0.069 g/bhp-hr (12 ppmv @ 15% O ₂)
Bay Area AQMD BACT Workbook Internal Combustion Engine Stationary prime, Non-Agricultural (Compression Ignited)	> 50 bhp	Latest Tier Standard (Achieved in Practice) 50% reduction of current Tier Standard (Technologically Feasible)
Bay Area AQMD Regulation 9, Rule 8	> 50 bhp	None
Santa Barbara APCD (From CARB BACT Clearinghouse) ICE: 881 BHP Lean Burn IC Engine used for Cogeneration (2015)	N/A	0.115 g/bhp-hr
EPA New Source Performance Standards (NSPS) 40 CFR Part 60 Subpart IIII	N/A	Compliance with Latest Tier Emission limits (Tier 4) 3.5 g/bhp-hr (NO _x + VOC) for Compression Ignited Engines rated between 50 BHP and 75 BHP 0.14 g-VOC/bhp-hr for Compression Ignited Engines rated at 75 BHP and greater
EPA New Source Performance Standards (NSPS) 40 CFR Part 60 Subpart JJJJ	N/A	0.7 g-VOC/bhp-hr or 60 ppmvd (as propane) @ 15% O ₂
EPA National Emission Standards for Hazardous Air Pollutants (NESHAPS) 40 CFR Part 63 Subpart ZZZZ	N/A	None

Additionally, the District performed a detailed industry survey and review of IC engines permitted within the District that are used for electric power generation. The following survey is divided into two subcategories:

- **First Table:** IC engines with heat recovery
- **Second Table:** IC engines without heat recovery

For cogeneration units with a heat recovery system, the quantity of heat recovered was determined either from the manufacturer's data provided in the original permitting action, or from information that was provided by the facility for previous analyses.

As part of the industry survey, the District reviewed up to three recent emissions source tests to gather the VOC emissions data for each engine. The following tables summarize the Districts review of VOC emissions from permitted engines used for power generation.

NOTE:

For each table below:

Green Highlight	IC Engine Achieves 0.10 lb-VOC/MW-hr or less
Red Highlight	IC Engine Does not Achieve 0.10 lb-VOC/MW-hr

VOC Data for Engines Used for Power Generation With a Heat Recovery System								
Facility and Permit Unit	bhp Rating	Generator Rating (kW)	Permitted VOC Limit (ppmv at 15% O ₂)	Heat Recovered -Design Value (MMBtu/hr)	lb-VOC/MW-hr (based on permitted VOC limit, with heat recovery)	VOC Source Test data (ppmv at 15% O ₂)		lb-VOC/MW-hr (based on highest VOC source test result, with heat recovery)
						Year	Result	
Atwater High N-1306-2-2	86	60	30	0.44	0.153	2013	0.05	0.0003
Ripon Unified N-686-3-0	122	60	30	0.366	0.179	2014	1.73	0.0104
						2016	0.61	
Dynatect Ro-Lab Inc. N-704-10-0	108	75	30	0.49	0.16	2014	0.4	0.0389
						2016	0.504	
						2018	7.4	
Dynatect Ro-Lab Inc N-704-11-0	108	75	30	0.49	0.16	2014	0.66	0.0440
						2016	1.07	
						2018	8.36	
Valley Chrome Plating C-1318-7-1	108	75	25	0.49	0.132	2013	0.99	0.0052
						2015	0.9	
						2017	0.9	
Yosemite Union High School C-1801-4-2	122	90	34	0.499	0.186	2012	3.4	0.0187
						2014	0.2	
						2016	0.5	
Yosemite Union High School C-1801-5-1	122	90	34	0.499	0.186	2013	2.2	0.0121
						2015	0.5	
						2017	0.5	
Pacific Choice Brands C-906-9-1	197	140	30	0.67	0.169	2011	0.3	0.0017
						2013	0.3	
						2016	0.03	
Super Store Industries N-3232-5-1	379	280	25	0.31824	0.23	2014	0.88	0.0437
						2016	1.01	
						2018	4.72	
Super Store Industries N-3232-6-1	379	280	25	0.31824	0.23	2014	3.01	0.0374
						2016	4.04	
						2018	2.88	
Super Store Industries N-3232-7-1	379	280	25	0.31824	0.23	2014	0.31	0.0496
						2016	4.03	
						2018	5.36	
Super Store Industries N-3232-8-1	379	280	25	0.31824	0.23	2014	1.41	0.0182
						2016	1.97	
						2018	1.49	
County of Tulare S-1609-4-1	1049	759	30	2	0.117	2011	5.13	0.0200
						2012	0.21	
						2013	2.42	
Western Co-Gen C-4161-1-3	1529	1140	25	2.41	0.117	2010	15.1	0.0709
						2011	10.8	
						2012	6.1	
Western Co-Gen C-4161-2-3	1529	1140	25	2.41	0.117	2013	4.4	0.0254
						2014	5.4	
						2015	1.02	

