

**Draft Engineering Evaluation  
San Mateo Water Quality Control Plant  
2050 Detroit Drive, San Mateo, California 94404  
Plant No. 861**

**Application Nos. 30448 & 30449**

**Project Description: New Stationary Emergency Diesel Engine-Generator Sets &  
Publicly Owned Treatment Works Upgrade**

**BACKGROUND**

San Mateo Water Quality Control Plant (City of San Mateo) has applied to obtain an Authority to Construct (A/C) and/or Permit to Operate (P/O) for the following equipment:

*New Sources:*

**S-34 Stationary Emergency Diesel Engine-Generator Set  
Make: Caterpillar, Model: C32, Model Year: 2021  
1,483 BHp, 10.01 MMBtu/Hr  
Engine Family: MCPXL32.0NZS  
Abated by Selective Catalytic Reduction, A-34**

**A-34 Selective Catalytic Reduction  
Safety Power, Inc., ecoCUBE, 3 Series 9330-H200**

**S-35 Stationary Emergency Diesel Engine-Generator Set  
Make: Caterpillar, Model: C32, Model Year: 2021  
1,483 BHp, 10.01 MMBtu/Hr  
Engine Family: MCPXL32.0NZS  
Abated by Selective Catalytic Reduction, A-35**

**A-35 Selective Catalytic Reduction  
Safety Power, Inc., ecoCUBE, 3 Series 9330-H200**

**S-36 Stationary Emergency Diesel Engine-Generator Set  
Make: Caterpillar, Model: C32, Model Year: 2021  
1,483 BHp, 10.01 MMBtu/Hr  
Engine Family: MCPXL32.0NZS  
Abated by Selective Catalytic Reduction, A-36**

**A-36 Selective Catalytic Reduction  
Safety Power, Inc., ecoCUBE, 3 Series 9330-H200**

**S-37 Stationary Emergency Diesel Engine-Generator Set  
Make: Caterpillar, Model: C32, Model Year: 2021  
1,483 BHp, 10.01 MMBtu/Hr  
Engine Family: MCPXL32.0NZS  
Abated by Selective Catalytic Reduction, A-37**

**San Mateo Water Quality Control Plant  
Plant No. 861  
Application Nos. 30448 & 30449**

- A-37 Selective Catalytic Reduction  
Safety Power, Inc., ecoCUBE, 3 Series 9330-H200**
  
- S-38 Stationary Emergency Diesel Engine-Generator Set  
Make: Caterpillar, Model: C18, Model Year: 2021  
900 BHp, 5.89 MMBtu/Hr  
Engine Family: MCPXL18.1NYS**
  
- S-39 Stationary Emergency Diesel Engine-Generator Set  
Make: Caterpillar, Model: C18, Model Year: 2021  
900 BHp, 5.89 MMBtu/Hr  
Engine Family: MCPXL18.1NYS**

***Modifications:***

- S-110 Preliminary Treatment  
Influent Injunction Box, Preliminary Screens, Grit Removal, & Fine Screens  
Dry Weather Effluent Flow Rate: 15.7 Million Gallon Per Day  
(Averaged Over 3 Consecutive Months During May 1 to October 31)  
Peak Wet Weather Effluent Flow Rate: 78 Million Gallon Per Day  
Enclosed and Abated by Odor Control System, A-20**
  
- S-120 Primary Treatment  
Four (4) 190' Length x 20' Width Rectangular Clarifiers  
Dry Weather Effluent Flow Rate: 15.7 Million Gallon Per Day  
(Averaged Over 3 Consecutive Months During May 1 to October 31)  
Peak Wet Weather Effluent Flow Rate: 78 Million Gallon Per Day  
Enclosed and Abated by Odor Control System, A-20**
  
- A-20 Odor Control System  
Two (2) Parallel Trains, Each Consisting of One (1) Biotrickling Scrubber, One (1) Mist Eliminator, and One (1) Carbon Adsorber for a Total of Two (2) Biotrickling Scrubbers, Two (2) Mist Eliminators, and Two (2) Carbon Adsorbers  
Bioscrubber: 12' Diameter x 27' Height, 49,100 Lb Operating Weight  
Carbon Adsorber: 12' Diameter x 14' Height, 17,500 lb Total Media Weight  
13,000 Cubic Feet Per Minute Capacity Each Train for a Total of 26,000 Cubic Feet Per Minute Capacity**

**San Mateo Water Quality Control Plant  
Plant No. 861  
Application Nos. 30448 & 30449**

*Altered Sources:*

**S-130 Secondary Treatment**

**Biological Nutrient Removal**

**2-Stage Modified Ludzack-Ettinger Process & Membrane Bioreactor**

**Dry Weather Effluent Flow Rate: 15.7 Million Gallon Per Day**

**(Averaged Over 3 Consecutive Months During May 1 to October 31)**

**Peak Wet Weather Effluent Flow Rate: 78 Million Gallon Per Day**

**S-140 Secondary Clarifier**

**Biological Contact Tank Effluent to High-Rate Solids Separation System (Actiflo)**

**Consisting of Ferric Salt Addition, Coagulation, Polymer, Microsand Addition,  
Settling Clarifier, and San Recirculation**

**Operating Only During Wet Weather Conditions**

**Peak Wet Weather Effluent Flow Rate: 78 Million Gallon Per Day**

**S-160 Disinfection**

**Chlorine Contact Basin, 60 Million Gallon Per Day Capacity**

Emergency Engines

The City of San Mateo is proposing to install six (6) new emergency diesel engine-generator sets (S-34 through S-39). S-38 and S-39 will replace existing engines at the facility. S-34 through S-39 will provide the facility auxiliary power during an emergency as defined by Regulation 9-8-230.

The engines will be able to operate unrestricted during emergency use event. However, the engines' annual maintenance and testing hours will be limited in accordance with the California Air Resources Board (CARB) "*Airborne Toxic Control Measure for Stationary Compression Ignition Engines*" (ATCM). The criteria pollutants associated with the source are nitrogen oxides (NO<sub>x</sub>), POC, sulfur dioxide (SO<sub>2</sub>), particulate matter 10 microns in size (PM<sub>10</sub>), particulate matter 2.5 microns in size (PM<sub>2.5</sub>), and carbon monoxide (CO).

The City of San Mateo is proposing engines that meet the Environmental Protection Agency (EPA) Tier 2 emission standards. However, S-34 through S-37 will be equipped with Selective Catalytic Reduction to control emissions of NO<sub>x</sub>. The engines will burn commercially available CARB low sulfur diesel fuel. The sulfur content of the diesel shall not exceed 0.0015% by weight. The routine operation of the engines should not pose any health threat to the surrounding community or the public at large.

Wastewater Treatment Plant

The City of San Mateo currently operates an existing wastewater treatment plant (WWTP), which has existing emissions. The City of San Mateo initially proposed upgrades to the facility's WWTP within New Source Review (NSR) Application #28996. However, the City of San Mateo has updated proposed plans in order to meet the water quality standards of other regulatory agencies. The proposed changes will result in a new design of the Preliminary Treatment (S-110), a

## San Mateo Water Quality Control Plant

Plant No. 861

Application Nos. 30448 & 30449

modification of the Primary Treatment (S-120), and alterations of the Secondary Treatment (S-130), Secondary Clarifier (S-140), and Disinfection (S-160). The proposed changes will also increase the organic compound emission limits for the Odor Control System (A-20), which were established in Application #28996.

Emissions from the WWTP are expected from S-110 and S-120. In order to minimize emissions from the WWTP, the City of San Mateo will cover S-110 and S-120 and route the exhaust to A-20. A-20 consists of two (2) parallel abatement trains. Each train consists of a biotrickling scrubber, a mist eliminator, and carbon adsorption vessel, which are configured in series. A-20 is designed to incorporate redundant abatement devices, in the event one of the abatement trains will require maintenance. A-20 can abate emissions through both abatement trains or one abatement train at a time. A-20 will not exceed a maximum exhaust flowrate of 26,000 cfm, or 13,000 cfm for each train.

The City of San Mateo will be subject to an annual wastewater throughput of 5,730.50 million gallons per year. The criteria pollutants associated with the WWTP are precursor organic compounds (POC) and non-precursor organic compounds (NPOC). The routine operation of the WWTP should not pose any health threat to the surrounding community or the public at large.

### **EMERGENCY DIESEL ENGINE-GENERATOR SET EMISSION CALCULATIONS**

The City of San Mateo is proposing to install six (6) new emergency stationary diesel engine-generator sets, which will provide auxiliary power in the event of an emergency. The following information is from supporting documents, submitted by the applicant. Supporting documents include manufacturer specification and emissions data.

