

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**

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Application 3926

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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 Volume 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, of more than 100 tons per year of a regulated air pollutant, by virtual of the combustion processes.

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.

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. This application is for a permit renewal. Although the current permit expired on June 30, 2002, it continues in force until the District takes final action on the permit renewal. The standard sections of the permit have changed since the permit was first issued. The proposed permit shows all changes to the permit in strikeout/underline format.

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, and cogeneration engine generators.

Average dry weather wastewater flow capacity is approximately 120,000,000 gal/day. Average wet weather flow capacity is approximately 325,000,000 gal/day. 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 NO_x and CO have the potential to emit more than 100 tons per year, hence East Bay Municipal Utility District's need for a Federal Title V Major Facility Permit.

C. Permit Content

The legal and factual basis for the permit follows. The permit sections are described in the order presented in the permit.

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. 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.

SIP Regulation 2, Rule 4 - Permits, Emissions Banking and BAAQMD Regulation 2, Rule 6 - Permits, Major Facility Review have been added to Standard Condition 1.A.

Standard Condition I.B.1 has been modified to explain that the facility may continue to operate after the permit expiration date if the facility has submitted a complete and timely application and the District has not acted on the application. This is the "application shield" pursuant to BAAQMD Regulation 2-6-407.

Standard Condition I.B.11, which requires the responsible official to certify all documents submitted, was added to conform to changes in Regulation 2, Rule 6.

Standard Condition I.E.1 requiring the permit holder to provide any information, records, and reports requested or specified by the APCO, was added because it was omitted in error.

The following language was added as Standard Condition I.B.12: "The permit holder is responsible for compliance, and certification of compliance, with all conditions of the permit, regardless whether it acts through employees, agents, contractors, or subcontractors. (Regulation 2-6-307)." The purpose is to reiterate that the Permit Holder is responsible for ensuring that all activities at the facility comply with all applicable requirements.

The dates of the reporting periods and reporting deadlines have been added to Standard Conditions I.F and I.G for additional clarity.

The first sentence of Standard Condition I.F has been changed from " All required monitoring reports must be submitted to the District at least once every six months." to " Reports of all required monitoring must be submitted to the District at least once every six months, except where an applicable requirement specifies more frequent reporting. " to conform more closely to BAAQMD Regulation 2-6-409.18.

The minor addition of the word "prepared" was made to Standard Condition I.F to conform to the current standard.

Standard Condition I.H was modified to conform to the current standard.

Standard Condition I.J has been added to clarify that the capacity limits shown in Table II-A are enforceable limits.

The section on Accidental Releases has been removed. Originally the Permit Holder used gaseous chlorine for effluent disinfection. The system to inject gaseous chlorine has been removed and a new system to add sodium hypochlorite solution (similar to detergent bleaching agent) has been installed. Therefore the facility is no longer subject to the accidental release provisions of 40 CFR Part 68, which required a Risk Management Plan (RMP) and certain compliance certification requirements. Accordingly any discussion of or reference to Accidental Releases has been removed from the Title V Permit.

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., S-24).

Permitted sources are those sources that require a BAAQMD operating permit pursuant to BAAQMD Rule 2-1-302.

Significant sources are those sources that have a potential to emit of more than 2 tons of a "regulated air pollutant," as defined in BAAQMD Rule 2-6-222, per year or 400 pounds of a "hazardous air pollutant," as defined in BAAQMD Rule 2-6-210, per year.

The District has reviewed the operations at the East Bay Municipal Utility District and concluded that there are no sources at this facility that are exempt and significant, as defined above.

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., A-24). 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”).

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.

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.

Following are explanations of the differences in the equipment list between the time of the most recent Title V Minor Revision permit and the date of issuance of this renewal permit.

Changes to permit:

Devices Removed from Service or Archived since November 14, 2000 Minor Revision - Major Facility Review permit was issued:

Source #	Description	Application Number	Explanation
S-3	Hot Water Boiler (distillate oil, digester gas)	N/A	Boiler archived in December, 1999
S-4	Hot Water Boiler (distillate oil, digester gas)	N/A	Boiler archived in December, 1999
S-6	Hot Water Boiler (distillate oil, digester gas)	N/A	Boiler archived in December, 1999
S-42	Aerosol Can Painting Operation	N/A	Exempt source per BAAQMD 2-1-119.3.
S-44	Chlorination Building	N/A	EBMUD Switched to liquid (hypochlorite) addition. Gaseous chlorination facilities removed. Facility no longer subject to CAA Section 112(R)
S-46	Influent Pump Station	3926	Pump station has been incorporated into source S-110 Headworks
S-150	Tertiary Treatment	N/A	Facility demolished in spring 2004. Source S-150 was to convert wastewater effluent into recycled water for onsite use only. EBMUD has future plans to build an industrial scale tertiary treatment facility – to produce water for recycle uses.

Source #	Description	Application Number	Explanation
S-171	Sludge Handling – GBT 11-east	27693	Source has not been removed; integrated into S-170
S-172	Sludge Handling – GBT 12 – center	27693	Source has not been removed; integrated into S-170
S-173	Sludge Handling – GBT 13 - west	1209	Source has not been removed; integrated into S-170
A-4	Chlorine (Emergency) Scrubber	N/A	Removed from service when S-44 was dismantled
A-5	H2S Wet Scrubber	1068	Replaced by scrubbers: A-461, A-462

Devices Permitted Since 11-14-2000 Major Facility Review permit (Minor Modification) was issued:

Source #	Description	Application Number	Explanation
S-49	Diesel Engine BUG, Portable, Allis Chalmers 134 HP	4077	Permitted under loss of exemption
S-50	Diesel Engine BUG, Detroit Diesel, 238 HP	4063	Permitted under loss of exemption
S-51	Diesel Engine BUG, Generac, 268 HP	4064	Permitted under loss of exemption
S-52	Diesel Engine BUG, Portable, Generac, 280 HP	4078	Permitted under loss of exemption
S-53	Diesel Engine BUG, SN 44852080, 277 HP	4062	Permitted under loss of exemption
A-461	Carbon Adsorption Scrubber-1	1068	Replacement for A-5 H2S Scrubber
A-462	Carbon Adsorption Scrubber-2	1068	Replacement for A-5 H2S Scrubber

Devices with Changed Permit Status since 11-14-2000 Major Facility Review permit (Minor Modification) was issued:

Source #	Description	Application Number	Explanation
S-5	Hot Water Boiler, 90E3 therms/yr	3694, 7012	3694: Change of condition to allow 3 engine simultaneous operation 7012: Change of condition to allow S-5 boiler to operate simultaneously with 2 engines
S-37	Dual Fuel Engine Generator <u>Multi-Fuel Cogeneration Engine #1</u>	3694, 7012	3694: Change of condition to allow 3 engine simultaneous operation 7012: Change of condition to allow S-5 boiler to operate simultaneously with 2 engines 3926: Name changed for clarification purposes
S-38	Dual Fuel Engine Generator <u>Multi-Fuel Cogeneration Engine #2</u>	3694, 7012	3694: Change of condition to allow 3 engine simultaneous operation 7012: Change of condition to allow S-5 boiler to

Source #	Description	Application Number	Explanation
			operate simultaneously with 2 engines 3926: Name changed for clarification purposes
S-39	Dual Fuel Engine Generator <u>Multi-Fuel Cogeneration Engine #3</u>	3694, 7012	3694: Change of condition to allow 3 engine simultaneous operation 7012: Change of condition to allow S-5 boiler to operate simultaneously with 2 engines 3926: Name changed for clarification purposes
S-48	GDF #9008	10237 10353	Change of Condition: GDF modified from underground tank to aboveground tank

District permit applications not included in this proposed permit

At this time, there are no outstanding permit applications which have not been incorporated into the Title V Permit for the East Bay Municipal Utility District.