VOC Data for Engines Used for Power Generation With a Heat Recovery System								
Facility and Permit Unit	bhp Rating	Generator Rating (kW)	Permitted VOC Limit (ppmv at 15% O ₂)	Heat Recovered -Design Value (MMBtu/hr)	lb-VOC/MW-hr (based on permitted VOC limit, with heat recovery)	VOC Source Test data (ppmv at 15% O ₂)		lb-VOC/MW-hr (based on highest VOC source test result, with heat recovery)
						Year	Result	
Fresno County Maintenance C-1629-6-1	1737	1250	25	2.57	0.178	2013	45 ⁵	0.3216 ⁵
						2014	2.7	
						2015	3.2	
Hilmar Cheese Turlock N-9141-3-1	3681	2652	25	8.542	0.142	2016	2.8	0.0159
						2018	1.9	
Hilmar Cheese Turlock N-9141-4-1	3681	2652	25	8.542	0.142	2016	2	0.0142
						2018	2.5	

VOC Data for Engines Used for Power Generation Without a Heat Recovery System								
Facility and Permit Unit	bhp Rating	Generator Rating (kW)	Permitted VOC Limit (ppmv at 15% O ₂)	lb-VOC/MW-hr (based on permitted limit)	VOC Source Test data (ppmv at 15% O ₂)		lb-VOC/MW-hr (based on highest source test result)	
					Year	Result		
California Power Holdings C-3775-1-9	4157	3100	30	0.355	2013	0.5	0.0106	
					2015	0.9		
					2017	0.5		
California Power Holdings C-3775-2-9	4157	3100	30	0.355	2013	0.5	0.0237	
					2015	2		
					2017	0.5		
California Power Holdings C-3775-3-9	4157	3100	30	0.355	2013	0.7	0.0083	
					2015	0.7		
					2017	0.5		
California Power Holdings C-3775-4-9	4157	3100	30	0.355	2013	0.49	0.0059	
					2015	0.3		
					2017	0.5		
California Power Holdings C-3775-5-9	4157	3100	30	0.355	2013	0.5	0.0059	
					2015	0.4		
					2017	0.5		
California Power Holdings C-3775-6-9	4157	3100	30	0.355	2013	0.5	0.0106	
					2015	0.9		
					2017	0.5		
California Power Holdings C-3775-7-9	4157	3100	30	0.355	2013	0.91	0.0414	
					2015	3.5		
					2017	0.5		
California Power Holdings C-3775-8-9	4157	3100	30	0.355	2013	0.51	0.2377	
					2015	20.1		
					2017	0.5		
California Power Holdings C-3775-9-9	4157	3100	30	0.355	2013	0.97	0.0438	
					2015	3.7		
					2017	0.5		
California Power Holdings C-3775-10-9	4157	3100	30	0.355	2013	0.81	0.1963	
					2015	16.6		
					2017	0.5		
California Power Holdings C-3775-11-9	4157	3100	30	0.355	2013	0.5	0.0449	
					2015	3.8		
					2017	0.5		