<b>Table 1. Engine Specifications &amp; Emission Factors, S-34 through S-37</b>	
<b>Engine Manufacturer</b>	Caterpillar
<b>Model</b>	C32
<b>Model Year</b>	2021
<b>Family Name</b>	MCPXL32.0NZS
<b>Engine Power Rating (BHp)</b>	1,483
<b>Fuel Consumption (gal/hr)</b>	71.5
<b>Maximum Input Heat Rating (MMBtu/hr)</b>	10.01
<b>Displacement (L)</b>	32.1
<b>NO<sub>x</sub>, Abated Emission Factor (g/hp-hr)</b>	0.5
<b>POC (g/hp-hr)<sup>1</sup></b>	0.07
<b>PM (g/hp-hr)<sup>2</sup></b>	0.04
<b>CO (g/hp-hr)</b>	0.5

<sup>1</sup> Manufacturer specification provides an emission factor for non-methane hydrocarbon (NMHC). It is assumed that NMHC = POC.

<sup>2</sup> It is assumed that particulate matter (PM) is equivalent to PM<sub>10</sub> and PM<sub>2.5</sub>.

San Mateo Water Quality Control Plant  
 Plant No. 861  
 Application Nos. 30448 & 30449

Table 2. Engine Specifications & Emission Factors, S-38 & S-39	
Engine Manufacturer	Caterpillar
Model	C18
Model Year	2021
Family Name	MCPXL18.1NYS
Engine Power Rating (BHp)	900
Fuel Consumption (gal/hr)	42.1
Maximum Input Heat Rating (MMBtu/hr)	5.9
Displacement (L)	18.1
NO <sub>x</sub> (g/hp-hr)	3.8
POC (g/hp-hr) <sup>1</sup>	0.08
PM (g/hp-hr) <sup>2</sup>	0.05
CO (g/hp-hr)	0.6

<sup>1</sup> Manufacturer specification provides an emission factor for NMHC. It is assumed that NMHC = POC.

<sup>2</sup> It is assumed that PM is equivalent to PM<sub>10</sub> and PM<sub>2.5</sub>.

SO<sub>2</sub> emissions are estimated using an emission factor from EPA AP-42, Table 3.4-1, which is a function of the fuel sulfur content. Since, the engine will operate within California, the fuel consumed will most likely be CARB approved. Therefore, the sulfur content of the diesel fuel is expected to be 15 parts per million (ppm) by weight or 0.0015% sulfur by weight. The following review provides SO<sub>2</sub> emission factor details.

$$SO_2 \text{ Emission Factor (lb/MMBtu)} = 1.01 \cdot S_1$$

Where S<sub>1</sub> is the sulfur content of the fuel in percentage.

$$= 1.01 \cdot \left( \frac{15}{10^6} \times 100\% \right)$$

$$= 0.001515 \text{ lb } SO_2 / \text{MMBtu}$$

Assuming that the heat content of the diesel fuel is 140 MMBtu per thousand gallons, the following are the SO<sub>2</sub> emission rate estimates for each engine.

Option for S-34 through S-37

$$\frac{0.001515 \text{ lbs } SO_2}{\text{MMBtu}} \times \frac{71.5 \text{ gal diesel}}{\text{hr}} \times \frac{140 \text{ MMBtu}}{1,000 \text{ gal diesel}} \times \frac{24 \text{ hr}}{\text{day}} = 0.36 \text{ lbs } SO_2 / \text{day}$$

$$\frac{0.001515 \text{ lbs } SO_2}{\text{MMBtu}} \times \frac{71.5 \text{ gal diesel}}{\text{hr}} \times \frac{140 \text{ MMBtu}}{1,000 \text{ gal diesel}} \times \frac{50 \text{ hr}}{\text{yr}} = 0.76 \text{ lbs } SO_2 / \text{yr}$$

**San Mateo Water Quality Control Plant  
Plant No. 861  
Application Nos. 30448 & 30449**

Option for S-38 and S-39

$$\frac{0.001515 \text{ lbs } SO_2}{MMBtu} \times \frac{42.1 \text{ gal diesel}}{\text{hr}} \times \frac{140 \text{ MMBtu}}{1,000 \text{ gal diesel}} \times \frac{24 \text{ hr}}{\text{day}} = 0.21 \text{ lbs } SO_2/\text{day}$$

$$\frac{0.001515 \text{ lbs } SO_2}{MMBtu} \times \frac{42.1 \text{ gal diesel}}{\text{hr}} \times \frac{140 \text{ MMBtu}}{1,000 \text{ gal diesel}} \times \frac{50 \text{ hr}}{\text{yr}} = 0.45 \text{ lbs } SO_2/\text{yr}$$

The following tables provide a summary of the emissions from each engine option.

<b>Table 3. Engine Option #1 Potential to Emit Emissions Review for S-34 through S-37</b>							
<b>Pollutant</b>	<b>Emission Rate (g/hp-hr)</b>	<b>Power Rating (hp)</b>	<b>Daily Operation<sup>1</sup> (hr/day)</b>	<b>Daily Emissions (lb/day)</b>	<b>Annual Operation<sup>2</sup> (hr/yr)</b>	<b>Annual Emissions (lb/yr)</b>	<b>Annual Emissions (ton/yr)</b>
NO <sub>x</sub> <sup>3</sup>	0.5	1,483	24	39.20	150	244.99	0.122
POC	0.07	1,483	24	5.49	150	34.30	0.017
PM <sub>10</sub>	0.04	1,483	24	3.14	150	19.60	0.010
PM <sub>2.5</sub>	0.04	1,483	24	3.14	150	19.60	0.010
SO <sub>2</sub>	--	--	--	0.36	--	2.27	0.001
CO	0.5	1,483	24	39.20	150	244.99	0.122

<sup>1</sup> Maximum daily operation assumed to be 24 hours.

<sup>2</sup> Maximum annual operation will only include reliability-related activities as defined in Regulation 9-8-232, plus 100 hours for emergencies.

<sup>3</sup> The emission factor value is after abatement.

<b>Table 4. Engine Option #2 Potential to Emit Emissions Review for S-38 and S-39</b>							
<b>Pollutant</b>	<b>Emission Rate (g/hp-hr)</b>	<b>Power Rating (hp)</b>	<b>Daily Operation<sup>1</sup> (hr/day)</b>	<b>Daily Emissions (lb/day)</b>	<b>Annual Operation<sup>2</sup> (hr/yr)</b>	<b>Annual Emissions (lb/yr)</b>	<b>Annual Emissions (ton/yr)</b>
NO <sub>x</sub>	3.8	900	24	180.79	150	1129.96	0.565
POC	0.08	900	24	3.81	150	23.79	0.012
PM <sub>10</sub>	0.05	900	24	2.38	150	14.87	0.007
PM <sub>2.5</sub>	0.05	900	24	2.38	150	14.87	0.007
SO <sub>2</sub>	--	--	--	0.21	--	1.34	0.001
CO	0.6	900	24	28.55	150	178.41	0.089

<sup>1</sup> Maximum daily operation assumed to be 24 hours.

<sup>2</sup> Maximum annual operation will only include reliability-related activities as defined in Regulation 9-8-232, plus 100 hours for emergencies.

In addition, ammonia slip emissions were calculated for S-34 through S-37. Emissions were based on an ammonia slip limitation of 10 ppmv @ 15% O<sub>2</sub> at the stack at dry standard conditions. The following table provides a summary of the ammonia emissions from S-34 through S-37.

San Mateo Water Quality Control Plant  
 Plant No. 861  
 Application Nos. 30448 & 30449

<b>Table 5. Ammonia Slip Emissions From S-34 through S-37</b>				
<b>Source</b>	<b>Hourly Emission Rate (lb/hr)</b>	<b>Annual Emission Rate (lb/yr)</b>	<b>Acute Trigger Level (lb/hr)</b>	<b>Chronic Trigger Level (lb/yr)</b>
S-34	1.4E-01	6.8E+00	-	-
S-35	1.4E-01	6.8E+00	-	-
S-36	1.4E-01	6.8E+00	-	-
S-37	1.4E-01	6.8E+00	-	-
<b>Total Project</b>	<b>5.6E-01</b>	<b>2.7E+01</b>	<b>7.1E+00</b>	<b>7.7E+03</b>

**WASTEWATER TREATMENT PLANT EMISSION CALCULATIONS**

Total organic and hydrogen sulfide (H<sub>2</sub>S) emissions from S-110 and S-120 were estimated using the maximum design flowrate of A-20, an organic volumetric concentration limit of 8 ppmv, and an H<sub>2</sub>S volumetric concentration limit of 1.5 ppmv.

Furthermore, organic toxic air contaminant emissions from S-110 and S-120 were estimated using the latest influent and effluent reported concentrations provided, a volatilization factor from Table III of the EPA *"Toxic Chemical Release Inventory Reporting Forms and Instructions"* (Revised 2019 Version), and an assumed abatement efficiency of 50% by weight from A-20. For compounds that have a non-determined (ND) measurement, half of the method detection limit (MDL) was used to calculate emissions. Organic compounds, which were detected, listed in the *"80th Percentile Emission Factors POTW Liquid Processes"* list in the District's Permit Handbook, or are identified as BTEX (benzene, toluene, ethylbenzene, and xylenes), are assumed to be the only compounds emitted from the operation. Although perchloroethylene is listed in the 80<sup>th</sup> percentile list, perchloroethylene was not detected in the influent and is not expected to be emitted from these operations, because perchloroethylene has been essentially phased out of dry cleaning operations in accordance with Air District and CARB regulations and is no longer a common pollutant for POTWs.

