

**Bay Area Air Quality Management District**

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**Permit Evaluation  
and  
Statement of Basis  
for  
RENEWAL of**

**MAJOR FACILITY REVIEW PERMIT**

**for  
East Bay Municipal Utility District  
Facility #A0591**

**Facility Address:**  
2020 Wake Avenue  
Oakland, CA 94607

**Mailing Address:**  
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Site Engineer: Simrun Dhoot

Applications: 28689, 26296, 26517, 26686

July 2019

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## **Title V Statement of Basis**

### **A. Background**

This facility is subject to the Operating Permit requirements of Title V of the federal Clean Air Act, Part 70 of Title 40 of the Code of Federal Regulations (CFR), and BAAQMD Regulation 2, Rule 6, Major Facility Review because it is a major facility as defined by BAAQMD Regulation 2-6-212. It is a major facility because it has the “potential to emit” (as defined by BAAQMD Regulation 2-6-218) more than 100 tons per year of a regulated air pollutant, carbon monoxide.

Major Facility Operating permits (Title V permits) must meet specifications contained in 40 CFR Part 70 as contained in BAAQMD Regulation 2, Rule 6. The permits must contain all “applicable requirements” (as defined in BAAQMD Regulation 2-6-202), monitoring requirements, recordkeeping requirements, and reporting requirements. The permit holders must submit reports of all monitoring at least every six months and compliance certifications at least every year.

Pursuant to Regulation 2, Rule 6, section 416, the District has reviewed the terms and conditions of this Major Facility Review permit and determined that they are still valid and correct. This review included an analysis of applicability determinations for all sources, including those that have been modified or permitted since the issuance of the initial Major Facility Review Permit. The review also included an assessment of all monitoring in the permit for sufficiency to determine compliance. The statement of basis documents for permit revisions that have occurred since the initial Major Facility Review permit was issued are hereby incorporated by reference and are available upon request.

In the Bay Area, state and District requirements are also applicable requirements and are included in the permit. These requirements can be federally enforceable or non-federally enforceable. All applicable requirements are contained in Sections I through VI of the permit.

Each facility in the Bay Area is assigned a facility identifier that consists of a letter and a 4-digit number. This identifier is also considered to be the identifier for the permit. The identifier for this facility is A0591.

This facility received its initial Title V permit on July 1, 1997. It was renewed on July 26, 2005, and December 19, 2012. This application is for a permit renewal. Although the current permit expired on December 18, 2017, it continues in force until the District takes final action on the permit renewal. The proposed permit shows all changes to the permit in strikeout/underline format.

This renewal incorporates the various minor revisions to the permit. The table below contains the Title V application numbers, any corresponding NSR application numbers, and a brief description of the projects. The NSR evaluations are attached in Appendix C of this Statement of Basis and form part of the Statement of Basis.

Title V Application #	NSR Application #	Description
26296	25905	Emergency generator, S58
	26237	Modification of S48, Gasoline Dispensing Facility
26517	26354	Digester modification, addition of blend tanks and FOG (Fats, oils, and greases) and high strength receiving station
26686	26687	Two emergency flares
28689		Title V Renewal

S58 was originally permitted as a prime engine, but the facility agreed to use it as an emergency engine after the Authority to Construct was issued.

## **B. Facility Description**

The East Bay Municipal Utility District (EBMUD) is a publicly owned treatment works (POTW) facility that provides wastewater collection, treatment and disposal services to the residents and businesses of parts of Alameda and Contra Costa County. The sources that are permitted include liquid and semi-liquid wastewater process sources, support systems such as a gasoline dispensing station, and a number of combustion sources to convert the plant produced digester gas into electricity and hot water to supply the plant energy needs. Liquid sources include preliminary treatment, primary treatment, secondary treatment, clarification, disinfection, sludge handling, and sludge digestion. Combustion operations include a hot water boiler, emergency standby diesel generator sets, digester gas emergency flares, a cogeneration turbine, and cogeneration engine generators.

Average dry weather wastewater flow capacity is approximately 120 million gal/day (MGD). Average wet weather flow capacity is approximately 325 million gal/day. The actual annual average flows through the facility from 2012-2018 range from 46-63 MGD, far less than the capacity. The wastewater processes at EBMUD are similar to any other “traditional” municipal wastewater treatment facility. The wastewater plant receives flows from a number of satellite pump stations throughout the aforementioned service area. Plant processes render the influent homogeneous, allow for physical separation to occur and hasten the occurrence of normal biological processes. The liquid and semi-solid wastes are processed such that the process resulting sludge is converted into digester gas fuel with residual biomass for offsite disposal. Effluent water outflow meets regional water quality control board standards for discharge or reuse.

The criteria pollutant emissions from the combustion processes, specifically the CO, has the potential to emit more than 100 tons per year, hence East Bay Municipal Utility District's requirement for a Federal Title V Major Facility Permit.

The emission changes for the site are summarized below.

Table 1. Emission Changes for Site # A0591

	2012 Actual Emissions	2017 Actual Emissions	Emission Changes
	tons/year	tons/year	tons/year
PM <sub>10</sub> /PM <sub>2.5</sub>	4.6	3.78	-0.82
POC	29.5	24.46	-5.04
NO <sub>x</sub>	53.2	38.51	-14.69
SO <sub>2</sub>	31.9	44.35	12.45
CO	152.2	99.65	-52.55

Emission changes from the revision in 2012 are the result of the removal of S52, Diesel Engine Backup Generator and the addition of S58, Emergency Standby Diesel Generator Set; S172, Pre-Digestion Blend Tanks; and A194 and A195, Digester Gas Enclosed Flares.

### C. Permit Content

The legal and factual basis for the permit follows. The permit sections are described in the order presented in the permit. Routine changes to the standard permit text in Section I “Standard Conditions”, Section III “Generally Applicable Requirements”, and Section XI “Glossary” are not considered part of the Title V permit renewal process, but may be made at the discretion of the District during the term of this permit.

#### Changes to Permit, Title Page:

- The Facility Contact information was corrected.
- The BAAQMD Contact information was corrected.
- The address for BAAQMD was updated.
- The mailing address for EBMUD was updated.

### I. Standard Conditions

This section contains administrative requirements and conditions that apply to all facilities. If the Title IV (Acid Rain) requirements for certain fossil-fuel fired electrical generating facilities or the accidental release (40 CFR § 68) programs apply, the section will contain a standard condition pertaining to these programs. This permit does not include Title IV or accidental release provisions.

Many of these conditions derive from 40 CFR § 70.6, Permit Content, which dictates certain standard conditions that must be placed in the permit. The language that the District has developed for many of these requirements has been adopted into the BAAQMD Manual of Procedures, Volume II, Part 3, Section 4, and therefore must appear in the permit.

The standard conditions also contain references to BAAQMD Regulation 1 and Regulation 2. These are the District’s General Provisions and Permitting rules.

Changes to permit:

- The dates of adoption and approval of rules in Standard Condition 1.A have been updated.
- The reference to District-generated forms was deleted from Section I, Part G, Compliance Certifications, because the District no longer provides the forms.

## **II. Equipment**

This section of the permit lists all permitted or significant sources. Each source is identified by an S and a number (e.g., S24). Permitted sources are those sources that require a BAAQMD operating permit pursuant to BAAQMD Rule 2-1-302. Each of the permitted sources has previously been issued a permit to operate pursuant to the requirements of BAAQMD Regulation 2, Permits. These permits are issued in accordance with state law and the District's regulations. The capacities in the permitted sources table are the maximum allowable capacities for each source, pursuant to Standard Condition I.J and Regulation 2-1-403. The permitted sources are listed in Table II-A.

Significant sources are those sources that have a potential to emit of more than 2 tons per year of a "regulated air pollutant" (as defined in BAAQMD Rule 2-6-222) or 400 pounds per year of a "hazardous air pollutant" (as defined in BAAQMD Rule 2-6-210). This facility has no unpermitted significant sources.

All abatement (control) devices that control permitted or significant sources are listed. Each abatement device whose primary function is to reduce emissions is identified by an A and a number (e.g., A24). If a source is also an abatement device, such as when an engine controls VOC emissions, it will be listed in the abatement device table but will have an "S" number. An abatement device may also be a source (such as a thermal oxidizer that burns fuel) of secondary emissions. If the primary function of a device is to control emissions, it is considered an abatement (or "A") device. If the primary function of a device is a non-control function, the device is considered to be a source (or "S").

Table II-C identifies any equipment or operations that are located at this facility but that are exempt from Title V permitting requirements. This table includes equipment or operations that are exempt from the District requirement to have a permit to operate pursuant to BAAQMD Regulation 2, Rule 1, Sections 103, 105, or 113-128 and that are not significant sources. It may also include equipment or operations that are required to have a District permit to operate but that are exempt from BAAQMD Regulation 2, Rule 6, Major Facility Review pursuant to Regulation 2, Rule 6, Sections 110-114. The applicable exemptions are identified in Table II-C.

The equipment section is considered to be part of the facility description. It contains information that is necessary for applicability determinations, such as fuel types, contents or sizes of tanks, etc. This information is part of the factual basis of the permit.

Following are explanations of the differences in the equipment list between the time that the Title V permit was last revised (December 2012) and the permit proposal date.

Changes to permit: (Section II)

- Added the horsepower rating for S37, S38, S39, Engines
- Deleted S52, Diesel Engine Backup Generator
- Corrected the number of nozzles at S48, Gasoline Dispensing Facility from one to two nozzles
- Added S58, Emergency Standby Diesel Generator Set
- Modified description of S100 to include wet and dry weather flowrate
- Added S172, Pre-Digestion Blend Tank
- Modified description of S180 to reflect 2 floating and 8 fixed digester covers, and 1 dyster (bag)
- Added A194, Digester Gas Enclosed Flare
- Added A195, Digester Gas Enclosed Flare
- Removed exempt S49, Portable Diesel Engine Backup Generator
- Added exempt S171, Fats, Oils, Grease (FOG) Receiving Station
- Added exempt S463, Portable Diesel Engine, Prime Engine
- Added exempt S464, Portable Diesel Engine, Prime Engine
- Added exempt Resource Recovery High Strength Station

**III. Generally Applicable Requirements**

This section of the permit lists requirements that generally apply to all sources at a facility including insignificant sources and portable equipment that may not require a District permit. If a generally applicable requirement applies specifically to a source that is permitted or significant, the standard will also appear in Section IV and the monitoring for that requirement will appear in Sections IV and VII of the permit. Parts of this section apply to all facilities (e.g., particulate, architectural coating, odorous substance, and sandblasting standards). In addition, standards that apply to insignificant or unpermitted sources at a facility (e.g., refrigeration units that use more than 50 pounds of an ozone-depleting compound) are placed in this section.

Unpermitted sources are exempt from normal District permits pursuant to an exemption in BAAQMD Regulation 2, Rule 1. They may, however, be specifically described in a Title V permit if they are considered “significant sources” as defined in BAAQMD Rule 2-6-239.

Changes to permit: Section III:

- The dates of adoption or approval of the rules and their “federal enforceability” status in Table III have been updated.
- For Table III, the District is amending dates of adoption or approval of the rules and adding a requirement. The items being amended or added are listed below:
  - Regulation 2, Rule 1, General Requirements
  - SIP Regulation 2, Rule 1, General Requirements
  - Regulation 2, Rule 5, New Source Review of Toxic Air Contaminants
  - Regulation 5, Open Burning
  - California Health and Safety Code Title 17, Section 93115, Airborne Toxic Control Measure for Stationary Compression Ignition (CI) Engines

#### **IV. Source-Specific Applicable Requirements**

This section of the permit lists the applicable requirements that apply to permitted or significant sources. These applicable requirements are contained in tables that pertain to one or more sources that have the same requirements. The order of the requirements is:

- District Rules
- SIP Rules (if any) are listed following the corresponding District rules. SIP rules are District rules that have been approved by EPA for inclusion in the California State Implementation Plan. SIP rules are “federally enforceable” and a “Y” (yes) indication will appear in the “Federally Enforceable” column. If the SIP rule is the current District rule, separate citation of the SIP rule is not necessary and the “Federally Enforceable” column will have a “Y” for “yes”. If the SIP rule is not the current District rule, the SIP rule or the necessary portion of the SIP rule is cited separately after the District rule. The SIP portion will be federally enforceable; the non-SIP version will not be federally enforceable, unless EPA has approved it through another program.
- Other District requirements, such as the Manual of Procedures, as appropriate.
- Federal requirements (other than SIP provisions)
- California Requirements (such as ATCMs, CARB Executive Orders for GDFs)
- BAAQMD permit conditions. The text of BAAQMD permit conditions is found in Section VI of the permit.
- Federal permit conditions. The text of Federal permit conditions, if any, is found in Section VI of the permit.

Section IV of the permit contains citations to all of the applicable requirements. The text of the requirements is found in the regulations, which are readily available on the District or EPA websites, or in the permit conditions, which are found in Section VI of the permit. All monitoring requirements are cited in Section IV. Section VII is a cross-reference between the limits and monitoring requirements. A discussion of monitoring is included in Section C.VII of this permit evaluation/statement of basis.

#### **Complex Applicability Determination:**

BAAQMD Regulation 6, Rule 1, Particulate Matter, General Requirements and SIP Regulation 6, Particulate Matter and Visible Emissions

BAAQMD Regulation 6-1-301 and SIP Regulation 6-301 for Multi-Fuel Cogeneration Engines (S37, S38 and S39)

The displacement of the engines is 28,600 cubic inches. Therefore, the engines are subject to the Ringelmann 1 limit in BAAQMD Regulations 6-1-301 and SIP Regulation 6-301, not the Ringelmann 2 limit in BAAQMD Regulations 6-1-303 and SIP Regulation 6-303.

BAAQMD Regulation 6-1-310, Total Suspended Particulate (TSP) Concentration Limits

The rule was amended on August 1, 2018. Section 6-1-310.2 now contains more stringent limits for sources that have a potential to emit (PTE) more than 1,000 kg of TSP/yr. The new limits are effective on July 1, 2020.



The following sources are not subject because Section 6-1-114.1 exempts boilers, turbines, and other heat-exchange equipment.

- S37, S38, S39, Cogeneration Engines
- S55, Boiler
- S56, Turbines

The following sources are not subject because Section 6-1-114.2 exempts “gas-fuel fired control devices that control only gaseous emissions.”

- A190, A191, A192, A193, A194, A195, Flares

The following sources are not subject because their PTE is lower than 1,000 kg of TSP/yr.

- S50, S51, S53, S54, S58, Standby Engines

Therefore, no sources at this facility are subject to the new limits.

#### NSPS or NESHAP Applicability for Multi-Fuel Cogeneration Engines (S37, S38 and S39)

The NSPS for Compression Ignition Internal Combustion Engines (40 CFR Part 60, Subpart IIII) does not apply as these engines were installed in 1985 and the displacement is greater than 30 liters per cylinder. NSPS is not applicable for these sources as construction commenced prior to July 11, 2005.

The NESHAP for Stationary Reciprocating Internal Combustion Engines (40 CFR, Part 63, Subpart ZZZZ) applies to reciprocating IC engines (RICE) located at major and area sources of HAP. This facility is not a major source of HAP, but it is an area source of HAP. All three sources are CI engines that use digester gas and small amounts of diesel fuel. These engines are considered to be existing RICE, because the engines commenced construction prior to June 12, 2006 (40 CFR Part 63.6590(a)(1)(iii)). In accordance with 40 CFR Part 63.6595(a)(1), existing stationary compression-ignition (CI) RICE must comply with the applicable emission and operating limitations of Subpart ZZZZ by no later than May 3, 2013. Section 63.6603(a) identifies the location of the applicable emissions and operating limitations for existing stationary RICE located at area sources of HAP. For these sources, the applicable limitations are in Table 2d. For digester gas CI engines, these limitations include only engine maintenance criteria (frequencies of inspections and oil and filter changes, inspect spark plugs every 1440 hours of operation, inspect all hoses) and do not include any emission limitations. All applicable Subpart ZZZZ requirements for these sources are identified in Tables IV-A and B, and the operating limitations are summarized in Table VII-A and B.

#### NESHAP for GDF (S48 GDF #9008)

Source S48 is subject to 40 CFR Part 63 Subpart CCCCCC as this is an area source per 63.11111(a) and throughput is 10,000 gallons per month or more but less than 100,000 gallons per month. The facility is subject to 63.1111(c). The facility complies with the requirements of 63.11116 and 63.11117. The facility is subject to and complies with requirement 63.11120, Testing and monitoring requirements. The facility complies with vapor recovery test procedure TP-201.1E- for leak rate and cracking pressure of pressure/vacuum vent valves. This is equivalent to BAAQMD Regulation 8-7 test procedures for phase I and phase II. The facility complies with records and reporting requirements per 63.11124.

NSPS or NESHAP Applicability for Stationary IC Engines (S50, S51, S53, S54, and S58)

The NSPS for Compression Ignition Internal Combustion Engines (40 CFR Part 60, Subpart IIII) is potentially applicable to any stationary compression ignition engines at a site. Sources S50, S51, and S53 were loss of exemption sources that existed prior to April 2002. Per 40 CFR Part 60 Subpart IIII section 60.4200(a)(2), sources S50, S51 and S53 are not subject to subpart IIII. For source S54, this emergency diesel generator was issued an A/C in May of 2006, however the engine is a 2005 model year. The engine was not manufactured after April 1, 2006 and therefore 40 CFR Part 60 Subpart IIII section 60.4200(a)(2)(i) is not applicable.

S58 is subject to 40 CFR Part 60, Subpart IIII and meets the applicability criteria. Per Section 60.4200(a)(2), a stationary compression ignition engine manufactured after April 1, 2006, other than fire pump engines, and for which construction commenced after July 11, 2005 is subject to this rule. S58 is a stationary compression ignition engine manufactured after April 1, 2006. Section 60.4204(b) specifies the emission standards for stationary nonemergency CI internal combustion engines of 2007 model year and later with less than 30 liters per cylinder. S58 is a 2013 model year engine with 6 cylinders and a total displacement of 12.5 L, or 2.08 liters per cylinder. S58 is also subject to Section 60.4211(f) which requires the engine to run less than 100 hours per year. S58 is limited to 50 hours per year of operation for testing and maintenance purposes in the permit conditions. The owner/operator is not required to perform tests in accordance with section 60.4212 or 60.4213. Section 40.4214 states that the owner/operator does not have to submit an initial notification to EPA for emergency engines.

The NESHAP for Stationary Reciprocating Internal Combustion Engines (40 CFR, Part 63, Subpart ZZZZ) applies to reciprocating IC engines (RICE) located at major and area sources of HAP. This facility is not a major source of HAP, but it is an area source of HAP. All five sources are Emergency Back-Up Generator Diesel Engines. S50, S51, S53, and S54 are considered to be an existing RICE because the engine commenced construction prior to June 12, 2006 (40 CFR Part 63.6590(a)(1)(iii)). S58 is considered to be a new RICE because the engine commenced construction after June 12, 2006 (40 CFR Part 63.6590(a)(2)(iii)). In accordance with 40 CFR Part 63.6595(a)(1), existing stationary compression-ignition (CI) RICE must comply with the applicable emission and operating limitations of Subpart ZZZZ by no later than May 3, 2013. In accordance with 40 CFR Part 6590(c)(1) new stationary RICE located in an area source must only meet the requirements of 40 CFR 60 Subpart IIII. No further requirements apply for new stationary RICE (S58). Section 63.6603(a) identifies the location of the applicable emissions and operating limitations for existing stationary RICE located at area sources of HAP. For these sources, the applicable limitations are in Table 2d. For emergency CI engines, these limitations include only engine maintenance criteria (frequencies of inspections and oil and filter changes) and do not include any emission limitations. Therefore, the testing requirements in Sections 63.6612, 63.6615, and 63.6620 and Tables 1b, 2b, 3, and 4 do not apply. The diesel fuel usage requirements of Section 63.6604 (i.e. the engine must use diesel fuel that complies with 40 CFR 80.510(b)) do not apply to emergency CI RICE. Section 64.6605 applies to all engines subject to this subpart. Other applicable monitoring, operating, and administrative requirements are contained in Sections 63.6625, 63.6630, 63.6635, 63.6640, 63.6645, 63.6650, 63.6655, 63.6660, and 63.6665. All applicable Subpart ZZZZ requirements for these sources are identified in Tables IV-E and F, and the operating limitations are summarized in Table VII-E and F.

Applicability of 40 CFR 63 Subpart YYYY, NESHAP for Combustion Turbines (MACT) -S56

East Bay Municipal Utility District is not subject to MACT standards for Combustion Turbines because it is not a major source of Hazardous Air Pollutants (HAPs).

NSPS for Stationary Gas Turbines (40 CFR Part 60 Subparts GG and KKKK)- source S56.

Facility is subject to 40 CFR Part 60 Subpart KKKK, because it was built after February 18, 2005. The NSPS citations for the turbine have been corrected.

Applicability of CAA 112 (j), Equivalent Emission Limitation by Permit

This section ensures control of HAP emissions even if the EPA should miss a scheduled NESHAP promulgation date. If the EPA misses a scheduled promulgation date by 18 months, major sources in that category must submit to their respective State (or local) agencies a permit application proposing source-specific MACT. Conditions of the MACT determination must be incorporated into the Title V operating permit. Section 112(j) is commonly referred to as the "MACT hammer."

East Bay Municipal Utility District is not subject to CAA Section 112 (j) because it is not a major source of Hazardous Air Pollutants (HAPs).

Applicability of 40 CFR Part 63, Subpart VVV -POTW NESHAP

This NESHAP was evaluated to determine if East Bay Municipal Utility District was subject to the MACT emission control requirements. The NESHAP requires MACT controls at POTWS which are a major source of HAP which are defined as "any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate 10 tons per year (tpy) or more of any HAP or 25 tpy or more of any combination of HAP".

The District has reviewed the wastewater borne emissions potential of the most frequently seen HAPs and concluded that East Bay Municipal Utility District is not a major source for HAP emissions or for combined HAP emissions. A conservative estimate of HAP emissions may be obtained by using the 80<sup>th</sup> % factors as developed by the BAAT-AMSA – CWEA studies in the 1990s. Using this method, the total plant throughput would have to be over 177 million gallons per dry-weather day on an ongoing basis to be a major source for HAP, based on the 80<sup>th</sup> percentile (most conservative) calculation basis. The East Bay Municipal Utility District maximum dry weather flow rate is 120 million gallons per day and the average daily flow rate (annualized) is about 60 MGD. Therefore, we conclude the facility is not a major source for HAP.

In addition, this POTW is an existing POTW that has not been reconstructed (as defined by 40 CFR 63.1595). Furthermore, the East Bay Municipal Utility District is not an Industrial POTW as defined by 40 CFR 63.1595. East Bay Municipal Utility District processes strictly domestic wastewater streams.

Applicability of Regulation 8 Rules to Digester Gas Combustion -S180

The anaerobic digesters S180 produce digester gas, which is principally combusted in the digester gas engines, turbine, or hot water boiler, and secondarily in the digester gas flares. The composition of the digester gas is roughly 64% methane, 36% carbon dioxide, with about

21 ppmv of non-methane organic compounds as hexane. The District evaluated whether the digester S180 as well as the associated digester gas energy recovery sources and digester gas flares were subject to Regulation 8-1-110.3 (exemption from Regulation 8 Rules) or to 8-2-301 (Organic Compounds – Miscellaneous Operations). This discussion of applicability follows.

Regulation 8-1-110.3 states

**8-1-110 Exemptions:** The following shall be exempted from the provisions of this regulation:

110.1 Any structure designed and used exclusively as a dwelling for not more than two families, provided that this exclusion does not apply to the application of an architectural coating.

110.2 Any internal combustion engine.

**110.3 Any operation or group of operations which are related to each other by being a part of a continuous process, or a series of such operations on the same process material, which are subject to Regulation 8, Rule 2 or Rule 4, and for which emissions of organic compounds are reduced at least 85% on a mass basis. Where such reduction is achieved by incineration, at least 90% of the organic carbon shall be oxidized to carbon dioxide.**

Regulation 8-2-301 states:

8-2-301 Miscellaneous Operations: A person shall not discharge into the atmosphere from any miscellaneous operation an emission containing more than 6.8 kg. (15 lbs.) per day and containing a concentration of more than 300 PPM total carbon on a dry basis.

Organic compounds are defined in 8-1-201 as “any compound of carbon excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate”. The District has performed a conservative calculation (see Appendix B) to estimate the NMOC emissions potential from digester gas. The use of NMOC emissions potential is conservative since this includes all compounds of carbon with the exception of methane and carbon dioxide. EBMUD has estimated a maximum daily digester gas production rate (highest month average) of 3,800,000 cu ft, with a conservative maximum concentration of 82 micro-grams NMOC per liter of digester gas (16 ppmv). While it is expected that the destruction efficiency of NMOC in the heat recovery sources would easily exceed 90% it cannot be assured in any of the digester gas combustion devices. This is due to the very low inlet concentration (16 ppmv) of NMOC that upon combustion at 90% efficiency would result in an outlet concentration less than 2 ppm NMOC. It is difficult to ensure outlet concentrations at such low levels and to source test for NMOC at concentration levels near the error limits of the test methods. Based on these findings the District concludes 8-1-110.3 is not applicable to digester gas sources and combustion (abatement) devices.

Regulation 8-2-301 is applicable to the digester gas sources and combustion devices. Based on the calculation presented in Appendix B, and assuming all digester gas is vented at the maximum NMOC concentration gives a daily uncontrolled emission rate of approximately 19 lb per day (controlled emissions estimated as 1.9 lb/day), at a maximum concentration of 16 ppmv. Since the controlled emission level of NMOC from digester gas is less than both the daily limit and the emission stream concentration limit (on both molar and mass basis) as specified in 8-2-301, the digester S180 and the respective digester gas fired engines, boiler and flares are subject to and will comply with Reg 8-2-301. Regulation 8-2-301 is included Table IV, Applicable Requirements for S180 Anaerobic Digester as well as all combustion devices burning or abating digester gas.

Applicability of 40 CFR Part 64, Compliance Assurance Monitoring

Sources at Title V facilities may be subject to the Compliance Assurance Monitoring (CAM) requirements in 40 CFR, Part 64. The District has reviewed applicability of the Compliance Assurance Monitoring (CAM) requirements in 40 CFR, Part 64, for this facility. Three criteria specified in 40 CFR Part 64.2(a)(1-3) must be met for CAM to apply:

- The source must be subject to a federally enforceable emission limit for a regulated air pollutant, other than an exempt limitation.
- The source must use a control device to achieve compliance with this emission limitation.
- The pre-controlled emissions of the specific pollutant being controlled must be greater than the major facility emissions threshold for that pollutant.

The applicability of compliance assurance monitoring (CAM) must be considered at this facility because the facility uses emission control devices to achieve compliance with a federally enforceable emission limit.

The control devices in use are flares A190, A191, A192, A193, A194, and A195. In addition, the boiler (S55), cogeneration engines (S37, S38, and S39), and gas turbine (S56) burn digester gas to make power and heat and therefore control emissions of digester gas. The flares and other combustion devices control emissions from the anaerobic digesters S180 and are subject to the requirements of SIP Regulation 8, Rule 2-301 (see discussion above). This section prohibits the discharge of an emission containing more than 15 lbs/day and a concentration of more than 300 ppm total carbon.

In Appendix B, the District performed a conservative calculation to estimate the NMOC emissions potential from digester gas. The calculation includes all compounds of carbon except for methane and carbon dioxide. EBMUD has a theoretical maximum of 4.896 million cu ft/day, based on the limit to combustion sources of 3,400 cfm in condition #18860, with a maximum concentration of 82 micro-grams NMOC per liter (16 ppmv), of digester gas. Assuming all digester gas is vented at the maximum NMOC concentration gives a daily uncontrolled emission rate of approximately 25 lb per day. CAM only applies if the uncontrolled emissions are more than 100 tpy. Since the maximum potential annual uncontrolled emissions are 4.6 ton (9,139 lb/yr), CAM is not required.