⁵ Unit C-1629-6-1 failed its 2013 source test for VOC

California Power Holdings C-3775-12-9	4157	3100	30	0.355	2013	0.51	0.0154
					2015	1.3	
					2017	0.5	
California Power Holdings C-3775-13-9	4157	3100	30	0.355	2013	0.5	0.0083
					2015	0.7	
					2017	0.5	
California Power Holdings C-3775-14-9	4157	3100	30	0.355	2013	0.81	0.0096
					2015	0.3	
					2017	0.5	
California Power Holdings C-3775-15-9	4157	3100	30	0.355	2013	0.59	0.0070
					2015	0.3	
					2017	0.5	
California Power Holdings C-3775-16-9	4157	3,100	30	0.355	2013	0.82	0.0106
					2015	0.9	
					2017	0.5	
Modesto Irrigation District N-3233-6-3	11667	8,440	20	0.219	2016	2.1	0.0230
					2017	1.8	
					2018	1.3	
Modesto Irrigation District N-3233-7-3	11667	8,440	20	0.219	2016	2.4	0.0263
					2017	2	
					2018	1.3	
Modesto Irrigation District N-3233-8-3	11667	8,440	20	0.219	2016	2.1	0.0230
					2017	1.9	
					2018	1.2	
Modesto Irrigation District N-3233-9-3	11667	8,440	20	0.219	2016	1	0.0306
					2017	2.8	
					2018	1.3	
Modesto Irrigation District N-3233-10-3	11667	8,440	20	0.219	2016	0.011	0.0646
					2017	2.4	
					2018	5.9	
Modesto Irrigation District N-3233-11-3	11667	8,440	20	0.219	2016	3	0.0339
					2017	3.1	
					2018	2.8	

Based on an extensive review of California air district rules and BACT guidelines, and a survey of source tests for IC engines permitted in the District, the following VOC control options were identified:

VOC Control Option #1

- For all Compression-Ignited Engines: Use of an engine meeting the latest Tier standard;
- For all spark-ignited engines: 25 ppmvd VOC @ 15% O₂ or 0.15 g/bhp-hr

This option is based upon the District's previous achieved-in-practice BACT Guideline requirements and has been achieved by multiple units within the District.

VOC Control Option #2

- For Compression-Ignited Engines: 50 percent reduction of latest Tier standard for VOC emissions using a catalytic oxidation system;
- For rich burn spark-ignited engines: 12 ppmvd @ 15% O₂ or 0.069 g/bhp-hr

This option is based on the District's previous technologically feasible BACT Guideline requirements for full time compression ignited IC engines. No full-time compression ignited IC engines were identified in the District's survey of permitted units. The rich-burn engines within the District are complying with the VOC limit listed in this option of 12 ppmvd @ 15% O2 or 0.069 g/bhp-hr.

VOC Control Option #3 - 0.10 lb-VOC/MW-hr

This option is based on SCAQMD Rule 1110.2 and the SCAQMD BACT requirements for IC engines installed after February 1, 2008 that are used for non-emergency electrical generation.

South Coast AQMD Rule 1110.2 allows operators of IC engines used to generate both heat and electric power to demonstrate compliance with the VOC emissions standard of 0.10 lb/MW-hr by taking credit for the recovered thermal energy at the of one MW-hr for each 3.4 million Btus of heat recovered.

Nearly all of the units operating within the District have source tested at levels that achieve the 0.10 lb-VOC/MW-hr limit of South Coast AQMD Rule 1110.2. Furthermore, South Coast AQMD provided the following list of engines powering electrical generators that are currently complying with Rule 1110.2 requirements.