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* pursuant to the definition in BAAQMD Rule 2-6-239. This facility has no unpermitted significant sources.

Changes to permit:

Language has been added to Section III to clarify that this section contains requirements that may apply to temporary sources. This provision allows contractors that have "portable" equipment permits that require them to comply with all applicable requirements to work at the facility on a temporary basis, even if the permit does not specifically list the temporary source. Examples are temporary sand-blasting or soil-vapor extraction equipment.

Section III has been modified to say that SIP standards are now found on EPA's website and are not included as part of the permit.

The note regarding SIP information from the Rule Development Section has been deleted since the SIP standards are now found on EPA's website.

Table III has been updated by adding the following rules and standards to conform to current practice:

- BAAQMD Regulation 2, Rule 1, General Requirements
- BAAQMD 2-1-429, Federal Emissions Statement
- SIP Regulation 2, Rule 1, General Requirements
- SIP Regulation 6 has been deleted because BAAQMD Regulation 6 is now in the SIP.
- BAAQMD Regulation 8, Rule 40 Aeration of Contaminated Soil and Removal of Underground Storage Tanks
- BAAQMD Regulation 8, Rule 47, Air Stripping and Soil Vapor Extraction Operations
- SIP Regulation 8, Rule 51, Adhesive and Sealant Products
- SIP Regulation 9, Rule 1 has been deleted because BAAQMD Regulation 9, Rule 1 is now in the SIP.
- California Health and Safety Code Section 44300 et seq., Air Toxics “Hot Spots” Information and Assessment Act of 1987
- 40 CFR Part 61, Subpart M, National Emission Standards for Hazardous Air Pollutants – National Emission Standard for Asbestos

The dates of adoption or approval of the rules and their "federal enforceability" status in Table III have also been updated.

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)
- 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’s or EPA’s 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-POTW NESHAP: 40 CFR Part 63, Subpart VVV contains the NESHAP standards for POTWs. 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 major sources for HAP which are defined thusly: *...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 conclude 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 80th % factors as developed by the BAAT-AMSA – CWEA studies in the 1990s. This procedure is the most conservative of the 7 accepted procedures developed for calculating emissions from wastewater processes. Most conservatively, 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 80th 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 flowrate (annualized) is 80 MM gpd. 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.

Digester Gas Combustion, Applicable Regulation 8 Rule: The anaerobic digesters S-180 produce digester gas, which is principally combusted in the digester gas engines or hot water boiler, and secondarily in the digester gas flares. The composition of the digester gas is roughly 59% methane, 41% carbon dioxide, with about 21 ppmv of non methane organic compounds as hexane. The District evaluated whether the digester S-180 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 C) 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 micrograms 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 which, 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.

We conclude the 8-2-301 is applicable to the digester gas sources and combustion devices. Based on the aforementioned calculation presented in Appendix C, 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 an 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, we conclude that the digester S-180 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 will be included Table IV, Applicable Requirements for S-180 Anaerobic Digester as well as all combustion devices burning or abating digester gas.

Compliance Assurance Monitoring: The applicability of compliance assurance monitoring (CAM) must be considered at this facility because the facility uses an emission control device to achieve compliance with a federally enforceable emission limit. The control devices in use are flares A-190, A-191, A-192 and A-193. In addition, the boiler S-5 and cogeneration engines S-37, S-38, and S-39 burn digester gas to make power and heat and therefore control emissions of digester gas. These flares and other combustion devices control emissions from the anaerobic digesters S-180, and are subject to the requirements of 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 C, the District performed a conservative calculation to estimate the NMOC emissions potential from digester gas. The calculation includes all compounds of carbon with the exception of methane and carbon dioxide. EBMUD has a historical maximum daily digester gas production rate of 2,160,000 cu ft (theoretical maximum of 3,800,000 cu ft/day), 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 19 lb per day (see Appendix C for calculation). CAM only applies if the uncontrolled emissions are more than 100 tpy. Since the maximum potential annual uncontrolled emissions are 3.5 ton (6,935 lb/yr), CAM is not required.

112 (j) Case By Case MACT: This requirement does not apply because there are no major sources for HAP, nor does the facility qualify as a major facility for HAP.

Changes to permit

General:

Section IV has been modified to say that SIP standards are now found on EPA's website and are not included as part of the permit.

BAAQMD Regulation 6, Particulate Matter and Visible Emissions, has been added to all combustion sources, since they are sources of particulate emissions. In the case of combustion sources which burn gaseous fuel, BAAQMD Regulation 6-401 is not applicable, since the requirement states "Every person responsible for an emission (except from gas fired heat transfer operations regulated by Sections 6-301, 6-303 and 6-304) shall have and maintain means whereby the operator of the plant shall be able to know the appearance of the emission at all times." The hot water boiler S-5 is a gaseous fuel source. Engines S-37, S-38, S-39 and the diesel gensets S-49 through S-52 are all subject to the Appearance of Emissions requirement, since they also burn diesel fuel (liquid fuel). Our interpretation of this requirement is that the Permit Holder must provide the means for an operator to observe the emissions. In other words, the emission sources may not be placed in such a way as to prevent a plant operator from making a casual observation of the emissions.

BAAQMD Regulation 8, Rule 2, Miscellaneous Operations, has been added to all sources that burn digester gas, since the digester is subject to the standard and the combustion sources are control devices.

BAAQMD Regulation 9 Rule 1, Sulfur Dioxide, has been added to all combustion sources, since they are sources of sulfur dioxide.

By source:

Sources S-3, S-4, S-6 Hot Water Boilers: These sources were shutdown at some point since the original Title V permit application and were physically removed from the site in early 2004. The sources were archived on December 31, 1999, and are hence no longer sources at EBMUD.

S-5 Hot Water Boiler, S-37, S-38, S-39, Applications 3694 and 7012: The first and foremost change to the permit involves the firing capacity of the cogeneration engines S-37, S-38 and S-39 as listed in the source table in the original Title V permit. A typographical error showing 10.65 MM Btu/hr firing capacity (shown in the original source listing) has been corrected to 19.8 MM Btu/hr. There has been no increase in the engines capacities. The erroneously stated 10.65 MM Btu/hr was discovered to be a typographical error and needed to be corrected.

Beyond that, boiler S-5 and cogeneration engines S-37, S-38, and S-39 have all experienced several changes in their operating conditions as a result of the above permit applications 3694 and 7012. Both of these applications and the attendant operating and condition changes will be discussed in turn.

Prior to the above two permit applications, S-5 and the engines S-37, S-38 and S-39 were restricted by Condition 278 which allowed the two following operating modes:

1. Operate with a maximum of two of the three engines and no boiler simultaneously, (this operating mode was changed in Application 3694)
2. Operate a maximum of 1 engine (either S-37, S-38 or S-39) and boiler S-5 simultaneously (this operating mode was changed in Application 7012).

Note: Since the boiler S-5 and cogeneration engines were all included under the same condition, any alteration of the condition affects all of the above sources.

Application 3694 was for a change of condition to change operating mode #1, above, to allow the operation of all three engines simultaneously. The three cogeneration engines S-37, S-38 and S-39, all 2980 BHP multi-fuel cogeneration engines, were originally permitted in 1982 on the basis of two engines operating simultaneously with the third engine as a spare.