For the emergency diesel engines sources (S50, S51, S53, S54, and S58), they are subject to NESHAP 40 CFR Part 63 subpart ZZZZ. In addition, these engines do not have an abatement device, as such they are not subject to CAM as there is no add on control- abatement device.

For the cogeneration engines sources S37, S38, S39, the hot water boiler S55, and the gas turbine engine S56 these sources are not subject to CAM per 40 CFR Part 64.2(a)(2), as no abatement device is attached to each of these sources. S172 is not subject to CAM per 40 CFR Part 64.2(a)(2).

Changes to permit, Section IV:

- Minor changes due to amendments of BAAQMD Regulation 6, Rule 1, dated 8/1/18 were added to many tables.
- The opacity citation for S37, S38, and S39 was changed from BAAQMD Regulation 6-1-303 to 6-1-301.
- In Table IV-D for S48 GDF, Conditions 24887 and 25723 were added.

- The following CARB Executive orders were removed because they no longer apply:
  - G-70-17-AD
  - G-70-161
  - G-70-52-AM
- In Table IV-E, S52 was removed and S58 was added.
- In Table IV-G:
  - The limited exemption and low fuel provisions in BAAQMD Regulation 9- 7-112 and SIP Regulation 9, Rule 7, Sections 111, 304, 503.1, and 504, were removed because the boiler cannot be subject to the terms of the exemption and the provisions for unlimited sources at the same time. The facility has confirmed that the boiler complies with the standards in BAAQMD Regulation 9, Rule 7, Sections 307.7, 9-7-311, and 9-7-312.
  - SIP Regulation 9, Rule 7, Section 503.3 was removed because the boiler does not use non-gaseous fuels.
  - The interim limits in BAAQMD Regulation 9-7-301 were deleted because they do not apply to sources that are subject to BAAQMD Regulation 9-7-307.
  - The periodic monitoring in BAAQMD Regulation 9-7-506 was added.
- Table IV-M was added for new source S172.
- Table IV-M was renumbered as Table IV-N and the description was changed to 2 floating, 8 fixed, and 1 Dystor and five flares.
- SIP Regulation 8, Rule 2 and SIP Regulation 9, Rule 1 were added to applicable IV tables.
- Condition 18860 was revised to incorporate new sources and abatement devices.
- Condition 22820 was deleted because S52 was removed from service.

## V. Schedule of Compliance

A schedule of compliance is required in all Title V permits pursuant to BAAQMD Regulation 2-6-409.10 which provides that a major facility review permit shall contain the following information and provisions:

“409.10 A schedule of compliance containing the following elements:

- 10.1 A statement that the facility shall continue to comply with all applicable requirements with which it is currently in compliance;
- 10.2 A statement that the facility shall meet all applicable requirements on a timely basis as requirements become effective during the permit term; and
- 10.3 If the facility is out of compliance with an applicable requirement at the time of issuance, revision, or reopening, the schedule of compliance shall contain a plan by which the facility will achieve compliance. The plan shall contain deadlines for each item in the plan. The schedule of compliance shall also contain a requirement for submission of progress reports by the facility at least every six months. The progress reports shall contain the dates by which each item in the plan was achieved and an explanation of why any dates in the schedule of compliance were not or will not be met, and any preventive or corrective measures adopted.”

Since the District has not determined that the facility is out of compliance with an applicable requirement, the schedule of compliance for this permit contains only sections 2-6-409.10.1 and 2-6-409.10.2.

Changes to Permit, Section V:

- The District is not proposing any changes to this section.

**VI. Permit Conditions**

During the Title V permit development, the District has reviewed the existing permit conditions, deleted the obsolete conditions, and, as appropriate, revised the conditions for clarity and enforceability. Each permit condition is identified with a unique numerical identifier, up to five digits.

When necessary to meet Title V requirements, additional monitoring, recordkeeping, or reporting requirements have been added to the permit.

All changes to existing permit conditions are clearly shown in “strike-out/underline” format in the proposed permit. When the permit is issued, all “strike-out” language will be deleted and all “underline” language will be retained, subject to consideration of comments received.

The existing permit conditions are derived from previously issued District Authorities to Construct (A/C) or Permits to Operate (P/O). Permit conditions may also be imposed or revised as part of the annual review of the facility by the District pursuant to California Health and Safety Code (H&SC) § 42301(e), through a variance pursuant to H&SC § 42350 *et seq.*, an order of abatement pursuant to H&SC § 42450 *et seq.*, or as an administrative revision initiated by District staff. After issuance of the Title V permit, permit conditions will be revised using the procedures in Regulation 2, Rule 6, Major Facility Review.

Conditions that are obsolete or that have no regulatory basis have been deleted from the permit.

Conditions have also been deleted due to the following:

- Redundancy in recordkeeping requirements.
- Redundancy in other conditions, regulations and rules.
- The condition has been superseded by other regulations and rules.
- The equipment has been taken out of service or is exempt.
- The event has already occurred (i.e. initial or start-up source tests).

The regulatory basis is listed following each condition. The regulatory basis may be a rule or regulation. The District is also using the following terms for regulatory basis:

- **BACT:** This term is used for a condition imposed by the Air Pollution Control Officer (APCO) to ensure compliance with the Best Available Control Technology in Regulation 2-2-301.
- **Cumulative Increase:** This term is used for a condition imposed by the APCO that limits a source’s operation to the operation described in the permit application pursuant to BAAQMD Regulation 2-1-403.
- **Offsets:** This term is used for a condition imposed by the APCO to ensure compliance with the use of offsets for the permitting of a source or with the banking of emissions from a source pursuant to Regulation 2, Rules 2 and 4.

- PSD: This term is used for a condition imposed by the APCO to ensure compliance with a Prevention of Significant Deterioration permit issued pursuant to Regulation 2, Rule 2.
- TRMP: This term is used for a condition imposed by the APCO to ensure compliance with limits that arise from the District’s Toxic Risk Management Policy. This policy was replaced by Regulation 2, Rule 5 in 2005.

Changes to permit, Section VI:

S52, Engine

Source S52 was removed, therefore, condition 22820 was deleted.

S58, Engine

S58 was added and, therefore, Condition #22850 was added.

S172, Pre-Digestion Blend Tanks

S172 was added and, therefore, Condition #25919 was added.

Flares

A194 and A195 were added and as a result, Condition #18860 was modified.

S48, Gasoline Dispensing Facility

Condition #24887 and Condition #25723 were added while Condition #25107 was deleted.

**Summary of Changes to Operating Conditions**

The following table lists the sources in order with their former condition numbers and current permit condition numbers.

Source Number	Former Condition #	Current Permit Condition #
37	18860, 20651	18860, 20651
38	18860, 20651	18860, 20651
39	18860, 20651	18860, 20651
43	2409	2409
45	2409	2409
47	2409	2409
48	25107, 21663	24887, 25723
50	22830	22830
51	22850	22850
53	22830	22830
55	18860, 20651	18860, 20651
56	18860, 24050	18860, 24050
58	N/A	22850
100	21759	21759



<b>Source Number</b>	<b>Former Condition #</b>	<b>Current Permit Condition #</b>
110	17335	17335
170	18006	18006
172	N/A	25919
180	18860	18860

## VII. Applicable Limits and Compliance Monitoring Requirements

This section of the permit is a summary of numerical limits and related monitoring requirements for each source. The summary includes a citation for each monitoring requirement, frequency of monitoring, and type of monitoring. The applicable requirements for monitoring are completely contained in Sections IV, Source-Specific Applicable Requirements, and VI, Permit Conditions, of the permit.

The District has reviewed all monitoring and has determined the existing monitoring is adequate with the following exceptions.

The tables below contain only the limits for which there is no monitoring or inadequate monitoring in the applicable requirements. The District has examined the monitoring for other limits and has determined that monitoring is adequate to provide a reasonable assurance of compliance. Calculations for potential to emit will be provided in the discussion when no monitoring is proposed due to the size of a source.

Monitoring decisions are typically the result of a balancing of several different factors including: 1) the likelihood of a violation given the characteristics of normal operation, 2) degree of variability in the operation and in the control device, if there is one, 3) the potential severity of impact of an undetected violation, 4) the technical feasibility and probative value of indicator monitoring, 5) the economic feasibility of indicator monitoring, and 6) whether there is some other factor, such as a different regulatory restriction applicable to the same operation, that also provides some assurance of compliance with the limit in question.

These factors are the same as those historically applied by the District in developing monitoring for applicable requirements. It follows that, although Title V calls for a re-examination of all monitoring, there is a presumption that these factors have been appropriately balanced and incorporated in the District's prior rule development and/or permit issuance. It is possible that, where a rule or permit requirement has historically had no monitoring associated with it, no monitoring may still be appropriate in the Title V permit if, for instance, there is little likelihood of a violation. Compliance behavior and associated costs of compliance are determined in part by the frequency and nature of associated monitoring requirements. As a result, the District will generally revise the nature or frequency of monitoring requirements only when it can support a conclusion that existing monitoring is inadequate.

### NOx Sources

S# & Description	Emission Limit Citation	Federally-Enforceable Emission Limit	Periodic Monitoring
S37, S38, S39, Multi-Fuel Cogeneration Engines	BAAQMD 9-8-302.1	≤ 70 ppmv @ 15% O2, dry	P/A Source Test
S37, S38, S39, Multi-Fuel Cogeneration Engines	BAAQMD 9-8-302.1	≤ 70 ppmv @ 15% O2, dry	P/Q Portable monitor

**NOx Sources**

<b>S# &amp; Description</b>	<b>Emission Limit Citation</b>	<b>Federally-Enforceable Emission Limit</b>	<b>Periodic Monitoring</b>
S37, S38, S39, Multi-Fuel Cogeneration Engines	SIP 9-8-302.1	≤ 140 ppmv @ 15% O <sub>2</sub> , dry	P/A Source Test
S37, S39, Multi-Fuel Cogeneration Engines	BAAQMD Condition # 20651; Part 10	≤ 70 ppmv @ 15% O <sub>2</sub> , dry	P/A Source Test
S38 Multi-Fuel Cogeneration Engine #2	BAAQMD Condition # 20651, Part 6	≤ 1.25 grams per bhp-hr	P/A Source Test
S55 Hot Water Boiler	BAAQMD 9-7-301.1 and SIP 9-7-301.1	≤ 30 ppm @ 3% O <sub>2</sub> , dry	Annual source test or use of portable monitor
S55 Hot Water Boiler	BAAQMD 9-7-307.7	≤ 30 ppm @ 3% O <sub>2</sub> , dry	Annual source test or use of portable monitor
S55 Hot Water Boiler	BAAQMD Condition # 20651, Part 5	≤ 30 ppm @ 3% O <sub>2</sub> , dry	P/A Source test
S56 Digester Gas Turbine #1	BAAQMD 9-9-301.1.1 and SIP 9-9-301.1	≤ 42 ppmv @ 15% O <sub>2</sub> , dry	P/A Source test
S56 Digester Gas Turbine #1	BAAQMD 9-9-301.2	≤ 2.53 pounds per MW-hour or ≤ 50 ppmv @ 15% O <sub>2</sub> , dry	P/A Source test
S56 Digester Gas Turbine #1	BAAQMD Condition # 24050, Part 3	≤ 23 ppmv @ 15% O <sub>2</sub> , dry and 34,400 pounds/year (excluding startup, shutdown, and commissioning)	P/A Source test
A194 Digester Gas Flare A195 Digester Gas Flare	Condition #18860, part 9	0.06 lb/MMBtu	Source test every 8,760 hours or every 5 years, whichever comes first

**NOx Emissions Discussion**

The Hot Water Boiler S55 has a federally enforceable 30 ppm @ 3% O<sub>2</sub> NO<sub>x</sub> limit from three applicable requirements (9-7-301.1, 9-7-307.7, and condition #20651 part 5). A previous permit revision requires an annual source test for S55, therefore this should also be sufficient to satisfy 9-7-307.7.

A194 and A195 have NO<sub>x</sub> limits of 0.06 lb/MMBtu (RACT for thermal oxidizers) enforced in Permit Condition #18860. The condition requires testing every 8,760 hours or every 5 years, whichever comes first.

**CO Sources**

<b>S# &amp; Description</b>	<b>Emission Limit Citation</b>	<b>Federally-Enforceable Emission Limit</b>	<b>Monitoring</b>
S37, S38, S39, Multi-Fuel Cogeneration Engines	BAAQMD 9-8-302.3 SIP 9-8-302.3	≤ 2000 ppmv @ 15% O <sub>2</sub> , dry	P/A Source Test
S37 Multi-Fuel Cogeneration Engine #1, S39 Multi-Fuel Cogeneration Engine #3	BAAQMD Condition # 20651, Part 11	≤ 2000 ppmv @ 15% O <sub>2</sub> , dry	P/A Source Test
S38 Multi-Fuel Cogeneration Engine #2	BAAQMD Condition # 20651, Part 8	≤ 3.0 grams per bhp-hr	<u>P/A Source Test</u>
S55 Hot Water Boiler	BAAQMD 9-7-301.4 and SIP 9-7-301.2	≤ 400 ppm @ 3% O <sub>2</sub> , dry	<u>Annual source test or use of portable monitor</u>
S55 Hot Water Boiler	BAAQMD 9-7-307.7	≤ 400 ppm @ 3% O <sub>2</sub> , dry	Annual source test or use of portable monitor
S55 Hot Water Boiler	BAAQMD Condition # 20651, Part 5	≤ 50 ppm @ 3% O <sub>2</sub> , dry	P/A <u>Source Test</u>
S56 Digester Gas Turbine #1	BAAQMD Condition # 24050, Part 4	≤ 100 ppmv @ 15% O <sub>2</sub> , dry and ≤ 92,200 pounds/year (excluding startup, shutdown, and commissioning)	P/A <u>Source Test</u>
A194 & A195, Digester Gas Flares	Condition #18860	0.2 lb/MMBtu	Source test every 8,760 hours or every 5 years, whichever comes first

**CO Monitoring Discussion**

The Hot Water Boiler S55 has federally enforceable CO limits of 400 ppm @3% O<sub>2</sub> and 50 ppm @3% O<sub>2</sub> as noted above. There is annual source test for S55 under Condition 20651, part 19. A previous permit revision requires annual source test for S55, therefore this should also be sufficient to satisfy 9-7-307.7.

A194 and A195 are required to meet RACT CO standards of 0.2 lb/MMBtu. A source test must be conducted every 8,760 hours or every 5 years, whichever comes first.

**SO<sub>2</sub> Sources**

<b>S# &amp; Description</b>	<b>Emission Limit Citation</b>	<b>Federally-Enforceable Emission Limit</b>	<b>Monitoring</b>
S37, S38, S39, Engines; S50, S51, S53, S58, Diesel Engines, S55, Hot Water Boiler, S56 Digester Gas Turbine	BAAQMD 9-1-301	GLC of: ≤ 0.5 ppm for 3 min, ≤ 0.25 ppm for 60 min, and ≤ 0.05 ppm for 24 hours	N
S37, S38, S39, Multi-Fuel Cogeneration Engines	BAAQMD 9-1-302	≤ 300 ppm (dry)	P/W or M, Sulfur Content Testing
A190 to A195, Digester Gas Flares	BAAQMD 9-1-302	≤ 300 ppm (dry)	P/W or M, Sulfur Content Testing
S37, S38, S39, Multi-Fuel Cogeneration Engines	Regulation 9-1-304	Sulfur content of fuel < 0.5% by weight	None
S50, S51, S53, S54, S58, Diesel Engines	CCR Title 17 93115.5(b) and CCR Title 13, Section 2281(a) (2 and 5)	Standby Engines must use CARB Diesel Fuel or other CARB Approved Alternative Standby Engines must use CARB Diesel Fuel or other CARB Approved Alternative Fuel, which has Fuel Sulfur Limits of: ≤ 15 ppmw of S	None
S56 Digester Gas Turbine #1	BAAQMD Condition # 24050, Part 5	150 ppmv @ 15% O <sub>2</sub> , dry	P/A Source test
S56 Digester Gas Turbine #1	40 CFR, Subpart <u>KKKK 60.</u> 60.4333(a) (3)	≤ 0.015% @ 15% O <sub>2</sub> , dry	<u>P/W/D</u> Fuel Sulfur Content

### SO2 Monitoring Discussion

#### BAAQMD Regulation 9-1-301 (Ground-Level SO2 Concentration Limitations)

Area monitoring to demonstrate compliance with the ground level SO2 concentration requirements of Regulation 9-1-301 is at the discretion of the APCO (per BAAQMD Regulation 9-1-501). This facility does not have equipment that emits large amounts of SO2 and therefore is not required to have ground level monitoring by the APCO.

#### Standby Generator Diesel Engines (Sources S50, S51, S53, S54, and S58)

Diesel Engines are fired exclusively on California low-sulfur diesel fuel (15 ppmw sulfur) and are operated infrequently during power outages and equipment testing. Therefore, monitoring for ground-level SO2 concentrations is not justified for these sources.

#### Cogeneration Engines, Hot Water Boiler and Turbine Engine (Sources S37, S38, S39, S55 and S56)

Digester Gas Combustion: Area monitoring to demonstrate compliance with the ground level SO2 concentration requirements of Regulation 9-1-301 is at the discretion of the APCO (per BAAQMD Regulation 9-1-501). Based on an hourly digester gas production rate of 159,000 cu ft/hr at 300 ppmv sulfide level the resulting SO2 emission rate at a single combustion emission point would be 7.9 lb/hr (0.99 g/sec). Using conservative meteorology in conjunction with conservative exhaust rates gives an absolute worst-case BEEST modeled fence line (worst-case) concentration of 0.02 ppm of SO2, which is less than the 0.05 ppmv averaged over 24 hours (9-1-301). We conclude no ground level monitoring is needed.

#### BAAQMD Regulation 9-1-302 (300 ppmv maximum, from any vapor stream)

This regulation prohibits the discharge of any stream containing SO2 in excess of 300 ppm (liquid or solid fuel burning sources are exempt). Permit Condition 18860 limits digester gas total sulfur content not to exceed 200 ppmv on an annual basis.

#### Digester Gas Combustion for sources S38 and S55

The digester gas is limited to 200 ppmv H2S (sulfide) on an annual basis. This is less than the calculated level which would directly produce an exhaust stream of 300 ppmv SO2. Digester gas sulfide levels are typically less than 200 ppmv, hence the 300 ppmv standard is not expected to be approached from 100% digester gas combustion. Therefore, monitoring for this standard is not necessary.

#### S55: Hot Water Boiler; S38: Cogeneration Engine

This digester gas fired equipment is subject to SIP Regulation 9-1-302, which limits exhaust SO2 emissions to 300 ppmv. Condition 18860 part 3 limits the total sulfur content of digester gas used as fuel to 200 ppmv. This limits SO2 emissions from the combustion equipment to 58.4 ppmv as follows:

For digester gas (64% methane, 36% CO<sub>2</sub>); the stoichiometric combustion factor is 5.82 cu ft dry reactants per cu ft fuel (5.82 cu ft FG/cu ft DG).

$$\begin{aligned} \text{SO}_2 &= [(340 \text{ E-6 cu ft S/cu ft DG})(\text{cu ft SO}_2/\text{cu ft S})]/(5.82 \text{ cu ft FG/cu ft DG}) \\ &= 5.84 \text{ E-5 cu ft SO}_2/\text{cu ft FG} \\ &= 58.4 \text{ ppmv} \end{aligned}$$

The BAAQMD concludes that a demonstration of compliance with the digester gas fuel sulfur limit also demonstrates compliance with the SO<sub>2</sub> limit of SIP Regulation 9-1-302. Therefore, monitoring for this standard is not necessary.

BAAQMD Regulation 9-1-304 (Sulfur Content of Liquid & Solid Fuels) for Cogeneration Engines and Turbine (Sources S37, S38, S39, and S56)

This section only applies when these sources are using liquid fuels. In this case, these sources may use diesel oil for very short periods of time as pilot fuel. CARB diesel oil fuel sulfur content restrictions (0.0015% by weight) are far below the Regulation 9-1-304 limit (0.5% by weight). Since these sources may only use CARB diesel fuel, no monitoring is required.

Regulation 9, Rule 1: Inorganic Gaseous Pollutants – Sulfur Dioxide for A194 and A195

The new flares are subject to Regulation 9, Rule 1, Section 9-1-301 and Section 9-1-302. Section 9-1-301 limits ground level concentration limits to 0.5 ppm continuously for 3 minutes, 0.25 ppm averaged over 60 minutes, and 0.05 ppm averaged over 24 hours. Section 9-1-302 limits sulfur dioxide emissions to no more than 300 ppmv, dry, in the exhaust. The facility has a limit for total sulfur content of 200 ppmv on an annual average basis in the digester gas. This limits SO<sub>2</sub> emissions from the combustion equipment to about 34 ppmv as follows:

For digester gas (64% methane, 36% CO<sub>2</sub>), the stoichiometric combustion factor is 5.82 cf dry reactant per cf of fuel (5.82 cu ft FG/cu ft DG).

$$\begin{aligned} \text{SO}_2 &= (200 \text{ scf S}/10\text{E}6 \text{ scf DG}) \times (1 \text{ scf SO}_2/1 \text{ scf S}) \times (1 \text{ scf DG}/5.82 \text{ scf flue gas}) = 34.4 \text{ scf SO}_2/10\text{E}6 \text{ DG} \\ \text{SO}_2 &= 34 \text{ ppmv} \end{aligned}$$

Therefore, compliance with the 300 ppmv SO<sub>2</sub> exhaust limit in Section 9-1-302 is expected.

**H<sub>2</sub>S Sources**

# & Description	Emission Limit Citation	Federally-Enforceable Emission Limit	Monitoring
S172 Pre-Digestion Blend Tanks	Regulation 9-2	0.06 ppm averaged over three consecutive minutes or 0.03 ppm averaged over any 60 consecutive minutes	None

**H2S Sources**

S# & Description	Emission Limit Citation	Federally-Enforceable Emission Limit	Monitoring
S180 Anaerobic Digesters (11); 3 float, 7 fixed, 1 dystor	BAAQMD 9-2-301	Property Line Ground Level Limits: ≤ 0.06 ppmv during any 24-hour period and ≤ 0.03 ppmv during any 60-minute period	None
S180 Anaerobic Digesters (11); 3 float, 7 fixed, 1 dystor	BAAQMD Condition # 18860, Part 3	≤ 200 ppmv on an annual average basis in digester gas	Weekly digester gas sulfur monitoring
Digester Gas Flare A194 Digester Gas Flare A195	Regulation 9-2	0.06 ppm averaged over three consecutive minutes or 0.03 ppm averaged over any 60 consecutive minutes	Weekly digester gas sulfur monitoring

**Regulation 9, Rule 2: Inorganic Gaseous Pollutants – Hydrogen Sulfide for A194 and A195**

The ground level concentration limit on hydrogen sulfide in Section 9-2-301 is 0.06 ppm averaged over 3 minutes or 0.03 ppm averaged over 60 minutes. H<sub>2</sub>S burns readily and therefore, the flares are not expected to contribute to an exceedance of the standard. The facility is required to demonstrate compliance by conducting weekly sampling and testing of the digester gas.

**Regulation 9, Rule 2: Inorganic Gaseous Pollutants: Hydrogen Sulfide for S172**

The maximum H<sub>2</sub>S concentration at the blend tank OCU outlet is 20.0 ppm. The Air District modeled H<sub>2</sub>S emissions produced by the blend tanks on December 24, 2014 to determine the concentration at the fence line. It was determined that the one-hour concentration of H<sub>2</sub>S at the fence line is 16.88 ug/m<sup>3</sup> or 0.009 ppm. Therefore, S172 is expected to comply with Regulation 9, Rule 2.



**PM Sources**

<b>S# &amp; Description</b>	<b>Emission Limit Citation</b>	<b>Federally-Enforceable Emission Limit</b>	<b>Monitoring</b>
S37, S38, S39, Multi-Fuel Cogeneration Engines	BAAQMD Regulation 6-1-301 and SIP 6-301	Ringelmann 1	None, operated infrequently
S37, S38, S39, Multi-Fuel Cogeneration Engines	BAAQMD 6-1-310 and SIP 6-310	≤ 0.15 grains per dscf	None
S38 Multi-Fuel Cogeneration Engine #2	BAAQMD Condition # 20651, Part 9	≤ 0.085 grams per bhp-hr	P/A
S50 Standby Diesel Engine, S51 Standby Diesel Engine, S53 Standby Diesel Engine, S58 Emergency Standby Diesel Generator Set	BAAQMD 6-1-310 and SIP 6-310	≤ 0.15 grains per dscf	None
S54 Standby Diesel Engine	BAAQMD 6-1-303 and SIP 6-303	> Ringelmann 2.0 for no more than 3 min in any hour	None
S54 Standby Diesel Engine	BAAQMD 6-1-310 and SIP 6-310	≤ 0.15 grains per dscf	None
S55 Hot Water Boiler	BAAQMD 6-1-301 and SIP 6-301	> Ringelmann 1.0 for no more than 3 min in any hour	None
S55 Hot Water Boiler	BAAQMD 6-1-310 and SIP 6-310	≤ 0.15 grains per dscf at 6% Oxygen	None
S56 Digester Gas Turbine #1	BAAQMD 6-1-301 and SIP 6-301	> Ringelmann 1.0 for no more than 3 min in any hour	None
S56 Digester Gas Turbine #1	BAAQMD 6-1-310 and SIP 6-310	0.15 grains per dscf at 6% Oxygen	None

**PM Emissions Discussion**

**Regulation 6-1-301 Visible Emissions (Sources S55 and S56)**

BAAQMD Regulation 6-1-301 limits visible emissions to a Federally enforceable limit of Ringelmann 1.0 for 3 minutes in any hour. Visible emissions from gaseous fuel combustion are not expected to exceed this limitation. This includes emissions from all sources burning digester

gas, including the hot water boiler S55 and the turbine engine S56. There are no visible emissions from the liquid wastewater sources. Since there are no gaseous fuel derived visible emissions expected, periodic monitoring to ensure compliance with Regulation 6-301 from liquid sources as well as combustion sources burning digester gas is not required. No monitoring for visible emissions from the digester gas combustion is necessary.

Regulation 6-1-303 Visible Emissions (Emergency Backup Generator Engines - sources S50, S51, S53, S54, S58 digester gas sources - (S37, S38, S39)

SIP Regulation 6-303 applies to the diesel fired emergency standby generators at the facility and limits visible emissions to Ringelmann 2.0 for 3 minutes in any hour. Although there may be a potential for some visible emissions from diesel engine operation, we do not expect the intermittent and brief operation of the diesel engines to necessarily exceed the Ringelmann 2.0 standard, particularly since the engines are all required to use ultra-low sulfur fuel ( $\leq 0.0015\%$ ). No monitoring for visible emissions from or diesel combustion sources is recommended.

Regulation 6-1-310 Particulate Weight Limitation

BAAQMD Regulation 6-1-310 limits filterable particulate (FP) emissions from any source to 0.15 grains per dry standard cubic foot (gr/dscf) of exhaust volume. Section 310.3 limits filterable particulate emissions from “heat transfer operations” to 0.15 gr/dscf at 6% O<sub>2</sub>. These are the “grain loading” standards. There are no sources burning gaseous fuel (digester gas) that would ever be expected to have emissions near this limitation.