Facility	Engine/Control Equipment	bhp	VOC Emission Limit
Palm Springs City (Facility ID 42218)	Lean-Burn GE Jenbacher Model #JMS416B86 Engine with SCR	1,573	0.17 lb/MW _e -hr*
Play Capital Company (Facility ID 176353)	Rich Burn GE/Tecogen Model 7400 Engine with a 3-way catalyst	108	0.444 lb/MW _e -hr*
Southern California Gas Company – Aliso Canyon (Facility ID 800128)	Engine #1: Rich-Burn Generac Model 6.8GNGD-100 Engine with a 3-way catalyst	147	0.20 lb/MW-hr
Southern California Gas Company – Aliso Canyon (Facility ID 800128)	Engine #2: Rich-Burn Generac Model 6.8GNGD-100 Engine with a 3-way catalyst	147	0.20 lb/MW-hr
Southern California Gas Company – Aliso Canyon (Facility ID 800128)	Engine #3: Rich-Burn Generac Model 6.8GNGD-130 Engine with a 3-way catalyst	189	0.20 lb/MW-hr
Southern California Gas Company – Aliso Canyon (Facility ID 800128)	Engine #4: Rich-Burn Generac Model 6.8GNGD-130 Engine with a 3-way catalyst	189	0.20 lb/MW-hr
Southern California Gas Company – Aliso Canyon (Facility ID 800128)	Engine #5: Rich-Burn Generac Model 13.3 GTA-250 Engine with a 3-way catalyst	385	0.20 lb/MW-hr
Coachillin' Holdings (Facility ID 187790)	Engine #1: Lean-Burn Mechanische Werstatte Mannheim Model TCG-2016-V16 Engine with SCR and Oxidation Catalyst	1,107	0.43 lb/MW _e -hr*
Coachillin' Holdings (Facility ID 187790)	Engine #2: Lean-Burn Mechanische Werstatte Mannheim Model TCG-2016-V16 Engine with SCR and Oxidation Catalyst	1,107	0.43 lb/MW _e -hr*

* This engine is complying with the overall SCAQMD Rule 1110.2 Rule limit of 0.10 lb-VOC/MW-hr by using a thermal credit as specified in the Rule. SCAQMD used the quantity of heat recovered for this cogeneration system to calculate a lb-VOC/MW_e-hr emission limit that is equivalent to the 0.10 lb-VOC/MW-hr Rule limit.

Based on data from permitted engines operating within SJVAPCD, the 0.10 lb-VOC/MW-hr limit is approximately equivalent to:

- 17 ppmvd VOC @ 15% O₂ (as CH₄) for units with heat recovery
- 10 ppmvd VOC @ 15% O₂ (as CH₄) for units without heat recovery

b. Step 2 - Eliminate technologically infeasible options

VOC Control Option #1, Part 1 (For Compression-Ignited Engines):

The first part of Control Option #1 - Use of an engine meeting the latest Tier standard for all compression ignited engines is not applicable for the engine because it is a spark-ignited engine; therefore, this option will be removed from consideration for this BACT analysis.

VOC Control Option #2 (For Compression-Ignited Engines and Spark-Ignited Rich-Burn IC Engines):

Control Option #2 – 50% reduction of latest Tier standard for VOC emissions using a catalytic oxidation system for compression ignited engines and a VOC limit of 12 ppmvd @ 15% O₂ or 0.069 g/bhp-hr for rich-burn spark ignited engines is not applicable for the engine because it is a spark-ignited, lean-burn IC engine; therefore, this option will also be removed from consideration for this BACT analysis.

VOC Control Option #4: Electric Motor (except for engines that will be used to generate electricity) (Alternate Basic Equipment)

Option 2, Electric Motor, is not feasible for the project since the engine will be used to generate electric power; therefore, this option will be eliminated from consideration.

c. Step 3 - Rank remaining options by control effectiveness

- 1) 0.010 lb-VOC/MW-hr* (approximately 10 ppmvd VOC @ 15% O₂ for units without heat recovery and 17 ppmv VOC @ 15% O₂ for units with heat recovery) (based on SCAQMD Rule 1110.2 - Achieved in Practice)

*When determining compliance with the lb/MW-hr VOC requirement, engines with heat recovery may include up to one megawatt-hour (MW-hr) for each 3.4 million Btus of useful heat recovered (MW_{th}-hr) in addition to each MW-hr of net electricity produced (MW_e-hr)

d. Step 4 - Cost Effectiveness Analysis

The applicant has proposed the highest ranked control option identified above and this option has been determined to be achieved in practice. Therefore, a cost effectiveness analysis is not required.

e. Step 5 - Select BACT

Pursuant to the above BACT Analysis, BACT for VOC emissions from the engine is VOC emissions ≤ 10 ppmv @ 15% O₂ (equivalent to 0.010 lb-VOC/MW-hr) without heat recovery. The applicant has proposed an IC engine with 10 ppmv @ 15% O₂ for VOC emissions. Therefore, the BACT requirements for VOC will be satisfied.