Emissions from S-130, S-140, and S-160 are presumed negligible.

For regulatory purposes, wet weather conditions will be used to review hourly and daily emission rates. Furthermore, annual emission rates will be based on a throughput limit of 5,730.50 million gallons of wastewater per year.

<b>Table 6. Criteria Pollutant Potential to Emit Emissions Review</b>				
<b>Pollutant</b>	<b>Hourly Emission Rate (lb/hr)</b>	<b>Daily Emission Rate (lb/day)</b>	<b>Annual Emission Rate (lb/yr)</b>	<b>Annual Emission Rate (ton/yr)</b>
Organics	0.52	12.47	4551.72	2.276

San Mateo Water Quality Control Plant  
 Plant No. 861  
 Application Nos. 30448 & 30449

<b>Table 7. Acute Toxic Air Contaminant Emissions Review</b>				
<b>Toxic Air Contaminant</b>	<b>CAS#</b>	<b>Hourly Emission Rate (lb/hr)</b>	<b>Acute HRA Trigger (lb/hr)</b>	<b>Exceeds Acute HRA Trigger?</b>
1,1,1-Trichloroethane (TCA)	71-55-6	4.89E-03	1.50E+02	<b>no</b>
1,1,2,2-Tetrachloroethane	79-34-5	9.78E-03		--
1,4-Dichlorobenzene	106-46-7	2.39E-03		--
Benzene	71-43-2	1.12E-03	6.00E-02	<b>no</b>
Chloroform	67-66-3	2.57E-02	3.30E-01	<b>no</b>
Ethylbenzene	100-41-4	3.17E-03		--
Methylene Chloride	75-09-2	2.92E-03	3.10E+01	<b>no</b>
Toluene	108-88-3	8.41E-03	8.20E+01	<b>no</b>
Trichloroethene (TCE)	79-01-6	5.04E-03		--
Xylenes, Total	1330-20-7	2.22E-03	4.90E+01	<b>no</b>
Phenol	108-95-2	1.07E-02	1.30E+01	<b>no</b>
Hydrogen Sulfide	7783-06-4	2.07E-01	9.3E-02	<b>YES</b>

<b>Table 8. Chronic Toxic Air Contaminant Emissions Review</b>				
<b>Toxic Air Contaminant</b>	<b>CAS#</b>	<b>Annual Emission Rate (lb/yr)</b>	<b>Chronic HRA Trigger (lb/yr)</b>	<b>Exceeds Chronic HRA Trigger?</b>
1,1,1-Trichloroethane (TCA)	71-55-6	8.62E+00	3.90E+04	<b>no</b>
1,1,2,2-Tetrachloroethane	79-34-5	1.72E+01	1.40E+00	<b>YES</b>
1,4-Dichlorobenzene	106-46-7	4.21E+00	7.20E+00	<b>no</b>
Benzene	71-43-2	1.98E+00	2.90E+00	<b>no</b>
Chloroform	67-66-3	4.53E+01	1.50E+01	<b>YES</b>
Ethylbenzene	100-41-4	5.59E+00	3.30E+01	<b>no</b>
Methylene Chloride	75-09-2	5.15E+00	8.20E+01	<b>no</b>
Toluene	108-88-3	1.48E+01	1.20E+04	<b>no</b>
Trichloroethene (TCE)	79-01-6	8.89E+00	4.10E+01	<b>no</b>
Xylenes, Total	1330-20-7	3.92E+00	2.70E+04	<b>no</b>
Phenol	108-95-2	1.88E+01	7.70E+03	<b>no</b>
Hydrogen Sulfide	7783-06-4	1.81E+03	3.9E+02	<b>YES</b>

**PROJECT EMISSION CALCULATIONS**

<b>Table 9. Application Daily Emission Rate Summary</b>						
<b>Source</b>	<b>Daily Emission Rate</b>					
	<b>NO<sub>x</sub> (lb/day)</b>	<b>POC (lb/day)</b>	<b>PM<sub>10</sub> (lb/day)</b>	<b>PM<sub>2.5</sub> (lb/day)</b>	<b>SO<sub>2</sub> (lb/day)</b>	<b>CO (lb/day)</b>
S-34	39.20	5.49	3.14	3.14	0.36	39.20
S-35	39.20	5.49	3.14	3.14	0.36	39.20
S-36	39.20	5.49	3.14	3.14	0.36	39.20
S-37	39.20	5.49	3.14	3.14	0.36	39.20
S-38	180.79	3.81	2.38	2.38	0.21	28.55
S-39	180.79	3.81	2.38	2.38	0.21	28.55
S-110/ S-120	--	12.47	--	--	--	--
S-130	--	--	--	--	--	--
S-140	--	--	--	--	--	--
S-160	--	--	--	--	--	--

For annual potential to emit (PTE) emissions from emergency engines, 100 hours per year for emergency use will be included with the 50 hours per year for test and maintenance. The PTE for emergency engines will be used for purposes of determining applicability of Offsets and Title V. The following provides a summary of the PTE for each source proposed in this application.

<b>Table 10(a). Application Potential to Emit Summary <sup>1</sup></b>						
<b>Source</b>	<b>Annual Emission Rate</b>					
	<b>NO<sub>x</sub> (ton/yr)</b>	<b>POC (ton/yr)</b>	<b>PM<sub>10</sub> (ton/yr)</b>	<b>PM<sub>2.5</sub> (ton/yr)</b>	<b>SO<sub>2</sub> (ton/yr)</b>	<b>CO (ton/yr)</b>
S-34	0.122	0.017	0.010	0.010	0.001	0.122
S-35	0.122	0.017	0.010	0.010	0.001	0.122
S-36	0.122	0.017	0.010	0.010	0.001	0.122
S-37	0.122	0.017	0.010	0.010	0.001	0.122
S-38	0.565	0.012	0.007	0.007	0.001	0.089
S-39	0.565	0.012	0.007	0.007	0.001	0.089
S-110/ S-120	--	2.276	--	--	--	--
S-130	--	--	--	--	--	--
S-140	--	--	--	--	--	--
S-160	--	--	--	--	--	--
<b>Total</b>	<b>1.618</b>	<b>2.368</b>	<b>0.054</b>	<b>0.054</b>	<b>0.006</b>	<b>0.666</b>

1. For emergency standby engines, the potential to emit includes the permitted limit of 50 hours/year of operating time for reliability related testing plus an estimated 100 hours/year of operating time for emergencies (or 150 hours/year of total operating time).

**San Mateo Water Quality Control Plant**  
**Plant No. 861**  
**Application Nos. 30448 & 30449**

If the facility is subject to Offsets based on their PTE, the cumulative increase is used to determine the amount of emission reduction credits (ERC) owed by the facility. For emergency engines, the cumulative increase will only include the 50 hours per year for test and maintenance. The following provides a summary of the cumulative increase for each source proposed in this application.

<b>Table 10(b). Application Cumulative Emission Increase Summary <sup>2</sup></b>						
<b>Source</b>	<b>Annual Emission Rate</b>					
	<b>NO<sub>x</sub> (ton/yr)</b>	<b>POC (ton/yr)</b>	<b>PM<sub>10</sub> (ton/yr)</b>	<b>PM<sub>2.5</sub> (ton/yr)</b>	<b>SO<sub>2</sub> (ton/yr)</b>	<b>CO (ton/yr)</b>
S-34	0.041	0.006	0.003	0.003	0.000	0.041
S-35	0.041	0.006	0.003	0.003	0.000	0.041
S-36	0.041	0.006	0.003	0.003	0.000	0.041
S-37	0.041	0.006	0.003	0.003	0.000	0.041
S-38	0.188	0.004	0.002	0.002	0.000	0.030
S-39	0.188	0.004	0.002	0.002	0.000	0.030
S-110/ S-120	--	2.276	--	--	--	--
S-130	--	--	--	--	--	--
S-140	--	--	--	--	--	--
S-160	--	--	--	--	--	--
<b>Total</b>	<b>0.540</b>	<b>2.307</b>	<b>0.018</b>	<b>0.018</b>	<b>0.002</b>	<b>0.223</b>

2. For emergency standby engines, the cumulative emission increase only includes the permitted limit of 50 hours/year of operating time for reliability related testing. Emergency operating time is not included in the cumulative emission increase.

**TOXIC RISK SCREENING ANALYSIS**

Pursuant to Regulation 2-5-110, the applications are subject to the provisions of this rule since the project increase in TACs, from new/modified sources, exceed trigger levels listed in Table 2-5-1 of Regulation 2-5. The project includes TAC emissions from NSR Application #'s 27505 and 28886. A health risk assessment (HRA) model was completed for this project.