On a routine basis, there are no sources which could approach the limit of 6-310, since only gaseous fuels are typically combusted. The only sources that could potentially exceed these limits are the standby diesel generators. The standby diesel generators include sources S50, S51, S53, S54, and S58 as well as the cogeneration engines S37, S38, and S39, which would be operated as emergency backup generators in the event of an emergency.

Backup Diesel Generators Sources S50, S51, S53, S58

BAAQMD Regulation 6-1-310 limits PM emissions to 0.15 gr/dscf, if it is assumed that the diesel engine exhaust gases contain 15% excess oxygen under normal operating conditions, the Regulation 6-1-310 limit can be compared to the expected emissions from the generators as follows:

From 40 CFR 60, Appendix A, Method 19, Table 19-1, a stoichiometric dry gas combustion factor of 9,190 dscf/MMBTU is given for distillate oil combustion. At 15% excess O<sub>2</sub> this factor becomes:

$$9,190 \times [21\% / (21\% - 15\%)] = 32,165 \text{ dscf (combustion products) / MMBTU}$$

The conversion of 0.15 gr/dscf @ 15% O<sub>2</sub> to lb/MMBTU is then:

$$(32,165 \text{ dscf / MMBTU}) \times (0.15 \text{ gr / dscf}) \times (\text{lb} / 7,000 \text{ gr}) = 0.689 \text{ lb / MMBTU}$$

The manufacturer's PM emission rate for S54 (0.14 g/bhp-hr) is converted to lb/MMBTU as follows:

$$\begin{aligned} & [(0.14 \text{ g/bhp-hr} \times 1114 \text{ bhp})/453.6 \text{ g/lb}] / [(54.8 \text{ gal diesel/hr}) \times (0.137 \text{ MMBTU/gal diesel})] \\ & = 0.046 \text{ lb/MMBTU} \end{aligned}$$

Since the manufacturer's PM emission factor for all emergency diesel generators is less than the converted Regulation 6-1-310 limit, compliance is assumed. Standby Generator Diesel Engine is fired exclusively on California low-sulfur diesel fuel with a maximum sulfur content of 15 ppmw. Therefore, particulate emissions are expected to be minimal and monitoring for this emission limit is not justified.

Per A/N 14243- S55 Hot Water Boiler, and A/N 17749 S56 Digester Gas turbine

PM-10 Emissions:  $[20.41 \text{ MMBtu/hr}][7796 \text{ hr/yr}][3.167\text{E-}03 \text{ lb/MM Btu}] = 504 \text{ lb/yr}$  (1.4 lb/day annual average)

$$\begin{aligned} \text{Highest day emissions} & = [[504 \text{ lb/yr}]/[7796 \text{ hr/yr}]]*24\text{hr/day} = 1.6 \text{ lb/day=} \\ & 584 \text{ lbs/yr (0.292 tons/yr)} \end{aligned}$$

and A/N 17749 S56 Digester Gas turbine

The applicant supplied a total PM emission factor of 0.03 lb/MM Btu Fuel input which includes all condensable compounds including water in the factor.

$$\text{Total PM} - (0.03 \text{ lb/MM Btu})(44.5 \text{ MM Btu/hr})(24 \text{ hours/day})(365 \text{ days/yr}) = 5.8 \text{ tons/yr}$$

Based on AP-42, water typically accounts for about 70% of the particulate on a weight basis. Therefore, non-condensables = (.3\*5.8 tons/yr) =

PM, PTE for turbine engine S56: 1.7 tons/year (9.5 lbs/day or 0.4 lb/hr)

PM PTE for each cogeneration Engines (S37, S38, S39) PM:  $(0.085 \text{ g/bhp-hr})(2980 \text{ bhp})(7,796 \text{ hr/yr})(\text{lb}/454 \text{ g}) = 4,350 \text{ lb/yr}$   
(2.2 tpy) per engine

#### Regulation 6, Rule 1: Particulate Matter for A194 and A195

A194 and A195 are subject to the Ringelmann 1 limit and visible emissions prohibition in Sections 301 and 305. Visible particulate emissions are normally not associated with combustion of gaseous fuels, such as natural gas and digester gas, so compliance with this section is expected. The flares are also subject to Section 310 filterable particulate emission limit of 0.15 grains per dry standard cubic foot of exhaust volume. EPA's AP-42 emission factor for waste gas combustion in a flare (0.017 lbs PM10/MMdscf) is equivalent to 0.012 grains/dscf at 0% oxygen. Therefore, the proposed flares are expected to comply with Section 310.

**POC Sources**

<b>S# &amp; Description</b>	<b>Emission Limit Citation</b>	<b>Federally-Enforceable Emission Limit</b>	<b>Monitoring</b>
Cogeneration Engine #1, S39 Multi-Fuel Cogeneration Engine #3,	BAAQMD 8-2-301 and SIP 8-2-301	≤ 15 pounds/day or ≤ 300 ppm total carbon concentration	None
S38 Multi-Fuel Cogeneration Engine #2	BAAQMD Condition # 20651, Part 7	≤ 0.6 grams per bhp-hr	P/A
S38 Multi-Fuel Cogeneration Engine #2	BAAQMD 8-2-301 and SIP 8-2-301	≤ 15 pounds/day or ≤ 300 ppm total carbon concentration	None
S43 Wet Weather Primary Sludge Thickeners (2), S45 Aerated Grit Tanks (8), S47 Scum Thickening Building	BAAQMD 8-2-301 and SIP 8-2-301	≤ 15 pounds/day or ≤ 300 ppm total carbon concentration	None
S48 GDF #9008	BAAQMD 8-7-301.10	Equipment certified to recover 98% of gasoline vapors during tank filling	None
S48 GDF #9008	BAAQMD 8-7-301.2	All Phase I Systems Shall Meet the Emission Limitations of the Applicable CARB Certification	P/E
S48 GDF #9008	BAAQMD 8-7-301.5	Maintain Phase I Equipment in compliance with CARB Executive Order	P/E
S48 GDF #9008	BAAQMD 8-7-301.6	All Phase I Equipment (except components with allowable leak rates) shall be leak free (≤3 drops/minute) and vapor tight	P/A
S48 GDF #9008	BAAQMD 8-7-302.2	All Phase II equipment shall be maintained per CARB certifications and manufacturer's specifications	P/A
S48 GDF #9008	BAAQMD 8-7-302.5	All Phase II Equipment (except components with allowable leak rates or at the nozzle/fill-pipe interface) Shall Be: leak free (≤3 drops/minute) and vapor tight	P/A

**POC Sources**

<b>S# &amp; Description</b>	<b>Emission Limit Citation</b>	<b>Federally-Enforceable Emission Limit</b>	<b>Monitoring</b>
S48 GDF #9008	SIP 8-5-403	Inspection Requirement for Pressure Vacuum Valves- twice per calendar year at 4 to 8 months intervals	P/E
S55 Hot Water Boiler	BAAQMD 8-2-301 and SIP 8-2-301	≤ 15 pounds/day or ≤ 300 ppm total carbon concentration	None
S56 Digester Gas Turbine #1	BAAQMD 8-2-301	≤ 15 pounds/day or ≤ 300 ppm total carbon concentration	None
S100 Municipal Wastewater Treatment Plant	BAAQMD 8-2-301 and SIP 8-2-301	≤ 15 pounds/day of total carbon or ≤ 300 ppm of total carbon concentration	None
S110 Headworks; IPS; Barscreens, S120 Primary Treatment; 16 Sedimentation Tanks, S130 Secondary Treatment; 8 HPO Activated Sludge Units C/V; S140 Secondary Clarifiers; 12 Clarifiers, S160 Disinfection, Chlorination Contact Tanks, Non-ducted, S170 Sludge Handling; 3 WASGBTs, 6 Dewatering Centrifuges	BAAQMD 8-2-301 and SIP 8-2-301	≤ 15 pounds/day of total carbon or ≤ 300 ppm of total carbon concentration	None
S172 Pre-Digester Blend Tanks	BAAQMD Condition #25919, Part 4	<u>&lt;20.3 ppm of total carbon concentration and &lt;2.02 pounds/day of POC</u>	P/Q
S172 Pre-Digester Blend Tanks	BAAQMD 8-2-301	15 lb/day and greater than 300 ppm total carbon	P/Q
S180 Anaerobic Digesters (11); 3 float, 7 fixed, 1 dystor	BAAQMD 8-2-301 and SIP 8-2-301	≤ 15 pounds/day of total carbon or ≤ 300 ppm of total carbon concentration	None

**POC Sources**

S# & Description	Emission Limit Citation	Federally-Enforceable Emission Limit	Monitoring
A194 Digester Gas Flare A195 Digester Gas Flare	BAAQMD 8-2-301	15 lb/day and greater than 300 ppm total carbon	Source test every 8,760 hours or every 5 years, whichever comes first

**POC Emissions Discussion:**

Potential POC emission sources include the combustion sources as a result of incomplete combustion of any organics that may be in the digester gas (trace amounts) and the precursor organics that may result from the wastewater processes. Conservative digester gas sampling indicates the precursor organic levels are less than 82 microgram/liter (5.1 lb/MM cu ft). For the purposes of this PTE calculation, we will estimate uncontrolled emissions as well as worst case un-combusted organics assuming a conservative 90% destruction efficiency.

Digester Gas Combustion: The PTE is based on the estimated maximum digester gas production rate of 204,000 cu ft/hr (maximum digester production rate)

$$\text{PTE, organics from digester gas, uncontrolled} = (204,000 \text{ scf DG/hr})(8760 \text{ hr/yr})(5.1 \text{ lb/1E6 scf DG}) = 9,139 \text{ lb/yr (25 lb/day)}$$

$$\text{PTE, organics from digester gas, after abatement} = (9,139 \text{ lb/yr})(0.1) = 913 \text{ lb/yr (2.5 lb/day)}$$

Since the potential to emit POC from all digester gas combustion sources is less than 15 lb/day, comply with SIP Regulation 8-2-301. No monitoring is recommended.

Since the potential to emit POC from digester gas combustion sources is less than 100 ton per yr, no compliance assurance monitoring of POC emissions from digester gas sources is needed.

Wastewater POC Sources: The PTE for organics from the wastewater sources is based on emission factors developed from the AB-2588 programs for sewage treatment plants. The maximum plant liquid flow rate is 120 MM gpd with an uncontrolled POC emission factor of 243 lb/yr per million gallon per day (BAAT-AMSA 80% Conservative Emission Factor). The PTE for POCs from the wastewater processes is:

$$\text{PTE} = (120 \text{ E6 gpd})(243 \text{ lb/yr-1E6 gpd}) = 29,160 \text{ lb/yr (80 lb/day throughout wastewater sources, all locations combined)}$$

The emissions of POCs occur at various locations, at numerous liquid sources throughout the wastewater processes and are typically represented in high volume, highly dilute vapor streams, spread out over many processes that are difficult to capture and control. Modern grassroots POTWs are increasingly designed to be covered and vented to high efficiency control systems, but

the costs associated with such retroactive controls are not cost effective. There are no conditions to control and/or monitor POC emissions from any of the liquid wastewater sources. We do not expect any wastewater POC emission source to have a concentration approaching 300 ppmv, hence no monitoring is needed.

### Miscellaneous Operations Standards

BAAQMD Regulation 8, Rule 2 Miscellaneous Operations is the 'back-stop' organic compound emission regulation in that if no other rule in Regulation 8 applies, Rule 2 does. Flares, the turbine, the engines and the hot water boiler burn the digester gas from the water treatment plant. Combustion is a very effective means of reducing organic emissions. Therefore, no monitoring is required to assure compliance with this limit for these sources.

#### Regulation 8, Rule 2: Miscellaneous Operations for S172

By definition, the operation of S172 is categorized as miscellaneous. Condition #25919 requires that organic emissions from S172 be limited to 2.02 lbs/day and 20.3 ppm. Quarterly POC readings will ensure compliance.

Changes to permit

#### Table VII-A and VII-B, Cogeneration Engines:

The quarterly monitoring for NO<sub>x</sub> and CO required by BAAQMD Regulation 9-8-503 was added.

The opacity requirement was changed from Ringelmann 2 (6-1-303) to Ringelmann 1 (6-1-301) because the displacement of each engine is more than 1,500 cubic inches.

The requirement to comply with the BAAQMD 6-1-310.1 particulate limit at 6% O<sub>2</sub>, dry, was added.

#### Table VII-D, GDF

The CARB Executive Order Number was added.

The description of the annual pressure decay test was corrected.

#### Tables VII-E and VII-F, Standby Engines

S52 was deleted and S58 was added.

Regulation 9-8-330.2 was deleted because it is obsolete.

Table VII-G, Boiler

The interim limits in BAAQMD Regulation 9-7-301 were deleted because they do not apply to sources that are subject to BAAQMD Regulation 9-7-307.

BAAQMD Regulation 9-7-403 was deleted because the initial source test requirement has been fulfilled.

The requirement for an annual source test or monitoring with a portable monitor in BAAQMD Regulation 9-7-506 has been added.

Table VII-H, Turbine

The requirements of NSPS Subpart KKKK have been added and the requirements of NSPS Subpart Subpart GG have been deleted because the turbine was built after 2005.

BAAQMD Regulation 9-1-304 has been deleted because the turbine burns no liquid or solid fuels.

Table VII-K, Pre-Digestion Blend Tanks has been added.

Table VII-L, Digesters and Flares

The flares have been added to this table. NO<sub>x</sub>, CO, H<sub>2</sub>S, total sulfur, temperature, residence time, opacity, grain loading, and heat input requirements have been added for the flares.

A total sulfur limit on digester gas has been added. A total digester gas production limit has also been added.

## **VIII. Test Methods**

This section of the permit lists test methods that are associated with standards in District or other rules. It is included only for reference. In most cases, the test methods in the rules are source test methods that can be used to determine compliance but are not required on an ongoing basis. They are not “applicable requirements” as defined by Regulation 2-6-202.

If a rule or permit condition requires ongoing testing, the requirement will also appear in Section IV of the permit.

Changes to permit

- Test methods will be added and deleted as shown in Table VIII of the proposed permit revision in accordance with the changes to other sections of the permit that have previously been discussed.



### **IX. Permit Shield:**

The District rules allow two types of permit shields. The permit shield types are defined as follows: (1) A provision in a major facility review permit explaining that specific federally enforceable regulations and standards do not apply to a source or group of sources, or (2) A provision in a major facility review permit explaining that specific federally enforceable applicable requirements for monitoring, recordkeeping and/or reporting are subsumed because other applicable requirements for monitoring, recordkeeping, and reporting in the permit will assure compliance with all emission limits.

The second type of permit shield is allowed by EPA's "White Paper 2 for Improved Implementation of the Part 70 Operating Permits Program." The District uses the second type of permit shield for all streamlining of monitoring, recordkeeping, and reporting requirements in Title V permits. The District's program does not allow other types of streamlining in Title V permits.

This facility has no permit shields.

### **X. Revision History**

This section of the permit summarizes each revision to the permit.

#### Changes to Permit, Section X:

- The permit renewal (Application # 28689) has been added to this section.

### **XI. Glossary**

This section of the permit defines and explains acronyms, abbreviations, and other terms that are used in this permit.

#### Changes to Permit, Section XI:

- None

### **D. Alternate Operating Scenarios:**

No alternate operating scenario has been requested for this facility.

### **E. Compliance Status:**

The responsible official for EBMUD submitted a signed Certification Statement form dated June 26, 2019. On this form, the responsible official certified that the following four statements are true:

Based on information and belief formed after reasonable inquiry, the sources identified in the

Applicable Requirements and Compliance Summary form that are in compliance will continue to comply with the applicable requirements;

Based on information and belief formed after reasonable inquiry, the sources identified in the Applicable Requirements and Compliance Summary form will comply with future-effective applicable requirements on a timely basis;

Based on information and belief formed after reasonable inquiry, information on application forms, all accompanying reports, and other required certifications is true, accurate, and complete;

All fees required by Regulation 3, including Schedule P have been paid.

**F. Differences between the Application and the Proposed Permit:**

The Title V permit application was originally submitted on May 2, 2017. This version is the basis for constructing the proposed Title V permit.

In addition, the District has proposed numerous updates to the standard permit language, regulatory descriptions, and regulatory amendment dates throughout the permit to reflect regulatory changes, to clarify limits and other applicable requirements, to explain permit terminology, to remove obsolete requirements, and to correct permit errors.

## APPENDIX A

### GLOSSARY

**ACT**  
Federal Clean Air Act

**AP-42**  
An EPA Document "Compilation of Air Pollution Emission Factors" that is used to estimate emissions from numerous source types. It is available electronically from EPA's web site at: <http://www.epa.gov/ttn/chief/ap42/index.html>

**APCO**  
Air Pollution Control Officer: Head of Bay Area Air Quality Management District

**API**  
American Petroleum Institute

**ARB**  
Air Resources Board

**ASTM**  
American Society for Testing and Materials

**ATCM**  
Airborne Toxic Control Measure

**BAAQMD**  
Bay Area Air Quality Management District

**BACT**  
Best Available Control Technology

**Basis**  
The underlying authority which allows the District to impose requirements.

**C1**  
An organic chemical compound with one carbon atom, for example: methane

**C3**  
An organic chemical compound with three carbon atoms, for example: propane

**C5**  
An organic chemical compound with five carbon atoms, for example: pentane

**C6**  
An organic chemical compound with six carbon atoms, for example: hexane

**C<sub>6</sub>H<sub>6</sub>**  
Benzene

**CAA**  
The federal Clean Air Act

**CAAQS**

California Ambient Air Quality Standards

**CAM**

Compliance Assurance Monitoring per 40 CFR Part 64

**CAPCOA**

California Air Pollution Control Officers Association

**CARB**

California Air Resources Board (same as ARB)

**CCR**

The California Code of Regulations

**CEC**

California Energy Commission

**CEQA**

California Environmental Quality Act

**CEM**

A “continuous emission monitor” is a monitoring device that provides a continuous direct measurement of some pollutant (e.g. NO<sub>x</sub> concentration) in an exhaust stream.**CEQA**  
California Environmental Quality Act

**CFR**

The Code of Federal Regulations. 40 CFR contains the implementing regulations for federal environmental statutes such as the Clean Air Act. Parts 50-99 of 40 CFR contain the requirements for air pollution programs.

**CH<sub>4</sub> or CH<sub>4</sub>**

Methane

**CI**

Compression Ignition

**CIWMB**

California Integrated Waste Management Board

**CO**

Carbon Monoxide

**CO<sub>2</sub> or CO<sub>2</sub>**

Carbon Dioxide**CO<sub>2</sub>e**

Carbon Dioxide Equivalent. A carbon dioxide equivalent emission rate is the emission rate of a greenhouse gas compound that has been adjusted by multiplying the mass emission rate by the global warming potential of the greenhouse gas compound. These adjusted emission rates for individual compounds are typically summed together, and the total is also referred to as the carbon dioxide equivalent (CO<sub>2</sub>e) emission rate.

**CT**

## Combustion Zone Temperature

### **Cumulative Increase**

The sum of permitted emissions from each new or modified source since a specified date pursuant to BAAQMD Rule 2-1-403, Permit Conditions (as amended by the District Board on 7/17/91) and SIP Rule 2-1-403, Permit Conditions (as approved by EPA on 6/23/95). Used to determine whether threshold-based requirements are triggered.

### **District**

The Bay Area Air Quality Management District

### **E6, E9, E12**

Very large or very small number values are commonly expressed in a form called scientific notation, which consists of a decimal part multiplied by 10 raised to some power. For example, 4.53E6 equals  $(4.53) \times (10^6) = (4.53) \times (10 \times 10 \times 10 \times 10 \times 10 \times 10) = 4,530,000$ . Scientific notation is used to express large or small numbers without writing out long strings of zeros.

### **EG**

Emission Guidelines

### **EO**

Executive Order

### **EPA**

The federal Environmental Protection Agency.

### **Excluded**

Not subject to any District Regulations.

### **FE, Federally Enforceable,**

All limitations and conditions which are enforceable by the Administrator of the EPA including those requirements developed pursuant to 40 CFR Part 51, subpart I (NSR), Part 52.21 (PSD), Part 60 (NSPS), Part 61 (NESHAPs), Part 63 (HAP), and Part 72 (Permits Regulation, Acid Rain), and also including limitations and conditions contained in operating permits issued under an EPA-approved program that has been incorporated into the SIP.

### **FP**

Filterable Particulate as measured by BAAQMD Method ST-15, Particulate.

### **FR**

Federal Register

### **GDF**

Gasoline Dispensing Facility

### **GHG**

Greenhouse Gas

### **GLC**

Ground Level Concentration

**GLM**

Ground Level Monitor

**Grains**

1/7000 of a pound

**Gpd**

Gallons per day

**GRS**

Gas Recovery Systems, Inc.

**GWP**

Global Warming Potential. A comparison of the ability of each greenhouse gas to trap heat in the atmosphere relative to that of carbon dioxide over a specific time period.

**H<sub>2</sub>S or H<sub>2</sub>S**

Hydrogen Sulfide

**H<sub>2</sub>SO<sub>4</sub> or H<sub>2</sub>SO<sub>4</sub>**

Sulfuric Acid

**H&SC**

Health and Safety Code

**HAP**

Hazardous Air Pollutant. Any pollutant listed pursuant to Section 112(b) of the Act. Also refers to the program mandated by Title I, Section 112, of the Act and implemented by 40 CFR Part 63.

**Hg**

Mercury

**HHV**

Higher Heating Value. The quantity of heat evolved as determined by a calorimeter where the combustion products are cooled to 60 °F and all water vapor is condensed to liquid.

**LEA**

Local Enforcement Agency

**LFG**

Landfill gas

**LHV**

Lower Heating Value. Similar to the higher heating value (see HHV) except that the water produced by the combustion is not condensed but retained as vapor at 60°F.

**Long ton**

2200 pounds

**Major Facility**

A facility with potential emissions of regulated air pollutants greater than or equal to 100 tons

per year, greater than or equal to 10 tons per year of any single hazardous air pollutant, and/or greater than or equal to 25 tons per year of any combination of hazardous air pollutants, or such lesser quantity as determined by the EPA administrator.

**MAX or Max.**

Maximum

**MFR**

Major Facility Review. The District's term for the federal operating permit program mandated by Title V of the Act and implemented by District Regulation 2, Rule 6.

**MIN or Min.**

Minimum

**MOP**

The District's Manual of Procedures.

**MSDS**

Material Safety Data Sheet

**MSW**

Municipal solid waste

**MW**

Molecular weight

**N2 or N<sub>2</sub>**

Nitrogen

**NA**

Not Applicable

**NAAQS**

National Ambient Air Quality Standards

**NESHAPs**

National Emission Standards for Hazardous Air Pollutants. See 40 CFR Part 61.

**NMHC**

Non-methane Hydrocarbons

**NMOC**

Non-methane Organic Compounds (Same as NMHC)

**NO<sub>2</sub>**

Nitrogen Dioxide

**NO<sub>x</sub>**

Oxides of nitrogen.

**NSPS**

Standards of Performance for New Stationary Sources. Federal standards for emissions from new stationary sources. Mandated by Title I, Section 111 of the Act, and implemented by both 40 CFR



Part 60 and District Regulation 10.

**NSR**

New Source Review. A federal program for preconstruction review and permitting of new and modified sources of air pollutants for which criteria have been established in accordance with Section 109 of the Federal Clean Air Act. Mandated by Title I of the Clean Air Act and implemented by 40 CFR Parts 51 and 52 as well as District Regulation 2, Rule 2. (Note: There are additional NSR requirements mandated by the California Clean Air Act.)

**O<sub>2</sub> or O<sub>2</sub>**

Oxygen

**Offset Requirement**

A New Source Review requirement to provide federally enforceable emission offsets at a specified ratio for the emissions from a new or modified source. Applies to emissions of POC, NO<sub>x</sub>, PM<sub>10</sub>, and SO<sub>2</sub>.

**Phase II Acid Rain Facility**

A facility that generates electricity for sale through fossil-fuel combustion and is not exempted by 40 CFR 72 from Titles IV and V of the Clean Air Act.

**PERP**

Portable Equipment Registration Program

**POC**

Precursor Organic Compounds

**PM**

Particulate Matter

**PM<sub>10</sub>**

Particulate matter with aerodynamic equivalent diameter of less than or equal to 10 microns

**PSD**

Prevention of Significant Deterioration. A federal program for permitting new and modified sources of air pollutants for which the District is classified "attainment" of the National Air Ambient Quality Standards. Mandated by Title I of the Act and implemented by both 40 CFR Part 52 and District Regulation 2, Rule 2.

**PTE**

Potential to Emit as defined by BAAQMD Regulation 2-6-218

**PV or P/V Valve or PRV**

Pressure / Vacuum Relief Valve

**RICE**

Reciprocating Internal Combustion Engine

**RMP**

Risk Management Plan, as defined in 40 CFR Part 68.

**RWQCB**

Regional Water Quality Control Board

**S**

Sulfur

**SCR**

A “selective catalytic reduction” unit is an abatement device that reduces NOx concentrations in the exhaust stream of a combustion device. SCRs utilize a catalyst, which operates within a specific temperature range, and injected ammonia to promote the conversion of NOx compounds to nitrogen gas.

**Short ton**

2000 pounds

**SIP**

State Implementation Plan. State and District programs and regulations approved by EPA and developed in order to attain the National Ambient Air Quality Standards. Mandated by Title I of the Act.

**SO<sub>2</sub> or SO<sub>2</sub>**

Sulfur dioxide

**SO<sub>3</sub> or SO<sub>3</sub>**

Sulfur trioxide

**SSM**

Startup, Shutdown, or Malfunction

**SSM Plan**

A plan, which states the procedures that will be followed during a startup, shutdown, or malfunction, that is prepared in accordance with the general NESHAP provisions (40 CFR Part 63, Subpart A) and maintained on site at the facility.

**TAC**

Toxic Air Contaminant

**TBACT**

Best Available Control Technology for Toxics

**THC**

Total Hydrocarbons (NMHC + Methane)

**therm**

100,000 British Thermal Units

**Title V**

Title V of the federal Clean Air Act. Requires a federally enforceable operating permit program for major and certain other facilities.