APPENDIX C
HRA Summary

San Joaquin Valley Air Pollution Control District

Risk Management Review

To: Mungi Hong – Permit Services
 From: Kyle J Melching – Technical Services
 Date: March 09, 2022
 Facility Name: SCALE MICROGRID SOLUTIONS INC
 Location: 18700 E SOUTH AVE, REEDLEY
 Application #(s): C-10021-1-0
 Project #: C-1213371

1. Summary

1.1 Risk Management Review (RMR)

Units	Prioritization Score	Acute Hazard Index	Chronic Hazard Index	Maximum Individual Cancer Risk	T-BACT Required	Special Permit Requirements
1	74.45	0.10	0.03	3.13E-06	Yes	Yes
Project Totals	74.45	0.10	0.03	3.13E-06		
Facility Totals	>1	0.10	0.03	3.13E-06		

1.2 Proposed Permit Requirements

To ensure that human health risks will not exceed District allowable levels; the following shall be included as requirements for:

Unit # 1-0

- The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction.

T-BACT is required for this unit because of emissions of Formaldehyde which is a VOC.

2. Project Description

Technical Services received a request on March 09, 2022 to perform a Risk Management Review (RMR) for the following:

- Unit -1-0: 1,676 BHP (CONTINUOUS) MITSUBISHI MODEL GS16R2PTK EPA CERTIFIED LEAN-BURN NATURAL GAS-FIRED IC ENGINE WITH A SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM AND AN OXIDATION CATALYST SYSTEM POWERING AN ELECTRICAL GENERATOR

3. RMR Report

3.1 Analysis

The District performed an analysis pursuant to the District's Risk Management Policy for Permitting New and Modified Sources (APR 1905, May 28, 2015) to determine the possible cancer and non-cancer health impact to the nearest resident or worksite. This policy requires that an assessment be performed on a unit by unit basis, project basis, and on a facility-wide basis. If a preliminary prioritization analysis demonstrates that:

- A unit's prioritization score is less than the District's significance threshold and;
- The project's prioritization score is less than the District's significance threshold and;
- The facility's total prioritization score is less than the District's significance threshold

Then, generally no further analysis is required.

The District's significant prioritization score threshold is defined as being equal to or greater than 1.0. If a preliminary analysis demonstrates that either the units', the project's or the facility's total prioritization score is greater than the District threshold, a screening or a refined assessment is required.

If a refined assessment is greater than one in a million but less than 20 in a million for carcinogenic impacts (cancer risk) and less than 1.0 for the acute and chronic hazard indices (non-carcinogenic) on a unit by unit basis, project basis and on a facility-wide basis the proposed application is considered less than significant. For units that exceed a cancer risk of one in a million, Toxic Best Available Control Technology (TBACT) must be implemented.

Toxic emissions for this project were calculated using the following methods:

- Fuel usage rates for the proposed operation were provided by the Permit Engineer. These usage rates were speciated into toxic air contaminants (TACs) using emission factors derived from the 2000 AP42 emission factors for Natural Gas Fired Internal Combustion Engines. (The use of a catalyst reduced TACs by 76% (NESHAP).

These emissions were input into the San Joaquin Valley APCD's Hazard Assessment and Reporting Program (SHARP). In accordance with the District's Risk Management Policy, risks from the proposed unit's toxic emissions were prioritized using the procedure in the 2016 CAPCOA Facility Prioritization Guidelines. The prioritization score for this proposed facility was greater than 1.0 (see RMR Summary Table). Therefore, a refined health risk assessment was required.