The project has a maximum cancer risk of 0.80 in a million, a chronic hazard index of 0.025, and an acute hazard index of 0.84. Since the project is below a cancer risk of 10 in a million and a chronic hazard index of 1.0, the project risk is acceptable. Furthermore, each individual source has a cancer risk less than 1.0 in a million and a chronic hazard index less than 0.2. Therefore, Best Available Control Technology for toxics (TBACT) does not apply. The project and each new source meet the requirements of Regulation 2-5.

**PLANT CUMULATIVE EMISSIONS**

The following table provides a summary of the facility's PTE.

**San Mateo Water Quality Control Plant  
Plant No. 861  
Application Nos. 30448 & 30449**

<b>Table 11. Facility Potential to Emit Summary</b>			
<b>Pollutant</b>	<b>Existing<sup>1</sup> (ton/yr)</b>	<b>New<sup>2</sup> (ton/yr)</b>	<b>Total (ton/yr)</b>
NO <sub>x</sub>	15.265	1.618	16.883
POC	9.003	2.368	11.371
PM <sub>10</sub>	0.838	0.054	0.892
PM <sub>2.5</sub>	0.838	0.054	0.892
SO <sub>2</sub>	6.169	0.006	6.175
CO	30.140	0.666	30.806

- <sup>1</sup> The existing PTE was obtained from NSR Application #27481. Within NSR Application #27481, an extensive review of all permitted sources was performed to estimate the facility’s PTE. However, since an emergency engine-generator set (S-17) was removed from service, the emissions from S-17 were subtracted from the PTE from NSR Application #27481. Furthermore, since NSR Application #27481, an emergency engine-generator set (S-21) has been permitted, S-180 and S-191 are proposed to undergo a modification, and the WWTP will undergo a retrofit. As a result, emissions from the WWTP have been removed, the emissions from S-180 and S-191 have been adjusted to reflect the proposed modification, and the emissions from S-21 have been included. Lastly, the PTE for emergency engines include 100 hours of emergency operation in addition to the allowed test and exercise hours.
- <sup>2</sup> New emissions include releases from the WWTP and six (6) engines. The potential to emit for these emergency engines is based on 150 hour/year of total estimated operating time (reliability related testing plus emergencies).

Pursuant to Regulations 2-2-302 and 2-2-303, offsets are required for a facility’s cumulative increase, minus any onsite contemporaneous emission reduction credits, if the facility’s PTE is greater than 10 tons per year for NO<sub>x</sub> and POC, and for any new PM<sub>10</sub>, PM<sub>2.5</sub>, or SO<sub>2</sub> emissions increase at a major facility. The facility has a NO<sub>x</sub> and POC PTE greater than 10 tons and is subject to the offsetting requirements of 2-2-302. However, the facility is not a major facility for PM<sub>10</sub>, PM<sub>2.5</sub>, or SO<sub>2</sub> and is not subject to the offset requirements of Regulation 2-2-303.

The cumulative increase includes all emissions increases since April 5, 1991. In addition, the cumulative increase includes onsite contemporaneous emission reduction credits from the proposed replacements of emergency diesel engines S-10, S-11, S-12, and S-16. The onsite contemporaneous emission reduction credits are based on throughput data submitted for years 2018 through 2020. The following table provides a summary of the facility’s cumulative increase.

**San Mateo Water Quality Control Plant**  
**Plant No. 861**  
**Application Nos. 30448 & 30449**

**Table 12. Facility Cumulative Increase Summary**

<b>Pollutant</b>	<b>Existing (ton/yr)</b>	<b>New <sup>1</sup> (ton/yr)</b>	<b>Onsite Contemporaneous Emission Reduction Credit <sup>2</sup> (ton/yr)</b>	<b>Total (ton/yr)</b>
NO <sub>x</sub>	8.183	0.540	(0.388)	8.335
POC	8.319	2.307	(0.031)	10.595
PM <sub>10</sub>	0.770	0.018	(0.028)	0.760
PM <sub>2.5</sub>	0.000	0.018	(0.028)	0.000 <sup>3</sup>
SO <sub>2</sub>	4.062	0.002	(0.276)	3.788
CO	22.304	0.223	(0.084)	22.443

<sup>1</sup> New emissions include releases from the WWTP and six (6) emergency engines. For these emergency engines, only the permitted routine operating time (50 hours/year for reliability related testing) is included in the cumulative emission increase.

<sup>2</sup> Emergency diesel engines (S-10, S-11, S-12, and S-16) will be replaced by S-38 and S-39. Onsite contemporaneous emission reduction credits were determined using the latest throughput information provided from 2018 through 2020.

<sup>3</sup> 0.010 ton/yr of PM<sub>2.5</sub> onsite contemporaneous emission reduction credits will remain 5 years after the shutdown of S-10, S-11, S-12, and S-16.

**BEST AVAILABLE CONTROL TECHNOLOGY**

Pursuant to Regulation 2-2-301, Best Available Control Technology (BACT) is required for any new or modified source with a PTE emission rate equal to or greater than 10 pounds of a regulated air pollutant per day.

Wastewater Treatment Process

The combined emissions from S-110 and S-120 will result in a daily PTE of 12.47 lb POC/day. Although, the emissions from S-110 and S-120 are likely to be below 10 lb POC/day each, it is difficult to quantify emissions from each individual source. Therefore, for regulatory purposes, it is conservatively assumed that either S-110 and S-120 has the potential to emit more than 10 lb/day.

In the District BACT Guideline *“Sewage Treatment Plant – Headworks and Primary Treatment,”* Document 150.1.1, Revision 2 (06/02/1995), BACT(2) is identified as a packed scrubber for odor control at the headworks and fixed covers for primary clarifiers. BACT(1) is identified as process modifications and covers with vapor phase controls.

The structures that make up S-110 and S-120, will be covered and abated by A-20. A-20 consists of multiple abatement device components, which include two (2) parallel trains of biotrickling scrubbers with an operating weight of 49,100 lb each, followed by two (2) mist eliminators, and finished with two (2) carbon adsorbers with a 17,500 lb capacity. Furthermore, A-20 will be limited to an organic volumetric concentration of 8 ppmv and an exhaust flowrate of 26,000 cfm.

**San Mateo Water Quality Control Plant**

**Plant No. 861**

**Application Nos. 30448 & 30449**

The combination of fully covering S-110 and S-120, abating emissions through biotrickling scrubbers, mist eliminators, and carbon adsorbers, limiting the exhaust volumetric concentration from A-20 to 8 ppmv, and frequently monitoring the performance of A-20 would result in the most stringent controls available.

Emergency Engines

Furthermore, S-34 through S-39 are expected to emit more than 10 pounds of NO<sub>x</sub> and CO per day. Therefore, the BACT requirements of Regulation 2-2-301 apply to S-34 through S-39.

The following tables provide the NO<sub>x</sub> and CO BACT requirements for emergency engine-generator sets. These requirements were obtained from the District’s BACT Guidelines “IC Engine-Compression Ignition: Stationary Emergency, Non-Agricultural, Non-Direct Drive Fire Pump for Engines 50 BHp and Less Than 1,000 BHp,” Document 96.1.3, Revision 8 (12/22/2020) and “IC Engine-Compression Ignition: Stationary Emergency, Non-Agricultural, Non-Direct Drive Fire Pump for Engines Greater Than 1,000 BHp,” Document 96.1.5, Revision 0 (12/22/2020).

<b>Table 13. Best Available Control Technology for Emergency Diesel Engines (≥1,000 BHp)</b>			
<b>Pollutant</b>	<b>BACT Requirement (g/hp-hr)</b>	<b>Option #1 Engine Data (g/hp-hr)</b>	<b>Compliance With BACT?</b>
NO <sub>x</sub>	0.5	0.5	Yes
CO	2.6	0.5	Yes

<b>Table 14. Best Available Control Technology for Emergency Diesel Engines (50 ≥ BHp &lt; 1,000)</b>			
<b>Pollutant</b>	<b>BACT Requirement (g/hp-hr)</b>	<b>Option #2 Engine Data (g/hp-hr)</b>	<b>Compliance With BACT?</b>
NO <sub>x</sub>	4.56	3.80	Yes
CO	2.6	0.60	Yes

As shown in Table 13 and 14, the emergency engines (S-34 through S-39) are expected to meet BACT.

**OFFSETS**

Pursuant to Regulation 2-2-302, offsets must be provided for any new or modified source at a facility that emits, or is permitted to emit, more than 10 tons per year of POC or NO<sub>x</sub>. The facility has a PTE greater than 10 tons per year, but less than 35 tons per year of POC and NO<sub>x</sub>. Offsets must be provided for the cumulative increase of POC and NO<sub>x</sub>. However, since the facility emits less than 35 tons per year of POC and NO<sub>x</sub>, the facility may be provided offsets from the District’s Small Facility Banking Account. Although, per Regulation 2-2-302.1.2, if the District’s Small Facility Banking Account is exhausted, or if the applicant owns or controls offsets, the applicant shall provide any required offsets.