**TOC**

Total Organic Compounds (NMOC + Methane, Same as THC)

**TPH**

Total Petroleum Hydrocarbons

**TRMP**

Toxic Risk Management Plan

**TSP**

Total Suspended Particulate

**TSP**

Total Suspended Particulate

**TVP**

True Vapor Pressure

**VOC**

Volatile Organic Compounds

**VMT**

Vehicle Miles Traveled

**Symbols:**

<	=	less than
>	=	greater than
≤	=	less than or equal to
≥	=	greater than or equal to

**Units of Measure:**

atm	=	atmospheres
bbl	=	barrel of liquid (42 gallons)
bhp	=	brake-horsepower
Btu	=	British Thermal Unit
°C	=	degrees Centigrade
cfm	=	cubic feet per minute
dscf	=	dry standard cubic feet
°F	=	degrees Fahrenheit
ft <sup>3</sup>	=	cubic feet
g	=	grams
gal	=	gallon
gpm	=	gallons per minute
gr	=	grains
hp	=	horsepower
hr	=	hour
in	=	inches

kW	=	kilowatt
lb	=	pound
in	=	inches
lbmole	=	pound-mole
max	=	maximum
m <sup>2</sup>	=	square meter
m <sup>3</sup>	=	cubic meters
min	=	minute
MM	=	million
MM BTU	=	million BTU
MMcf	=	million cubic feet
Mg	=	mega grams
M scf	=	one thousand standard cubic feet
MW	=	megawatts
ppb	=	parts per billion
ppbv	=	parts per billion, by volume
ppmv	=	parts per million, by volume
ppmw	=	parts per million, by weight
psia	=	pounds per square inch, absolute
psig	=	pounds per square inch, gauge
scfm	=	standard dry cubic feet
scfm	=	standard cubic feet per minute
yd	=	yard
yd <sup>3</sup>	=	cubic yards
yr	=	year

**APPENDIX B  
CALCULATIONS**

APPENDIX B  
CALCULATIONS

1. NMOC Compound Concentrations in Digester Gas

Average MW of NMOC: 113 lb/lb-mole (113 g/g-mole)  
Concentration of NMOC: 82 µg/l = 82 E-06 g/l (taken from EBMUD Source Tests, based on highest observed concentration; µg = microgram = 1,000,000<sup>th</sup> of a gram; average measured concentration = 50 µg/l)

EBMUD Digester Gas Production Rate, estimated: 4,896,000 cu ft/day (204,000 cu ft/hr)  
(Note: Highest monthly average, actual = 3,500,000 cu ft/day)

Digester Gas Typical Composition:

Methane: 59% (typical, dry basis)  
CO<sub>2</sub>: 41%  
(Average DG Density = 1.22 g/l at STP)  
Nitrogen + Oxygen: <1%

NMOC Emissions, maximum-Uncontrolled = (4,896,000 cu ft/day)(82 E-06 g NMOC/liter)(1000 liter/cu m)(cu m/35.314cu ft)(lb/454 g) = 25 lb/day (9,139 lb/yr)

Conversion of 82 µg/l to ppmv, basis 1,000,000 liter digester gas: (82 E-06 g NMOC/liter DG)(1,000,000 liter DG)(g-mole NMOC/113 g NMOC)(22.4 liter NMOC/g-mole NMOC) = 16 liter NMOC per 1,000,000 liter DG = 16 ppmv

Concentration Conversion from Volume to Weight basis:  
[82 E-6 g/l DG][L DG/1.22 g] = 66 ppm, wt

300 ppm Carbon in Digester Gas (DG):

MW, Methane: 16.1 lb/mole  
Highest daily digester gas production rate: 4,896,000 cu ft/day

Total carbon (NMOC) emitted @ 300 ppm = [4,896,000 cu ft/day][300 cu ft NMOC as methane/1E6 cu ft DG][lb-mole/386 cu ft][16.1 lb/lb-mole] = 61 lb/day

APPENDIX C  
EVALUATIONS

## **Revised Engineering Evaluation Report Application # 25905**

East Bay Municipal Utility District, P#591  
2020 Wake Avenue, Oakland, CA 94623

### **BACKGROUND**

East Bay Municipal Utility District (EBMUD) owns and operates a large waste water treatment plant located in Oakland, CA (near the Oakland entrance to the Bay Bridge). In addition to waste water treatment and recycling sources, this plant includes cogeneration equipment (engines and boilers fired on blends of natural gas and sewage digester gas), a non retail gasoline dispensing facility, and several diesel fired engines that are used for emergency or portable power.

EBMUD has been operating a small scale pilot project that involves adding ground food waste to the digesters to recycle food waste and enhance digester gas production. EBMUD is planning to expand this pilot project. This expansion will not require any changes to any existing equipment, but it will require additional power, primarily for lighting. The location of the food scrap handling area is too far from existing utilities to accommodate either electrically powered equipment or natural gas fired engines. This pilot project is expected to last no more than 30 months. Expansion of the existing utilities for this temporary project would be prohibitively expensive. Therefore, EBMUD is proposing to use a new prime diesel-fired IC engine (430 bhp) to power a 320 kW generator for this temporary project.

S-58 Prime Diesel-Fired Engine and Generator for Food Waste Pilot Project; equipped with integral oxidation catalyst and diesel particulate filter; Caterpillar, C13, Model Year 2013, 430 bhp, 320 kW, 23.1 gals/hr diesel oil

During the 30-month food waste pilot project, EBMUD has proposed to operate S-58 at a maximum of 100% load for up to 16 hours/day and up to 364 days/year (2,446,080 bhp-hours/year). However, EBMUD expects that S-58 will – on average – only operate at 50% load for about 10 hours/day and 264 days/year (554,400 bhp-hours/year). As discussed in more detail in the BACT section below, the District initially proposed to limit operation of S-58 to 16 hour/day and 330 days/year, which is equivalent to 2,217,600 bhp-hours/year or a maximum diesel fuel usage rate of 122,000 gallons/year, to ensure that NOx emissions do not exceed 3.0 tons/year. At a NOx emission level of 3.0 tons/year or less, SCR is not cost effective and would not be required for S-58. However, the District is now limiting the annual operating rate to 4780 hours/year (about 299 days/year) and 110,418 gallons/year of diesel oil to ensure that the required amount of NOx and POC emission reduction credits for this application do not exceed the amount of POC credits available.

When the food waste pilot project is complete, EBMUD plans to use S-58 as an emergency standby engine and generator. Under this operating scenario, S-58 will be limited to operating 50 hours/year for reliability related purposes with unlimited operating time for emergencies. This alternative operating scenario will also be considered under Application #25905.



**EMISSIONS**

This 2013 model year, prime, diesel-fired IC engine (S-58) is CARB certified, pursuant to Executive Order U-R-001-0454, to meet the Tier 4 – interim standards that apply to engines with an output rating between 175 bhp and 750 bhp.<sup>1</sup> The CARB certified emission rates and equivalent outlet emission concentrations for S-58 are presented in Table 1.

**Table 1. CARB Certified Emission Rates from S-58**

	g/kw-hr	g/bhp-hr	g/hr	lbs/hr	ppmv @ 15% O2	grains/dscf @ 0% O2
HC (POC)	0.050	0.0373	16.03	0.0353	8	
NOx	1.600	1.1931	513.04	1.1311	90	
CO	1.400	1.0440	448.91	0.9897	129	
PM10	0.002	0.0015	0.64	0.0014		0.0003
SO2 (a)	0.007	0.0052	2.23	0.0049	0.3	

(a) Sulfur dioxide emissions were determined based of the maximum sulfur content for CARB certified diesel fuel (0.0015% S, by weight) and the maximum fuel usage rate for this engine (23.1 gallons/hour).

Maximum daily emissions from S-58 are presented below for each proposed operating scenario: Case A (S-58 operating as a prime engine for the food waste pilot project) and Case B (S-58 operating as an emergency standby engine).

**Table 2. Maximum Daily Emissions from S-58 for Each Proposed Operating Scenario**

	maximum at 100% load pounds/hour	Case A – maximum hours/day	Case A – maximum pounds/day	Case B – maximum hours/day	Case B – maximum pounds/day
HC (POC)	0.0353	16	0.566	24	0.848
NOx	1.1311	16	18.097	24	27.146
CO	0.9897	16	15.835	24	23.752
PM10	0.0014	16	0.023	24	0.034
SO2	0.0049	16	0.079	24	0.118

As shown in Table 2, NOx and CO emissions will each exceed 10 pounds/day for both proposed operating scenarios. Therefore, BACT is triggered for these pollutants.

Maximum annual emissions from S-58 are summarized in Table 3 below for each proposed operating scenario (Case A and Case B) based on the maximum usage rates presented below.

<sup>1</sup> Since this application was declared complete in 2013, the S-58 engine may be allowed to meet Tier 4 – interim standards (if it complies with BACT without SCR controls) rather than Tier 4 – final standards that became effective on 1/1/2014.

**Table 3. Maximum Annual Emissions from S-58 for Each Proposed Operating Scenario**

	maximum at 100% load pounds/hour	Case A – maximum hours/year <sup>(a)</sup>	Case A – maximum tons/year	Case B – maximum hours/year	Case B – maximum tons/year
HC (POC)	0.0353	4780	0.084	50	0.001
NOx	1.1311	4780	2.703	50	0.028
CO	0.9897	4780	2.365	50	0.025
PM10	0.0014	4780	0.003	50	0.000
SO2	0.0049	4780	0.012	50	0.000

(a) When S-58 is operating as a prime engine, total operating time will be limited to 4780 hours/year (16 hours/day for about 299 days/year) by District permit conditions to keep prevent exceeding the amount of emission reduction credits currently available at this site.

**STATEMENT OF COMPLIANCE**

**Regulation 1: General Provisions and Definitions**

All sources are subject to Regulation 1, Section 301, which prohibits discharge of air contaminants resulting in public nuisance. The proposed prime diesel engine has very low particulate emissions and is not expected to be a source of public nuisance.

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

District Regulation 2, Rule 1, Section 310 specifies that all proposed new and modified sources subject to District permit requirements must be reviewed in accordance with the California Environmental Quality Act (CEQA) requirements, except for ministerial projects or projects exempt from CEQA under Section 2-1-312. The engineering review for this project requires only the application of standard permit conditions and standard emission factors in accordance with Permit Handbook Chapter 2.3.1, Combustion Equipment – Internal Combustion Engines, Stationary Diesel Engines. Therefore, this application is considered to be ministerial and is exempt from CEQA review.

**Regulation 2, Rule 1: School Public Notice Requirements**

The public notification requirements of Regulation 2-1-412 apply to modifications which result in any increase in toxic air contaminant or hazardous air contaminant emissions at facilities within 1,000 feet of the boundary of a K-12 school. The applicant has reported no K-12 school within that radius of this facility. The District’s database found that the nearest K-12 school is 0.99 miles from the facility. Therefore, the public notice requirements in Regulation 2-1-412 do not apply.

**Regulation 2, Rule 2: Best Available Control Technology (BACT) Requirements**

Regulation 2, Rule 2, Section 301 states that BACT requirements are triggered if maximum potential emissions from a new or modified source are 10 lbs/day or more. As shown in Table 2, the emissions from S-58 could exceed 10 pounds/day of NOx or CO for both potential operating

scenarios (prime or emergency standby). Therefore, BACT is required for NOx and CO emissions, and both operating scenarios should be considered.

The BACT/TBACT Workbook Document 96.1.4 - dated 4/13/2009 - applies to prime compression ignition internal combustion engines larger than 50 hp. The standards for BACT1 (technologically feasible/cost effective) and BACT2 (achieved in practice) for NOx and CO emissions from prime engines are summarized in Table 4.

**Table 4**  
BACT for Prime Compression Ignition Engines > 50 hp (Document # 96.1.4)

Pollutant	BACT1 / TBACT	Typical Technology	BACT2	Typical Technology	S-58 Certified Emissions
NOx	<b>85% reduction</b> of current tier standard	Selective Catalytic Reduction (SCR) + Current Certified Engine	Current Tier Standard at Applicable hp Rating: <b>1.50 g/bhp-hr</b>	Current Certified Engine	<b>1.193 g/bhp-hr</b>
CO	<b>50% reduction</b> of current tier standard	Catalytic Oxidation + Current Certified Engine	The lesser of: 2.75 g/bhp-hr, or Current Tier Standard at Applicable hp Rating: <b>2.60 g/bhp-hr</b>	Current Certified Engine	<b>1.044 g/bhp-hr</b> (engine is equipped with an oxidation catalyst)

The BACT/TBACT Workbook Document 96.1.3 - dated 12/22/2010 - applies to emergency standby compression ignition internal combustion engines larger than 50 hp (non-agricultural engines and non-fire pump engines). The standards for BACT1 (technologically feasible/cost effective) and BACT2 (achieved in practice) for NOx and CO emissions from emergency standby engines are summarized in Table 5.

**Table 5**  
BACT for Emergency Standby Compression Ignition Engines > 50 hp (Document # 96.1.3)

Pollutant	BACT1 / TBACT	Typical Technology	BACT2	Typical Technology	S-58 Certified Emissions
NOx	n/s	n/s	CARB ATCM Standard at Applicable hp Rating: 3.0 g/bhp-hr for NMHC+NOx <b>(2.85 g/bhp-hr for NOx)</b>	Any Engine Certified or Verified to Achieve the Applicable Standard	<b>1.193 g/bhp-hr</b>
CO	n/s	n/s	CARB ATCM Standard at Applicable hp Rating: <b>2.60 g/bhp-hr</b>	Any Engine Certified or Verified to Achieve the	<b>1.044 g/bhp-hr</b> (engine is equipped with an oxidation catalyst)

				Applicable Standard	
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**NOx BACT:**

As shown in Tables 4 and 5, BACT2 requirements include the use of an engine that has been certified to meet the specified NOx limit. For prime engines, the applicable NOx limit is the current applicable Tier standard. For engines covered in applications that were declared complete prior to 1/1/2014, the applicable tier standard for engines between 175 bhp and 750 bhp is the Tier 4 interim standard, which is 1.5 grams of NOx per bhp-hour. For emergency standby engines, the applicable NOx limit for BACT2 requirements is the CARB ATCM standard, which is 2.85 grams of NOx per bhp-hour. The proposed engine (S-58) is CARB certified to achieve an emission rate of 1.193 grams of NOx per brake-horsepower hour. This emission rate is less than both the prime engine BACT2 limit and the emergency standby engine BACT2 limit. Therefore, S-58 complies with BACT2 for NOx.

For emergency standby operation, no BACT1 standards or typical technology have been specified for NOx. Therefore, no additional controls are necessary for S-58 when it is operated as an emergency standby engine.

For the prime operating scenario, the BACT1 NOx standard is specified in Table 4 as 85% reduction of the current Tier Standard for NOx. As stated above, the current Tier 4 interim standard for NOx is 1.5 g/bhp-hr. Thus, the BACT1 limit for a prime engine is 0.225 grams of NOx per bhp-hour. The typical technology used to achieve this standard is selective catalytic reduction (SCR), if BACT1 controls are found to be technologically feasible and cost effective.

The use of SCR technology on prime stationary diesel-fired engines is a well known control strategy. The feasibility of SCR is not under debate for this particular engine. No other NOx control strategies are expected to be able to achieve a BACT1 NOx limit of 0.225 grams of NOx per bhp-hr.

The applicant provided a capital cost estimate for SCR control technology from Johnson-Matthey and used standard assumptions to estimate sales tax, freight, direct installation costs, and indirect installation costs. The total installed capital cost for an SCR system for the proposed S-58 engine is \$92,820.

Using the procedures specified in the District’s BACT/TBACT Workbook, the District determined that the appropriate interest rate for either a 2-year or 3-year project is 3% based on Treasury Note data for calendar year 2013. The District used this 3% interest rate and the project life of 2.5 years to calculate the capital recovery factor (CRF) for this temporary project using the following equation:

$$CRF = i(1+i)^n / [(1+i)^n - 1]$$

$$CRF = 0.4212.$$

An annualized cost factor for the temporary project was calculated using this CRF and the standard tax, insurance, general, administration, operating and maintenance factors specified in the District' BACT/TBACT Workbook ( $CRF+0.01+0.01+0.02+0.05$ ) = 1.5112.

The annualized cost for this project is ( $\$92,820 * 0.5112$ ) = \$ 47,445/year

From Table 3, annual NOx emissions from S-58 are 2.703 tons/year. Johnson-Matthey expected that their proposed SCR system would achieve 90% reduction for NOx, or 2.433 tons/year of NOx reductions. The cost-effectiveness of SCR controls for this temporary project is:  
( $\$47,445 / \text{year}$ ) / (2.433 tons/year of NOx) = \$19,501/ton of NOx removed at S-58

The cost effectiveness analysis above was based on the assumption that S-58 would be operating at full load for the entire permitted operating time of 4780 hours/year. The Applicant expects that S-58 will actually operate at about 50% operating load. Thus, NOx emissions from S-58 are likely to be much lower than this worst case scenario. Under this average circumstance, NOx emission reductions would be about 1.35 tons/year, and the cost-effectiveness rate would increase to more than \$ 39,000/ton of NOx removed.

A similar procedure was used to evaluate the use of SCR on S-58 when it is operating as an emergency standby engine. For this case, the District assumed a project life of 20 years and calculated an applicable interest rate of 6%. The CRF for this case is 0.0872. The annualized cost was determined to be: \$16,446/year. Based on a 50 hour/year operating rate limit when S-58 is acting as an emergency standby engine, and 90% control of NOx emissions, the amount of NOx reductions for this case is 0.025 tons/year and the cost-effectiveness rate was more than \$600,000/ton of NOx removed.

Since the cost effectiveness for SCR controls on S-58 is expected to exceed \$17,500/ton for either proposed operating scenario (prime or standby), the District concludes that SCR is not a cost effective control option for S-58, provided that the operating time for S-58 does not exceed 5280 hours/year when it is operating as a prime engine.

#### CO BACT:

As shown in Tables 4 and 5, BACT2 requirements include the use of an engine that has been certified to meet the specified CO limit. For prime engines, the applicable CO limit is the lesser of 2.75 grams CO per bhp-hour or current applicable Tier standard. For engines covered in applications that were declared complete prior to 1/1/2014, the applicable tier standard for engines between 175 bhp and 750 bhp is the Tier 4 interim standard, which is 2.6 grams of CO per bhp-hour. For emergency standby engines, the applicable CO limit for BACT2 requirements is the CARB ATCM standard, which is 2.60 grams of CO per bhp-hour. The proposed engine (S-58) is CARB certified to achieve an emission rate of 1.044 grams of CO per brake-horsepower hour. This emission rate is less than both the prime engine BACT2 limit and the emergency standby engine BACT2 limit. Therefore, S-58 complies with BACT2 for CO.

For emergency standby operation, no BACT1 standards or typical technology have been specified for CO. Therefore, no additional controls are necessary for S-58 when it is operated as an emergency standby engine.

For the prime operating scenario, the BACT1 CO standard is specified in Table 4 as 50% reduction of the current Tier Standard for CO. As stated above, the current Tier 4 interim standard for CO is 2.6 grams per bhp-hr. Thus, the BACT1 limit for a prime engine is 1.30 grams of CO per bhp-hour. The typical technology used to achieve this standard is an oxidation catalyst. S-58 is equipped with an oxidation catalyst and is CARB certified to achieve a CO emission rate of 1.044 grams per bhp-hour. Therefore, S-58 as proposed is meeting the prime engine BACT1 standard for CO. No other controls are necessary.

**Regulation 2, Rule 2: Offsets**

The cumulative emission increases for this site and this application are summarized below.

**Table 6. Cumulative Emission Increase Inventory**

	Current Balance tons/year	Application Increases tons/year	Offset Ratio	ERCs Required tons/year	ERCs Provided tons/year	New Balance tons/year
POC <sup>(1)</sup>	0.000	0.084	1.15	0.097	0.097	0.000
NOx <sup>(2)</sup>	0.000	2.703	1.15	3.108	3.108	0.000
CO	134.355	2.365	-			136.7 20
PM10	3.809	0.003	-			3.812
SO2	25.458	0.012	-			25.470

1. The previous POC Balance of 0.030 tons/year was due to Application # 9585 from 1992 for S-170 and S-181. S-181 has been shut down, but I cannot determine how much of the total 0.030 tons/year of POC emissions were attributed to S-181 because the application file is not available. Based on the emission factors on the old S-181 data form, all emissions could have been attributed to S-181. When the file becomes available, the District will determine the amount of emissions attributed to S-181 and will refund any excess credits. Application # 9585 should have been offset with credits from the small facility banking account when offsets were first triggered; and should therefore, no be subject to reimbursement with an offset ratio of 1.00/1.00 for this old application.
2. The District’s small facility banking account was used to provide POC and NOx ERCs for Applications # 3694 and #17749. Application # 3694 included permit condition modifications for S-5 (a boiler) and 3 engines (s-37, S-38, and S-39) that would eliminate a 2-engine only operating restriction and allow the 3 engiens to operate simultaneously. All emission increases were attributed to S-38, which is permitted to burn up to 60% natural gas with the balance from digester gas, but the project was found to comply with the co-generation project offset waiver in H&SC 42314. Application # 17749 was for two digester gas fired turbines that also qualified for the H&SC 42314 offset waiver. Therefore, the District provided the NOx and POC ERCs for these two application, and the site does not need to reimburse the District for these credits.

The offset requirements for precursor organic compounds (POC) and nitrogen oxides (NOx) are found in Regulation 2, Rule 2, Section 302. Under Section 2-2-302, POC and NOx emission offsets are required for new or modified sources at a facility which emits or will be permitted to emit 10 tons per year or more on a pollutant specific basis. If the facility emits or will be permitted to emit less than 35 tons of POC or NOx per year, the emission offsets may be provided by the District’s Small Facility Banking Account. If the facility will be permitted to emit more than 35 tons/year of POC or NOx, the site is responsible for providing the required offsets at a ratio of 1.15 to 1.0.

The proposed prime diesel engine, S-58, is a new source and will result in emission increases of both POC and NOx. The actual POC and NOx emissions from this facility are currently estimated

at 24.1 tons/year of POC and 38.1 tons/year of NO<sub>x</sub>. Based on Condition # 21759, Part 1, the S-100 Municipal Waste Water Treatment Plant has a maximum permitted throughput rate of 93,615 million gallons/year. Based on databank emission factors, the POC emission rate is 0.851 pounds/million gallons. The maximum permitted emission rate for S-100 is:

$(93,615 \text{ million gallons/year}) \times (0.851 \text{ pounds/gallon}) / (2000 \text{ pounds/ton}) = 39.8 \text{ tons/year}$

Based on this POC emissions data and the actual NO<sub>x</sub> emissions reported above, this site has the potential to emit more than 35 tons/year of both POC and NO<sub>x</sub>. Therefore, the site is required to provide offsets at a ratio of 1.15 to 1.0. As shown in Table 6, the required amount of emission reduction credits (ERCs) for this application are: 0.097 tons/year of POC and 3.108 tons/year of NO<sub>x</sub>, or 3.205 tons/year of POC credits total if POC credits offset both NO<sub>x</sub> and POC increases.

The facility owns Banking Certificate # 969, which has 0.601 tons/year of POC ERCs remaining. The site has purchased 2.6 tons/year of additional POC ERCs, which was assigned Banking Certificate # 1391. The site also purchased 0.2 tons/year of credits for Application # 25788, and will have 0.029 tons/year of POC credits remaining from Certificate # 1400 after completion of Application # 25788. The facility has requested that the District use all of these POC credits (0.601+2.6+0.029 = 3.230 tons/year) to offset both the POC and NO<sub>x</sub> increases for this project. These remaining credits are sufficient for this project.

The offset requirements for PM<sub>10</sub> and sulfur dioxides are found in Regulation 2, Rule 2, Section 303. Emission offsets for PM<sub>10</sub> and SO<sub>2</sub> are required for any new or modified source that is a major facility for PM<sub>10</sub> or SO<sub>2</sub> emissions. Offsets are required, if the project results in a cumulative increase, minus any contemporaneous emission reduction credits, in excess of 1.0 ton per year since April 5, 1991. This facility has actual emissions of 3.2 tons/year of PM<sub>10</sub> and 18.2 tons/year of SO<sub>2</sub>. Thus far, this site has not been deemed to be a major facility of PM<sub>10</sub> or SO<sub>2</sub> emissions and is not expected to be a major facility of PM<sub>10</sub> or SO<sub>2</sub>. PM<sub>10</sub> emissions are low and are not expected to ever exceed 100 tons/year. Therefore, this site is not a major facility for PM<sub>10</sub>. Since SO<sub>2</sub> emissions are potentially substantial, the District conducted a PTE analysis for SO<sub>2</sub> (see attached spreadsheet). The site-wide PTE for all sources of SO<sub>2</sub>, including the proposed engine (S-58), is 75.0 tons/year of SO<sub>2</sub>. Since the PTE for SO<sub>2</sub> is less than 100 tons/year, this facility is not a major source of SO<sub>2</sub> emissions. Since this site is not major for either PM<sub>10</sub> or SO<sub>2</sub>, offsets are not required for these pollutants.

#### Regulation 2, Rule 2: Prevention of Significant Deterioration (PSD) Requirements:

The PSD requirements in District Regulation 2, Rule 2, Sections 304 and 305 apply to major modifications at a major facility. Wastewater treatment plants are not one of the 28 PSD source categories that are subject to the 100 tons/year threshold. Therefore, the PSD thresholds for this facility are 250 tons/year for criteria pollutants and 100,000 tons/year for GHG. Based on the attached site-wide PTE calculations, the maximum potential emissions from this site (including the proposed S-58 engine) are 54,154 tons/year of non-biogenic<sup>2</sup> GHG and 186.0 tons/year of CO. The PTE for all other criteria pollutants is less than 100 tons/year for each pollutant. Since the GHG PTE does not exceed 100,000 tons/year and the CO PTE does not exceed 250 tons/year, this site is not currently subject to PSD. As a result, Regulation 2-2-304 and 2-2-305 do not apply to this project.

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<sup>2</sup> Per EPA amendments to the Tailoring Rule, biogenic GHG emissions have been deferred until July 1, 2014.

**Regulation 2, Rule 5: Health Risk Assessment Requirements:**

The District's regulation concerning toxic air contaminant emissions is codified in Regulation 2, Rule 5, New Source Review of Toxic Air Contaminants. All toxic air contaminants (TAC) emissions from new and modified sources are subject to risk assessment review, if emissions of any individual TAC from the project exceed the acute or chronic emission thresholds specified in Table 2-5-1 of Regulation 2, Rule 5.

Operation of the new prime diesel engine, S-58, will result in emissions of diesel particulate matter (PM), a toxic air contaminant. From Table 2-5-1, diesel PM does not have an acute trigger level, but it does have a chronic trigger level of 0.58 pounds/year. The worst-case annual diesel PM emissions will occur during prime operation of S-58. Based on the initially proposed maximum operating rate of 5824 hours/year, diesel PM emissions were determined to be 8.28 pounds/year. Therefore, this project requires a health risk screening analysis.

The HRSA was conducted using the District's Streamlined HRSA Spreadsheet for Diesel IC Engines (see attached). Based on this streamlined HRSA, the proposed engine will result in a maximum health impacts of: 7.4 in a million cancer risk and 0.003 chronic hazard index. Subsequent to this analysis, the District determined that S-58 should be limited to 4780 hours/year of operation (6.76 lbs/year of diesel PM), which will reduce the health impacts to 6.3 in a million cancer risk and 0.002 chronic hazard index. S-58 will be included in a detailed HRSA under Application # 25788.

Since the maximum cancer risk for S-58 will exceed 1 in a million cancer risk, Regulation 2-5-301 requires that S-58 be equipped with TBACT. From the BACT/TBACT Workbook (Document # 96.1.4 for prime compression ignition engines, 4/13/09), TBACT is the same as BACT for PM10 emissions. TBACT is an engine certified to meet an emission rate of 0.01 g/bhp-hr of PM or lower. S-58 is certified to meet an emission rate of 0.0015 g/bhp-hr of PM. Therefore, S-58 satisfies this TBACT requirement. Since the project risk limit does not exceed 10 in a million cancer risk or 1.0 chronic hazard index, and the engine will comply with TBACT, this engine also complies with the Regulation 2-5-302 project risk limits.

**Major Facility Review, Regulation 2, Rule 6**

The requirements of federal operating permit program have been codified in District Regulation 2, Rule 6. This rule requires that major and designated facilities apply for and obtain a Title V federal operating permit. This facility was initially determined to be subject to Title V because it has the potential to emit more than 100 tons/year of carbon monoxide.

The District issued the initial Title V operating permit for this facility on July 1, 1997. The permit was renewed on July 26, 1995 and again on December 19, 2012. The December 19, 2012 Title V permit is the current Title V operating permit for this site and includes all District revisions approved to date.

The permitting of a stationary diesel engine requires a minor revision of the Title V permit. This engine will be added to the Title V permit in a separate permitting action. The District has



requested that EBMUD submit the Title V application forms necessary to initiate the Title V minor revision. EBMUD will be submitting these forms shortly. Once these forms are received, the District will assign an application number and charge the necessary fees.

### **Regulation 3, Fees**

The facility has paid the District permit application fees and first year of permit to operate fees billed under Invoice 3GC29.