The AERMOD model was used, with the parameters outlined below and meteorological data for 2007-2010 from Visalia (rural dispersion coefficient selected) to determine the dispersion factors (i.e., the predicted concentration or X divided by the normalized source strength or Q) for a receptor grid. These dispersion factors were input into the SHARP Program, which then used the Air Dispersion Modeling and Risk Tool (ADMRT) of the Hot Spots Analysis and Reporting Program Version 2 (HARP 2) to calculate the chronic and acute hazard indices and the carcinogenic risk for the project.

The following parameters were used for the review:

Source Process Rates					
Unit ID	Process ID	Process Material	Process Units	Hourly Process Rate	Annual Process Rate
1	1	Natural Gas	Mmscf	0.011	96.36
1	2	NH3	Lb	0.17	1,457

Point Source Parameters						
Unit ID	Unit Description	Release Height (m)	Temp. (°K)	Exit Velocity (m/sec)	Stack Diameter (m)	Vertical/Horizontal/Capped
1	1676 BHP NG ICE	7.62	689	22.28	0.46	Vertical

4. Conclusion

4.1 RMR

The cumulative acute and chronic indices for this facility, including this project, are below 1.0; and the cumulative cancer risk for this facility, including this project, is less than 20 in a million. However, the cancer risk for one or more units in this project is greater than 1.0 in a million. **In accordance with the District's Risk Management Policy, the project is approved with Toxic Best Available Control Technology (T-BACT).**

To ensure that human health risks will not exceed District allowable levels; the permit requirements listed on page 1 of this report must be included for this proposed unit.

These conclusions are based on the data provided by the applicant and the project engineer. Therefore, this analysis is valid only as long as the proposed data and parameters do not change.

5. Attachments

- A. Modeling request from the project engineer
- B. Additional information from the applicant/project engineer
- C. Prioritization score w/ toxic emissions summary
- D. Facility Summary

APPENDIX D
Quarterly Net Emissions Change (QNEC)

Quarterly Net Emissions Change (QNEC)

The Quarterly Net Emissions Change is used to complete the emission profile screen for the District's PAS database. The QNEC shall be calculated as follows:

QNEC = PE2 - PE1, where:

QNEC = Quarterly Net Emissions Change for each emissions unit, lb/qtr.

PE2 = Post-Project Potential to Emit for each emissions unit, lb/qtr.

PE1 = Pre-Project Potential to Emit for each emissions unit, lb/qtr.

As seen above in Section I, the engine is considered a new emissions unit. Therefore, QNEC = PE2. Using the values in Sections VII.C.2 in the evaluation above, quarterly PE2 can be calculated as follows:

$$PE2_{\text{quarterly}} = PE2_{\text{annual}} \div 4 \text{ quarters/year}$$

Quarterly NEC [QNEC]		
Pollutant	PE2 (lb/yr)	QNEC (lb/qtr)
NO _x	971	242.75
SO _x	291	72.75
PM ₁₀	1,068	267.0
CO	63,602	15,900.5
VOC	1,359	339.75

APPENDIX E
Conversion from ppmv to g/bhp-hr

Parts Per Million Volume --> Grams/Brake Horsepower - Hour

ppmv --> g/Bhp-hr

Variables:

Engine Size:	1676	hp
NO _x :	2.5	ppmv
CO:	270	ppmv
VOC:	10	ppmv (as CH ₄)
O ₂ level:	15	%
Engine Efficiency	35	% (Assumed)
F-factor:	8578	dscf/MMBtu
Fuel Type	1	
OIL (CRUDE, RESIDUAL, OR DISTILLATE)		0
GAS (NATURAL)		1
GAS (PROPANE)		2
GAS (BUTANE)		3

Given:

Conversion #1:	379.5	dscf/lb-mol
Conversion #2:	393.236	bhp-hr/MMBtu
Conversion #3:	453.59	g/lb
MW _(NO_x) :	46	as NO ₂
MW _(CO) :	28	
MW _(VOC) :	16	as CH ₄
O ₂ Correction:	3.542	
Pressure (p)	1	atm
Temp (°F)	60	°F

