

Bay Area Air Quality Management District

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**Permit Evaluation
and
Statement of Basis
for
MINOR REVISION to the
MAJOR FACILITY REVIEW PERMIT**

for
**San Jose/Santa Clara
Water Pollution Control
Facility #A0778**

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Application Engineer: M.K. Carol Lee
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Application: 17755

Title V Statement of Basis

Minor Revision of Title V permit for San Jose/Santa Clara Water Pollution Control

This minor revision includes a change to Permit Condition ID # 17900, Part 3 for S-36 and S-37 Engine Generators that resulted from the approval on May 19, 2008 of a District application for Change of Condition (Application # 17754) submitted by the facility. A copy of the evaluation report for that application is provided in the Appendix.

Changes to the Permit

Section IV

- Re-label Regulation 9-8 reference in Tables IV-A, IV-B, IV-E, and IV-H as SIP Regulation 9, Rule 8 with an adoption date of 12/15/2007 for fossil fuel and waste gas combustion engines.
- Add amended Regulation 9, Rule 8 (7/25/07) version as an applicable requirement for fossil fuel and waste gas combustion engines in Tables IV-A, IV-B, IV-E, and IV-H.

Section VI

Part 3 of Permit Condition ID # 17900 was amended as follows: [strikethroughs indicate deletions while underlines indicate additions]

3. Emissions of CO shall not exceed ~~413.4~~546 lb per engine in any consecutive 24 hour period. (Basis: Cumulative Increase)

Section VII

District Regulation 9-8 was amended on July 25, 2007. As a result, the facility has more stringent nitrogen oxide standards for S-36 and S-37, which take effect in 2012. As a result, they submitted Application # 17754 to amend the permit conditions to allow for the increase of carbon monoxide emissions so that they can achieve the nitrogen oxide standard by 2012.

Amended Regulation 9, Rule 8 will be added to Tables VII-A, VII-B, VII-E, and VII-I and the citations of the previous version of Regulation 9, Rule 8 has been labeled as SIP versions.

Table VII-E will be amended to reflect the change in conditions increasing CO from 413.4 to 546 pounds per engine in any consecutive 24-hour period.

APPENDIX

EVALUATION REPORT

Company San Jose/Santa Clara Water Pollution Control Plant Application # 17754
Plant # 778

1. Background:

San Jose/Santa Clara Water Pollution Control Plant (SJ/SCWPCP) is applying for a Change of Condition for S-36 and S-37 Engine Generator (Condition ID # 17900, Part 3) to raise CO emissions from 413.4 lbs/day to 546 lbs/day. Due to the recent amendments to Regulation 9-8, S-36 and S-37 will be soon subject to a nitrogen oxide (NOx) limit of 70 ppm @ 15% oxygen (O₂) for waste-derived fuel, which is to be effective in 2012. Any change to reduce the nitrogen oxide emissions will increase their carbon monoxide (CO) emissions to exceed their daily permit condition limit of 413.4 lbs/day. To be able to maintain compliance with the 2012 NOx standard, San Jose/Santa Clara Water Pollution Control Plant has requested that we allow them to increase CO emissions up to the level of the existing BACT2 limits of 2.65 g/bhp-hr.

2. Emission Calculations:

To attain BACT2 level for CO for S-36 and S-37, the CO limit is calculated as follows:

$$\begin{aligned} \text{Basis: HP} &= 3900 \text{ HP} \\ \text{BACT2} &= 2.65 \text{ g/bhp-hr CO} \end{aligned}$$

$$\text{CO limit} = 2.65 \text{ g/bhp-hr}(3900 \text{ HP})(24 \text{ hr/day})/454 \text{ g/lb} = 546 \text{ lbs/day}$$

The increase in CO emissions for this Change of Condition application is:

$$\begin{aligned} \text{CO} &= (546 \text{ lbs/day} - 413.4 \text{ lbs/day})(365 \text{ day/yr}) = 48,524 \text{ lbs/day} \\ \text{CO} &= 24.3 \text{ TPY} \end{aligned}$$

S-36 and S-37 have limits on NOx (Part 2), CO (Part 3), TSP (Part 4), and Non-Methane Hydrocarbons (NMHC = Part 5). The facility has only requested that the CO limit be increased. All other limits (for NOx, TSP and NMHC) shall remain unchanged.