The engines were subsequently modified in 1995 (AN 25067) with Cooper Industries Clean-Burn Heads. The modification was done to ensure compliance with the BARCT-based Regulation 9 Rule 8. Although the BARCT application in 1995 required the engines to meet a maximum NO_x level of 140 ppm @ 15% O₂ and 2000 ppmv CO @ 15% O₂, the source tests have shown the engine emissions are below the BARCT levels. Source test averages for the years 2000, 2001, 2002, indicate the engines are consistently achieving BACT₂ for NO_x, CO and POC for digester gas/natural gas fired engines and may meet BACT₁ emission levels as well.

Permitting Basis: Offsets for the original engine project in 1982 were provided from the available onsite emission offsets + utility offset credits + credits provided as per AB 1862 for the citing of cogeneration projects. The basis for permit application 3694 was to keep the two engines S-37 and S-39 on an "as is" condition - subject to the current BARCT emission standards of 9-8-302, permitted to operate at 100% operating factor. Engine #2 (S-38) was permitted as a new source, subject to NSR requirements for BACT, Offsets, and Toxics. To replace the old condition 278, a new single permit condition was developed for all three engines as well as the existing S-5 boiler.

BACT: Engine S-38 was subject to BACT for PM₁₀, POC, NO_x, SO₂ and CO. BACT was determined to be 0.085 g/bhp-hr for PM, 3.0 g/bhp-hr for CO, 1.25 g/bhp-hr for NO_x, 0.6 g/bhp-hr of POC, and 0.3 g/bhp-hr for Sox. The engine was subsequently conditioned to the above levels for NO_x, POC, CO, and PM. Since SO₂ emissions from the engine are a function of the fuel, the gaseous fuel sulfide condition part was revised accordingly.

Offsets: The facility emissions of POC and NO_x, post-project (AN 3694), were projected to be greater than 50 tpy, hence offsets for the project were required at a ratio of 1.15 to 1.0.

California Health and Safety Code (H&S) Section 42314 allows the District to provide offsets for “cogeneration technology projects” or “resource recovery projects”, if the District has established a sufficient growth allowance to cover the emissions from the project, and if the project meets the criteria identified in H&S Section 42314(a)(1-5). These criteria were met with this project and the offsets provided accordingly from the District small facilities bank account.

Toxic Evaluation: A toxic risk evaluation was performed for engine S-38 based on actual onsite meteorological data as well as actual source test developed emission factors. The results showed that the health risks experienced by the maximally exposed individual are well below toxic threshold levels. There is no significant risk to any off-site receptor and therefore the engine complied with toxic risk analysis.

Notes on NO_x from S-38: Engine S-38 has demonstrated the ability to operate at an emission level less than 1 g/hp-hr. A review of past source tests indicate that although the engine can typically achieve 1 g/hp-hr, when the engine approaches a time when an overhaul is needed, the 1 g/hp-hr may be exceeded at times. This standard of 1.0 g/hp-hr represents BACT2 for a natural gas fired engine, and BACT1 for a digester gas fired engine. Upon review of the testing history for the engines at EBMUD, and upon further consideration we have determined that engine S-38 will be conditioned to 1.25 g/bhp-hr (BACT2 for digester gas fired engine, achieved in practice). If the limit of 1.25 g/hp-hr is exceeded EBMUD would be in violation of their permit condition. The emission level of 1.0 g/hp-hr will be established in the permit conditions as an emission level triggering the action to either retest to verify the emission level or shut down the engine for maintenance.

The fact that the engine is a compression ignition engine with some diesel fuel for a pilot should be reiterated. Current BACT limits for a compression ignition diesel-fired engine is 6.9 g/hp-hr for BACT2 and 1.5 g/hp-hr for BACT1. Engine S-38 will be conditioned to a maximum emission level of 1.25 g/hp-hr, with engine maintenance required if 1.0 is exceeded. Clean-burn engine S-38 conditioned to a maximum NO_x dual standard represents the most stringent emission limitation achieved by an emission control device or technique for the type of equipment comprising the source.

One further addition from AN 3694 was to specify in the conditions, the allowable fuels which could be used and the appropriate circumstances of use. The engines are allowed to use digester gas, natural gas or a blend along with a slipstream of diesel for a pilot. Additionally the engines may be fired on 100% diesel during certain specified transient periods or when catastrophic damage to the natural gas supply occurs, if there is insufficient digester gas. This is an operating mode that EBMUD has employed since the engines were installed, but needed to be added to the conditions for clarifying purposes.

Application 7012 was to modify the operating conditions for engine S-37, S-38, S-39 and boiler S-5 to allow the simultaneous operation of up to two engines and the boiler as needed. Since the conditions for the engines and boilers had been modified in application 3694 to add a third engine to the pre-existing maximum allowable two engine operation, the three engine operating

mode became the basis for the emissions cap. In addition to the above changes, EBMUD source tested the boiler and discovered the capacity was less than 10 million BTU/hr operated on 100% digester gas. This allowed the boiler to be exempted from the emission limitations of Regulation 9, Rule 7, as long as certified tune-ups were regularly performed on the boiler.

The boiler emissions used in the evaluation were based on AP-42 derived data. A comparison of both the worst case and actual emissions cases for 3 engine operation vs. 2 engines + S-5 boiler shows there is no emission increase with this operational change for this application. Similar trends are fully expected for the other criteria pollutants POC and PM10. Likewise SO₂ emissions will not increase as they are a function of sulfide content in digester gas, with the maximum feedrate of the boiler well below that of any single engine.

In summary, the cogeneration engines and the boiler S-5 all operate under a single condition with their operating modes contingent on permitted co-operating emission levels.

The baseline worst case emission levels is with all three engines operating simultaneously. Under this case boiler S-5 may not operate coincidental with the engines. The basis for this operation is for engine S-37 and S-39 to be subject to their original conditioned emission levels based on BARCT technology – the installation of clean-burn technology in 1995. Engine S-38 is subject to BACT and must demonstrate annually compliance with those specifications. The boiler-engine cooperation allows up to two engine (any two engines) to operate simultaneously with the boiler. These operating modes are reflected in the new Condition 20651.

An additional clarification was made in AN 7012, specifying that only digester gas may be used for fuel in boiler S-5 (included in Condition 20651).

S-42 Aerosol Painting Operation: This source is exempt from permit requirements and is therefore being de-listed in the permitted source listing. This source was mistakenly permitted although exempt by Reg 2-1-119.3 which exempts any source which employs only non-refillable hand held aerosol cans. This is a minimal source as aerosol painting is only used for small projects, touchups, etc. This exempt source is not a significant source of either a regulated pollutant or a hazardous air pollutant.

S-44 Chlorination Building: The chlorination building housed the gaseous chlorine storage tanks and injection facilities and is no longer used. EBMUD handles disinfection requirements by injecting sodium hypochlorite solution into the wastewater. The chlorination building is no longer operational and the continuation as a source no longer appropriate. Likewise disinfection with sodium hypochlorite is exempt from permitting per Regulation 2-1-103, Source Not Subject to any District Rule).

S-46/S-110 Change of Description/Integration of Influent Pump Station S-46: To further improve consistency in source descriptions and to integrate like source groups, source S-46 identified as Influent Pump Station has been archived and the influent pump station included in the description of S-110, via AN 1068. In addition the old H₂S scrubber A-5 has been replaced with new carbon adsorption scrubbers A-461 and A-462. The new scrubbers are expected to result in improved scrubbing of the vapors vented from S-110. There is no process change and

there are no discrete emissions which can be charged against the influent pump station. The new description of S-110 is as follows: S-110 Headworks; IPS, Barscreens.