### **Regulation 6, Rule 1: Particulate Matter – General Requirements**

Like all combustion sources, this prime diesel engine is subject to Regulation 6, Rule 1. Since the engine displacement is less than 1500 cubic inches, Section 6-1-303 applies instead of 6-1-301. Section 6-1-303 limits visible emissions to not exceed Ringelmann 2.0 for periods aggregating more than 3 minutes in any hour or equivalent opacity. Section 6-1-305 prohibits public nuisance caused by fallout of visible particulate emissions. This prime diesel engine will be equipped with a diesel particulate filter, so if properly operated, the abated engine is not expected to produce visible emissions or fallout in violation of these sections.

Section 6-1-310 limits particulate emissions to 0.15 grains/dscf of exhaust gas volume. The certified particulate emission rate from this engine after abatement by the particulate filter is 0.0015 grams per bhp-hour, which result in an outlet grain loading of 0.0003 grains per dscf at 0% O<sub>2</sub>. This emission rate is several orders of magnitude less than the limit in Section 6-1-310, so compliance with this section is assured through use of the certified engine as equipped with a particulate filter.

### **Regulation 8, Rule 1: Organic Compounds – General Provisions**

All internal combustion engines are exempt from Regulation 8 per Section 8-1-110.2, therefore none of the rules in Regulation 8 apply to this engine.

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

This prime diesel engine is subject to Regulation 9, Rule 1. The engine burns diesel fuel and is subject to Section 9-1-304, which prohibits burning of fuel containing more than 0.5% sulfur by weight. The facility is expected to comply with this requirement since only CARB-certified diesel fuel is allowed for use in California with a maximum sulfur content of 0.0015% by weight.

### **Regulation 9, Rule 2: Inorganic Gaseous Pollutants – Hydrogen Sulfide**

The ground level concentration limit on hydrogen sulfide in Section 9-2-301 is 0.06 ppm averaged over 3 minutes or 0.03 ppm averaged over 60 minutes. This prime engine is not expected to be a significant source of hydrogen sulfide emissions, therefore compliance with this rule is expected.

### **Regulation 9, Rule 8: Inorganic Gaseous Pollutants – Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines**

Regulation 9, Rule 8 applies to stationary internal combustion engines with a rated output greater than 50 bhp. The new prime diesel engine, S-58, has a rated capacity of 430 bhp and is subject to this rule.

For compression ignition engines larger than 175 bhp, Section 9-8-304 limits emissions of NO<sub>x</sub> to 110 ppmvd, corrected to 15% O<sub>2</sub> and emissions of CO to 310 ppmvd, corrected to 15% O<sub>2</sub>. For this engine, the certified emission limits of 1.6 grams/kW-hour for NO<sub>x</sub> and 1.4 grams/kW-hour for CO are equivalent to outlet concentrations of 90 ppmv of NO<sub>x</sub> at 15% O<sub>2</sub> and 129 ppmv of CO at 15% O<sub>2</sub>. These certified emission rates are less than the Regulation 9-8-304 limits; therefore, S-58 is expected to meet these standards.

**Airborne Toxic Control Measure for Stationary Compression Ignition Engines, Section 93115, Title 17, CA Code of Regulations**

The prime diesel engine is subject to the California Air Resources Board Air Toxic Control Measure (ATCM) for stationary compression ignition engines since it is a compression ignition (diesel-fuelled) engine with a rating greater than 50 brake horsepower, and it does not meet any of the exemptions in Section 93115.3. It is considered a new stationary compression ignition engine, since it was installed after January 1, 2005 and is considered a prime engine because it does not currently meet the definition of emergency standby use. As discussed previously, EBMUD plans to covert S-58 to emergency use only at a later date. The following discussion pertains to use of S-58 as a prime engine.

Section 93115.5, Fuel Restrictions: This prime diesel engine is subject to the fuel use restriction in Section 93115.5(a). Compliance with this requirement is expected, as the owner/operator will be limited to use of CARB Diesel fuel by permit condition.

Section 93115.7, Emission Standards: The applicable emission standards for this stationary prime diesel engine are in Section 93115.7(a). Section 93115.7(a)(1) limits diesel PM emissions to the more stringent of 0.01 g/bhp-hr or the Off-Road CI Engine Certification Standard for an off-road engine of the same maximum rated power. The off-road standard, title 13 CCR, section 2423, limits off-road engines of the same maximum rated power to PM emissions of 0.020 g/kW-hr (0.015 g/bhp-hr). Therefore, this stationary prime diesel engine is limited to the more stringent level: 0.01 g/bhp-hr. The engine is certified to diesel PM emissions of 0.0015 g/bhp-hr and will comply with the CARB ATCM limit.

Section 93115.7(a)(2) of this rule requires NMHC, NO<sub>x</sub>, and CO emissions to meet the Off-Road CI engine Certification Standard for an off-road engine of the model year and maximum rated power. The model year 2013 engine family for this engine has been certified to meet the title 13 CCR, section 2423 emission standards under CARB Executive Order U-R-001-0454. Therefore, the engine complies with this section.

**Table 7**  
 Section 93115.7 Emission Standards (175-750 bhp, Model Year 2013)

	PM, g/kW-hr	NMHC, g/kW-hr	NO <sub>x</sub> , g/kW-hr	CO, g/kW-hr
<b>Emission Standard</b>	<b>0.02</b>	<b>0.19</b>	<b>2.0</b>	<b>3.5</b>
<b>S-58 Certified Emissions</b>	<b>0.002</b>	<b>0.05</b>	<b>1.6</b>	<b>1.4</b>

Section 93115.10, Recordkeeping, Reporting, and Monitoring Requirements: Section 93115.10(a) requires the owner/operator to provide information on any new stationary compression ignition engine greater with capacity greater than 50 hp to the District, prior to installation of the new engine. This application was submitted to provide the required data.

Section 93115.10(c) requires the owner/operator to provide emission data to the District to demonstrate compliance with the applicable emission limits under this rule. The Applicant has provided emission data demonstrating compliance with all applicable limits.

Section 93115.10(e) requires installation of a non-resettable hour meter with a minimum display capability of 9,999 hours upon engine installation. Installation and operation of this meter will be required by permit condition.

Section 93115.13, Compliance Demonstration: Section 93115.13(a)(1) states that off-road engine certification test data for the stationary diesel engine is acceptable for demonstrating compliance with this rule. S-58 has been shown to comply with all applicable limits through the engine certification. Therefore, no additional testing is necessary.

**40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS):  
 Subpart A, Standards of Performance for New Stationary Sources – General Provisions  
 Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal  
 Combustion Engines**

40 CFR Part 60, Subpart IIII applies to compression ignition engines. Per Section 60.4200(a)(2), a stationary compression ignition engine manufactured after April 1, 2006, other than fire pump engines, and for which construction commenced after July 11, 2005 is subject to this rule. S-58 meets these applicability criteria and is subject to this rule.

Emission Standards: Section 60.4204(b) specifies the emission standards for stationary non-emergency CI internal combustion engines of 2007 model year and later with less than 30 liters per cylinder. S-58 is a 2013 model year engine with 6 cylinders and a total displacement of 12.5 L, or 2.08 liters per cylinder. Model year 2007 and later engines with a displacement of less than 10 liters per cylinder and maximum power of 3000 hp or less are subject to the certification emission standards for new nonroad CI engines in 40 CFR Part 89.112-113 for 2013 and earlier model years or 40 CFR Part 1039.101-102, 1039.104-105, 1039.107, and 1039.115 for model year 2014 and later. 40 CFR Part 89.112(a) identifies the applicable limits for S-58, which are summarized in Table 8. This engine also meets the Blue Sky limits in 40 CFR Part 89.112(f)(1).

**Table 8**  
 40 CFR Part 60, Subpart IIII Emission Standards  
 (225-450 kW engines, Tier 3, Model Year 2006-2013)

	PM, g/kW-hr	HC+NO <sub>x</sub> , g/kW-hr	CO, g/kW-hr
<b>Emission Standard</b>	<b>0.20</b>	<b>4.0</b>	<b>3.5</b>
<b>Blue Sky Standard</b>	<b>0.12</b>	<b>4.0</b>	<b>NA</b>
<b>S-58 Certified Emissions</b>	<b>0.002</b>	<b>1.65</b>	<b>1.4</b>

Section 89.113 contains smoke emission standards. Section 89.113(a) limits exhaust opacity to no more than 20% during acceleration, 15% during lugging, and 50% during peaks in either mode. Section 89.113(b) requires opacity levels to be measured as specified in 40 CFR Part 86, Subpart I. Demonstration of compliance with these opacity standards was required for engine certification.

Section 60.4206 requires compliance with these emission standards over the entire life of the engine.

Operating Restrictions: Beginning October 1, 2007, Section 60.4207(a) limits fuel use to diesel fuel meeting the requirements of 40 CFR 80.510(a). Part 80.510(a) limits the sulfur content of diesel fuel to 500 ppmw and cetane index to 40 or maximum aromatic content to 35%, by volume. As of October 1, 2010, for an internal combustion engine with a displacement of less than 30 liters per cylinder, the maximum sulfur content of allowable fuel will be reduced to 15 ppmw (40 CFR 80.510(b) for nonroad diesel fuel). CA diesel fuel is limited to 15 ppmw sulfur and 10% by volume aromatic content. As CA diesel is mandated for use in California, compliance with these federal fuel restrictions is expected.

Monitoring, Recordkeeping, Reporting: Section 60.4209 requires installation of a non-resettable hour meter prior to startup of the engine, and a backpressure monitor for the diesel particulate filter. Permit conditions will require installation and operation of these monitors.

Compliance Requirements: Section 60.4211(a) requires operation of the engine according to the manufacturer's instructions and Parts 89, 94, and/or 1068 if applicable. Part 89 applies to non-road engines subject to Part 61, Subpart III, but contains only general provisions and does not specify additional engine operating restrictions. Part 94 applies to marine engines and Part 1068 applies to manufacturers of nonroad engines, therefore neither applies. Operation in compliance with the manufacturer's instructions will be included in the permit conditions for this source.

Section 60.4211(c) requires 2007 model year and later engines to be certified to comply with the emission standards in 60.4204(b) and installed and configured per the manufacturer's specifications. The CARB-certified emissions have been summarized in Table 8 above and comply with the emission standards of this rule.

Notification, Reports, and Records: Section 60.4214(c) requires the owner/operator of a stationary CI engine equipped with a diesel particulate filter to keep records of any corrective action taken after notification of the backpressure monitor that the high backpressure limit of the engine is approached. This requirement will be included in the permit conditions for this source.

Table 8 in this rule lists the applicable general provisions from Subpart A that apply to units regulated by this subpart. All sections from Subpart A apply, except for Sections 60.11 and 60.18.

**40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants for Source Categories/Maximum Achievable Control Technology (MACT) Standards:**

**Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants – for Stationary Reciprocating Internal Combustion Engines**

40 CFR Part 63, Subpart ZZZZ applies to stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. This facility is not a major source of HAP emissions, and is therefore an area source of HAP emissions. As S-58 has a capacity less than 500 bhp and will be installed after June 12, 2006, the source is considered a new source under this subpart. Section 63.6590(c) specifies that an affected source that is a new or reconstructed, compression ignition, stationary RICE located at an area source must meet the requirements of this subpart by meeting the requirements of 40 CFR Part 60, Subpart IIII. No other requirements apply under this subpart. Therefore, S-58 complies with this Subpart ZZZZ by complying with Subpart IIII, which was addressed above.

**Permit Condition # 25725**

For: S-58 Prime Diesel-Fired Engine and Generator

1. The owner/operator shall use only CARB approved diesel fuel at S-58. (Basis: Cumulative Increase and CCR Title 17 Section 93115.5)
2. The owner/operator shall properly install, operate, and maintain a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) at S-58 that measures the hours of operation for the engine. (Basis: Cumulative Increase, CCR Title 17 Section 93115.10(e), and 40 CFR Part 60.4209)
3. The owner/operator shall ensure that S-58 operates for no more than 4,780 hours during any consecutive 12-month period. (Basis: Cumulative Increase, Offsets, and BACT Cost-Effectiveness)
4. The owner/operator shall maintain a copy of the manufacturer's written operating and maintenance instructions for S-58 and the integral particulate filter, oxidation catalyst, and any associated monitoring devices for the life of the engine. The owner/operator shall ensure that the engine, abatement systems, and monitoring systems are properly maintained and operated in accordance with the manufacturer's instructions at all times. (Basis: BACT, TBACT, CCR Title 17 Section 93115.7(a), 40 CFR Part 60.4211(a))
5. The owner/operator shall monitor the backpressure at the diesel particulate filter and shall follow the manufacturer's recommended procedures to clean or regenerate the filter if backpressure exceeds the set point. (Basis: CCR Title 17 Section 93115.7(a), and 40 CFR Part 60.4209)
6. To demonstrate on-going compliance with the applicable NO<sub>x</sub> and CO emission limits specified in Regulation 9-8-304.2, the owner/operator shall conduct the monitoring required by Regulation 9-8-503 during any quarter in which a source test is not performed. (Basis: Regulation 9-8-503)
7. To demonstrate compliance with these conditions and applicable regulations, owner/operator shall maintain the following records in a District-approved log for at least 60 months from the date of entry. Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request:

- a. Records of start-up and shut-down times for S-58.
- b. Monthly records of the operating time for S-58 and a summary of the total operating time for each consecutive rolling 12-month period.
- c. Fuel purchase records, showing the fuel specifications for each delivery, and monthly records of fuel usage at S-58.
- d. Records of all maintenance conducted on S-58, the integral diesel particulate filter, oxidation catalyst (including records of any catalyst changes), and monitoring devices.
- e. Description of corrective action taken after notification that the high backpressure limit of the engine has been approached;
- f. Records of the dates and results of all monitoring conducted pursuant to Part 6.  
(Basis: District Regulations 2-1-403 and 9-8-501, CCR Title 17 Section 93115, 40 CFR Part 60.4211(c))

### Recommendation

I recommend issuance of an Authority to Construct for the following equipment subject to the above permit conditions:

**S-58 Prime Diesel-Fired Engine and Generator for Food Waste Pilot Project;** equipped with integral oxidation catalyst and diesel particulate filter; Caterpillar, C13, Model Year 2013, 430 bhp, 320 kW, 23.1 gals/hr diesel oil

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Carol S Allen  
Supervising Air Quality Engineer

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Date

### **Addendum to Engineering Evaluation Report**

Date: October 19, 2015

To: Application File #25905, Plant 591  
East Bay Municipal Utility District (EBMUD)

From: Simrun Dhoot

Subject: Change S-58 to an Emergency Standby Generator and Re-issue Authority to Construct

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S-58 was evaluated as both a prime and emergency diesel generator under A/N 25905. The facility initially intended to use the engine as a prime engine for their food waste pilot project. Therefore, an Authority to Construct was issued for S-58 as a prime engine. The facility decided not to proceed with the pilot project and has requested to have the Authority to Construct for S-58 reissued as an emergency engine. The original issue date of February 6, 2014 will still apply.

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#### **Emissions**

As calculated in the original engineering evaluation for A/N 25905, prepared by Carol Allen, the maximum daily and yearly emissions for S-58 as an emergency engine are outlined in the table below:

Table 1. Emissions from S-58, Emergency Engine

<b>Pollutant</b>	<b>Maximum Emissions, lb/day</b>	<b>Maximum Emissions, lb/yr</b>	<b>Maximum Emissions, tpy</b>
POC	0.848	1.8	0.001
NOx	27.146	56.6	0.028
CO	23.752	49.5	0.025
PM10	0.034	0.1	0.000
SO2	0.118	0.2	0.000

#### **Best Available Control Technology (BACT)**

The emissions from S-58 could exceed 10 pounds/day of NOx or CO. Therefore, BACT is required for NOx and CO emissions. A BACT analysis was conducted for S-58 as an emergency engine in the original engineering evaluation. It was determined that S-58 complies with BACT2 for NOx and CO. For emergency standby operations, no BACT1 standards or typical technology have been specified for NOx and CO.

#### **Cumulative Increase**

The cumulative emissions increases for the facility were recorded based on the operation of S-58 as a prime engine. The increase in emissions will be revised to the tons per year values listed in Table 1 above.

### **Offsets**

The facility provided offsets for NO<sub>x</sub> and POC for the operation of S-58 as a prime engine. EBMUD used POC credits from Banking Certificates #969, #1391, and #1400 to offset both the POC and NO<sub>x</sub> increases for the project. The total provided was 3.205 tons/year of POC ERCs.

As an emergency engine, the facility must provide 0.032 tons/year of NO<sub>x</sub> ERCs ( $0.028 \times 1.15 = 0.032$ ) and 0.001 tons/year of POC ERCs ( $0.001 \times 1.15 = 0.001$ ). Therefore, the Air District will return 3.172 tons/year of POC ERCs.

### **Health Risk Assessment Requirements**

The chronic trigger limit for diesel exhaust particulate matter is 0.34 lb/year, as specified in Table 2-5-1 of Regulation 2, Rule 5. The yearly PM<sub>10</sub> emissions from the operation of S-58 as an emergency engine is 0.1 lb/year (see Table 1). Therefore, a health risk screening analysis is not triggered for S-58 as an emergency engine.

### **Airborne Toxic Control Measure for Stationary Compression Ignition Engines, Section 93115, Title 17, CA Code of Regulations**

**Section 93115.5, Fuel Restrictions:** The emergency diesel engine is subject to the fuel use restrictions in Section 93115.5(b). Compliance with this requirement is expected, as the owner/operator will be limited to the use of CARB Diesel fuel in the permit conditions.

**Section 93115.6, Operating Requirements and Emission Standards:** The applicable operating requirements and emission standards for this stationary emergency engine are in Section 93115.6(a). Compliance with the operating requirements is expected, as they will be enforced by the permit conditions. The emission standards for new stationary emergency standby diesel-fueled CI engines are listed in Table 1 of Section 93115.6(a)(3). The emissions standards for a 320 kW engine are 0.20 g/kW-hr for PM, 4.0 g/kW-hr for NMHC+NO<sub>x</sub>, and 3.5 g/kW-hr for CO. According to the EPA certified manufacturer specifications, the engine will comply with the standards of Section 93115.6.

Sections 93115.10 and 93115.13 apply to both emergency and prime engines and are discussed in detail in the original engineering evaluation. While operating as an emergency engine, S-58 will continue to comply with the requirements of these Sections.

### **NEW SOURCE PERFORMANCE STANDARDS (NSPS)**

S-58 is subject to all of the 40 CFR 60, Subpart IIII, standards mentioned in the original evaluation. It is also subject to and expected to comply with Section 60.4211(f) which requires that the engine runs for less than 100 hours per year for maintenance checks and readiness testing, and the prohibition of running for any reason other than emergency operation, maintenance, and testing. S-58 is limited by the permit condition to 50 hours per year for reliability testing and otherwise may only operate for emergencies.



The owner/operator is not required to perform tests in accordance with Section 60.4212 or 60.4213. Section 60.4214 states that owner/operators do not have to submit an initial notification to EPA for emergency engines.

**Statement of Compliance**

The Air District Regulations discussed in the original engineering evaluation continue to apply to S-58 as an emergency engine. However, S-58 is subject to different requirements in Regulation 9, Rule 8.

Regulation 9, Rule 8: S-58 will be operated as an emergency standby engine and therefore is not subject to the emission rate limits in Regulation 9, Rule 8. S-58 is exempt from the requirements of Sections 9-8-301 through 305, 501 and 503 per Reg. 9-8-110.5 -- Exemptions.

S-58 is subject to and expected to comply with 9-8-330 -- Emergency Standby Engines, Hours of Operation, since nonemergency hours of operation will be limited in the permit conditions to 50 hours per year.

S-58 is also subject to and expected to comply with monitoring and record keeping requirements of Regulation 9-8-530 -- Emergency Standby and Low Usage Engines, Monitoring and Recordkeeping. These requirements will be incorporated into the proposed permit conditions

**Permit Conditions**

Permit Condition No. 25725 will be removed and replaced with Permit Condition No. 22850 for stationary emergency diesel engines.

COND# 22850 -----

1. The owner/operator shall not exceed 50 hours per year per engine for reliability-related testing. [Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]
2. The owner/operator shall operate each emergency standby engine only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, State or Federal emission limit, or for reliability-related activities (maintenance and other testing, but excluding emission testing). Operating while mitigating emergency conditions or while emission testing to show compliance with District, State or Federal emission limits is not limited. [Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]
3. The owner/operator shall operate each emergency standby engine only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours)

that measures the hours of operation for the engine is installed, operated and properly maintained. [Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

4. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 36 months from the date of entry (60 months if the facility has been issued a Title V Major Facility Review Permit or a Synthetic Minor Operating Permit). Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.
- a. Hours of operation for reliability-related activities (maintenance and testing).
  - b. Hours of operation for emission testing to show compliance with emission limits.
  - c. Hours of operation (emergency).
  - d. For each emergency, the nature of the emergency condition.
  - e. Fuel usage for each engine(s).
- [Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

5. At School and Near-School Operation:

If the emergency standby engine is located on school grounds or within 500 feet of any school grounds, the following requirements shall apply:  
The owner/operator shall not operate each stationary emergency standby diesel-fueled engine for non-emergency use, including maintenance and testing, during the following periods:

- a. Whenever there is a school sponsored activity (if the engine is located on school grounds)
  - b. Between 7:30 a.m. and 3:30 p.m. on days when school is in session.
- "School" or "School Grounds" means any public or private school used for the purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in a private home(s). "School" or "School Grounds" includes any building or structure, athletic field, or other areas of school property but does not include unimproved school property. [Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

***End of Conditions***

**Recommendation**

Re-issue an Authority to Construct with the original issue date of February 6, 2014 to EBMUD for the following equipment subject to the above permit conditions:

**S-58 Emergency Diesel-Fired Engine**

Caterpillar, C13, Model Year 2013, 430 bhp, 320 kW, 23.1 gals/hr diesel oil

By: \_\_\_\_\_  
Simrun Dhoot

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

Permit Evaluation and Statement of Basis:  
Site No: A0591

East Bay Municipal Utility District  
2020 Wake Avenue, Oakland, CA 94607

Air Quality Engineer

**Evaluation Report  
A/N 26237  
G# 900 (Plant 591, Source 48)  
EBMUD, 2020 Wake Ave., Oakland**

**Background**

Rummex Construction, on behalf of EBMUD, has applied for an A/C to replace the Phase I vapor recovery on EBMUD's existing aboveground gasoline tank with EVR certified Phase I equipment. No other work is proposed under this application.

EBMUD currently operates a 3,000 gallon aboveground Containment Solutions Protected aboveground gasoline tank with one gasoline nozzle equipped with two-point Phase I and balance Phase II vapor recovery equipment. This equipment is permitted as Source 48 at Plant 591 and is subject to condition #21663, which limits annual gasoline throughput to 334,000 gal/yr and #25107, which requires annual pressure decay (ST-38) testing.

Proposed Phase I equipment consists of Morrison Brothers EVR Phase I per CARB Executive Order VR-402. Materials have also been submitted verifying that this tank has been painted and a Husky 5885 PV valve installed per the SLC requirements of VR-301.

**Emissions**

No change in permitted throughput has been requested.

As the EVR Phase I equipment is certified at 98% efficiency (vs. 95% for conventional Phase I) there should be no increase in emissions per unit throughput.

The net emission increase under this A/N will be zero.

**Statement of Compliance**

As there will be no net emissions increase from this project, this application is exempt from the BACT and offset requirements of Regulation 2, Rule 2.

The proposed Morrison Brothers EVR Phase I equipment is certified under VR-402, while the existing Phase II equipment is certified under G-70-52AM and G-70-194. Use of CARB certified equipment satisfies all requirements of District Regulation 8, Rule 7.

**Permit Conditions**

*Authority to Construct Conditions:*

**Condition # 25854 (to be removed after S/U)**

1. The Phase I equipment shall be installed in accordance with California Air Resources Board (CARB) Executive Order VR-402 (Morrison Brothers EVR Phase I systems).

2. Only the replacement of the existing Phase I system with EVR-certified equipment is authorized under this Authority to Construct. No other work, including modifications to dispensers or vapor recovery piping, is allowed.
3. The Aboveground Storage Tank (AST) and the PV (vent) valve(s) shall meet the requirements for Standing Loss Control under California Air Resources Board (CARB) EO VR-301.
4. Within ten (10) days, but no later than thirty (30) days of start-up, the applicant must perform and pass a Static Pressure Performance Test on all gasoline compartments pursuant to EO VR-401.
5. The applicant shall notify Source Test by email at [gdfnotice@baaqmd.gov](mailto:gdfnotice@baaqmd.gov) or by FAX at (510) 758-3087, at least 48 hours prior to any testing required for permitting. Test results for all performance tests shall be submitted within fifteen (15) days of testing. Start-up tests results submitted to the District must include the application number and the GDF number (For annual test results submitted to the District, enter "Annual" in lieu of the application number). Test results may be submitted by email ([gdfresults@baaqmd.gov](mailto:gdfresults@baaqmd.gov)), FAX (510) 758-3087) or mail (BAAQMD Source Test Section, Attention Hiroshi Doi, 939 Ellis Street, San Francisco CA 94109).
6. The current gasoline throughput at this facility shall not exceed 334,000 gallons of fuel per year.

*Permit to Operate Conditions*

COND# 21663 -----

S-48 GDF G-9008

Pursuant to BAAQMD Toxic Section Policy, this facility's annual gasoline throughput shall not exceed 334,000 gallons in any consecutive 12 month period.  
(Basis: Regulation 2-5-302)

COND# 25723-----

1. The Morrison Brothers EVR Phase I Vapor Recovery System,  
including all associated plumbing and components, shall be operated and maintained in accordance with the most recent version of California Air Resources Board (CARB) Executive Order VR-402. Section 41954(f) of the California Health and Safety Code prohibits the sale, offering for sale, or installation of any vapor control system unless the system has been certified by the state board.

2. The Morrison Brothers EVR Phase I Vapor Recovery System

301

shall only be installed on tanks meeting the Standing Loss Control requirements of CARB Executive Orders VR-301 or VR-302

3. The owner or operator shall conduct and pass a Static Pressure Performance Test (CARB Test Procedure TP 201.1B) at least once in each 12-month period. Measured leak rates of each component shall not exceed the levels specified in VR-402.

The applicant shall notify Source Test by email at gdfnotice@baaqmd.gov or by FAX at (510) 758-3087, at least 48 hours prior to any testing required for permitting. Test results for all performance tests shall be submitted within fifteen (15) days of testing. Start-up tests results submitted to the District must include the application number and the GDF number. (For annual test results submitted to the District, enter "Annual" in lieu of the application number.) Test results may be submitted by email (gdfresults@baaqmd.gov), FAX (510) 758-3087) or mail (BAAQMD Source Test Section, Attention Hiroshi Doi, 939 Ellis Street, San Francisco CA 94109).

**Title V Permit Revisions**

This plant has a Title V permit. This project will require a minor revision of the Title V permit.

Proposed revisions to the Title V permit are attached.

**Recommendation**

All fees have been paid. Recommend that an A/C be issued for the above project.