3. Statement of Compliance:

BAAQMD Regulation 9-8

Operation of S-36 and S-37 Engine Generator is subject to Regulation 9, Rule 8 (Nitrogen Oxides and Carbon Monoxides for Stationary Internal Combustion Engines). Currently, the engine generators meet the NOx and CO standards of 210 and 2000 ppm @ 15% O₂, respectively. The proposed change of conditions will ensure that the facility will continue to meet Regulation 9-8-302 when the standard for NOx is lowered to 70 ppm @ 15% O₂ (the CO limit remains at 2000 ppm @ 15% O₂).

BACT

Because there is an increase in CO emissions from S-36 and S-37 as the result of the proposed change of conditions, Best Available Control Technology (BACT) review is triggered. The engine generators (S-36 and S-37) are permitted to be fired on natural gas, sewage sludge digester gas, landfill gas, or a combination thereof (Condition # 17000, Part 1). As a result, the applicable BACT is that for landfill gas fired engines (see BACT Workbook (Document # 96.2.1)).

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Best Available Control Technology (BACT) Guideline

Source Category

Source:	IC Engine - Landfill Gas Fired	Revision:	3
Class:	≥250 HP Output	Document #:	96.2.1
		Date:	06/02/95

Determination

POLLUTANT	BACT		TYPICAL TECHNOLOGY
	1. Technologically Feasible/ Cost Effective	2. Achieved in Practice	
POC	1. 0.6 g/bhp-hr ^{a,T} 2. 1.0 g/bhp-hr ^{a,T}		1. n/s 2. Lean Burn Technology ^{a,T}
NOx	1. 1.0 g/bhp-hr ^a 2. 1.25 g/bhp-hr ^a		1. n/s 2. Lean Burn Technology ^a
SO ₂	1. n/s 2. 0.3 g/bhp-hr ^a		1. Fuel Gas Treatment w/ ≥80% H ₂ S Removal ^a 2. Addition of iron salts to digester sludge to remove H ₂ S ^a
CO	1. 2.1 g/bhp-hr ^a 2. 2.65 g/bhp-hr ^a		1. n/s 2. Lean Burn Technology ^a
PM ₁₀	1. n/d 2. n/s		1. n/s 2. Lean Gas Pretreatment ^a
NPOC	1. n/a 2. n/a		1. n/a 2. n/a

References

^a BAAQMD
^T TBACT

The District's Source Test Section performed source tests on S-36 and S-37 in 2006 to determine compliance with their permit conditions (Condition # 17900 Parts 2 and Parts 3). The results are summarized below:

Pollutant	S-36	S-37	Reg 9-8-302 limit (Current)	Reg. 9-8-302 Limit (2012)
NOx, ppm @ 15% O ₂	40.8	35.1	210 ppm @ 15% O ₂	70 ppm @ 15% O ₂
NOx, g/bhp-hr	0.7	0.6	1.8 g/bhp-hr (Condition # 17900, Part 2)	
CO, ppm @ 15% O ₂	211.5	190.6	2000	2000
CO, g/bhp-hr	2.1	1.8		
CO, lb/day	420.1	359.2	413.4 lbs/day (Condition # 17900, Part 3)	

The facility has demonstrated from the 2006 source testing that they can meet the 2012 standard for NOx but the limit on CO did rise above the permit condition limit of 413.4 lb/day. The facility has indicated in their correspondence to the District that they have difficulty consistently meeting that permit condition limit especially when they burn waste derived fuels such as landfill and sewage sludge digester gas. Furthermore, in a recent meeting with the facility in April 2008, Kevin Maung and Chuck Hagenmaier of SJ/SCWPCP indicated concern that as the engine generators age that it would become increasingly difficult to keep CO levels at 2.1 g/bhp-hr while keep NOx levels below 70 ppm @ 15% O₂. Randy Frazier, District expert on IC engines, agreed with them. He has recently amended BACT for digester fired IC

engines (BACT Workbook Document # 96.5.1) acknowledging that as engines age that they may need engine overhaul once emissions reach a certain level. BACT2 for Digester Gas Fired Engines is also 2.65 g/br-hr. Hence, S-36 and S-37 will meet both BACT2 for landfill and digester gas fired.