S-48 Gasoline Dispensing Facility (G-9008) AN 10353-Title V + AN 10237 (NSR): This application was to replace their existing underground gasoline storage tank with an above-ground tank. The GDF was originally permitted to pump 400,000 gal of gasoline per year. The permit was processed as a no net increase permit, and since above-ground tanks have higher emissions per unit of gasoline pumped, the permitted throughput has been reduced to 334,000 gal/yr. The NSR application was 10327 and the Title V Minor Modification permit was AN 10353. This work has been completed and the GDF relevant operating condition changed from 7523 (400,000 gal/yr) to condition 21663 (334,000 gal/yr) and 16516 (requiring an annual static pressure test).

S-49, Portable Backup Generator (BUG), 134 HP (Loss of Exemption AN 4077): This application was for the loss of exemption permitting of a portable emergency diesel engine powered generator. The engine was permitted to operate as a portable emergency backup generator subject to Condition 19058, which establishes the time limits for portability, the maximum hours of operation in the proximity of a school, fuel sulfur content limitations, and other appropriate specifications as well as monitoring, recordkeeping and reporting. In addition to the above operating conditions, the engine must meet federally enforceable regulations for particulate/visible emissions (Regulation 6) and sulfur dioxide (Regulation 9-1).

S-50, Backup Generator (BUG), 238 HP (Loss of Exemption AN 4063): This application was for the loss of exemption permitting of an emergency diesel engine powered generator, size 238 hp. The engine was permitted to operate as a portable emergency backup generator subject to Condition 19040. This condition establishes conditions on the type of operation, diesel fuel sulfur content limitations, as well as monitoring, recordkeeping and recording. Since this engine is less than 250 hp and was installed prior to May 17, 2000, there is to be no condition limiting the hours of operation of the engine, although the engine is only allowed to operate for reliability and emergency purposes. The lack of no hourly operating limits is due to the fact that prior to May 17, 2000, all engines less than 250 hp were exempt from permit requirements regardless of intended use. In addition to the above operating conditions, the engine must meet federally enforceable regulations for particulate/visible emissions (Regulation 6) and sulfur dioxide (Regulation 9-1).

S-51, Backup Generator (BUG), 268 HP (Loss of Exemption AN 4064): Engine generator S-51 was permitted under loss of exemption permit application 4064 to operate as an emergency backup generator although no permit conditions were established. Since the engine is larger than 250 hp, S-51 will be permitted to operate for a maximum of 200 hours per year and for unlimited hours during actual emergencies according to permit condition 21921. This condition establishes conditions on the type of operation, diesel fuel sulfur content limitations, as well as monitoring, recordkeeping and recording. In addition to the standard operating conditions containing the above requirements, the engine must meet federally enforceable regulations for particulate/visible emissions (Regulation 6) and sulfur dioxide (Regulation 9-1).

S-52, Portable Backup Generator (BUG), 238 HP (Loss of Exemption AN 4078): This application was for the loss of exemption permitting of a portable emergency diesel engine

powered generator. The engine was permitted to operate as a portable emergency backup generator subject to Condition 19184, which establishes the time limits for portability, the maximum hours of operation in the proximity of a school, fuel sulfur content limitations, and other appropriate specifications as well as monitoring, recordkeeping and reporting. In addition to the above operating conditions, the engine must meet federally enforceable regulations for particulate/visible emissions (Regulation 6) and sulfur dioxide (Regulation 9-1).

S-53, Backup Generator (BUG), 277 HP (Loss of Exemption AN 4062): Engine generator S-53 was permitted under loss of exemption permit application 4062 to operate as an emergency backup generator under template condition 19534. Since the template condition only requires the keeping of records for 2 years, a new condition was necessary- condition 21924. This condition establishes conditions on the type of operation, diesel fuel sulfur content limitations, as well as monitoring, recordkeeping and recording. Since the engine is larger than 250 hp, S-53 has been permitted to operate for a maximum of 200 hours per year and for unlimited hours during actual emergencies. In addition to the standard operating conditions containing the above requirements, the engine must meet federally enforceable regulations for particulate/visible emissions (Regulation 6) and sulfur dioxide (Regulation 9-1).

S-100 Municipal Wastewater Treatment Plant: There was no existing permit condition for this source; therefore condition 21759 has been established for source S-100. This new condition will establish a maximum dry weather flow limit, a maximum wet weather flow limitation as well as address issues of public nuisance (odors) and monitoring, recordkeeping and reporting.

S-150 Tertiary Treatment, Nitrification Clarifier, Gravity Filtration: This source was demolished in the spring of 2004 although the tertiary treatment operation has been out of service for some time. This source was constructed to provide recycle water for irrigation and testing requirements at EBMUD. Since the source is no longer in operation, S-150 has been appropriately archived.

S-180 Anaerobic Digesters, (11), 10 Floating Cover, 1 Dystor: The former condition for S-180, Condition 13132, as established in the original Title V Permit, states the following:

For S-180 Anaerobic Digesters; 12 Floating Cover Digesters

1. S-180 shall be vented to A-190, A-191, A-192 or A-193, Digester Gas Flare in addition to, or when not vented to S-37, S-38, S-3, S-4, S-5 or S-6. (Basis: BAAQMD 1-301)

This condition will be modified for the purposes of correction, clarification and expansion of requirements. First the description is incorrect. Originally, the source was described as having 12 floating cover digesters. This was never completely accurate. Actually there are now 10 floating cover digesters and a single Dystor unit – which is a combination digester/storage vessel. One digester was taken out of service and is now used to contain the hypochlorite storage and injection equipment. This structural unit will never be placed back in digester service.

The Dystor unit is a combination digester and digester gas storage unit, and is the location for the main digester gas header manifold which makes the gas available for combustion at the

cogeneration engines S-37, S-38, S-39 and/or S-5 boiler or at the flares. As noted in a previous discussion, boilers S-3, S-4 and S-6 are no longer in service and all references to them will be deleted.

Digester Gas-Incidental leakage: The issue of unintentional, non-accidental and unavoidable digester gas leakage needs to be addressed. The above condition 13132 has been interpreted to mean that all digester gas must be processed first in a heat recovery unit and if heat recovery is not possible, in a gas destruction unit (a flare). This is an impossible requirement due to the digester gas system design; on an ongoing basis there will be some unavoidable leakage of digester gas to the atmosphere.

The 11 digesters (including the Dystor unit) are placed in two rows of vessels in an area roughly covering 3 city blocks. Each unit has an external floating cover, with a pressure relief valve, and flexible piping joined to the digester gas header system. Operationally the digesters are all unique, with some producing more or less digester gas based on the biological conditions and the nature of the digester feed. Due to the pressure drop created by the length of flexible piping involved, occasionally a floating cover relief valve will vent. Owing to the system's physical design this is unavoidable, as the tank pressure must be relieved for safety reasons. Although this is not a daily occurrence, it does happen on occasion and may be discovered upon operator inspection.

Furthermore, the external floating roof covers, while fairly snug, are not airtight. Over the years of operation, some activated digester sludge material has extruded from around the edges of the cover and bubbling occurs where some digester gas is produced and/or escapes into the ambient air above the cover of the tank. This has been happening since the tanks were constructed and placed in service and will continue until the tanks are redesigned or replaced with fixed roof tanks.

In addition, the Dystor unit has a potential for periodic venting of small amounts of diluted digester gas in order to maintain safe operation. The need to modify Condition 13132 to account for routine digester gas leakage became apparent recently (April-May 2004) when a tear (leak) seemed to be evident in the Dystor flexible cover. This cover consists of an inner and outer membrane with an air chamber between the two layers to maintain a somewhat rigid bubble (covering) over the digester while allowing for fluctuations in digester gas storage. The manufacturer indicates that during operation of this flexible system there occurs some routine diffusion of digester gas into the air chamber. Further, when the Dystor air chamber is deflated to allow increased storage of digester gas, any diffused digester gas [within the air chamber] is released to the atmosphere.