**San Mateo Water Quality Control Plant**

**Plant No. 861**

**Application Nos. 30448 & 30449**

Furthermore, pursuant to Regulation 2-2-303 offsets must be provided for any new or modified source at a major facility with a cumulative increase that exceeds 1.0 ton per year of PM<sub>10</sub> or SO<sub>2</sub>. Pursuant to the definition of a “Major Facility” as defined in Regulation 2-6-212 and based upon Table 11 of the Plant Cumulative Emissions section of this evaluation, the facility is not defined as a major source and is not subject to the requirements of Regulation 2-2-303.

**NEW SOURCE PERFORMANCE STANDARDS**

The following New Source Performance Standards (NSPS) apply to the facility.

**40 CFR Part 60 Subpart QQQ**

Pursuant to §60.690 the provisions of this subpart apply to affected facilities located in petroleum refineries for which construction, modification, or reconstruction is commenced after May 4, 1987. Since the publicly owned treatment works (POTW) does not operate at a refinery, the POTW is not subject to the requirements of this subpart.

**40 CFR Part 60 Subpart IIII**

According to §60.4200(a)(1)(i), the emergency engine is subject to the requirements of 40 CFR Part 60 Subpart IIII, “Standards of Performance of Stationary Compression Ignition Internal Combustion Engines.”

Pursuant to §60.4205(b), owners or operators of 2007 model year and later stationary emergency diesel engine-generator sets with a displacement of less than 30 liters per cylinder must comply with §60.4202. In accordance with §60.4202(a)(2), the emission standards must meet those established in 40 CFR 89.112 and 40 CFR 89.113. Pursuant to 40 CFR 89.112, engines with a rated power greater than 560 kW (750 hp) must meet the following emission standards.

<b>Pollutant</b>	<b>NSPS Emission Standard (g/kW-hr)</b>	<b>NSPS Emission Standard (g/hp-hr)</b>	<b>Manufacturer’s Emission Rate (g/kW-hr)</b>	<b>Manufacturer’s Emission Rate (g/hp-hr)</b>
NMHC+NO <sub>x</sub>	6.4	4.8	0.76 <sup>1</sup> /5.20 <sup>2</sup>	0.57 <sup>1</sup> /3.88 <sup>2</sup>
CO	3.5	2.6	0.7 <sup>1</sup> /0.8 <sup>2</sup>	0.5 <sup>1</sup> /0.6 <sup>2</sup>
PM	0.20	0.15	0.05 <sup>1</sup> /0.07 <sup>2</sup>	0.04 <sup>1</sup> /0.05 <sup>2</sup>

<sup>1</sup> Emission factor for Option #1, Caterpillar Model C32.

<sup>2</sup> Emission factor for Option #2, Caterpillar Model C18.

The emergency engine-generator sets are expected to meet the emission standards of 40 CFR 89.112. In addition, the emergency engine-generator sets are expected to meet the opacity standards of 40 CFR 89.113.

**San Mateo Water Quality Control Plant  
Plant No. 861  
Application Nos. 30448 & 30449**

<b>Table 16. 40 CFR 89.113 Opacity Standards</b>	
<b>Mode</b>	<b>Opacity (%)</b>
Acceleration	20
Lugging	15
Peak (During acceleration or lugging modes)	50

§60.4206 and §60.4211(a) require the owner or operator to maintain and operate the emergency engines according to the manufacturer’s written instructions or owner/operator developed procedures approved by the manufacturer for the entire life of the emergency engine. The emergency engines are expected to be maintained and operated in accordance with the requirements of §60.4206 and §60.4211(a).

§60.4207(b) requires diesel fuel consumed after October 1, 2010 to meet the requirements of 40 CFR 80.510(b), which is a maximum sulfur content of 15 ppm. The fuel consumed is expected to meet this requirement.

§60.4209(a) requires the installation of a non-resettable hour meter. This will be included as a permit requirement.

The emergency engines are certified to the requirements of 40 CFR Part 89 and are expected to comply with §60.4211(c).

Per §60.4211(f), the emergency engines will be allowed to operate unrestricted during emergencies. In addition, the emergency engines will be limited to less than 100 hours per calendar year for maintenance and testing. However, the requirements of the CARB ATCM may further limit the maintenance and testing hours.

**NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS**

The following National Emission Standards for Hazardous Air Pollutants (NESHAP) apply to the facility.

**40 CFR Part 63 Subpart ZZZZ**

Pursuant to §63.6585, engines located at an area source are subject to the requirements of 40 CFR Part 63 Subpart ZZZZ, “National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.”

However, according to §63.6590(a)(1)(iii) & §63.6590(c)(1), diesel engines that commenced construction on June 12, 2006 or later and that operate at a facility that emits or has the potential to emit any single hazardous air pollutant (HAP) at a rate of less than 10 tons per year or any combination of HAPs at a rate of less than 25 tons per year, comply with the standard by meeting the requirements of 40 CFR Part 60 Subpart III, “Standards of Performance of Stationary Compression Ignition Internal Combustion Engines.” The emergency engines are expected to comply with the requirements of this subpart by meeting the standards of 40 CFR Part 60 Subpart III, “Standards of Performance of Stationary Compression Ignition Internal Combustion Engines.”

**CARB AIRBORNE TOXIC CONTROL MEASURE FOR STATIONARY COMPRESSION IGNITION ENGINES**

§93115.2 requires any person who purchases a stationary compression ignition engine to meet the requirements of the ATCM.

As of January 1, 2006, owners and operators of new engines are required to consume CARB diesel fuel in accordance with §93115.5.

According to §93115.6(a)(1), an engine located within 500 feet of school grounds shall not operate for non-emergency use between 7:30 A.M. and 3:30 P.M. on days when school is in session.

Pursuant to §93115.6(a)(3), a new engine must meet the following requirements as of January 1, 2005.

- ATCM “Table 1 Emission Standards for New Stationary Emergency Standby Diesel-Fueled CI Engines” for specific model year and maximum engine power, which is shown below;

<b>Table 17. Airborne Toxic Control Measure for Stationary Emergency Diesel Engine-Generator Set</b>				
<b>Maximum Engine Power</b>	<b>Model Year</b>	<b>PM (g/bhp-hr)</b>	<b>NMHC+NO<sub>x</sub> (g/bhp-hr)</b>	<b>CO (g/bhp-hr)</b>
hp > 750	2008+	0.15	4.8	2.6

- After December 31, 2008, be certified to the new non-road compression-ignition engine emission standard for all pollutants for 2007 and later model year engines as specified in 40 CFR, Part 60, Subpart III; and,
- Not operate more than 50 hours per year for maintenance and testing purposes, except as provided in §93115.6(a)(3)(A)(2). This regulation does not limit engine operation for emergency use and for emission testing to show compliance with §93115.6(a)(3).

The engines are expected to meet the emissions requirement and will be limited, through permit condition, to operate unrestricted only for emergencies and a maximum of 50 hours per year for maintenance and testing purposes. In addition, the permit will include near-school operating provisions that meet the requirements of §93115.6(a)(1).

Pursuant to §93115.10(d) (1) a non-resettable hour meter with a minimum display capability of 9,999 hours shall be installed upon engine installation. The owner/operator of the engine shall keep monthly records of the following for 36 months, with the prior 24 months readily accessible at the site and the prior 25 to 36 months available to the District within 5 working days from the request.

- Emergency use hours of operation;

**San Mateo Water Quality Control Plant  
Plant No. 861  
Application Nos. 30448 & 30449**

- Maintenance and testing hours of operation;
- Hours of operation for emission testing to show compliance with §933115.6(a)(3) and §93115.6(b)(3);
- Initial start-up testing hours;
- If applicable, hours of operation to comply with the requirements of NFPA 25;
- Hours of operation for all uses other than those specified in §93115.10(g)(1)(A) through (D);
- If applicable, DRP engine hours of operation; and,
- The fuel used.

**STATEMENT OF COMPLIANCE**

**Regulation 6, Rule 1**

Pursuant to Regulations 6-1-301 and 6-1-302, a person shall not emit from any source for a period or periods aggregating more than three minutes in any hour, a visible emission which is as dark or darker than No. 1 on the Ringelmann Chart, or of such opacity as to obscure an observer's view to an equivalent or greater degree and/or an emission equal to or greater than 20% opacity as perceived by an opacity sensing device, where such a device is required by District regulations.

Furthermore, pursuant to Regulation 6-1-303, engines with a displacement less than 25 liters shall not emit from any source for a period or periods aggregating more than three minutes in any hour, a visible emission which is as dark or darker than No. 2 on the Ringelmann Chart, or of such opacity as to obscure an observer's view to an equivalent or greater degree, or to be equal to or greater than 40 percent opacity.

Lastly, pursuant to Regulation 6-1-310.1, no person shall emit total suspended particulates (TSP) from any source in excess of 0.15 gr/dscf. The two engine options will emit 0.002 gr TSP/dscf.

The project is expected to meet the requirements of Regulations 6-1-301, 6-1-302, 6-1-303, and 6-1-310.1.

**Regulation 8, Rule 8**

Pursuant to Regulation 8-8-115, the requirements of Sections 8-8-301 through 8-8-314 shall not apply to any publicly owned municipal wastewater treatment facility. The City of San Mateo's wastewater treatment operation is not subject to the requirements of this rule since the facility is a POTW.