By \_\_\_\_\_ date \_\_\_\_\_

Scott Owen  
Supervising AQ Engineer

Permit Evaluation and Statement of Basis:  
Site No: A0591

East Bay Municipal Utility District  
2020 Wake Avenue, Oakland, CA 94607

**Table IV-D  
 Source Specific Applicable Requirements  
 S-48, Non Retail Gasoline Dispensing Facility #9008**

Applicable Requirement	Regulation Title or Description of Requirement	Federally Enforceable (Y/N)	Future Effective Date
<del>BAAQMD Regulation 8, Rule 5</del>	<del>Organic Compounds—Storage of Organic Liquids (10/18/06)</del>		
8-5-116	Exemption, Gasoline Storage Tanks at Gasoline Dispensing Facilities	N	
<del>SIP Regulation 8, Rule 5</del>	<del>Organic Compounds—Storage of Organic Liquids (6/5/03)</del>		
8-5-116	Exemption, Gasoline Storage Tanks at Gasoline Dispensing Facilities	Y	
8-5-206	Gas tight	Y	
8-5-302	Requirements for Submerged Fill Pipes	Y	
8-5-301	Storage Tank Control Requirements	Y	
8-5-303	Requirements for Pressure Vacuum Valves	Y	
8-5-303.1	Pressure Setting	Y	
8-5-303.2	Gas Tight	Y	
8-5-403	Inspection Requirements for Pressure Vacuum Valves	Y	
8-5-501	Records	Y	
8-5-501.1	Types and amounts of materials stored	Y	
8-5-502	Tank Degassing Annual Source Test Requirement	Y	
8-5-503	Portable Hydrocarbon Detector	Y	
<b>BAAQMD Regulation 8, Rule 7</b>	<b>Organic Compounds – Gasoline Dispensing Facilities ( 11/6/02)</b>		
8-7-113	Tank Gauging and Inspection Exemption	Y	
8-7-114	Stationary Tank Testing Exemption	Y	
8-7-116	Periodic Testing Requirements Exemption	Y	
8-7-301	Phase I Requirements	Y	
8-7-301.1	Requirement for Transfer into Stationary Tanks, Cargo Tanks, and Mobile Refuelers -CARB Phase I System	Y	
8-7-301.2	Installation of Phase I Equipment per CARB Certification Requirements	Y	
8-7-301.3	Submerged Fill Pipe Requirements	Y	
8-7-301.5	Maintenance and Operation of Phase I Equipment per Manufacturers and/or the applicable CARB Executive Order	Y	



**Table IV-D  
 Source Specific Applicable Requirements  
 S-48, Non Retail Gasoline Dispensing Facility #9008**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
8-7-301.6	Leak-Free, Vapor-Tight Requirements for Components	Y	
8-7-301.7	Fitting Requirements for Vapor Return Line Poppeted Drybreaks	Y	
8-7-301.8	Coaxial Phase I Prohibition	Y	
8-7-301.9	Swivel Adaptors	Y	
8-7-301.10	98% Phase I Vapor Recovery Efficiency	Y	
8-7-301.12	Vapor Spill Box Drain Valve Prohibition	Y	
8-7-301.13	Annual Vapor Tightness Testing	Y	
8-7-302	Phase II Requirements	Y	
8-7-302.1	Requirement for CARB Certified Phase II System	Y	
8-7-302.2	Maintenance of Phase II System per CARB Requirements	Y	
8-7-302.3	Maintenance of All Equipment as Specified by Manufacturer	Y	
8-7-302.4	Repair of Defective Parts Within 7 Days	Y	
8-7-302.5	Leak-Free, Vapor-Tight	Y	
8-7-302.6	Nozzle Insertion Interlocks	Y	
8-7-302.7	Nozzle Vapor Check Valves	Y	
8-7-302.8	Liquid Removal Devices	Y	
8-7-302.9	Coaxial Hoses	Y	
8-7-302.10	Construction Materials Specifications	Y	
8-7-302.12	Liquid Retain Limitation	Y	
8-7-302.13	Nozzle Spitting Limitation	Y	
8-7-302.14	Annual Back Pressure Test Requirements for Balance Systems	Y	
8-7-303	Topping Off	Y	
8-7-304	Certification Requirements	Y	
8-7-306	Prohibition of Use	Y	
8-7-307	Posting of Operating Instructions	Y	
8-7-308	Operating Practices	Y	
8-7-309	Contingent Vapor Recovery Requirements	Y	
8-7-311	Exempt Tank Requirements	Y	
8-7-313	Requirements for New and Modified Phase II Installations	Y	
8-7-316	Pressure Vacuum Valves, Aboveground Storage Tanks and Vaulted Below Grade Storage Tanks	Y	
8-7-401	Equipment Installation and Modification	Y	
8-7-406	Testing Requirements, New and Modified Installations	Y	
8-7-407	Periodic Testing Requirements	Y	
8-7-408	Periodic Testing Notification and Submission Requirements	Y	
8-7-501	Burden of Proof	Y	

**Table IV-D  
 Source Specific Applicable Requirements  
 S-48, Non Retail Gasoline Dispensing Facility #9008**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
8-7-502	Right of Access	Y	
8-7-503	Record Keeping Requirements	Y	
8-7-503.1	Gasoline Throughput Records	Y	
8-7-503.2	Maintenance Records	Y	
8-7-503.3	Records Retention Time	Y	
<b>40 CFR Part 63, Subpart A</b>	<b>National Emission Standards for Hazardous Air Pollutants – General Provisions (9/13/10)</b>		
63.4	Prohibited activities and circumvention	Y	
63.5	Preconstruction review and notification requirements	Y	
63.5(b)	Requirements for existing, newly constructed, and reconstructed sources	Y	
63.6	Compliance with standards and maintenance requirements	Y	
63.8	Monitoring requirements	Y	
63.10	Record keeping and reporting requirements	Y	
63.10(b)	General record keeping requirements	Y	
63.10(c)	Additional record keeping requirements for sources with continuous monitoring systems	Y	
63.10(d)	General reporting requirements	Y	
63.10(e)	Additional reporting requirements for sources with continuous monitoring systems	Y	
<b>40 CFR Part 63 Subpart CCCCCC</b>	<b>National Emission Standards for Hazardous Air Pollutants for Gasoline Dispensing Facilities (1/24/2011)</b>		
63.11110	What is the purpose of this subpart?	Y	
63.11111	Am I Subject to the requirements in this subpart	Y	
63.11111(a)	Each GDF that is located at an area source	Y	
63.11111(c)	Monthly throughput of 10,000 gallons of gasoline or more-subject to 63.11117	Y	
63.11111(e)	Demonstrate their monthly throughput level as specified in 63.11112(d)	Y	
63.11111(i)	If throughput ever exceeds an applicable throughput threshold, the affected source will remain subject to the requirements for sources above the threshold	Y	
63.11112	What parts of my affected source does this subpart cover?	Y	

**Table IV-D**  
**Source Specific Applicable Requirements**  
**S-48, Non Retail Gasoline Dispensing Facility #9008**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
63.11112(a)	Gasoline storage tanks and associated equipment components in vapor or liquid gasoline service	Y	
63.11112(d)	An affected source is an existing affected source if it is not new or reconstructed	Y	
63.11113	When do I have to comply with this subpart?	Y	
63.11113(c)	If affected source becomes subject to control requirements in this subpart because of monthly throughput increases per 63.11111(c) , you must comply with standard no later than 3 years after the affected source is subject to control requirements	Y	
63.11113(3)	The initial compliance demonstration test required per 63.11120(a)(1 and 2) must be conducted as specified below in (e)(1 and 2)	Y	
63.11113(e)(2)	For existing affected source, you must conduct the initial compliance test as specified in paragraphs (e)(2)(i)	Y	
63.11113(e)(2)(i)	For vapor balance systems installed on or before December 15, 2009, you must test no later than 180 days after the applicable compliance date specified in paragraph c of this section.	Y	
63.11115	What are my general duties to minimize emissions?	Y	
63.11115(b)	Keep applicable records and submit reports as specified in 63.11125(d) and 63.11126(b)	Y	
63.11116	Requirements for facilities with monthly throughput of less than 10,000 gallons of gasoline	Y	
63.11116(a)	Handling requirements to prevent vapor releases to atmosphere	Y	
63.11116(a)(1)	Minimize gasoline spills	Y	
63.11116(a)(2)	Clean up spills as expeditiously as practicable	Y	
63.11116(a)(3)	Cover all open gasoline containers and all gasoline storage tank fill-pipes with a gasketed seal when not in use.	Y	
63.11116(a)(4)	Minimize gasoline sent to open waste collection systems that collect and transport gasoline to reclamation and recycling devices- such as oil/water separators	Y	
63.11117	Requirements for facilities with monthly throughput of 10,000 gallons of gasoline or more	Y	
63.11117(a)	Comply with the requirements in section 63.11116(a)	Y	
63.11117(b)	Only load gasoline into storage tanks utilizing submerged filling as defined in 63.11132 and as specified below	Y	
63.11117(b)(1)	Submerged fill pipes installed on or before November 9, 2006 must be no more than 12 inches from the bottom of the tank.	Y	

**Table IV-D**  
**Source Specific Applicable Requirements**  
**S-48, Non Retail Gasoline Dispensing Facility #9008**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
63.11117(b)(3)	Submerged fill pipes not meeting the specifications of paragraph (b)(1) are allowed if the owner or operator can demonstrate that the liquid level in the tank is always above the entire opening of the fill pipe.	Y	
63.11117(e)	You must submit the applicable notification as specified in 63.11124 (a)	Y	
63.11117(f)	You must comply with the requirements of this subpart by the applicable dates contained in 63.11113	Y	
63.111120	What testing and monitoring requirements must I meet?	Y	
63.111120(b)	Under the provision 63.6(g) – you must demonstrate to the Administrator or delegated authority under paragraph 63.11131(a) of this subpart, the equivalency of their vapor balance system to that described in Table 1	Y	
63.111120(c)	Conduct of performance tests	Y	
63.111120(c)(1)	Demonstrate compliance with the leak rate and cracking pressure requirements specified	Y	
63.111124	What notifications must I submit and when?	Y	
63.111124(a)	Each owner/operator subject to control per 63.11117 must comply with (a)(1-3)	Y	
63.111124(a)(1)	Subject to initial notification requirements		
63.111124(a)(1)(i)	The name and address of the owner and operator	Y	
63.111124(a)(1)(ii)	The address (... physical location) of the GDF	Y	
63.111124(a)(1)(iii)	A statement that the notification is being submitted in response to this subpart and identifying the requirements in paragraphs (a) through (c) of 63.11117 that apply to you	Y	
63.111124(a)(2)	Submit Notification of Compliance Status to EPA within 60 days of compliance date unless you meet (a)(3) below	Y	
63.111124(a)(3)	If prior to January 10, 2008, you are operating in compliance with an enforceable State, local or tribal rule or permit that requires submerged fill as specified in 63.11117(b), you are not required to submit an initial Notification or a Notification of Compliance Status under paragraph (a)(1) or paragraph (a)(2) of this section.	Y	
63.111125	What are my recordkeeping requirements?	Y	

**Table IV-D  
Source Specific Applicable Requirements  
S-48, Non Retail Gasoline Dispensing Facility #9008**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
63.111125(d)	Keep records as specified in paragraphs (d)(1) and (2) of this section	Y	
63.111125(d)(1)	Records of the occurrence and duration of each malfunction of operation or of air pollution control and monitoring equipment	Y	
63.111125(d)(2)	Records of actions taken during periods of malfunction to minimize emissions in accordance with 63.1115(a)	Y	
63.111126	What are my reporting requirements?	Y	
63.111126(b)	Each owner or operator of an affected source under this subpart shall report by March 15 of each year, the number, duration and a brief description of each type of malfunction which occurred during the previous calendar year and which caused any applicable emission limitation to be exceeded.	Y	
Table 3 to Subpart CCCCCC of Part 63	Applicability of General Provisions	Y	
63.7(e)(1)	Conditions for conducting Performance Tests- 63.11120(c)	Y	
<b>BAAQMD Condition # 21663</b>	<b>Gasoline Throughput Limit (Regulation 2-5-302)</b>	N	
<del>BAAQMD Condition # 25107</del>	<del>Annual Leak Test (Regulation 8-7-407)</del>	<del>Y</del>	
<del>BAAQMD Cond # 25723</del>	<del>Morrison Bros. Phase I EVR Installation/Operating Requirements per CARB VR-402</del>	<del>Y</del>	
<del>BAAQMD Cond # 25854</del>	<del>AC + Construction + SU Testing condition</del>	<del>Y</del>	
<del>CARB Executive Order G-70-17-AD</del>	<del>Modification of Certification of the Emco-Wheaton Balance Phase II Vapor Recovery System (5/6/93)</del>		
<del>Paragraph 9</del>	<del>Piping and Component Configurations</del>	<del>N</del>	
<del>Paragraph 10</del>	<del>Nozzle Type Requirements for New Installations</del>	<del>N</del>	
<del>Paragraph 11</del>	<del>Dispensing Rate Limit</del>	<del>N</del>	
<del>Paragraph 12</del>	<del>Restrictions on Use of Nozzle Extenders</del>	<del>N</del>	
<del>Paragraph 13</del>	<del>Requirement to Comply with Other Agencies' Rules and Regulations</del>	<del>N</del>	
<del>Paragraph 14</del>	<del>Nozzle Performance Shall Conform to Certification</del>	<del>N</del>	

**Table IV-D  
Source Specific Applicable Requirements  
S-48, Non Retail Gasoline Dispensing Facility #9008**

<b>Applicable Requirement</b>	<b>Regulation Title or Description of Requirement</b>	<b>Federally Enforceable (Y/N)</b>	<b>Future Effective Date</b>
Paragraph 15	Prohibition on Alteration of Equipment, Parts, Design, or Operation	N	
Paragraph 16	Operating and Maintenance Requirements	N	
<b>CARB Executive Order G-70-161</b>	<b>Certification of Hoover Containment Systems, Incorporated Fuelmaster Aboveground Tank Vapor Recovery System (11/30/94)</b>		
Paragraph 9	Tank Design Configuration Limitations	N	
Paragraph 10	Emergency Vent Leak Limit	N	
Paragraph 11	Requirement to Use ARB Certified Phase I and Phase II Systems	N	
Paragraph 12	Phase I Piping Configuration Requirements and Disconnection Leak Limit	N	
Paragraph 13	Coaxial Hose Routing Requirements for Liquid Trap Limitations	N	
Paragraph 14	P/V Valve Requirements	N	
Paragraph 15	Tank Insulation Requirements	N	
Paragraph 16	Tank Exterior Surface Requirements	N	
Paragraph 17	Requirement to Comply with Local Air District Rules	N	
Paragraph 18	Requirements for Deliveries from a Cargo Truck	N	
Paragraph 19	Leak Checking Requirements	N	
Paragraph 20	Requirement to Comply with Local Fire Official's Requirements	N	
Paragraph 21	Requirement to Comply with Other Agencies' Rules and Regulations	N	
Paragraph 22	Prohibition on Alteration of Equipment, Parts, Design, or Operation	N	
<b>CARB Executive Order G-70-52-AM</b>	<b>Certification of Components for Red Jacket, Hirt, and Balance Phase II Vapor Recovery Systems (10/4/91)</b>		
Paragraph 2	Test procedures for determining compliance of Phase II vapor recovery system (VRS)	N	
Paragraph 10	Compliance with the applicable certification requirements and rules and regulations	N	
Paragraph 11	Components and alternative hose configurations certified hereby shall perform in actual use with the same effectiveness as the certification test system	N	
Paragraph 12	Any alternation of the equipment, parts, design, or operation of the configurations certified hereby is prohibited	N	

**Table IV-D  
Source Specific Applicable Requirements  
S-48, Non Retail Gasoline Dispensing Facility #9008**

Applicable Requirement	Regulation Title or Description of Requirement	Federally Enforceable (Y/N)	Future Effective Date
<del>Paragraph 13</del>	<del>All nozzles approved with the Phase II VRS specified in this Executive Order shall be 100% performance checked at the factory including checks of proper functioning of all automatic shutoff mechanisms.</del>	<del>N</del>	
<b>CARB Executive Order VR-301-D</b>	<b>Standing Loss Control Vapor Recovery System for Existing Installations of Aboveground Storage Tanks</b>		
<del>Paragraph 6</del>	<del>Standing loss Vapor Recovery System is not to exceed 2.26 pounds of hydrocarbon per 1000 gallons of ullage per day when installed, operated and maintained as specified</del>	<del>N</del>	
<del>Paragraph 14</del>	<del>Standing Loss Requirements valid through May 1, 2013</del>	<del>N</del>	

**Table VII-D  
Applicable Limits and Compliance Monitoring Requirements  
S-48, GDF #9008**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
Organic Compounds	BAAQMD 8-7-301.10	Y		Equipment certified to recover 98% of gasoline vapors during tank filling	None	N	
Organic Compounds	BAAQMD 8-7-301.2	Y		All Phase I Systems Shall Meet the Emission Limitations of the Applicable CARB Certification	CARB EO G-70-161, CARB EO VR-301-D	P/E	CARB Certification Procedures
Organic Compounds	BAAQMD 8-7-301.5	Y		Maintain Phase I Equipment in compliance with CARB Executive Order	CARB EO G-70-161, <del>CARB EO VR-301-D</del>	P/E	CARB Certification Procedures

**Table VII-D  
Applicable Limits and Compliance Monitoring Requirements  
S-48, GDF #9008**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
Organic Compounds	BAAQMD 8-7-301.6	Y		All Phase I Equipment (except components with allowable leak rates) shall be leak free ( $\leq 3$ drops/minute) and vapor tight	CARB EO G-70-161, paragraph 19 and BAAQMD 8-7-301.13 and 8-7-407 and BAAQMD Condition # 25107, and 40 CFR 63.11120	P/A	Annual Check for Vapor Tightness and Proper Operation of Vapor Recovery System
Organic Compounds	BAAQMD 8-7-302.2	Y		All Phase II equipment shall be maintained per CARB certifications and manufacturer's specifications	CARB EO <del>G-70-17AD</del> <a href="#">G-70-102 &amp; -161</a> paragraph 4	P/A	
Organic Compounds	BAAQMD 8-7-302.5	Y		All Phase II Equipment (except components with allowable leak rates or at the nozzle/fill-pipe interface) Shall Be: leak free ( $\leq 3$ drops/minute) and vapor tight	CARB EO G-70-52AM and G-70-17 AD, paragraph 4 and BAAQMD 8-7-301.13 and 8-7-407 and BAAQMD Condition # 25107	P/A	Annual Check for Vapor Tightness and Proper Operation of Vapor Recovery System
<del>Organic Compounds</del>	<del>SIP 8-5-403</del>	<del>Y</del>		<del>Inspection Requirement for Pressure Vacuum Valves twice per calendar year at 4 to 8 months intervals</del>	<del>SIP 8-5-303</del>	<del>P/E</del>	<del>Semi-Annual Inspection</del>



**Table VII-D  
 Applicable Limits and Compliance Monitoring Requirements  
 S-48, GDF #9008**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
Defective Component Repair/ Replacement Time Limit	BAAQMD 8-7-302.4	Y		Shall be repaired or replaced within 7 days	BAAQMD 8-7-503.2	P/E	Records
Liquid Removal Rate	<del>BAAQMD 8-7-302.8</del>	<del>Y</del>		<del><math>\geq 5</math> ml per gallon dispensed, when dispensing rate <math>&gt; 5</math> gallons/minute</del>	<del>CARB EO G-17AD</del>	<del>P/E</del>	<del>CARB Certification Procedures</del>
Liquid Retain from Nozzles	<del>BAAQMD 8-7-302.12</del>	<del>Y</del>		<del><math>\leq 100</math> ml per 1000-gallons dispensed</del>	<del>CARB EO G-17AD</del>	<del>P/E</del>	<del>CARB Certification Procedures</del>
Nozzle Spitting	<del>BAAQMD 8-7-302.13</del>	<del>Y</del>		<del><math>\leq 1.0</math> ml per nozzle per test</del>	<del>CARB EO G-17AD</del>	<del>P/E</del>	<del>CARB Certification Procedures</del>
Back Pressure Test	BAAQMD 8-7-302.14	Y		Back-Pressure Test Required once every 12 months	CARB EO G-17AD, and BAAQMD 8-7-601	P/A	CARB Certification Procedures, BAAQMD Manual of Procedures St 27
Pressure Vacuum Valve Requirements	BAAQMD 8-7-316 and CARB EO G-70-161, paragraph 14,	Y		Pressure Settings: $> 2.5$ inches of water column gauge	CARB EO-161 paragraph 14, CARB EO VR-301-D	P/E	CARB Certification Procedures

**Table VII-D  
 Applicable Limits and Compliance Monitoring Requirements  
 S-48, GDF #9008**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
Inspection Frequency	SIP 8-5-303.1 and 303.2	Y		Tank Pressure Vacuum Valve Shall Be: Gas Tight or $\leq 500$ ppmv (expressed as methane) above background for PRVs (as defined in SIP 8-5-206)	SIP 8-5-403 and 8-5-503, and CARB EO G-70-161, CARB EO VR-301-D,	P/E	Semi-Annual Inspection with Portable Hydrocarbon Detector
Inspection Frequency	SIP 8-5-403	Y		Inspection Requirement for Pressure Vacuum Valves twice per calendar year at 4 to 8 months intervals	SIP 8-5-303	P/E	Semi-Annual Inspection
Dispensing Rate Limit	CARB EO G-70-17AD, paragraph 11	N		$< 10$ gallons per minute	CARB EO G-70-17AD	P/E	CARB Certification Procedures
Disconnect on Liquid Leaks	CARB EO G-70-160, paragraph 12			$\leq 10$ ml per disconnect, averaged over 3 disconnect operations	CARB EO G-70-161, paragraph 19 and BAAQMD 8-7-301.13 and 8-7-407 and BAAQMD Condition #25107	P/A	Annual Check for Vapor Tightness and Proper Operation of Vapor Recovery System

**Table VII-D  
 Applicable Limits and Compliance Monitoring Requirements  
 S-48, GDF #9008**

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
Submerged fill pipes	40 CFR 63.11117 (b)(1)	Y		Submerged fill pipes installed on or after November 9, 2006 must be no more than 12 inches from the bottom of the tank	40 CFR 63.11117 (b)(1)	None	None
Gasoline Throughput	BAAQMD Condition # 21663 and 40 CFR 63.11117 (d)	Y		Gasoline throughput shall not exceed 334,000 gallons per year	BAAQMD 8-7-503.1	P/A	Records
Phase I Pressure Integrity Test	BAAQMD Condition # <a href="#">254072572</a> <u>3</u> , and 40 CFR 63.11120	Y		Annual pressure decay ( <del>ST-38</del> test <a href="#">CARB TP 201.1B</a> )	BAAQMD 8-7-407	P/A	Records

**Engineering Evaluation  
East Bay Municipal Utility District  
Application No. 26354  
Plant No. A0591**

**BACKGROUND**

East Bay Municipal Utility District (EBMUD) has applied for a modification to the following source:

**S-180 Anaerobic Digesters (11)**

The modification to the anaerobic digesters is the result of the addition of the sources listed below. EBMUD has applied for an exemption for the following:

**S-171 Fats, Oils, Grease (FOG) Receiving Station, 32,000 gallon capacity each (2 tanks), abated by A-12 Biofilter, 200 cfm**

and for a Permit to Operate for the following:

**S-172 Pre-digestion Blend Tanks, 200, 000 gallon capacity each (2 tanks), abated by A-9 Iron Oxide Vessel, A-10 Biofilter, and A-11 Activated Carbon**

The sources above are located at 2020 Wake Avenue, Oakland, CA 94607.

Installation of the new FOG receiving station and the two pre-digestion blend tanks are part of EBMUD's Digester Upgrade Project – Phase II. This project is a continuation of digester system improvements EBMUD began in 2003 as part of the Phase I improvements. The project proposes to improve performance of the anaerobic digestion system by making digester tank improvements, digester system additions and improvements, and relocation of the existing FOG receiving facility.

**Fog Receiving Station**

The new FOG receiving station has been relocated from its previous location at the plant. Accumulation of FOG in collection systems has historically caused operational problems which reduce system capacity and caused blockages as it flowed through the different stages of treatment. The relocated FOG facility will enable the material to be discharged to the new blending tanks where it will be mixed with raw sludge and then fed directly to the anaerobic digesters, eliminating potential fouling in the liquid stream process. The FOG station will receive waste through truck unloading bays into two 32,000 gallon below-grade concrete tanks. The new receiving station will receive 50,000 gallons of trucked waste per day on average. This is consistent with the flows that were received at the previous location. An increase in waste received at this station is not expected.

An odor control unit consisting of a biofilter will be used to remove odors from the air removed from the headspace of the FOG tanks. This odor control unit (OCU) is rated at 200 cfm for removal of hydrogen sulfide and methyl mercaptan.

The operation of the FOG receiving station and its abatement device are exempt from permit requirements per Regulation 2, Rule 1, Sections 123.3.2 and 113.2.4 as follows:

**2-1-123:** The following equipment is exempt from the requirements of Sections 2-1-301 and 302, provided that the source does not require permitting pursuant to Section 2-1-319.  
3.2 Storage or loading of organic liquids or mixtures containing organic liquids; where the initial boiling point of the organics is greater than 302°F and exceeds the actual storage temperature by at least 180°F.

**2-1-113.2:** The following sources and operations are exempt from the requirements of Sections 2-1-301 and 302:  
2.4 Any abatement device which is used solely to abate equipment that does not require an Authority to Construct or Permit to Operate.

**Pre-digestion Blend Tanks**

The two new pre-digestion tanks (200,000 gallons each) will receive waste from four separate sources. The four sources are:

- Fats, Oils, and Grease (FOG) Station (S-171)
- High Strength Station (exempt)
- Primary Sedimentation Tanks (S-120)
- Gravity Belt Thickeners (S-170)

Currently, waste from the high strength receiving station, the primary sedimentation tanks, and the gravity belt thickeners is fed directly to the anaerobic digesters, S-180. The components from the sources listed above will be blended and, if necessary, heated using the hot water loop to 80-90°F in the new tanks. Typical residence time of the wastes in the pre-digestion blend tanks will be 6-10 hours. The maximum daily throughput for both tanks is 2,100,000 gallons. The blended material will be pumped to the anaerobic digesters for digestion. The purpose of the blend tanks is to produce a more homogenized mixture of waste before it is sent to the anaerobic digesters. This will improve digestion and reduce digester gas flow peaks created by less controlled introduction of high strength wastes to the digesters.

Both blend tanks will be abated by an OCU. The OCU has a capacity of up to 600 cfm and consists of two permanent stages of treatment. The first stage of treatment is an iron oxide vessel and the second stage of treatment is a biofilter. During operational testing, a third treatment stage consisting of an activated carbon vessel was added to the OCU to control odors as the media in the biofilter grows. At this time it is uncertain whether or not the third stage of abatement will be removed after the biofilter media has grown to be effective on its own.

#### Modification to Anaerobic Digesters

EBMUD's Resource Recovery program will increase the production of digester gas in various ways. An increase in digester gas is a modification of the existing anaerobic digesters, S-180.

Digester gas production is influenced by multiple factors including characteristics of the waste stream, digester temperature, organic loading rate, and type of bacteria. The FOG receiving station and blend tanks will provide a stable biochemical oxygen demand (BOD) load to the digesters. Introducing a more homogenized mixture of waste at a constant temperature to the anaerobic digesters will increase digester gas production.<sup>3</sup> In other efforts to increase production, EBMUD replaced floating covers on 8 of 11 digesters with fixed covers and moved away from using mesophilic organisms to thermophilic organisms which can better handle high organic loading. EBMUD expects an increase in gas production from roughly 1,900 scfm to 2,700 scfm.

Digester gas currently fuels the facility's three multi-fuel cogeneration engines (S-37, S-38, and S-39), one hot water boiler (S-55), and one turbine (S-56). Any excess gas is sent to the four flares (A-190, A-191, A-192, and A-193).