Formula:

ppmv	F-factor	MW _{pollutant}	20.9	1	1	Conversion #3	1
1	1	1	(20.9 - O ₂ %)	Conversion #1	Conversion #2	1	Engine Eff.

for NO_x:

$$\begin{array}{c}
 \rightarrow \frac{2.5 \text{ parts}}{10^6 \text{ parts}} \times \frac{8578 \text{ dscf}}{\text{MMBtu}} \times \frac{46 \text{ lb}}{1 \text{ lb-mol}} \times \frac{20.9}{20.9 - 15} \times \frac{1 \text{ lb-mol}}{379.5 \text{ dscf}} \times \frac{\text{MMBtu}}{393.24 \text{ bhp-hr}} \times \frac{453.59 \text{ g}}{\text{lb}} \times \frac{1}{35\%} = \\
 = \mathbf{0.030 \text{ g/bhp-h} \quad 50.1 \text{ g/hr} \quad 0.110462 \text{ lbs/hr} \quad 2.651 \text{ lbs/day}}
 \end{array}$$

for CO:

$$\begin{array}{c}
 \rightarrow \frac{270 \text{ parts}}{10^6 \text{ parts}} \times \frac{8578 \text{ dscf}}{\text{MMBtu}} \times \frac{28 \text{ lb}}{1 \text{ lb-mol}} \times \frac{20.9}{20.9 - 15} \times \frac{\text{lb}}{379.5 \text{ dscf}} \times \frac{\text{MMBtu}}{393.24 \text{ bhp-hr}} \times \frac{453.59 \text{ g}}{\text{lb}} \times \frac{1}{35\%} = \\
 = \mathbf{1.965 \text{ g/bhp-h} \quad 3293 \text{ g/hr} \quad 7.261674 \text{ lbs/hr} \quad 174.3 \text{ lbs/day}}
 \end{array}$$

for VOC:

$$\begin{array}{c}
 \rightarrow \frac{10 \text{ parts}}{10^6 \text{ parts}} \times \frac{8578 \text{ dscf}}{\text{MMBtu}} \times \frac{16 \text{ lb}}{1 \text{ lb-mol}} \times \frac{20.9}{20.9 - 15} \times \frac{\text{lb}}{379.5 \text{ dscf}} \times \frac{\text{MMBtu}}{393.24 \text{ bhp-hr}} \times \frac{453.59 \text{ g}}{\text{lb}} \times \frac{1}{35\%} = \\
 = \mathbf{0.042 \text{ g/bhp-h} \quad 69.7 \text{ g/hr} \quad 0.153686 \text{ lbs/hr} \quad 3.688 \text{ lbs/day}}
 \end{array}$$

APPENDIX F
HRA Summary for District Project C-1213371

San Joaquin Valley Air Pollution Control District

Risk Management Review and Ambient Air Quality Analysis

To: Mungi Hong – Permit Services
 From: Will Worthley – Technical Services
 Date: April 29, 2022
 Facility Name: SCALE MICROGRID SOLUTIONS INC
 Location: 18700 E SOUTH AVE, REEDLEY
 Application #(s): C-10021-1-1
 Project #: C-1221245

1. Summary

1.1 Risk Management Review (RMR)

1.2. An RMR was not performed as this modification triggered only an Ambient Air Quality Analysis. Risk from this unit is unchanged as the modification only changed the CO emissions.

1.2 Ambient Air Quality Analysis (AAQA)

Pollutant	Air Quality Standard (State/Federal)				
	1 Hour	3 Hours	8 Hours	24 Hours	Annual
CO	Pass		Pass		
NO _x	Pass				Pass
SO _x	Pass	Pass		Pass	Pass
PM10				Pass ³	Pass ³
PM2.5				Pass ⁴	Pass ⁴

Notes:

- Results were taken from the attached AAQA Report.
- The criteria pollutants are below EPA's level of significance as found in 40 CFR Part 51.165 (b)(2) unless otherwise noted below.
- Modeled PM10 concentrations were below the District SIL for non-fugitive sources of 5 µg/m³ for the 24-hour average concentration and 1 µg/m³ for the annual concentration.
- Modeled PM2.5 concentrations were below the District SIL for non-fugitive sources of 1.2 µg/m³ for the 24-hour average concentration and 0.2 µg/m³ for the annual concentration.