**Regulation 9, Rule 1**

The emergency engines are subject to the SO<sub>2</sub> limitations of Regulation 9-1-301 (Limitations on Ground Level Concentrations of Sulfur Dioxide), Regulation 9-1-302 (Limitations Sulfur Dioxide Emissions) and 9-1-304 (Burning of Solid and Liquid Sulfur Dioxide Fuel).

Pursuant to Regulation 9-1-301, the ground level concentrations of SO<sub>2</sub> shall not exceed 0.5 ppm continuously for 3 consecutive minutes or 0.25 ppm averaged over 60 consecutive minutes, or 0.05 ppm averaged over 24 hours. Pursuant to Regulation 9-1-302, a person shall not emit from any

## **San Mateo Water Quality Control Plant**

**Plant No. 861**

**Application Nos. 30448 & 30449**

source, a gas stream containing SO<sub>2</sub> in excess of 300 ppm (dry). Lastly, pursuant to Regulation 9-1-304, a person shall not burn any liquid fuel having a sulfur content in excess of 0.5% by weight. Compliance with Regulation 9-1 is expected due to the use of CARB low sulfur diesel fuel with a sulfur content of 0.0015% by weight.

### **Regulation 9, Rule 2**

Per Regulation 9-2-301, a person shall not emit during any 24-hour period, H<sub>2</sub>S in such quantities as to result in ground level concentration in excess of 0.06 ppm average over three consecutive minutes or 0.03 ppm averaged over any 60 consecutive minutes.

An HRA was performed. The estimated hourly ground level H<sub>2</sub>S concentration at the fence line is 0.024 ppm, which is less than the hourly threshold of 0.03 ppm. The facility is expected to be in compliance with this regulation.

### **Regulation 9, Rule 8**

This rule limits NO<sub>x</sub> and CO emissions from stationary internal combustion engines with an output rated by the manufacturer at more than 50 brake horsepower. S-34 through S-39 are intended to operate at a specific site for more than one year and will be attached to a foundation at the site. Therefore, the requirements of this rule apply.

In addition, S-34 through S-39 will be used for emergency use at an essential public service as defined pursuant to Regulations 9-8-230 and 9-8-233.

Pursuant to Regulation 9-8-110.5, emergency standby engines are exempt from the requirements of Regulations 9-8-301 through 305, 9-8-501, and 9-8-503. However, emergency standby engines at an essential public service are subject to the requirements of Regulation 9-8-331.

Pursuant to Regulation 9-8-331, an emergency engine will be allowed to operate 100 hours per calendar year for reliability-related activities. The requirements of the CARB ATCM are more stringent than the allowed annual reliability-related activity hours of this rule. Therefore, S-34 through S-39 will only be allowed to operate 50 hours per calendar year for reliability-related activities.

According to Regulation 9-8-530, emergency engines shall be equipped with a non-resettable totalizing meter that measures hours of operation or fuel usage. Monthly records for the following shall be kept for at least 2 years and be made available to District staff upon request.

- Total hours of operation;
- Emergency hours of operation; and,
- The nature of the emergency condition for each emergency.

S-34 through S-39 are expected to meet the requirements of this regulation.

**San Mateo Water Quality Control Plant**

**Plant No. 861**

**Application Nos. 30448 & 30449**

**California Environmental Quality Act**

The City of San Mateo prepared a Program Environmental Impact Report (PEIR) for the proposed project on April 2016. Furthermore, the City of San Mateo, serving as the Lead Agency under the California Environmental Quality Act (CEQA), adopted addendums within the PEIR in August 2019. The State Clearing House Number is 2015032006.

The main goal of the project is to address mending the recurring issue of wet-weather sanitary sewer overflows, which violate federal and state clean water standards. The project may include the following to accomplish the goal of meeting federal and state clean water standards:

- Upgrade collection systems;
- Install equalization basin upstream designated pump station;
- Install equalization basin at the WWTP;
- Install headworks at the WWTP;
- Upgrade and replace existing treatment processes at the WWTP;
- Increase the WWTP’s wet weather capacity up to 78 million gallons per day;
- Install new odor control systems at the WWTP; and,
- Install emergency diesel engine-generator sets.

The Lead Agency has determined that air quality impacts will be less than significant with mitigation incorporated. In addition, the project is not expected to exceed the District’s Air Quality CEQA Thresholds of Significance. Furthermore, the project was reviewed in accordance with *“Chapter 2.3.1 – Stationary Diesel Engines”* and *“Chapter 8.2 – Wastewater Treatment Facilities”* of the District’s Permit Handbook. Therefore, the individual components of the project would be ministerial exempt from CEQA pursuant to Regulation 2-1-311.

**California Health & Safety Code §42301.6 and Regulation 2-1-412**

Pursuant to California Health & Safety Code §42301.6(a), prior to approving an application for a permit to construct or modification of a source of hazardous air emissions, which is located within 1,000 feet from the outer boundary of a school site, the District shall prepare a public notice as detailed in §42301.6. §42301.9(a) defines a “school” as any public or private school used for the purposes of the education of more than 12 children in kindergarten or any grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in private homes.

The applicant has proposed the addition of new sources of hazardous air emissions within 1,000 feet from the outer boundary of the following school site identified in the following table.

<b>Table 18. School Sites Located Within 1,000 Feet of the Facility</b>			
<b>School Name</b>	<b>School Location</b>	<b>Grades</b>	<b>Description</b>
Bayside Middle School (Bayside STEM Academy)	2025 Kehoe Avenue San Mateo, CA 94403	6-8	Public

**San Mateo Water Quality Control Plant**

**Plant No. 861**

**Application Nos. 30448 & 30449**

This project will result in an increase in diesel exhaust particulate matter. Moreover, although the overall WWTP emissions are expected to decrease, this application includes the modification of permitted levels established in NSR Application #28996.

The District will be required to prepare a public notice as detailed in §42301.6. The public notice will be distributed to the addresses within 1,000 feet of the source and to the parents or guardians of children attending schools within a quarter (¼) mile of the source. The following schools are within a quarter mile of the source.

<b>Table 19. School Sites Located Within ¼ Mile of the Facility</b>			
<b>School Name</b>	<b>School Location</b>	<b>Grades</b>	<b>Description</b>
Bayside Middle School (Bayside STEM Academy)	2025 Kehoe Avenue San Mateo, CA 94403	6-8	Public
Lead Elementary School	949 Ocean View Avenue San Mateo, CA 94401	K-5	Public

**PERMIT CONDITIONS**

The following permit condition is for the stationary emergency diesel engine-generator sets, S-34 through S-39.

**Permit Condition #22850**

1. The owner/operator shall not exceed 50 hours per year per engine for reliability-related testing. [Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]
2. The owner/operator shall operate each emergency standby engine only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, State or Federal emission limit, or for reliability-related activities (maintenance and other testing, but excluding emission testing). Operating while mitigating emergency conditions or while emission testing to show compliance with District, State or Federal emission limits is not limited. [Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]
3. The owner/operator shall operate each emergency standby engine only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine is installed, operated and properly maintained. [Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]
4. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 36 months from the date of entry (60 months if the facility has been issued a Title V Major Facility Review Permit or a Synthetic Minor Operating Permit). Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.

**San Mateo Water Quality Control Plant**

**Plant No. 861**

**Application Nos. 30448 & 30449**

- a. Hours of operation for reliability-related activities (maintenance and testing).
- b. Hours of operation for emission testing to show compliance with emission limits.
- c. Hours of operation (emergency).
- d. For each emergency, the nature of the emergency condition.
- e. Fuel usage for each engine(s).

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

5. At School and Near-School Operation: If the emergency standby engine is located on school grounds or within 500 feet of any school grounds, the following requirements shall apply:

The owner/operator shall not operate each stationary emergency standby diesel-fueled engine for non-emergency use, including maintenance and testing, during the following periods:

- a. Whenever there is a school sponsored activity (if the engine is located on school grounds).
- b. Between 7:30 a.m. and 3:30 p.m. on days when school is in session. "School" or "School Grounds" means any public or private school used for the purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in a private home(s). "School" or "School Grounds" includes any building or structure, athletic field, or other areas of school property but does not include unimproved school property.

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

***End of Conditions***

The following permit condition is for the stationary emergency diesel engine-generator sets, S-34 through S-37.

**Permit Condition #27496**

1. The owner/operator shall not operate unless the following emergency diesel engine generator set(s) are abated by the specified selective catalytic reduction (SCR), at all times.