To show that an increase in digester gas production does not result in a modification to the combustion sources utilizing it as a fuel source, the actual usage of digester gas was compared to the allowable limits outlined in the permit conditions of these sources. The three multi-fuel cogeneration engines are limited to a thermal throughput of 25 MMBtu/hr in Part 13 of Condition #20651. The total combined hours of operation are limited to 25,316 hours in Part 14 of the same condition. The permitted annual thermal throughput is  $(25 \text{ MMBtu/hr}) \times (25,316 \text{ hrs/yr}) = 632,900 \text{ MMBtu/yr}$ . Diesel fuel usage by the three cogeneration engines is limited to 150,000 gallons in Part 15. Diesel fuel usage limits the usage of digester gas. Therefore, when the maximum amount of diesel fuel is used (150,000 gallons), digester gas usage will be at a minimum. The maximum thermal throughput of diesel using its higher heat value is  $(0.137 \text{ MMBtu/gal}) \times (150,000 \text{ gal/yr}) = 20,550 \text{ MMBtu/yr}$ . Therefore, at maximum diesel fuel usage, the minimal amount of thermal throughput of digester gas can be determined. It is  $(632,900 \text{ MMBtu/yr}) - (20,550 \text{ MMBtu/yr}) = 612,350 \text{ MMBtu/yr}$ . In this scenario, digester gas usage by the three cogeneration engines is  $(612,350 \text{ MMBtu/yr}) \times (1 \text{ scf DG}/0.00065 \text{ MMBtu}) = 942,076,923 \text{ scf/year}$ . The actual digester gas usage for the previous six years as shown in Table 1 below is well below this permitted limit.

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<sup>3</sup> Day, D. (2012, December). Beyond Net Zero. *Treatment Plant Operator*, 30, 28-33.

Similarly, S-56 is limited to 389,820 MMBtu/yr in Part 2 of Condition #24050 and shall be fired only on digester gas. Therefore, the maximum digester gas limit is (389,820 MMBtu/yr) x (1 scf DG/0.00065 MMBtu) = 599,723,077 scf/yr. The actual usage of digester gas as shown in Table 1 is far below the capacity of the turbine.

Since the cogeneration engines and turbine are permitted at much higher levels for digester gas usage than what is actually used by EBMUD, an increase in digester gas resulting from S-171 and S-172 will not result in a modification to the combustion sources which operate on digester gas. The hot water boiler, S-55, is not taken into consideration for this matter because Part 2 of Condition #20296 limits its operation. S-55 cannot operate simultaneously with more than two of the three cogeneration engines S-37, S-38, or S-39.

**Table 1. Actual digester gas usage by combustion sources**

Source	Units	2008	2009	2010	2011	2012	2013
<b>Engines S-37, S-38, S-39</b>	scf	873,974,225	688,973,703	612,429,955	555,108,521	344,245,249	402,120,408
<b>Boiler S-55</b>	scf	25,115,947	86,521,276	92,206,355	104,645,949	51,379,365	19,800,156
<b>Flares A-190, A-191, A-192, A-193</b>	scf	108,430,234	394,218,835	368,566,747	382,757,375	209,895,085	135,425,929
<b>Turbine S-56</b>	scf	--	--	--	--	390,792,108	472,326,003
<b>Total</b>	scf	1,007,520,406	1,169,713,814	1,073,203,057	1,042,511,845	996,311,807	1,029,672,496

Table 2 below summarizes the allowable digester gas usage amounts for S-37, S-38, S-39, and S-56.

**Table 2. Allowable digester gas usage by combustion sources**

Source	Units	Allowable Limit of DG
Engines S-37, S-38, S-39*	scf/yr	973,692,307 - 942,076,923
Turbine S-56	scf/yr	599,723,077

\*The engines can operate on both digester gas and diesel. When diesel is used, digester gas usage is reduced. Therefore, Table 2 lists the allowable range of digester gas as imposed by Condition #20296.

**EMISSIONS CALCULATIONS**

The emission factors used to calculate organics emissions from S-172 were determined from a sample taken at the inlet of the OCU, prior to stage 1 – iron oxide, on February 13, 2014. EPA test method TO-15 was used to determine the concentration of organics. A summary of the detected organic compounds from the ALS Environmental Laboratory report dated February 27, 2014 is in Table 4. Hydrogen sulfide and methyl mercaptan emissions were determined from samples taken at the biofilter outlet on April 22, 2014. ASTM D 5504-08, for reduced sulfur compounds was used to analyze hydrogen sulfide and methyl mercaptan.

**Organics**

Basis: Maximum exhaust gas flow from OCU: 600 cfm  
 Maximum daily throughput: 2,100,000 gallons  
 Total organics concentration: 15,429 ug/m3

$$15,429 \frac{\mu\text{g}}{\text{m}^3} \times 600 \frac{\text{ft}^3}{\text{min}} \times \frac{1 \text{ m}^3}{35.315 \text{ ft}^3} \times \frac{1 \text{ lb}}{453,592,370 \mu\text{g}} \times \frac{60 \text{ min}}{\text{hr}} = 0.035 \frac{\text{lb}}{\text{hr}}$$

$$0.035 \frac{\text{lb}}{\text{hr}} \times 24 \frac{\text{hr}}{\text{day}} = 0.832 \frac{\text{lb}}{\text{day}}$$

These emission factors are estimations based on sampling. The facility requested using a peaking factor of 2.43 to estimate maximum emissions at the outlet of the OCU. The peaking factor allows for variations in organic content. Applying the peaking factor to the daily emissions results in the following emissions:

$$0.832 \frac{lb}{day} \times 2.43 = 2.02 \frac{lb}{day} = 0.369 \text{ TPY}$$

The large majority of the organics was determined to be ethanol (C<sub>2</sub>H<sub>6</sub>O). For this reason, the molecular weight of ethanol was used to determine the organics concentration in units of ppm.

Determining the concentration of organics in ppm:

Dry flow	600 cfm
Temperature	550 Rankine (90°F)
Pressure	1 atm
R constant	0.73 (ft <sup>3</sup> atm/R lb-mol)
Lb-mol air/min	1.49
Lb-mol air/hr	90
Lb-mol air/yr	788,400
Lb/hr of C <sub>2</sub> H <sub>6</sub> O	0.035
MW of C <sub>2</sub> H <sub>6</sub> O	46.07
Lb-mol C <sub>2</sub> H <sub>6</sub> O/hr	7.59E-04
Lb/yr of C <sub>2</sub> H <sub>6</sub> O	303.68
MW of C <sub>2</sub> H <sub>6</sub> O	46.07
Lb-mol C <sub>2</sub> H <sub>6</sub> O/yr	6.59
Hourly C <sub>2</sub> H <sub>6</sub> O concentration	<b>8.44 ppm x 2.43 = 20.5 ppm</b>
Yearly C <sub>2</sub> H <sub>6</sub> O concentration	<b>8.36 ppm x 2.43 = 20.3 ppm</b>

Hydrogen Sulfide

Basis: Maximum exhaust gas flow from OCU: 600 cfm  
 Maximum daily throughput: 2,100,000 gallons  
 Total hydrogen sulfide concentration: 2,800 ug/m<sup>3</sup>

$$2,800 \frac{\mu g}{m^3} \times 600 \frac{ft^3}{min} \times \frac{1 m^3}{35.315 ft^3} \times \frac{1 lb}{453,592,370 \mu g} \times \frac{60 min}{hr} = 0.006 \frac{lb}{hr}$$

$$0.006 \frac{lb}{hr} \times 24 \frac{hr}{day} = 0.151 \frac{lb}{day}$$

These emission factors are estimations based on sampling and believed to be representative of a weekly or annual average. Hydrogen sulfide concentrations are extremely variable in sludge and are based on waste input. Peaking factors of 10 for hourly emissions and 2 for annual emissions were assumed to estimate maximum emissions.

Applying the peaking factor to the hourly and daily emissions results in the following emissions:

$$0.006 \frac{lb}{hr} \times 10 = 0.06 \frac{lb}{hr}$$

$$1.51 \frac{lb}{day} \times 365 \frac{days}{yr} \times 2 = 110.23 \frac{lb}{yr}$$

Determining the concentration of hydrogen sulfide (H<sub>2</sub>S) in ppm:

Dry flow	600 cfm
Temperature	550 Rankine (90°F)
Pressure	1 atm
Gas constant	0.73 (ft <sup>3</sup> atm/R lb-mol)
Lb-mol air/min	1.49
Lb-mol air/hr	90
Lb-mol air/yr	788,400
Lb/hr of H <sub>2</sub> S	0.006
MW of H <sub>2</sub> S	34.08
Lb-mol H <sub>2</sub> S/hr	1.76E-4
Lb/yr of H <sub>2</sub> S	55.12
MW of H <sub>2</sub> S	34.08
Lb-mol H <sub>2</sub> S /yr	1.62
Hourly H <sub>2</sub> S concentration	<b>2.0 ppm x 10 = 20 ppm (short term peak)</b>
Yearly H <sub>2</sub> S concentration	<b>2.1 ppm x 2 = 4.2 ppm (estimated average)</b>

Methyl Mercaptan

Basis: Maximum exhaust gas flow from OCU: 600 cfm  
 Maximum daily throughput: 2,100,000 gallons  
 Total hydrogen sulfide concentration: 7,400 ug/m<sup>3</sup>

$$7,400 \frac{\mu g}{m^3} \times 600 \frac{ft^3}{min} \times \frac{1 m^3}{35.315 ft^3} \times \frac{1 lb}{453,592,370 \mu g} \times \frac{60 min}{hr} = 0.017 \frac{lb}{hr}$$

$$0.017 \frac{lb}{hr} \times 24 \frac{hr}{day} = 0.399 \frac{lb}{day}$$

Determining the concentration of methyl mercaptan (CH<sub>4</sub>S) in ppm:

Dry flow	600 cfm
Temperature	550 Rankine (90°F)
Pressure	1 atm
Gas constant	0.73 (ft <sup>3</sup> atm/R lb-mol)
Lb-mol air/min	1.49
Lb-mol air/hr	90
Lb-mol air/yr	788,400
Lb/hr of CH <sub>4</sub> S	0.017
MW of CH <sub>4</sub> S	48.11
Lb-mol CH <sub>4</sub> S	3.53E-4
Lb/yr of CH <sub>4</sub> S	145.64
MW of CH <sub>4</sub> S	48.11
Lb-mol CH <sub>4</sub> S	3.03



Permit Evaluation and Statement of Basis:  
Site No: A0591

East Bay Municipal Utility District  
2020 Wake Avenue, Oakland, CA 94607

Hourly CH <sub>4</sub> S concentration	<b>3.9 ppm</b>
Yearly CH <sub>4</sub> S concentration	<b>3.8 ppm</b>

**PLANT CUMULATIVE EMISSIONS AND OFFSETS**

Table 3 summarizes the cumulative emission increases for EBMUD and this application.

**Table 3. Cumulative increase in tons/yr**

<b>Pollutant</b>	<b>New</b>	<b>Offset Ratio</b>	<b>ERCs Required tons/year</b>	<b>ERCs Provided tons/year</b>
NO <sub>x</sub>	0.000	--	--	--
CO	0.000	--	--	--
POC	0.369	1.00/1.15	0.425	0.425
PM <sub>10</sub>	0.000	--	--	--
SO <sub>2</sub>	0.000	--	--	--

The offset requirements for POCs are found in Regulation 2-2-302. Emission offsets are required for new or modified sources at a facility which emits or will be permitted to emit 10 tons/year or more of a pollutant specific basis. If the facility emits or will be permitted to emit less than 35 tons of POC a year, the emission offsets may be provided by the District’s Small Facility Banking Account. If the facility will be permitted to emit more than 35 tons/year of POC, the site is responsible for providing the required offsets at a ratio of 1.15 to 1.0.

S-172 is a new source and will result in emission increases of POC. The actual POC from this facility is currently estimated at 24.1 tons/yr. Based on Condition #21759, Part 1, the maximum yearly throughput for S-100 is 93,615 million gallons. Based on databank emission factors, the POC emission rate is 0.851 pounds/million gallons. The maximum permitted emission rate for S-100 is: (93,615 million gallons/year)\*(0.851 pounds/million gallons)/(2000 pounds/ton) = 39.8 tons/yr. This facility has the potential to emit more than 35 tons/yr. Therefore, the site is required to provide offsets at a ratio of 1.15 to 1.0. As shown in Table 3, the required amount of emission reduction credits (ERCs) for this application are 0.425 tons/year of POC.

The facility owns Banking Certificate #1403, which has 0.025 tons/yr of POC ERCs remaining. They also own Banking Certificate #1399, which has 0.400 tons/yr of POC ERCs remaining. The facility has requested that the District use all of the POC credits from Banking Certificate #1403 and all of the POC credits from Banking Certificate #1399 to offset the POC increase for this project.

**TOXIC RISK SCREENING ANALYSIS**

Toxic air contaminants (TACs) were detected in the test sample collected on February 13, 2014. In a report prepared by ALS Environmental, dated February 27, 2014, the following TACs and their concentrations were identified:

**Table 4. Annual and hourly TAC emissions**

Compound	Pre OCU Measured Concentrations * (ug/m3)	Hourly Emissions (lb/hr)	Acute Trigger Level (lb/hr)	Acute Trigger Level Exceeded ? (Y/N)	Annual Emissions (lb/yr)	Chronic Trigger Level (lb/yr)	Chronic Trigger Level Exceeded ? (Y/N)
Acetaldehyde	63/22	1.4E-04	1.0E+00	N	1.2E+00	3.8E+01	N
Carbon disulfide	ND/15	3.4E-05	1.4E+01	N	2.9E-01	3.1E+04	N
Chlorobenzene	ND/3.3	7.4E-06	--	N	6.5E-02	3.9E+04	N
Chloroform	10/4.7	2.3E-05	3.3E-01	N	2.0E-01	2.0E+01	N
n-Hexane	3.2/0.98	7.2E-06	--	N	6.3E-02	2.7E+05	N
Hydrogen sulfide**	26,697	6.3E-02	9.3E-02	N	1.1E+02	3.9E+02	N
Methyl ethyl ketone	ND/9.2	2.1E-05	2.9E+01	N	1.8E-01	--	N
Methylene chloride	8.3/6.4	1.9E-05	3.1E+01	N	1.6E-01	1.1E+02	N
Propene	2.8/18	4.1E-05	--	N	3.5E-01	1.2E+05	N
Toluene	7.8/8.4	1.9E-05	8.2E+01	N	1.7E-01	1.2E+04	N
Vinyl Acetate	ND/7	1.6E-05	--	N	1.4E-01	7.7E+03	N

\*Concentrations listed are OCU inlet/outlet measurements except for hydrogen sulfide. The highest value of either concentration was used to calculate hourly and annual emissions.

\*\*Concentration of Hydrogen Sulfide obtained from sample taken at the outlet of the biofilter and adjusted using peaking factors mentioned above.

Hourly and annual emissions were determined using the flow rate based on the design flow of 600 cfm through the OCU. Emissions of organics were calculated in a similar way as shown above.

No trigger levels were exceeded. Therefore, a health risk screening analysis is not required.

**STATEMENT OF COMPLIANCE**

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

This application is not considered to be ministerial under the District’s Regulation 2-1-311 and, therefore, is subject to a CEQA review. The addition of the FOG receiving station and the two blend tanks are part of EBMUD’s Digester Upgrade Project. An Initial Study of the Digester Upgrade Project – Phase II was conducted in 2008 with EBMUD being the lead agency. The Initial Study showed that there would not be a significant impact on the environment, resulting in a Negative Declaration. The Air District did not comment on the Initial Study.

**Regulation 2, Rule 1: School Public Notice Requirements**

The public notification requirements of Regulation 2-1-412 apply to modifications which result in any increase in toxic air contaminant or hazardous air contaminant emissions at facilities within 1,000 feet of the boundary of a K-12 school. The facility is located more than 1,000 feet from the nearest K-12 school and therefore is not subject to the public notification requirements of Regulation 2-1-412.

**Regulation 2, Rule 2: Best Available Control Technology (BACT) Requirements**

In accordance with Regulation 2-2-301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, NO<sub>x</sub>, CO, SO<sub>2</sub> or PM<sub>10</sub>.

Based on the emissions displayed above, BACT is not triggered because POC emissions do not exceed 10 lbs/day.

Regulation 2, Rule 2: Prevention of Significant Deterioration (PSD) Requirements:

The PSD requirements in District Regulation 2, Rule 2, Sections 304 and 305 apply to major modifications at a major facility. Wastewater treatment plants are not one of the 28 PSD source categories that are subject to the 100 tons/yr threshold. Therefore, the PSD thresholds for this facility are 250 tons/yr for criteria pollutants. It was determined in Application #25905 that the maximum potential emissions from this site are 186 tons/yr of CO. The PTE for all other criteria pollutants is less than 100 tons/yr for each pollutant. Since the CO PTE does not exceed 250 tons/yr, this site is not currently subject to PSD. As a result, Regulation 2-2-304 and 2-2-305 do not apply.

Regulation 2, Rule 5: Health Risk Assessment Requirements

All TAC emissions from new and modified sources are subject to risk assessment review if emissions of any individual TAC from the project exceed the acute or chronic emission thresholds specified in Table 2-5-1 of Regulation 2, Rule 5. For this project, all TAC emissions were below the threshold limits and, therefore, this project did not require a health risk screening.

Regulation 2, Rule 6: Major Facility Review

This rule requires that major and designated facilities apply for a Title V federal operating permit. This facility was determined to be subject to Title V because it has the potential to emit more than 100 tons/yr of carbon monoxide.

The District issued the initial Title V operating permit for this facility on July 1, 1997. The permit was renewed on July 26, 1995 and again on December 19, 2012. The December 19, 2012 Title V permit is the current Title V operating permit for this site and includes all District revisions approved to date.

The permitting of the sources in this application requires a minor revision of the Title V permit. This will be done in a separate permitting action. EBMUD has submitted a Title V application for a minor revision.

Regulation 6, Rule 1: Particulate Matter – General Requirements

This project is not expected to be a source of particulate. Therefore, the requirements of Regulation 6, Rule 1, do not apply.

Regulation 7, Odorous Substances

This Regulation places general limitations on odorous substances and specific emission limitations on certain odorous compounds. S-172 and A-10 may emit odorous substances. However, Regulation 7 does not apply unless there have been ten or more complaints within a 90-day period.

To ensure that the process will not be odorous, a permit condition will be imposed to require corrective action if there are any complaints.

Regulation 8, Rule 2: Miscellaneous Operations

This Regulation requires that a source cannot discharge into the atmosphere from any miscellaneous operation an emission containing more than 15 pounds per day and containing a concentration of more than 300 ppm total carbon on a dry basis. By definition, the operation of S-172 is categorized as miscellaneous. A permit condition will be imposed to ensure that organic emissions are limited to 2.02 lbs/day and 20.3 ppm. Therefore, S-172 is expected to comply with Regulation 8, Rule 2.

Permit conditions specifying operating parameters will not be imposed on the OCU since the emissions for this project were intended to be conservative and were based on pre-abatement values. This will allow EBMUD to have some flexibility in maintaining A-10, biofilter, which after some time will need to be replenished.

Regulation 9, Rule 2: Inorganic Gaseous Pollutants: Hydrogen Sulfide

This rule limits ground level concentrations of hydrogen sulfide to 0.06 ppm averaged over three consecutive minutes or 0.03 ppm averaged over any 60 consecutive minutes. The maximum H<sub>2</sub>S concentration at the blend tank

OCU outlet is 20.0 ppm. The Air District modeled H<sub>2</sub>S emissions produced by the blend tanks on December 24, 2014 to determine the concentration at the fence line. It was determined that the one hour concentration of H<sub>2</sub>S at the fence line is 16.88 ug/m<sup>3</sup> or 0.009 ppm. Therefore, S-172 is expected to comply with Regulation 9, Rule 2.

New Source Performance Standards (NSPS)

There are no applicable NSPS.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

There are no applicable NESHAPs.

**PERMIT CONDITIONS**

COND #25919 -----

1. The owner/operator of S-172, Pre-digestion Blend Tanks, shall not exceed waste throughput limits of 2,100,000 gallons during any day. (Basis: Cumulative Increase)
2. The owner/operator shall ensure S-172 is abated at all times of operation by A-9, Iron Oxide Vessel and A-10, Biofilter. A-11, Activated Carbon shall be used during biofilter media growth periods and if A-9 or A-10 are out of service. A-11, Activated Carbon, will remain in use after start-up until EBMUD receives approval from the Air District to remove it. (Basis: Cumulative Increase)
3. When heat is needed, the owner/operator shall heat the solids in S-172, Pre-digestion Blend Tanks, using the facility hot water loop. (Basis: Cumulative Increase)
4. The owner/operator shall ensure that the precursor organic emissions of S-172, Pre-digestion Blend Tanks, A-9, Iron Oxide Vessel, A-10, Biofilter, and A-11, Activated Carbon, do not exceed 2.02 lbs/calendar day and 20.3 ppm total carbon on a daily basis. The exhaust gas flow shall not exceed 600 scfm. (Basis: Offsets)
5. The permit to operate for S-172, Pre-digestion Blend Tanks, is contingent upon compliance with Regulation 1-301, Standard for Public Nuisance, and Regulation 7, Odorous Substances. Upon receiving 10 or more complaints regarding odor in a 90 day period, the owner/operator shall take corrective action. (Basis: Regulation 2-1-403)
6. To demonstrate compliance with part 4 of this condition the owner/operator of S-172 shall take quarterly readings of POC at the outlet air stream of A-10, Biofilter or A-11, Activated Carbon. The owner/operator shall use a PID or a sample analyzed using EPA Test Method TO-15 to determine POC concentrations or an equivalent monitoring method approved by the Air Pollution Control Officer. (Basis: Regulation 8, Rule 2)
7. To determine compliance with the above conditions, the owner/operator shall maintain the following records and provide all of the data necessary to evaluate compliance with the above conditions, including but not limited to daily records of the following information:
  - a. Quarterly POC concentration readings
  - b. All source test results.(Basis: Regulation 1-441 and Cumulative Increase)
8. The owner/operator shall keep all monitoring, source test, and maintenance records as required by this condition, on site for at least five years from the date of data entry and the records shall be made available to District staff for inspection. These recordkeeping requirements shall not replace the recordkeeping requirements contained in any applicable District Regulations. (Basis: Cumulative Increase and Regulation 2-6-501)

**RECOMMENDATION**

It is recommended that a Letter of Exemption be issued to EBMUD for the following:

Permit Evaluation and Statement of Basis:  
Site No: A0591

East Bay Municipal Utility District  
2020 Wake Avenue, Oakland, CA 94607

**S-171 Fats, Oils, Grease (FOG) Receiving Station, 32,000 gallon capacity each (2 tanks), abated by A-12 Biofilter, 200 cfm**

It is recommended that a Permit to Operate be issued to EBMUD for the following:

**S-172 Pre-digestion Blend Tanks, 200, 000 gallon capacity each (2 tanks), abated by A-9 Iron Oxide Vessel, A-10 Biofilter, and A-11 Activated Carbon**

Issue a Permit to Operate to EBMUD to perform the modification to the following equipment:

**S-180 Anaerobic Digesters (11)**

By: \_\_\_\_\_  
Simrun Dhoot  
Air Quality Engineer

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

**Engineering Evaluation  
East Bay Municipal Utility District  
Application No. 26687  
Plant No. A0591**

**BACKGROUND**

East Bay Municipal Utility District (EBMUD) has applied for an Authority to Construct and/or Permit to Operate for the following abatement devices:

- A-194 Digester Gas Enclosed Flare, Abutec, 1500 scfm digester gas capacity, 63 MMBtu/hr, maximum**
- A-195 Digester Gas Enclosed Flare, Abutec, 1500 scfm digester gas capacity, 63 MMBtu/hr, maximum**

and for a modification to the following source:

- S-180 Anaerobic Digesters (11)**

The sources above are located at 2020 Wake Avenue, Oakland, CA 94607.

Flaring is a high-temperature oxidation process used to burn combustible components of waste gases from industrial operations. EBMUD currently operates four candlestick flares, A-190, A-191, A-192, and A-193 (10.5 MMBtu/hr each). Digester gas produced by the anaerobic digesters, S-180, is used by the facility's three multi-fuel cogeneration engines (S-37, S-38, S-39), one hot water boiler (S-55), one turbine (S-56), and abated by the four flares previously mentioned. Operation of the permitted digester gas flares occurs in the event that the digester gas production exceeds the available capacity of the combustion sources, or if needed to abate digester gas during equipment testing or emergency conditions. EBMUD anticipates occasional downtime of the combustion sources and the existing digester gas flares. Therefore, additional digester gas flares will be added to provide back-up abatement capacity.

EBMUD has been in negotiating agreements to accept processed food wastes for anaerobic digestion. This will increase the amount of digester gas produced from 2,933 scfm to 3,400 scfm. The food waste initiative is anticipated to come online by July 2017. The plan being negotiated is for digester gas to be used to produce biogenic compressed natural gas (CNG). The CNG facility will likely be installed and operated by a third party. A separate permitting effort for this process will occur when the food waste initiative details are finalized. This evaluation, however, will address anticipated impacts from the added waste to the digesters.

**EMISSIONS CALCULATIONS**

EBMUD has proposed a facility-wide digester gas combustion limit, which includes the amount flared in future permits. The facility has taken into account the possibility that the gases generated will be flared onsite in the event of an outage at the CNG facility which would prevent the delivery of digester gas to the third party. EBMUD assumed a 15% increase to the current implied facility digester gas combustion limit of 2,933 scfm. Therefore, the proposed facility-wide digester gas combustion limit will be 3,400 scfm (1.162 million MMBtu/yr). The average high heat value of the digester gas at the facility is 650 Btu/hr. Therefore, the heat to gas conversion is  $(1,161,576 \text{ MMBtu/yr}) / (1 \text{ scf DG} / 0.00065 \text{ MMBtu}) = 1,786,946,200 \text{ scf/yr}$ .

**Flaring Operations**

**NOx and CO Emission Factors**

The emissions for NOx and CO are based on RACT and manufacturer guarantees. NOx emissions are expected to be below 0.06 lb/MMBtu and CO emissions are expected to be below 0.2 lb/MMBtu.

**PM Emission Factor**

The emission factor for PM<sub>10</sub> is based on San Diego Air Pollution Control District's (SDAPCD's) emission factors for digester gas flares. The emission factor is 12.0 lb/MMscf.

**SO<sub>2</sub> Emission Factor**

EBMUD has agreed to the BACT limit of a 200 ppm concentration of sulfur in their digester gas on an annual average basis. The emission factor for SO<sub>2</sub> is based on the material balance using the sulfur content limit for the digester gas.

$$(200 \text{ scf S} / 10^6 \text{ scf DG}) \times (\text{lb-mole SO}_2 / 386 \text{ scf S}) \times (64 \text{ lb SO}_2 / \text{lb-mole SO}_2) \times (1 \text{ lb-mol SO}_2 / 1 \text{ lb-mol S})$$

$$= 33.16 \text{ lb SO}_2 / \text{MMscf}$$

**POC Emission Factor**

Conservative digester gas sampling indicates that POC levels are less than 82 microgram/liter (16 ppmv or 5.1 lb/MMscf). In fact, sampling from 08/2011, 12/2011, 5/2012, and 6/2012 resulted in POC concentrations of 5.1 ppmv, 3.6 ppmv, 5.9 ppmv, and 4.6 ppmv, respectively. The emission factors for POC are based on the assumption of 98% destruction efficiency of the flare and the estimated POC content of the digester gas. Therefore, the emission factor for POC is 0.102 lb/MMscf.