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Best Available Control Technology (BACT) Guideline**

Source Category

Source:	IC Engine – Digester Gas Fired	Revision:	1
Class:	≥ 50 Hp Output	Document #:	96.5.1
		Date:	2/21/2008

Determination

Pollutant	BACT 1. Technologically Feasible/ Cost Effective 2. Archived in Practice	TYPICAL TECHNOLOGY
POC	1. 0.6 g/bhp-hr ^a 2. 1.0 g/bhp-hr ^a	1. n/s ^a 2. Lean Burn Technology ^a
NOx	1. 1.0 g/bhp-hr ^a 2. 1.25 g/bhp-hr ^a	1. n/s ^a 2. Lean Burn Technology ^a
SO ₂	1. n/s ^a 2. 0.3 g/bhp-hr ^a	1. Digester gas treatment w/ > 80% H ₂ S removal ^a 2. Digester gas pretreatment to remove H ₂ S ^{a,f}
CO	1. 2.1 g/bhp-hr ^a 2. a) Nominal Standard ^{b,c} : Either 2.65 g/bhp-hr or 265 ppm @15% oxygen. b) Action Standard ^{b,d} : >345 ppm @15% oxygen c) Not to Exceed Standard ^{b,e} : 377 ppm @15% oxygen d) Engine Top End or major maintenance or overhaul required every 8,000 hrs of engine operation or 12 months of operation, whichever comes first ^e .	1. n/s ^a 2. Lean Burn Technology ^a
PM ₁₀	1. n/d ^a 2. n/s ^a	1. n/d ^a 2. Digester gas pretreatment ^{a,f}
NPOC	1. n/a ^a 2. n/a ^a	1. n/a ^a 2. n/a ^a

In addition, Randy Frazier indicated that the 2.1 g/bhp-hr BACT1 level was not feasible for their type of engine generators, which burn waste-derived fuels. As a result, S-36 and S-37 shall be required to meet BACT2 (2.65 g/bhp-hr for CO).

Offsets

The increase of CO will not trigger offset requirements, because offsets are not required for CO.

PSD

Because the increase in CO does not exceed 100 tons per year at this existing major facility, PSD modeling is not triggered, per Regulation 2-2-305.2.

Other Requirements

There is a NSPS for Stationary Compression Ignition Internal Combustion Engines (Subpart IIII of Part 60), which applies to engines installed after 2005. S-36 and S-37 were installed prior to 2005. As a result,

this application does not trigger **Regulation 10 - New Source Performance Standard**; or **Regulation 11 - Hazardous Pollutants**. Because this application is ministerial [Permit Handbook Chapters 2.3.2], the California Environmental Quality Act (CEQA) is not triggered.

S-36 and S-37 have limits on NOx (Part 2), CO (Part 3), TSP (Part 4), and Non-Methane Hydrocarbons (NMHC = Part 5). The facility has only requested that the CO limit be increased. All other limits (for NOx, TSP and NMHC) shall remain unchanged. The toxic emissions from S-36 and S-37 are not expected to increase or change for this change of condition application. As a result, a Toxic Risk Screening is not required.

4. Conditions:

I recommend the following change to Permit Condition ID # 17900, Part 3: [strikethroughs indicate deletions while underlines indicate additions].

3. Emissions of CO shall not exceed ~~413.4~~4546 lb per engine in any consecutive 24 hour period. (Basis: Cumulative Increase)

A copy of the permit conditions in their entirety is attached to this evaluation report.

5. Authority to Construct:

See Section 4.

6. Exemptions:

None.

12/80-ER1

By [signed by M.K. Carol Lee]
M.K. Carol Lee, PSD Engineer

Date May 18, 2008