S34 abated by SCR, A34

S35 abated by SCR, A35

S36 abated by SCR, A36

S37 abated by SCR, A37

[Basis: BACT and Cumulative Increase]

2. The owner/operator shall operate the Selective Catalytic Reductions, A34 through A35, in accordance with manufacturer specifications to meet the emission limits of Part 3 of this condition. [Basis: BACT, Cumulative Increase, and Regulation 2-1-403]
3. The owner/operator shall not exceed the following emission limitations:

## San Mateo Water Quality Control Plant

Plant No. 861

Application Nos. 30448 & 30449

- a. NOx: 0.5 gram/horsepower-hour  
[Basis: BACT]
4. The owner/operator shall ensure that the ammonia (NH<sub>3</sub>) slip emissions from the Selective Catalytic Reductions, A34 through A35, do not exceed 10 ppmv, dry @ 15% O<sub>2</sub>. If deemed necessary, the Air District may require source testing to determine compliance with the emission limit of this part.  
[Basis: Toxics]
5. Within 60 days from startup, and within a frequency of no less than once every three (3) years after each subsequent source test thereafter, the owner/operator shall conduct ISO 8178 D2 5-Mode Cycle Testing and/or District approved source test methods to determine compliance with the limits in Part 3 of this condition. The owner/operator shall submit the source test results to the District's Source Test Section no later than 60 days after the source test. [Basis: Regulation 2-1-403]
6. The owner/operator shall comply with all applicable testing requirements as specified in Volume IV of the District's Manual of Procedures. The owner/operator shall notify the District's Source Test Section, in writing, of the source test protocols and projected test dates at least 7 days prior to testing.  
[Basis: Regulation 2-1-403]
7. Source test apparatuses, sampling ports, and platforms must meet requirements specified in Volume IV of the District's Manual of Procedures. [Basis: MOP Volume IV and Regulation 2-1-403]
8. The owner/operator shall maintain the following records for at least 36 months from the date of entry (60 months if the facility has been issued a Title V Major Facility Review Permit or a Synthetic Minor Operating Permit). Log entries shall be retained on site, either at a central location or at the engine's location, and made immediately available to District staff upon request.
  - a. Source Test Notification
  - b. Source Test Report[Basis: Regulation 2-1-403]

### *End of Conditions*

The following permit condition is for sources related to the WWTP, which include the preliminary treatment, S-110, the primary treatment, S-120, the secondary treatment, S-130, the secondary clarifier, S-140, disinfection, S-160, and flow equalization, S-190.

#### **Permit Condition #26954**

[This condition, as initially adopted in New Source Review \(NSR\) Application #28996 on April 30, 2019, is further amended to include operational changes as a result of design changes to the approved project in NSR Application #28996.](#)

#### GENERAL CONDITIONS

1. The owner/operator of the municipal wastewater treatment plant, S-100, shall not exceed the following design capacities:
  - a. Total average dry weather effluent flow of 15.7 million gallons per day calculated as an average over three consecutive dry weather months from May 1 to October 31;

**San Mateo Water Quality Control Plant  
Plant No. 861  
Application Nos. 30448 & 30449**

- b. Peak wet weather effluent flow of 78 million gallons per day; and,
- c. 5,730.50 million gallons per consecutive 12-month period.

For the purposes of this part, dry weather season is typically from May 1 to October 31 and wet weather season is typically from November 1 to April 30. To determine compliance with this part, the owner/operator shall measure flow at Discharge Point 001, Monitoring Station EFF-001, as described in the Monitoring and Reporting Program of the facility's National Pollutant Discharge Elimination System permit. [Basis: Cumulative Increase]

- 2. To demonstrate compliance with Part 1 of this condition, the owner/operator shall record the following:
  - a. Daily and monthly records of the quantity of effluent processed at this facility; and,
  - b. Consecutive 12-month period quantity of effluent processed at this facility by totaling the monthly records of Part 2(a) of this condition.  
[Basis: Regulation 2-1-403]
- 3. The owner/operator of the preliminary treatment, S-110, ~~and~~ the primary treatment, S-120, ~~and the secondary clarifier, S-140~~, shall enclose those sources and abate emissions from those sources with the odor control system, A-20, at all times. [Basis: Cumulative Increase, Toxics, and Regulation 9-2]
- 4. The owner/operator of the odor control system, A-20, shall not exceed a combined total exhaust flowrate of ~~29,800~~26,000 dry standard cubic feet per minute through A-20. [Basis: Cumulative Increase]
- 5. The owner/operator of the flow equalization, S-190, shall abate emission with the iron salts dosing system #2, A-21, at all times that the source is in operation. The dosing rate of the iron salts dosing system #2, A-21, shall be a minimum of 20 milligram of iron salts per liter of wastewater, which is based on a maximum anticipated total sulfide concentration in the influent wastewater to S-190 of 5 milligrams per liter. Operation of S-190 begins with the introduction of wastewater into S-190 in the empty condition and ends with the removal of wastewater from S-190 returning it to the empty condition. Each time S-190 is operated, the owner/operator will analyze a sample of wastewater influent to S-190 within 8 hours of the start of operation to document that the concentration of total sulfides is equal to or less than 5 milligrams per liter. In the event that the total sulfide concentration exceeds 5 milligrams per liter, the owner/operator will increase the iron salts dose to 50 milligrams of iron salts per liter of wastewater. The owner/operator may continue to analyze samples of wastewater influent to S-190 for total sulfides and may reduce the iron salts dose to 20 milligrams per liter when the total sulfide concentration in the wastewater influent to S-190 is at or below 5 milligrams per liter. [Basis: Cumulative Increase]

**PRECURSOR ORGANIC COMPOUND (POC)/NON-PRECURSOR ORGANIC COMPOUND (NPOC) REQUIREMENTS**

**San Mateo Water Quality Control Plant**

**Plant No. 861**

**Application Nos. 30448 & 30449**

6. The owner/operator of the odor control system, A-20, shall properly operate the device according to manufacturer specifications, ~~to achieve a minimum POC and NPOC control efficiency of 85% by weight.~~ The following limitations at the maximum flowrate, as specified in Part 4 of this condition, are presumed to be in compliance with this part.
  - a. ~~1.38~~ ppmv combined POC and NPOC limit, measured as methane; or,
  - b. Combined POC and NPOC emission rate of ~~0.100.52~~ lb/hr.  
[Basis: Cumulative Increase]
  
7. To demonstrate compliance with the requirements of Part 6 of this condition, the owner/operator shall monitor organic compounds, as methane, with a flame ionization detector (FID), or analyze a sample using Environmental Protection Agency (EPA) Test Method TO-15, or other District approved instrument method, from the stack of the odor control system, A-20, at least once every calendar week. If the owner/operator can demonstrate 3 months of monitoring results equal to, or less than, half of the limits of Part 6 of this condition, monitoring may be reduced to once every calendar month. If any subsequent results, from the monthly monitoring, are above half of the limits of Part 6 of this condition, the owner/operator shall monitor every week until the owner/operator can demonstrate 3 months of monitoring results equal to, or less than, half of the limits of Part 6 of this condition, at which time the monitoring frequency may return to at least once every calendar month. [Basis: Cumulative Increase]

**HYDROGEN SULFIDE (H<sub>2</sub>S) REQUIREMENTS**

8. The H<sub>2</sub>S concentration from the odor control system, A-20, shall not exceed 1.5 ppmv.  
[Basis: Toxics and Regulation 9-2]
  
9. To demonstrate compliance with the standard in Part 8 of this condition, the owner/operator shall monitor and record the sulfur content from the stack of the odor control system, A-20, at least once every calendar week. If the owner/operator can demonstrate 3 months of sulfur results lower than 0.75 ppmv, the monitoring frequency for sulfur analysis may be reduced to at least once every calendar month. If any subsequent results, from monthly monitoring, are above the 0.75 ppmv, the owner/operator shall monitor every week until the owner/operator can demonstrate 3 months of sulfur results lower than 0.75 ppmv, at which time the monitoring frequency for sulfur analysis may return to at least once every calendar month.  
[Basis: Toxics and Regulation 9-2]
  
10. The owner/operator shall conduct the monitoring required by Part 9 of this condition in accordance with any of the following methodologies:
  - a. Draeger Tube Test Method: Draeger Tube tests capable of the following:
    - i. The owner/operator shall use a Draeger Tube test, or equivalent, with an H<sub>2</sub>S range from 0.2 to 5 ppmv to demonstrate compliance with the above limit.
    - ii. For measurements that are equal to or exceed the maximum range of the instrument specified in Part 10(a)(i) of this condition, the owner/operator shall use a Draeger

## San Mateo Water Quality Control Plant

Plant No. 861

Application Nos. 30448 & 30449

Tube test, or equivalent, with an H<sub>2</sub>S range from 0.5 to 15 ppmv to detect higher concentrations than the above limit.

- iii. For measurements that are equal to or exceed the maximum range of the instrument specified in Part 10(a)(ii) of this condition, the owner/operator shall use a Draeger Tube test, or equivalent, with an H<sub>2</sub>S range up to 200 ppmv to detect higher concentrations than the above limit.

For H<sub>2</sub>S measurements that are equal to or exceed 200 ppmv, the owner/operator shall detect higher concentrations than the above limit using the methods specified in Parts 10(b) and 10(c) of this condition.