**Criteria Pollutant Emissions**

Assuming a conservative 10% down time for the combustions sources and 24 hours per day on a worst case scenario, the facility anticipates up to 36.5 days per year when flaring would be required due to maintenance. The emissions from A-194 and A-195 are as follows, summarized in Table 1 below:

$NO_x = (0.06 \text{ lb/MMBtu})(1,162,000 \text{ MMBtu/yr}) = 69,720 \text{ lbs/yr} \times 10\% = 6,972 \text{ lb/yr} = 3.486 \text{ tpy}$   
 $CO = (0.2 \text{ lb/MMBtu})(1,162,000 \text{ MMBtu/yr}) = 232,400 \text{ lbs/yr} \times 10\% = 23,240 \text{ lb/yr} = 11.620 \text{ tpy}$   
 $PM_{10} = (12 \text{ lb/MMscf})(1,786,946,200 \text{ scf/yr})(\text{MMscf}/10E6 \text{ scf}) = 21,443 \text{ lbs/yr} \times 10\% = 2,144 \text{ lb/yr} = 1.072 \text{ tpy}$   
 $SO_2 = (33.16 \text{ lb/MMscf})(1,786,946,200 \text{ scf/yr})(\text{MMscf}/10E6 \text{ scf}) = 59,255 \text{ lbs/yr} \times 10\% = 5,926 \text{ lb/yr} = 2.963 \text{ tpy}$   
 $POC = (0.102 \text{ lb/MMscf})(1,786,946,200 \text{ scf/yr})(\text{MMscf}/10E6 \text{ scf}) = 182 \text{ lbs/yr} \times 10\% = 18 \text{ lb/yr} = 0.009 \text{ tpy}$

**Table 1. Pollutant Emissions from A-194 and A-195**

Pollutant	Emission Factor	Max Daily, lbs/day	Annual, lbs/yr	Annual, tpy
NO <sub>x</sub>	0.06 lb/MMBtu	191	6,972	3.486
CO	0.2 lb/MMBtu	636	23,240	11.620
PM <sub>10</sub>	12 lb/MMscf	59	2,144	1.072
SO <sub>2</sub>	33.16 lb/MMscf	162	5,926	2.963
POC	0.102 lb/MMscf	0.5	18	0.009
H <sub>2</sub> S*	0.0215 lb/MMscf	0.1	3.84	0.002

\*H<sub>2</sub>S emission factor obtained from SDAPCD's emission factors for digester gas flares. Discussed in more detail under Toxic Risk Screening portion of this evaluation.

NO<sub>x</sub>, CO, PM<sub>10</sub>, and SO<sub>2</sub> are considered to be secondary pollutants pursuant to BAAQMD Regulation 2-2-112, Exemption, Secondary Emissions from Abatement. H<sub>2</sub>S and POC are considered to be primary pollutants.

**Greenhouse Gas Emissions**

Digester gas contains approximately 64% methane (CH<sub>4</sub>) and 34% carbon dioxide (CO<sub>2</sub>) which are both greenhouse gases. During the combustion of digester gas at the flare, methane is converted to CO<sub>2</sub>. The CO<sub>2</sub> that is present in digester gas and the CO<sub>2</sub> produced during combustion of digester gas at the flares are both derived from the decomposition of organic waste materials (primarily vegetable matter) and is considered to be biogenic CO<sub>2</sub>. Biogenic CO<sub>2</sub> contains carbon that is present in organic materials that include, but are not limited to, wood, paper, vegetable oils, animal fat, and food, animal and yard waste. The destruction efficiency for methane is 99%, according to the manufacturer's specifications for the flares.

Constants used in the calculation of GHG emissions include the standard molar volume of gasses (SMV) and the molecular weights of methane and carbon dioxide. The molecular weight of methane is 16.043 lb/lbmol and the molecular weight of carbon dioxide is 44.010 lb/lbmol. The standard molar volume of gasses (SMV) is 387.006 scf/lbmol.

**Methane**

At the inlet to the flares, the methane concentration is 64% x 16.043 lb/lbmol x 1000/387.006 scf/lbmol = 26.530 lb/mscf of digester gas. The amount removed is 26.530 lb/mscf x 99% = 26.265 lb/mscf. Therefore, the total methane emitted is 2.653E-01 lb/mscf of digester gas.

$CH_4 = (2.653 \text{ E-}01 \text{ lb/mscf})(1,786,946,200 \text{ scf/yr})(\text{mscf}/10E3 \text{ scf}) = 474,076 \text{ lbs/yr} = 237 \text{ tpy}$

**Carbon Dioxide**

At the inlet to the flares, the carbon dioxide concentration is 34% x 44.010 lb/lbmol x 1000/387.006 scf/lbmol = 38.664 lb/mscf of digester gas. The amount of carbon dioxide produced from the conversion of methane to carbon dioxide is calculated by multiplying the amount of methane removed by the pounds of carbon dioxide generated divided by the pounds of methane destroyed. The calculation is 26.265 lb/mscf x 2.7433 = 72.052 lb/mscf. Therefore, the total amount of carbon dioxide emitted is 1.1072E+02 lb/mscf of digester gas.

$CO_2 = (1.1072 \text{ E}+02 \text{ lb/mscf})(1,786,946,200 \text{ scf/yr})(\text{mscf}/10E3 \text{ scf}) = 197,850,683 \text{ lbs/yr} = 98,925 \text{ tpy}$

**Table 2. Maximum Greenhouse Gas Emissions from Flares, A-194 and A-195**

Pollutant	Flare, tpy	Global Warming Potential, as CO <sub>2</sub>	Project, CO <sub>2</sub> e tons/year



<b>CH4</b>	237	21	4,977
<b>Biogenic CO2</b>	98,925	1	98,925
<b>Total Biogenic GHG</b>			103,902

**TOXIC RISK SCREENING**

The combustion of digester gas from A-194 and A-195 will result in the emissions of toxic air contaminants (TACs). The emission factors for TACs were based on SDAPCD’s emission factors for digester gas flares. The emission factors for benzene, formaldehyde, hexane, and toluene were obtained from EPA Speciation Profile # 0003. The remaining emission factors were obtained using a raw digester gas sample from the Point Loma Wastewater Treatment Plant. The TAC emission factors along with their trigger levels and emissions from the operation of both flares are summarized below.

**Table 3. Toxic Air Contaminant Emissions for each flare**

TAC	EF (lb/MMscf)	Emissions (lb/yr)	Chronic Trigger Level (lb/yr)	Exceeds Trigger Level (Y/N)	Emissions (lb/hr)	Acute Trigger Level (lb/hr)	Exceeds Trigger Level (Y/N)
Ammonia	0.0048	0.86	7,700.00	No	0.001	7.1	No
Benzene	0.0277	4.95	3.80	Yes	0.006	2.9	No
Chlorobenzene	0.0002	0.04	39,000.00	No	0.000	--	No
Dichlorobenzene	0.0018	0.32	9.50	No	0.000	--	No
Ethyl Benzene	0.001	0.18	43.00	No	0.000	--	No
Ethylene Dichloride	0.0014	0.25	5.30	No	0.000	--	No
Formaldehyde	0.2042	36.49	18.00	Yes	0.042	0.12	No
Hexane	0.0101	1.80	270,000.00	No	0.002	--	No
Hydrogen Chloride	0.6455	115.35	350.00	No	0.132	4.6	No
Hydrogen Sulfide	0.0215	3.84	390.00	No	0.004	0.093	No
Methylene Chloride	0.0001	0.02	110.00	No	0.000	31	No
MEK	0.0001	0.02	--	No	0.000	29	No
Perchloroethylene	0.0005	0.09	18.00	No	0.000	44	No
Toluene	0.0101	1.80	12,000.00	No	0.002	82	No
1,1,1-Trichloroethane	0.0001	0.02	--	No	0.000	150	No
Trichloroethylene	0.0003	0.05	54.00	No	0.000	--	No
Xylene	0.0045	0.80	27,000.00	No	0.001	49	No

Since the trigger levels for benzene and formaldehyde were exceeded, a health risk screening analysis (HRSA) is required. Results from the HRSA indicate that the maximum cancer risk is estimated at 0.06 in a million, and the maximum project chronic hazard index is estimated at 1.5E-03. This risk level is considered acceptable in accordance with Regulation 2, Rule 5.

**PLANT CUMULATIVE EMISSIONS**

Table 3 summarizes the cumulative emission increases for EBMUD and this application.

**Table 4. Cumulative increase in tons/yr**

Pollutant	Existing, tpy	New, tpy	Total, tpy
NOx	45.994	3.486	49.480
CO	136.820	11.620	148.44
PM10	3.821	1.072	4.893
SO <sub>2</sub>	25.470	2.963	28.433
POC	39.800	0.045	39.845

**OFFSETS**

Emission offset requirements for POC and NOx are set out in Regulation 2, Rule 2, Section 302. POC and NOx offsets are required for new or modified sources at a facility that emits or will be permitted to emit 10 tons per year or more of that pollutant. If the facility emits or will be permitted to emit less than 35 tons of POC a year, the emission offsets may be provided by the District’s Small Facility Banking Account. If the facility will be permitted to emit more than 35 tons/year of POC, the site is responsible for providing the required offsets at a ratio of 1.15 to 1.0.

This facility has the potential to emit more than 35 tons/yr for NOx and POC as shown in Table 3. Therefore, the site is required to provide offsets at a ratio of 1.15 to 1.0.

The offsets requirements for PM<sub>10</sub> and SO<sub>x</sub> are specified in Regulation 2, Rule 2, Section 303. Per Section 303, PM<sub>10</sub> and SO<sub>x</sub> emission offsets are required for any new or modified source that is a major facility for PM<sub>10</sub> or SO<sub>x</sub> emissions. EBMUD is not a major facility for PM<sub>10</sub> or SO<sub>x</sub> emissions. Therefore, offsets for PM<sub>10</sub> or SO<sub>x</sub> will not be required.

***The California Health and Safety Code Section 42301.2, specifies:***

***“A district shall not require emission offsets for any emission increase at a source that results from the installation, operation, or other implementation of any emission control device or technique used to comply with a district, state, or federal emission control requirement, including, but not limited to, requirements for the use of reasonably available control technology or best available retrofit control technology, unless there is a modification that results in an increase in capacity of the unit being controlled.”***

The facility will operate A-194 and A-195 as back-up abatement capacity when the existing flares and combustion sources are down for maintenance. However, the digesters have been modified due to changes made since 2014 as discussed in Application 26354. And with the addition of the food waste initiative in 2017, digester gas production levels are anticipated to increase further. Therefore, EBMUD has agreed to provide offsets for the emissions resulting from the increased capacity due to the food waste initiative.

Also, BAAQMD noted that past offsets provided to EBMUD from the Small Facility Banking Account to cover emissions from the turbine were granted under the resource recovery provisions in the Health and Safety Code and were not intended to cover flaring. Since the turbine could be unavailable at times and the excess gas flared when the boiler and engines are operating at capacity, offsets for this portion of the gas intended for the turbine will be required. EBMUD will provide offsets to account for turbine outages/peak flows and to address future food waste-related flaring. EBMUD will provide 5.500 tons/year in NO<sub>x</sub> offsets and 0.072 tons/year in POC offsets as outlined below.

1. Emissions from additional flaring that could occur during turbine outages or peak flows:

Assumptions:

- Turbine is out of service for 30 days per year and gas diverted to other sources
- All excess gas is flared (unlikely since engines/boiler will utilize most of this gas)
- Emissions are based on emission factors from new flares
- Gas flow to turbine is 1,200 cfm (typical operation near capacity)

$$30 \text{ days} \times 1,440 \text{ min/day} \times 1,200 \text{ cf/min} \times 0.00065 \text{ MMBtu/cf} = 33,696 \text{ MMBtu}$$

$$30 \text{ days} \times 1,440 \text{ min/day} \times 1,200 \text{ cf/min} = 51,840,000 \text{ cf} = 51.84 \text{ MMcf}$$

$$\text{NO}_x = 33,696 \text{ MMBtu} \times 0.06 \text{ lb/MMBtu} = 2,022 \text{ lbs} = 1.011 \text{ tons NO}_x/\text{yr}$$

$$\text{POC} = 51.84 \text{ MMcf} \times 0.51 \text{ lb/MMcf} = 26.4 \text{ lbs} = 0.013 \text{ tons POC/yr}$$

2. Emissions to account for additional flaring related to food waste initiative:

Assumptions:

- Facility digester gas combustion limit will be 3,400 cfm (1,161,576 MMBtu/yr)
- All excess gas is flared (unlikely since most will go to CNG facility)
- Emissions are based on emission factors from new flares
- Permitted thermal throughput for digester gas from the existing engines and boiler is 1,002,170 MMBtu/yr which equates to 1,541,800,000 scf/ year of digester gas. These limits are outlined in the permit conditions for the existing sources.

$$\text{New food waste related flaring NO}_x \text{ emissions determined by } 1,161,576 - (1,002,170 + 33,696) = 125,710 \text{ MMBtu}$$

$$\text{New food waste related flaring POC emissions determined by } 1,786,946,200 - (1,541,800,000 + 51,840,000) = 193,306,200 \text{ scf} = 193 \text{ MMcf}$$

$$\text{NO}_x = 125,710 \text{ MMBtu} \times 0.06 \text{ lb/MMBtu} = 7,543 \text{ lb NO}_x = 3.771 \text{ tons NO}_x/\text{year}$$

$$\text{POC} = 193 \text{ MMcf} \times 0.51 \text{ lb/MMcf} = 96 \text{ lb} = 0.049 \text{ tons POC/year}$$

3. Total offsets for both purposes:

$$\text{NO}_x = 1.011 + 3.771 = 4.782 \text{ tons/year} \times 1.15 = 5.500 \text{ tons/year NO}_x \text{ offsets}$$

$$\text{POC} = 0.013 + 0.049 = 0.063 \text{ tons/year} \times 1.15 = 0.072 \text{ tons/year POC offsets}$$

Regulation 2-2-302.2 allows a facility to use POC ERCs to offset increased emissions of NO<sub>x</sub>. EBMUD plans to provide a total of 5.572 tons/year of POC ERCs for this project. The facility owns Banking Certificate #1472, which has 3.172 tons/year of POC ERCs remaining. The facility has requested that the District use all of the POC credits from Banking Certificate #1472 to offset this project. The facility also recently purchased Banking Certificate #1443 which has 3.300 tons/year of POC ERCs. EBMUD will use 2.400 tons/year of POC ERCs from Banking Certificate #1443 to offset the remaining balance.

### **STATEMENT OF COMPLIANCE**

#### **Regulation 1: General Provisions and Definitions**

EBMUD is subject to Regulation 1, Section 301, which prohibits discharge of air contaminants or other material resulting in public nuisance. The proposed flares are required for abatement of digester gas and are not expected to be a source of public nuisance.

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

The proposed digester gas flares are abatement devices. In accordance with Regulation 2-1-312.2, permit applications involving the installation of abatement equipment are categorically exempt from CEQA review. Therefore, the proposed installation of A-194 and A-195 is exempt from CEQA review.

#### **Regulation 2, Rule 1: School Public Notice Requirements**

The public notification requirements of Regulation 2-1-412 apply to modifications which result in any increase in toxic air contaminant or hazardous air contaminant emissions at facilities within 1,000 feet of the boundary of a K-12 school. The facility is located more than 1,000 feet from the nearest K-12 school and, therefore, is not subject to the public notification requirements of Regulation 2-1-412.

#### **Regulation 2, Rule 2: Best Available Control Technology (BACT) Requirements**

Per Regulation 2-2-112, BACT requirements do not apply to emissions of secondary pollutants which are the direct result of the use of an abatement device which complies with the BACT or BARCT requirements for control of another pollutant. However, the use of Reasonably Available Control Technology (RACT) for control of secondary pollutants is required. The RACT for enclosed landfill gas flares are 0.06 lb NO<sub>x</sub>/MMBtu and 0.20 lb CO/MMBtu. The manufacturer's specifications for both flares guarantee that NO<sub>x</sub> and CO emissions will be less than 0.06 lb MM/Btu and 0.2 lb/MMBtu, respectively. EBMUD has agreed to a 200 ppm limit for H<sub>2</sub>S which is RACT for SO<sub>2</sub>. A-194 and A-195 are not subject to BACT for POC because POC emissions are less than 10 lb/day. Therefore, A-194 and A-195 are expected to comply with Regulation 2-2-112.

#### **Regulation 2, Rule 2: Prevention of Significant Deterioration (PSD) Requirement**

The PSD requirements in District Regulation 2, Rule 2, Section 304 and 305 apply to major modifications at a major facility. Wastewater treatment plants are not one of the 28 PSD source categories that are subject to the 100 tons/yr threshold. Therefore, the PSD thresholds for this facility are 250 tons/yr for criteria pollutants. It was determined in Application #25905 that the maximum potential emissions from this site are 186 tons/yr of CO. The PTE for all other criteria pollutants is less than 100 tons/yr for each pollutant. Since the CO PTE does not exceed 250 tons/yr, this site is not currently subject to PSD. As a result, Regulation 2-2-304 and 2-2-305 do not apply.

#### **Regulation 2, Rule 6: Major Facility Review**

This rule requires that major and designated facilities apply for a Title V federal operating permit. This facility was determined to be subject to Title V because it has the potential to emit more than 100 tons/yr of carbon monoxide.

The District issued the initial Title V operating permit for this facility on July 1, 1997. The permit was renewed on July 26, 1995 and again on December 19, 2012. The December 19, 2012 Title V permit is the current Title V operating permit for this site and includes all District revisions approved to date.

The permitting of the sources in this application requires a minor revision of the Title V permit. This will be done in a separate permitting action. EBMUD has submitted a Title V application for a minor revision.

#### **Regulation 3: Fees**

The facility has paid the application fees billed under Invoice 3MB03. The facility paid for the modification to the digesters under Invoice 3KM73.

#### **Regulation 6, Rule 1: Particulate Matter – General Requirements**

The new flares will be subject to the Ringelmann 1 limit and visible emissions prohibition in Sections 301 and 305. Visible particulate emissions are normally not associated with combustion of gaseous fuels, such as natural gas and digester gas, so compliance with this section is expected. The flares are also subject to Section 310 filterable particulate emission limit of 0.15 grains per dry standard cubic foot of exhaust volume. EPA's AP-42 emission factor for waste gas combustion in a flare (0.017 lbs PM<sub>10</sub>/MMdscf) is equivalent to 0.012 grains/dscf at 0% oxygen. Therefore, the proposed flares are expected to comply with Section 310.

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

*The new flare will be subject to Regulation 9, Rule 1, Section 9-1-301 and Section 9-1-302. Section 9-1-301 limits ground level concentration limits to 0.5 ppm continuously for 3 minutes, 0.25 ppm averaged over 60 minutes, and 0.05 ppm averaged over 24 hours. Section 9-1-302 limits sulfur dioxide emissions to no more than 300 ppmv, dry, in the exhaust. The facility*

*has a 591 ppmv limit for total sulfur content in the digester gas. This limits SO<sub>2</sub> emissions from the combustion equipment to 101.5 ppmv as follows:*

*For digester gas (64% methane, 36% CO<sub>2</sub>), the stoichiometric combustion factor is 5.82 cf dry reactant per cf of fuel (5.82 cu ft FG/cu ft DG).*

$$SO_2 = (591 \text{ scf S}/10E6 \text{ scf DG}) \times (1 \text{ scf SO}_2/1 \text{ scf S}) \times (1 \text{ scf DG}/5.82 \text{ scf flue gas}) = 101.5 \text{ scf SO}_2/10E6 \text{ DG}$$
$$SO_2 = 101.5 \text{ ppmv}$$

*Therefore, compliance with the 300 ppmv SO<sub>2</sub> exhaust limit in Section 9-1-302 is expected.*

Regulation 9, Rule 2: Inorganic Gaseous Pollutants – Hydrogen Sulfide

The ground level concentration limit on hydrogen sulfide in Section 9-2-301 is 0.06 ppm averaged over 3 minutes or 0.03 ppm averaged over 60 minutes. H<sub>2</sub>S burns readily and therefore, the flares are not expected to contribute to an exceedance of the standard.

New Source Performance Standards (NSPS)

EBMUD is not affected by any subpart of 40 CFR Part 60.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

40 CFR Part 63, Subpart VVV applies to any publicly owned treatment works (POTW) which:

- Is a major source of HAP emissions;
- Required to develop and implement a pretreatment program as defined by 40 CFR 403.8;
- Becomes a major source for any reason other than reconstruction; or
- Is reconstructed.

EBMUD does not meet the criteria listed above. Therefore, EBMUD is not affected by any subpart of 40 CFR 63.

CONDITIONS

Recommend modifying Condition 18860 for S-180 Anaerobic Digesters to include the addition of the proposed flares. All revisions are shown in strikeout/underline format.

COND# 18860 -----

S-180, Anaerobic Digesters

1. Emissions from S-180 shall be abated at all times by combustion at any or all of the following sources: S-37, S-38, S-39, S-55, and S-56, except as specified in Part 2. (Basis: Regulations 1-301, 8-2-301)
2. Emissions from S-180 shall be abated by any of the following: A-190, A-191, A-192, ~~or~~ A-193, A-194, or A-195 only when required as a result of gas production exceeding available combustion capacity, equipment testing, or emergency conditions. Fugitive or short-term unavoidable and incidental emissions of digester gas related to inherent digester design limitations, safety considerations or operational testing shall not be considered a violation of this part.

Inherent design limitations or standard operation and maintenance activities where incidental emissions of a digester gas could be expected to include (but are not limited to) the following:

- a. Digester gas bubbling around the digester tank(s) floating roof sludge seals.
- ~~b. Preventative maintenance on pressure relief valves to ensure proper operations.~~
- e-b. Manual draining of condensate from digester gas piping.
- ~~d-c.~~ Removing a digester or digester gas component from service.
- e-d. Collecting digester sludge samples through thief holes on digester covers.
- f-e. Digester gas diffusion through the Dystor membrane.
- ~~g. Manual venting of digester gas through thief holes to avoid tipping of digester covers.~~

If detected an known, the occurrence, duration and cause of all emissions of digester gas other than those due to inherent digester design limitations or standard operation and maintenance shall be recorded. The Permit Holder shall perform and record the results of a monthly visual inspection of each digester tank.

Notwithstanding the above, the Permit Holder shall not cause or allow any of the above fugitive or incidental emissions to create a violation of any District Regulation. (Basis: Cumulative Increase and Regulations 1-301 and 2-5-302)

3. Digester gas total sulfur content shall not exceed 200 ppmv on an annual average basis. (Basis: RACT, BACT)

4. The combined digester gas flow rate to the combustion sources shall not exceed 3,400 scfm as an annual average. In order to demonstrate compliance with this part, the owner/operator shall calculate and record, on a monthly basis, the maximum daily, total monthly, and rolling 12-month heat input to each combustion source. (Basis: Cumulative Increase, Regulation 2-1-301)
5. The combustion zone temperature of A-194 and A-195 shall be maintained at a minimum of 1,500 degrees F, averaged over any 3-hour period, and maintain a residence time of at least 0.6 seconds. (Basis: Regulation 2-1-403)
6. The owner/operator of A-194 and A-195 shall install a District approved flowmeter to ensure the combined dry gas flow rate does not exceed 3,000 cfm over a one-hour period to the abatement devices. (Basis: Cumulative Increase)
7. The owner/operator shall ensure that an initial Air District approved source test is conducted within 60 days of initial startup of A-194 and A-195. Additional source testing shall be conducted on A-194 and A-195 every 8,760 hours of operation or 5 years, whichever comes first. The source test shall determine the following:
  - a. Digester gas flow rate to each flare (dry basis);
  - b. Concentrations (dry basis) of carbon dioxide (CO<sub>2</sub>), nitrogen (N<sub>2</sub>), oxygen (O<sub>2</sub>), methane (CH<sub>4</sub>), hydrogen sulfide (H<sub>2</sub>S) and total non-methane organic compounds (NMOC) in the digester gas;
  - c. Stack gas flow rate from each flare (dry basis);
  - d. Concentrations (dry basis) of CH<sub>4</sub>, NMOC, NO<sub>x</sub>, CO, and O<sub>2</sub> in the stack gas for each flare.
  - e. The NMOC, methane, and hydrogen sulfide destruction efficiencies achieved by each flare; and
  - f. The average combustion temperature for each flare during the test period.

The Source Test Section of the District shall be contacted to obtain approval of the source test procedures at least 14 days in advance of each source test. The Source Test Section shall be notified of the scheduled test date at least 7 days in advance of each source test. The source test report shall be submitted to the Compliance and Enforcement Division and to the Source Test Section within 60 days of the test date. (Basis: Cumulative Increase, Regulation 2-1-301, 9-1-302)

8. In order to demonstrate compliance with the above conditions, the owner/operator shall maintain the following records in a District approved logbook:
  - a. Record the operating times and the combined digester gas flow rate to A-194 and A-195 on a daily basis. Summarize these records on a monthly basis. Calculate and record the combined heat inputs to A-194 and A-195.
  - b. Maintain continuous records of the combustion zone temperature for A-194 and A-195 during all hours of operation.
  - c. Maintain records of all test dates and the test results performed to demonstrate compliance with Parts 3, 4, and 5 above and any applicable rule or regulation.

All records shall be maintained on site or shall be made readily available to the District staff upon request for a period of at least 5 years from the date of entry. These record keeping requirements do not replace the record keeping requirements contained in any applicable rules or regulations. (Basis: Cumulative Increase, 2-1-301, 9-1-302)

9. The owner/operator shall ensure that the emissions of Nitrogen Oxides (NO<sub>x</sub>) from A-194 and A-195 do not exceed 0.06 pounds per million BTU (calculated as NO<sub>2</sub>). (Basis: RACT)
10. The owner/operator shall ensure that the emissions of Carbon Monoxide (CO) from A-194 and A-195 do not exceed 0.2 pounds per million BTU. (Basis: RACT)
11. The owner/operator shall ensure that the emissions of Hydrogen Sulfide (H<sub>2</sub>S) from A-194 and A-195 do not exceed 0.032 pounds per hour. (Basis: Regulation 9-2)

~~3. Digester gas total sulfur content shall not exceed 340 ppmv on an annual average basis. (Basis: RACT, BACT)~~

- 4.12. The Permit Holder shall demonstrate compliance with the above limit by conducting weekly sampling and testing of the digester gas according to any of the following methodologies (Basis: Regulation 1-441):
  - a. Draeger Tube Test Method: A Draeger Tube test or a meter using a Draeger H2S sensor, Part No 680910, or equivalent, demonstrating an H2S level up to 200 ppmv shall demonstrate compliance with the above limit. An H2S measurement by Draeger Tube exceeding 200 ppmv shall not be deemed a violation but shall trigger a requirement to demonstrate compliance using either of the following methods b or c.
  - b. Portable Instrument Method: A Draeger PAC-III (or equivalent) portable meter with a hydrogen sulfide sensor capable of measuring over 800 ppmv hydrogen sulfide. In the event that sulfide levels exceed 800 ppm, the Permit Holder shall commence to perform a source test using method c, as follows.

- c. Chromatographic Method: The Permit Holder 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 APCO.

An application for a change of condition to allow an alternative method for sampling and testing of the digester gas for sulfides shall be handled as a minor revision to the Title V Permit.

5-13. The permit holder shall record the dates, hours of use, and the purpose of flaring in a District-approved logbook, when any of the flares are used. (Basis: Regulation 2-6-409.2)

**RECOMMENDATION**

It is recommended that an Authority to Construct be issued to EBMUD for the following:

- A-194 Digester Gas Enclosed Flare, Abutec, 1500 scfm digester gas capacity, 63 MMBtu/hr, maximum**
- A-195 Digester Gas Enclosed Flare, Abutec, 1500 scfm digester gas capacity, 63 MMBtu/hr, maximum**

It is also recommended that a Permit to Operate be issued to EBMUD to perform the modification to the following equipment:

- S-180 Anaerobic Digesters (11)**

By: \_\_\_\_\_  
Simrun Dhoot  
Air Quality Engineer

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