During the April 2004 leak episode, however, increased purging of the air chamber became necessary when the digester gas concentration in the air chamber rose to unsafe levels. EBMUD routinely monitors the concentration of digester gas manually in the air chamber to ensure that a potentially explosive mixture of gas/air is never reached. An air purge is actuated when 20% of the LEL (lower explosive level) is reached within the Dystor air chamber. EBMUD sought and obtained a District staff-supported variance to purge the Dystor and to replace the flexible membrane at the earliest possible moment.

The environmental impact of this purging was not significant. After discovery of the elevated digester gas levels indicating a tear in the inner membrane, air purging of the air chamber was commenced and continued until the digester was removed from service and the membranes replaced, a total of 60 days. During this time the total quantity of digester gas which was vented was estimated (based on daily monitoring and recording) at 448,000 cu feet total for the 60-day period. This amounts to an emission of approximately 273,000 cu feet of methane, a non-regulated non-precursor organic compound and approximately 175,000 cu ft of CO₂ (at this writing a non-regulated compound). Based on regular monitoring the cumulative H₂S emission over the entire period were approximately 1.6 lb and the emissions of precursor organic compounds approximately 2 lb. This is based on an average H₂S and POC concentration of 43 and 20 ppmv, respectively.

District Staff modeled the resulting concentrations of H₂S and POC at the fence line to estimate the acute health risks as well as the chronic health risk (carcinogenic and non-cancer). The modeling study indicated that the acute and chronic hazard indices for both H₂S and POC (conservatively modeled as acrolein for acute risks and 1, 3 butadiene for cancer risk) combined were well below 1.0, which is the established level of significance. The maximum measured H₂S level in the purged membrane gas was 1 ppm. Furthermore, the carcinogenic residential risk from POC (modeled as 1, 3 butadiene, as worst case) at the fence line, was less than 1 in a million, which is the established level of significance. The chronic hazard index and carcinogenic risks were based on a 70 year continuous exposure. Further, based on 120 ppm H₂S in digester gas (high end, conservative), the modeled H₂S concentration at the location of the maximally exposed individual (fenceline) was 0.00003 ppm – well below the 0.06 ppm 3-minute average specified in Regulation 9-1-301.

In reality, the fugitive or short-term unavoidable and incidental emissions of digester gas are expected to be far less than occurred during the recent Dystor leak episode, and therefore are not considered a significant health or environmental risk. The POC emissions in digester gas are, in reality, a combination of a number of substances, with acrolein and 1, 3 butadiene chosen to represent the whole due to the conservatively low reference exposure level and high unit risk value, respectively. The average historic concentration of all combined precursor organic compounds is approximately 50 micro-gram/liter, with a maximum of 82 micro-gram/liter (which equates to 16 ppmv based on average molecular weight of 113).

Issues of digester gas leakage from the normal day to day operations of the anaerobic digester(s) S-180 are not expected to be an acute or chronic health concern. Inherent design limitations or standard operation and maintenance activities where incidental emissions of digester gas could be expected include the following scenarios:

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

The concern from digester gas leakage is related to noxious odors or public nuisance. On a long term basis, the Permit Holder plans to remedy the leakage of digester gas from the pressure relief valves and external floating covers when the entire system of digesters are redesigned to a fixed roof configuration and a low pressure-drop digester gas supply header.

Digester Gas Sulfide Levels: Regulation 9-1-302 establishes an exhaust limit of 300 ppm sulfur dioxide from any emission stream. An SO₂ level of 300 ppmv in the flue gas translates to an approximate digester gas H₂S level of 1545 ppmv. To ensure the 300 ppmv standard is not exceeded, a limit of 1500 ppmv of sulfide in the digester gas will be established in a permit condition to ensure ongoing compliance with the 300 ppmv SO₂ exhaust concentration standard of Reg 9-1. EBMUD controls their sulfide concentration to levels below 300 ppmv by ferric sulfide addition and therefore an exceedance of this limit is not expected nor acceptable for process reasons.

It should be further noted that EBMUD used Draeger tube technology to measure H₂S levels in the 200 ppmv range or less, while their operators have portable test methods capable of measuring H₂S levels over 800 ppmv. In light of this, condition wording will be added for S-180 requiring the use of gas chromatography to determine compliance with the 1500 ppmv limit in the event a reading above 800 ppmv is detected.

Existing condition 13132 shall be archived and a new condition established for S-180 anaerobic digesters, as follows.

The recommended revised permit conditions for S-180 are as follows:

For Source 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-5, except as specified in part 2. (Basis: Regulation 1-301)
2. Emissions from S-180 shall be abated by any of the following: A-190, A-191, A-192 or A-193 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, preventive or corrective maintenance, and/or safety 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 digester gas could be expected 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 operation.
- c. Manual draining of condensate from digester gas piping.
- d. Removing a digester or digester gas component from service.
- e. Collecting digester sludge samples through thief holes on digester covers.

- f. Digester gas diffusion through the Dystor membrane.
- g. Manual venting of digester gas through thief holes to avoid tipping of digester covers.

If detected and 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 or Toxic Risk Management Policy. (Basis: Regulation 1-301, Cumulative Increase)

- 3. Digester gas total sulfur content shall not exceed 1500 ppmv. (Basis: Regulation 9-1-302)
- 4. The Permit Holder shall demonstrate compliance with the above limit by weekly sampling and testing of the digester gas according to any of the following methodologies:
 - 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 ppmv, 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 alternate method for sampling and testing of the digester gas for sulfides shall be handled as a minor revision to the Title V Permit.

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

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.”

The BAAQMD Compliance and Enforcement Division has conducted a review of compliance over the past year and noted that for the period from October 1, 2003 to October 31, 2004, East Bay Municipal Utility District had one Notice of Violation (NOV); for increased hydrogen sulfide in the feed gas to the engines. There were no odor complaints, no monitoring excesses, and is under no Orders of Abatement.

East Bay Municipal Utility District is, however, under an Enforcement Agreement for the operation of the Dystor/anaerobic digester system. This Enforcement Agreement resulted after the Permit Holder filed for a variance on March 18, 2004 upon the discovery that digester gas was leaking from the inner membrane of the Dystor cover. The variance request was dismissed when the District and the Permit Holder reached an Enforcement Agreement. The Enforcement Agreement is effective from March 4, 2004 until Permit Condition 13132 (for S-180 Anaerobic Digester) is modified and incorporated in the revised MFR permit. Condition 13132 required that S-180 [Anaerobic Digester] be vented to any combination of the waste gas flares in addition to or when not vented to the cogeneration engines or to the boilers. Condition 13132 needed to be rewritten for clarification and to address incidental emissions of digester gas related to inherent design limitations, preventative maintenance and/or safety or operational testing. Condition 13132 has been reviewed and modified –and will have a new condition number – 18860; and will become effective when this Title V Permit becomes effective.

The new Condition 18860 requires abatement of digester gas at the cogeneration engines or hot water boiler or waste gas burners, and specifies that fugitive or short term (design-related) emissions shall not be a violation of the part. Condition 18860 also establishes a digester gas total sulfur content limit of 1500 ppm, to ensure compliance with the 300 ppm SO₂ content stream limitation of 9-1-302. Monitoring required includes: 1) Monthly visual monitoring and recording of [the inspection of] each digester tank, 2) weekly monitoring and recording of the digester gas sulfur content, and recording of the digester flaring activities.