- b. Portable Instrument Method: A Draeger PAC-III (or equivalent) portable meter with an H<sub>2</sub>S sensor capable of measuring over 800 ppmv H<sub>2</sub>S. In the event that H<sub>2</sub>S levels exceed 800 ppmv, the owner/operator shall commence to perform a source test using the method of Part 10(c) of this condition.
- c. Chromatographic Method: The owner/operator may sample and test for sulfides according to BAAQMD Lab Method 44A (Manual of Procedures, Volume III), or by ASTM Method 5504, or by any other equivalent method, approved in advance by the District.

The owner/operator may use alternative methods other than those specified in this part, as long as it is deemed equivalent, accurate, and approved in advance by the District. [Basis: Regulation 2-1-403]

### ABATEMENT DEVICE REQUIREMENTS

11. The odor control system, A-20, consists of two (2) parallel trains, each consisting of one (1) bio-trickling scrubber, one (1) mist eliminator, and one (1) carbon adsorption vessel. The owner/operator shall meet the following requirements for the specified event:
  - a. In the event that monitoring of one (1) of the two (2) odor control system trains results in values at or above the limits specified in Parts 6 or 8 of this condition: Upon the discovery that the limits of Parts 6 or 8 of this condition have been exceeded, the owner/operator will tag or label the odor control system train out of service and adjust the system valves/shutdown the associated fan such that all emissions will flow through the second functioning odor control system train. The owner/operator must repair the out of service odor control system train and demonstrate compliance with Parts 6 and 8 of this condition within 10 days of the discovery of the exceedance of the limits within Parts 6 or 8 of this condition.
  - b. In the event that monitoring of both odor control system trains result in values at or above the permitted limits specified in Parts 6 or 8 of this condition: Upon the discovery that the limits of Parts 6 or 8 of this condition have been exceeded, the owner/operator shall service one of the odor control system trains, abate emissions to the serviced odor control system train, and demonstrate compliance with Parts 6 and 8 of this condition within an

**San Mateo Water Quality Control Plant**

**Plant No. 861**

**Application Nos. 30448 & 30449**

8-hour period. The owner/operator must repair the other out of service odor control system train and demonstrate compliance with Parts 6 and 8 of this condition within 10 days of the discovery of the exceedance of the limits within Parts 6 or 8 of this condition. [Basis: Regulation 2-1-403]

**RECORD KEEPING REQUIREMENTS**

12. The owner/operator shall maintain the following records:

- a. Daily, monthly, and annual records of the quantity of effluent processed at this facility as measured at Discharge Point 001, Monitoring Station EFF-001, as described in the Monitoring and Reporting Program of the facility's National Pollutant Discharge Elimination System permit;
- b. POC/NPOC volumetric concentration measurements pursuant to Part 7 of this condition;
- c. H<sub>2</sub>S volumetric concentration measurements pursuant to Parts 9 and 10 of this condition;
- d. Operation of the flow equalization, S-190, and dosage of iron salts:
  - i. Date S-190 and iron salts dosing system #2, A-21, are in operation;
  - ii. Analysis of total sulfide concentration in the wastewater influent; and,
  - iii. Iron salt dose administered; and,
- e. Odor control system, A-20, service records:
  - i. Initial date and time service is required pursuant to Part 11 of this condition;
  - ii. Identification of the odor control system train that requires service;
  - iii. Date and time of corrective action; and,
  - iv. Compliance demonstration of Parts 6 and 8 of this condition associated with each event.

All records shall be retained onsite for two years from the date of entry, and made available for inspection by District staff upon request. These recordkeeping requirements do not replace the recordkeeping requirements contained in any applicable District regulation. [Basis: Recordkeeping]

*End of Conditions*

**RECOMMENDATION**

The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality related regulations. The preliminary recommendation is to issue an Authority to Construct for the proposal of the new, modified, and altered sources listed below. However, the proposed source will be located within 1,000 feet of a school, which triggers the public notification requirement of District Regulation 2-1-412. After the comments are received and reviewed, the District will make a final determination on the permit.

I recommend that the District initiate a public notice and consider any comments received prior to taking any final action on the issuance of a Permit to Operate for the following equipment:

**San Mateo Water Quality Control Plant  
Plant No. 861  
Application Nos. 30448 & 30449**

*New Sources:*

- S-34 Stationary Emergency Diesel Engine-Generator Set  
Make: Caterpillar, Model: C32, Model Year: 2021  
1,483 BHp, 10.01 MMBtu/Hr  
Engine Family: MCPXL32.0NZS  
Abated by Selective Catalytic Reduction, A-34**
- A-34 Selective Catalytic Reduction  
Safety Power, Inc., ecoCUBE, 3 Series 9330-H200**
- S-35 Stationary Emergency Diesel Engine-Generator Set  
Make: Caterpillar, Model: C32, Model Year: 2021  
1,483 BHp, 10.01 MMBtu/Hr  
Engine Family: MCPXL32.0NZS  
Abated by Selective Catalytic Reduction, A-35**
- A-35 Selective Catalytic Reduction  
Safety Power, Inc., ecoCUBE, 3 Series 9330-H200**
- S-36 Stationary Emergency Diesel Engine-Generator Set  
Make: Caterpillar, Model: C32, Model Year: 2021  
1,483 BHp, 10.01 MMBtu/Hr  
Engine Family: MCPXL32.0NZS  
Abated by Selective Catalytic Reduction, A-36**
- A-36 Selective Catalytic Reduction  
Safety Power, Inc., ecoCUBE, 3 Series 9330-H200**
- S-37 Stationary Emergency Diesel Engine-Generator Set  
Make: Caterpillar, Model: C32, Model Year: 2021  
1,483 BHp, 10.01 MMBtu/Hr  
Engine Family: MCPXL32.0NZS  
Abated by Selective Catalytic Reduction, A-37**
- A-37 Selective Catalytic Reduction  
Safety Power, Inc., ecoCUBE, 3 Series 9330-H200**
- S-38 Stationary Emergency Diesel Engine-Generator Set  
Make: Caterpillar, Model: C18, Model Year: 2021  
900 BHp, 5.89 MMBtu/Hr  
Engine Family: MCPXL18.1NYS**

**San Mateo Water Quality Control Plant  
Plant No. 861  
Application Nos. 30448 & 30449**

**S-39 Stationary Emergency Diesel Engine-Generator Set  
Make: Caterpillar, Model: C18, Model Year: 2021  
900 BHp, 5.89 MMBtu/Hr  
Engine Family: MCPXL18.1NYS**

***Modifications:***

**S-110 Preliminary Treatment  
Influent Injunction Box, Preliminary Screens, Grit Removal, & Fine Screens  
Dry Weather Effluent Flow Rate: 15.7 Million Gallon Per Day  
(Averaged Over 3 Consecutive Months During May 1 to October 31)  
Peak Wet Weather Effluent Flow Rate: 78 Million Gallon Per Day  
Enclosed and Abated by Odor Control System, A-20**

**S-120 Primary Treatment  
Four (4) 190' Length x 20' Width Rectangular Clarifiers  
Dry Weather Effluent Flow Rate: 15.7 Million Gallon Per Day  
(Averaged Over 3 Consecutive Months During May 1 to October 31)  
Peak Wet Weather Effluent Flow Rate: 78 Million Gallon Per Day  
Enclosed and Abated by Odor Control System, A-20**

**A-20 Odor Control System  
Two (2) Parallel Trains, Each Consisting of One (1) Biotrickling Scrubber, One (1) Mist Eliminator, and One (1) Carbon Adsorber for a Total of Two (2) Biotrickling Scrubbers, Two (2) Mist Eliminators, and Two (2) Carbon Adsorbers  
Bioscrubber: 12' Diameter x 27' Height, 49,100 Lb Operating Weight  
Carbon Adsorber: 12' Diameter x 14' Height, 17,500 lb Total Media Weight  
13,000 Cubic Feet Per Minute Capacity Each Train for a Total of 26,000 Cubic Feet Per Minute Capacity**

***Altered Sources:***

**S-130 Secondary Treatment  
Biological Nutrient Removal  
2-Stage Modified Ludzack-Ettinger Process & Membrane Bioreactor  
Dry Weather Effluent Flow Rate: 15.7 Million Gallon Per Day  
(Averaged Over 3 Consecutive Months During May 1 to October 31)  
Peak Wet Weather Effluent Flow Rate: 78 Million Gallon Per Day**

**S-140 Secondary Clarifier  
Biological Contact Tank Effluent to High-Rate Solids Separation System (Actiflo)  
Consisting of Ferric Salt Addition, Coagulation, Polymer, Microsand Addition,  
Settling Clarifier, and San Recirculation  
Operating Only During Wet Weather Conditions  
Peak Wet Weather Effluent Flow Rate: 78 Million Gallon Per Day**

**San Mateo Water Quality Control Plant  
Plant No. 861  
Application Nos. 30448 & 30449**

**S-160 Disinfection  
Chlorine Contact Basin, 60 Million Gallon Per Day Capacity**

By: \_\_\_\_\_  
Alfonso Borja  
Supervising Air Quality Engineer

Date: \_\_\_\_\_

DRAFT