To ensure that human health risks will not exceed District allowable levels; the following shall be included as requirements for:

Unit # 1-1

- The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction.

2. Project Description

Technical Services received a request on April 27, 2022 to perform a Risk Management Review (RMR) and Ambient Air Quality Analysis (AAQA) for the following:

- Unit -1-1: MODIFICATION OF 1,676 BHP (CONTINUOUS) MITSUBISHI MODEL GS16R2PTK LEAN-BURN NATURAL GAS-FIRED IC ENGINE WITH A SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM AND AN OXIDATION CATALYST SYSTEM POWERING AN ELECTRICAL GENERATOR (**RE-ISSUED ATC ON 4/19/22 TO CORRECT TYPO ON CONDITION #9**): REVISE CO EMISSION FACTOR

3. AAQA Report

The District modeled the impact of the proposed project on the National Ambient Air Quality Standard (NAAQS) and/or California Ambient Air Quality Standard (CAAQS) in accordance with District Policy APR-1925 (Policy for District Rule 2201 AAQA Modeling) and EPA's Guideline for Air Quality Modeling (Appendix W of 40 CFR Part 51). The District uses a progressive three level approach to perform AAQAs. The first level (Level 1) uses a very conservative approach. If this analysis indicates a likely exceedance of an AAQS or Significant Impact Level (SIL), the analysis proceeds to the second level (Level 2) which implements a more refined approach. For the 1-hour NO₂ standard, there is also a third level that can be implemented if the Level 2 analysis indicates a likely exceedance of an AAQS or SIL.

The modeling analyses predicts the maximum air quality impacts using the appropriate emissions for each standard's averaging period. Required model inputs for a refined AAQA include background ambient air quality data, land characteristics, meteorological inputs, a receptor grid, and source parameters including emissions. These inputs are described in the sections that follow.

Ambient air concentrations of criteria pollutants are recorded at monitoring stations throughout the San Joaquin Valley. Monitoring stations may not measure all necessary pollutants, so background data may need to be collected from multiple sources. The following stations were used for this evaluation:

Monitoring Stations				
Pollutant	Station Name	County	City	Measurement Year
CO	Clovis-Villa	Fresno	Clovis	2018
NOx	Visalia - N. Church	Tulare	Visalia	2018
PM10	Visalia - N. Church	Tulare	Visalia	2018
PM2.5	Visalia - N. Church	Tulare	Visalia	2018
SOx	Fresno - Garland	Fresno	Fresno	2018

Technical Services performed modeling for directly emitted criteria pollutants with the emission rates below:

Emission Rates (lbs/hour)						
Unit ID	Process	NOx	SOx	CO	PM10	PM2.5
1	1	0.10	0.03	7.30	0.10	0.10

Emission Rates (lbs/year)						
Unit ID	Process	NOx	SOx	CO	PM10	PM2.5
1	1	971	291	63,602	1,068	1,068

The AERMOD model was used to determine if emissions from the project would cause or contribute to an exceedance of any state of federal air quality standard. The parameters outlined

below and meteorological data for 2007-2010 from Visalia (rural dispersion coefficient selected) were used for the analysis:

The following parameters were used for the review:

Point Source Parameters						
Unit ID	Unit Description	Release Height (m)	Temp. (°K)	Exit Velocity (m/sec)	Stack Diameter (m)	Vertical/Horizontal/Capped
1	1676 BHP NG ICE	7.62	689	22.28	0.46	Vertical

4. Conclusion

4.1 AAQA

The emissions from the proposed equipment will not cause or contribute significantly to a violation of the State and National AAQS.

5. Attachments

- A. Modeling request from the project engineer
- B. Additional information from the applicant/project engineer
- C. Facility Summary
- D. AAQA results