No schedule of compliance is proposed because the revised condition addresses and obviates the non-compliance issue.

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 has 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; 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 or revised as appropriate.

Conditions may also have been deleted due to the following:

- Redundancy in record-keeping 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.

Summary of Changes to Operating Conditions

The following table lists the sources in order with their previous and future (final) condition status. The condition changes will be discussed in the numerical order of the conditions.

Source Number(s)	Previous Condition No	Post-Permit Condition No.
5	278	20651
37	278	20651
38	278	20651
39	278	20651
43	2409	2409
45	2409	2409
47	2409	2409
48	7523	21663, 16516
49	19058	19058
50	19040	19040
51	19041	21921
52	19184	19184
53	19534	21924
100	None	21759
110	17335	17335
170	18006	18006
180	13132	18860

Condition 278 for sources S-3, S-4, S-5, S-6, S-37, S-38, and S-39

This condition was archived as a result of Application #3694 and replaced by Condition 20296. Condition 20296 was archived as a result of Application 7012 and replaced by the final condition, Condition 20651. Sources S-3, S-4 and S-6 were archived in application 3694 and removed from service. The following ~~strikeout~~ text indicates text which has either been deleted or where major revisions/rearrangements were performed. The condition numbers shown in Condition 278 are the numbers which were used in this condition, and the requirements listed next to the numerals may or may not carry forward in the replacement condition, Condition 20296. See the comments noted in italics throughout the condition, as well as the new condition # 20296, listed later on in this Statement of Basis.

- For: S-37, Dual Fuel Engine Generator
- S-38, Dual Fuel Engine Generator
- S-39, Dual Fuel Engine Generator
- ~~S-3, Hot Water Boiler~~
- ~~S-4, Hot Water Boiler~~
- S-5, Hot Water Boiler
- ~~S-6, Hot Water Boiler~~

Sources S-3, S-4, and S-6 were removed from service and archived in Application 3694.

1. ~~The total nitrogen oxide emissions from each of the~~

~~three engines, S-37, S-38, and S-39, shall not exceed
140 ppmvd @15% Oxygen. (Basis: Regulation 9-8-302)~~

The NO_x standard for Source S-38 was changed from 140 ppmvd @ 15% oxygen (BARCT) to 1.25 g/bhp-hr (BACT) in application 3694. The 140 ppm standard for engines S-37 and S-39 was not changed.

- ~~2. The total carbon monoxide emissions from each of the
three engines, S-37, S-38, and S-39, shall not exceed
2000 ppmvd @15% Oxygen. (Basis: Regulation 9-8-302)~~

The CO standard for Source S-38 was changed from 2000 ppmvd @ 15% oxygen (BARCT) to 3.0 g/bhp-hr (BACT) in application 3694. The 2000 ppm standard for engines S-37 and S-39 was not changed.

- ~~3. The total diesel fuel used shall not exceed 550
gals/stream day. (Basis: Cumulative Increase)~~

Diesel fuel usage was reevaluated and clarified in AN 3694. The new limit is 150,000 gallons in any rolling 365-day period (reduction from 550 gal/day X 365 = 200,750 gal/yr). This revised (voluntary) limit amounts to a calendar average of approximately 411 gal/day. Adjusting the limit from a daily limit to an annual allows the diesel limit to more accurately reflect what is actually needed, while providing additional operational flexibility in the form of an annual (365 day) average.

4. Except as provided by Part Condition #5, the four hot water boilers (S-3, S-4, S-5, S-6) shall be operated only on a standby basis, during periods when the Power Cogeneration station is inoperative. (Basis: Cumulative Increase)

- ~~5. EBMUD shall not operate more than two of the three
engines (S-37, S-38, S-39) or one engine and hot
—water boiler S-5 at a time.
—(Basis: Cumulative Increase)~~

AN 3694 was submitted principally to change this part to allow the simultaneous operation of S-37, S-38 and S-39. Issues of BACT, offsets, and toxic risk management were addressed in this application.

6. In order to qualify for exemption from the NO_x and CO emissions limits of District Regulation 9, Rule 7, the hot water boiler S-5 is limited to less than 90,000 therms of heat input per unit in any consecutive 12-month period. (Basis: Regulation 9-7-111)
7. To determine compliance with the above conditions, the Permit Holder shall maintain the following records and provide all of the data necessary to evaluate compliance with the above conditions, including the following information:
 - a. Daily records of the hours of operation of each engine and boiler S-5.

- b. Total digester gas, natural gas, and/or diesel consumption for the engines and boiler S-5.

All records shall be retained on-site for five years, from the date of entry, and made available for inspection by District staff upon request. These recordkeeping requirements shall not replace the recordkeeping requirements contained in any applicable District Regulations. (Basis: BAAQMD Regulation 2-6-501)

8. The owner/operator shall ensure that an annual performance test is conducted on each engine in accordance with the District test procedures to demonstrate compliance with the NOx and CO limits required by ~~Conditions-Parts~~ #1 and #2, respectively. The owner/operator may submit an alternative monitoring plan to the District for approval. If the alternative monitoring plan is approved, the plan shall supersede the annual source test requirement. Approvals shall be processed using the permit modification procedure contained in Regulation 2, Rule 6. (Basis: Regulation 2-6-409.2)
9. To demonstrate compliance with the sulfur limits in Regulation 9, Rule 1, every delivery of diesel oil received onsite shall be accompanied by a vendor certification of sulfur content or shall be tested for sulfur content using a District-approved method. The vendor certifications or lab results shall be maintained onsite for at least 5 years and shall be made available to the District upon request. (Basis: Regulations 2-6-409.2, 2-6-501)
10. The owner/operator of the hot water boiler S-5 shall perform an inspection and tune up of the combustion section at least annually to ensure the proper air-to-fuel ratio is being used which maximizes efficiency and minimizes the production of nitrogen oxides and carbon monoxide, following the procedure of Regulation 9, Rule 7, Section 604 (CARB BARCT tune up procedure). The time interval between boiler tune-ups shall not exceed 12 months. (Basis: Regulation 9-7-304)
11. In order to demonstrate compliance with the requirements of ~~condition-part~~ #10, the owner/operator of the Hot Water Boilers S-3, S-4, S-5, and S-6 shall document each combustion unit tune up as follows: (Basis: Regulation 9-7-503.1)
 - a. Time and date of the tune up and the identity of the qualified technician.
 - b. Firing rate (MMBTU/hr), stack gas flow rate (scfm), and temperature (degrees F).
 - c. Stack gas oxygen concentrations (ppm dry) and carbon monoxide concentrations (ppm dry) before and after any adjustments are made.

These records shall be maintained for a period of at least 5 years from the date of the inspection and be available for review by District personnel upon request.

The requirements which are noted above which have not been struck have been essentially carried forward "as is" into the new Condition 20296, although the part number may have been changed.

Condition #911 for source S-42

This condition was archived when source S-42 was removed from service.

Condition #2409 for sources S-45 and S-47

This condition has been modified to improve understandability and to provide clarification. Source S-46, previously tied to this condition, has been removed from service and archived. Additionally, the chlorination building has been removed from service and is therefore no longer a part of source S-43.

For S-43, ~~Chlorination Building~~ Wet Weather Primary Sludge Thickeners
S-45, Aerated Grit Tanks
~~S-46, Influent Pump Station~~
S-47, Scum Thickening Building

*1. If the District receives more than five confirmed odor complaints within one month, the EBMUD shall take immediate action to remedy the odor problem. (Basis: BAAQMD Regulation 2-1-403)

Condition #7523 for source S-48, GDF #9008

This condition was archived and replaced by Condition 21663 (based on NSR Application #10237). In addition, Condition 16516 was established to require annual pressure leak testing of the new aboveground tank. A Title V Minor Modification application was opened up simultaneously for the NSR Application. The modification of the GDF is now complete and the appropriate changes will be incorporated into this Title V renewal application. The Title V Minor Modification application # 10353 will be closed.

~~Condition 7523~~

~~For S-48, GDF #9008~~

~~*1. Pursuant to BAAQMD Toxic Section Policy, this facility's annual gasoline throughput shall not exceed 400,000 gallons in any consecutive 12-month period. (Basis: BAAQMD Toxic Policy)~~

Condition #13132 for source S-180 Anaerobic Digesters

This condition, as previously written was very basic and will be replaced by Condition 18860. See discussion in Section C.IV of this Statement of Basis.

~~For S-180 Anaerobic Digesters; 12 Floating Cover Digesters~~

~~*1. S-180 shall be vented to A-190, A-191, A-192 or A-193, Digester Gas Flare in addition to, or when not vented to S-37, S-38, S-3, S-4, S-5 or S-6. (Basis: BAAQMD Regulation 1-301)~~

Condition 16516 (For Source S-48 GDF G-9008)

Condition 16516 was added as a result of Application #10237 (NSR Portion) and #10353 (Title V- Minor Modification). The modification of the GDF is now complete and the appropriate

changes will be incorporated into this Title V renewal application. The Title V Minor Modification application will be closed.

Condition 16516

The Static Pressure Performance Test (Leak Test) ST-38 shall be successfully conducted at least once in each twelve consecutive month period after the date of successful completion of the startup Static Pressure Performance Test. Test results shall be submitted to BAAQMD within 20 days of the test date. (basis: Regulation 8-7-407)

Condition #17335 for Source S-110

This condition was added in permit application 1068 and is now being integrated into the Title V Permit. Originally source S-110 (consisting of the headworks, influent pump station, and Barscreens, abated by A-461 and A-462) was not assigned a specific condition. This was addressed in permit application 1068 and condition 17335 established as a result. The individual requirements of this condition are not federally enforceable since the emissions of odorous substances and/or public nuisances are not included in the SIP. Hence the asterisk at the numerals for every part of this condition.

For S-110, Headworks: IPS, Barscreens, ducted to/abated by A-461 and/or A-462

- *1. Source S-110 shall be abated at all times by A-461 and/or A-462 carbon adsorber(s) to control emissions of H2S unless the abatement device is removed from service for maintenance or regeneration purposes. Periods of operation without the use of A-461 or A-462 shall be minimized. (Basis: BAAQMD Regulation 1-301, 2-1-403)
- *2. To ensure good H2S abatement efficiency, EBMUD shall replace or regenerate the carbon adsorption bed in A-461 and/or A-462 upon determination that breakthrough is imminent or has been reached. (Basis: BAAQMD Regulation 1-301, 2-1-403)
- *3. To ensure compliance with Part 2, the inlet and outlet H2S concentrations, as well as any other appropriate operating parameters shall be continuously monitored and reviewed on a daily basis to determine when carbon adsorption bed breakthrough is imminent or has been reached. (Basis: BAAQMD Regulation 1-301, 2-1-403)
- *4. Monitoring records shall be kept and maintained to document periods of shutdown of A-461 or A-462 and to demonstrate compliance with Parts 2 & 3 above. (Basis: BAAQMD Regulation 1-301, 2-1-403)
- *5. If the District receives more than five confirmed odor complaints within one month, the EBMUD shall take immediate action to remedy the odor problem. (Basis: BAAQMD Regulation 1-301, 2-1-403)

Condition 18006 for source S-170

Condition 18006 is similar to Condition 17399 and Condition 16810 (both archived) except for the reference to S-170 instead of S-171, S-172, and S-173, all Gravity Belt Thickeners. The gravity belt thickeners were originally permitted as individual sources S-171, S-172, S-173 in AN 1209, but are more appropriately a single source. All are characterized along with the waste activated sludge thickening centrifuges as source S-170 Sludge Handling. The conditions associated with S-171, S-172 and S-173 have been replaced with Condition 18006 for S-170.

For S –170, Sludge Handling; 3 GBTs, 4 W.A.S. Thickening Centrifuges, Abated by A-7 Atomized Mist Scrubber

1. Throughput
EBMUD shall monitor and record on a daily basis the activated sewage sludge throughput through S-170. (Basis: Cumulative Increase)
2. Abatement
All vapor emissions from S-170 shall be routed under negative pressure to A-7 Atomized Mist Scrubber. (Basis: Cumulative Increase)
3. A-7 Atomized Mist Scrubber shall be properly maintained and kept in good operating condition at all times. (Basis: Regulation 2-1-403)
4. Records
To demonstrate compliance with the above conditions, EBMUD shall keep and maintain the following records in a District approved log: (Basis: Regulation 2-6-409.2)
 - a. Records or all inspections and all maintenance work on A-7. Records of each inspection shall consist of a log containing the date of inspection and the initials of the personnel that inspected A-7.
 - b. Records noting the occurrence and duration of any malfunction of A-7, including the date, the suspected cause of the malfunction, and any action taken to restore normal operation.
 - c. All records shall be retained on-site for 5 years from the date of entry, and made available for inspection by District staff upon request. These recordkeeping requirements shall not replace the recordkeeping requirements contained in any applicable District Regulations.

Condition 18860 For Source S-180

Condition 18860 replaces Condition 13132. See discussion in section C. IV of this Statement of Basis on the rationale for the new condition.

For Source 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-5, except as specified in part 2. (Basis: Regulation 1-301)
2. Emissions from S-180 shall be abated by any of the following: A-190, A-191, A-192 or A-193 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, preventive or corrective maintenance, and/or safety 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 digester gas could be expected 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 operation.
- c. Manual draining of condensate from digester gas piping.
- d. Removing a digester or digester gas component from service.
- e. Collecting digester sludge samples through thief holes on digester covers.
- f. Digester gas diffusion through the Dystor membrane.
- g. Manual venting of digester gas through thief holes to avoid tipping of digester covers.

If detected and 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 or Toxic Risk Management Policy. (Basis: Regulation 1-301, Cumulative Increase)

3. Digester gas total sulfur content shall not exceed 1500 ppmv. (Basis: Regulation 9-1-302)
4. The Permit Holder shall demonstrate compliance with the above limit by weekly sampling and testing of the digester gas according to any of the following methodologies:
 - 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 ppmv, 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 alternate method for sampling and testing of the digester gas for sulfides shall be handled as a minor revision to the Title V Permit.

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

Condition 19040 for Source S-50

Condition 19040 was established in loss of exemption application #4063. This condition is modified to be consistent with District policy. Since this engine is less than 250 hp and was installed prior to May 17, 2000, there is to be no condition limiting the hours of operation of the engine, although the engine is only allowed to operate for reliability and emergency purposes. The lack of no hourly operating limits is due to the fact that prior to May 17, 2000, all engines less than 250 hp were exempt from permit requirements regardless of intended use. However, the engine must meet federally enforceable regulations for particulate/visible emissions (Regulation 6) and sulfur dioxide (Regulation 9-1). The sulfur limit will be assured by adding wording to limit the diesel sulfur level to a level not to exceed 0.5% by weight as required in Regulation 9-1-304.

S-50 Emergency Backup Generator: Diesel Fired, Detroit Diesel, 238 HP, Installed before May 17, 2000

1. Hours of Operation
The emergency standby generator, S-50, shall only be operated for emergency use or for reliability-related activities. No time limit is imposed on the operation for reliability-related activities for S-50. Operation for emergency use is unlimited. [Basis: Regulation 9-8-331, District Diesel Policy]
2. Emergency use is defined as the use of an emergency standby engine during any of the following: [Basis: Regulation 9-8-231]
 - a. Loss of regular natural gas supply.
 - b. Failure of regular electric power supply.
 - c. Flood mitigation.
 - d. Sewage overflow mitigation.
 - e. Fire,
 - f. Failure of a primary motor, but only for such time as needed to repair or replace the primary motor.

3. Reliability-related activities is defined as any of the following: [Basis: Regulation 9-8-232]
 - a. Operation of an emergency standby engine to test its ability to perform for an emergency use, or
 - b. Operation of an emergency standby engine during maintenance of a primary motor
4. This source shall only be fired on diesel fuel with a sulfur content not to exceed 0.5% by weight. [Basis: Regulation 9-1-304]

To demonstrate compliance with the above sulfur limit, the Permit Holder shall secure and maintain onsite, for at least 5 years, one of the following records: [Basis: Regulations 2-6-409.2, 2-6-501]

- a. A written statement, as applicable, received from the diesel fuel supplier(s) certifying that the diesel fuel purchased from the supplier does not exceed 0.5% by weight or meets the sulfur limitations for CARB Vehicular Diesel Fuel as specified in 13 CCR, Section 2281, California Code of Regulations, or
 - b. A vendor certification of sulfur content, or
 - c. Fuel test results showing the sulfur content from a District-approved test.
5. **Monitoring**
The Permit Holder shall equip and operate the emergency standby engine with either: [Basis: Regulation 9-8-530]
 - a. A non-resettable totalizing meter that measures and records the hours of operation, or
 - b. A non-resettable totalizing meter that measures and records the fuel usage.
 6. **Recordkeeping**
The Permit Holder shall maintain the following monthly records in a District-approved log for at least 5 years from the date of entry. The Permit Holder shall make the log available for District inspection upon request. [Basis: Regulations 1-441, 9-8-530]
 - a. Hours of operation (total)
 - b. Hours of operation (emergency).
 - c. For each emergency, the nature of the emergency condition.
 - d. Diesel sulfur records required in Part 4, above.
 - e. Monitoring records as noted in Part 5, above.

Condition 19041 for Source S-51

Condition 19041 Engine generator S-51 was permitted under loss of exemption permit under application #4064 to operate as an emergency backup generator subject to Condition 19041. (Although the BAAQMD Databank indicated Condition 19041 was established for this engine, there is no database record of Condition 19041, hence the following condition needed to be reconstructed from the engineering evaluation, and a new condition number established) Since the engine is larger than 250 hp, S-51 was conditioned to operate for a maximum of 200 hours per year for reliability-related activities and for unlimited hours during actual emergencies according to the new permit condition 21921. This new condition establishes conditions on the

type of operation, diesel fuel sulfur content limitations, as well as monitoring, recordkeeping and recording.

~~1. Hours of Operation: The emergency standby generator, S-51, shall only be operated for emergency use or for reliability related activities. Operation for reliability related activities shall not exceed 200 hours per calendar year for S-51. Operation for emergency use is unlimited. [Basis: 9-8-330]~~

~~2. Emergency use is defined as the use of an emergency standby engine during any of the following: [Basis: 9-8-231]~~

- ~~—1. In the event of loss of regular natural gas supply;~~
- ~~—2. In the event of failure of regular electric power supply;~~
- ~~—3. Flood mitigation;~~
- ~~—4. Sewage overflow mitigation;~~
- ~~—5. Fire;~~
- ~~—6. Failure of a primary motor, but only for such time as needed to repair or replace the primary motor. [Basis: Regulation 9-8-231]~~

~~3. Reliability related activities is defined as the use of an emergency standby engine during any of the following: [Basis: 9-8-232]~~

- ~~—1. Operation of an emergency standby engine to test its ability to perform for an emergency use;~~
- ~~—2. Operation of an emergency standby engine during maintenance of a primary motor.~~

~~4. Monitoring: Each emergency standby engine shall be equipped with either: [Basis: 9-8-530]~~

- ~~—1. A non-resettable totalizing meter that measures and records hours of operation.~~
- ~~—2. A non-resettable fuel usage meter.~~

~~5. Recordkeeping: All records shall be kept for at least two years, and shall be available for inspection by District staff upon request. The operator shall keep a monthly log of usage that shall indicate the following: [Basis: 9-8-530, 1-441]~~

- ~~—1. Hours of operation (total)~~
- ~~—2. Hours of operation (emergency) and the nature of the emergency condition.~~

Condition 19058 for Source S-49

Condition 19058 was established in loss of exemption application #4077 which permitted the portable emergency diesel engine powered generator. Condition 19058 establishes the time limits for portability, the maximum hours of operation in the proximity of a school, fuel sulfur content limitations, and other appropriate specifications as well as monitoring, recordkeeping and reporting.

S-49 Portable Standby Generator: Diesel Fired, Allis-Chalmers 3500 MK11, 134 HP, Installed before May 17, 2000

1. This portable equipment shall operate at all times in conformance with the eligibility requirements set forth in BAAQMD Regulation 2-1-220 for portable equipment. [Basis: Regulation 2-1-220]
2. If the portable equipment remains at any fixed location in the Bay Area Air Basin for more than 12 months, the portable permit will automatically revert to a conventional permanent location BAAQMD permit and will lose its portability. [Basis: Regulation 2-1-220]
3. Any violation of Part #1, above, shall be reported to the Director of the Compliance and Enforcement Division no later than two business days after the incidence. In addition, any loss of portability per Part #2 shall be reported to the Director of the Compliance and Enforcement Division no later than 30 days after the loss of its portability. [Basis: Regulation 2-1-403]
4. This source shall only be fired on diesel fuel with a sulfur content not to exceed 0.5% by weight. [Basis: Regulation 9-1-304]

To demonstrate compliance with the above sulfur limit, the Permit Holder shall secure and maintain onsite, for at least 5 years, one of the following records: [Basis: Regulations 2-6-409.2, 2-6-501]

- a. A written statement, as applicable, received from the diesel fuel supplier(s) certifying that the diesel fuel purchased from the supplier does not exceed 0.5% by weight or meets the sulfur limitations for CARB Vehicular Diesel Fuel as specified in 13 CCR, Section 2281, California Code of Regulations, or
 - b. A vendor certification of sulfur content, or
 - c. Fuel test results showing the sulfur content from a District-approved test.
5. ~~No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than 3 minutes in any one hour that is as dark or darker than Ringelmann 1 or equivalent to 20% opacity. [Basis: Regulation 6-301] Deleted 12-15-2004~~

Part 5 has been deleted since the engine is an emergency backup engine and is therefore subject to the Ringelmann 2 requirements of Regulation 6-303.

6. This source shall not emit emissions in sufficient quantities as to cause a public nuisance under Regulation 1-301. [Basis: Regulation 1-301]
7. This source shall not be operated for longer than 72 consecutive hours within 1,000 feet of a school. To operate for longer than 72 consecutive hours within 1,000 feet of a school, the Permit Holder must submit an application to the District so that proper notification of your intended operation can be made known to the affected public in advance of any continued usage of the equipment. [Basis: Regulation 2-1-412]

8. Recordkeeping

The following records shall be kept in a District approved logbook and retained for a period of at least five years following the date of entry. The log shall be kept with the equipment and made available to District staff upon request. [Basis: Regulation 1-441, 9-8-530]

- a. Monthly hours of operation or monthly fuel usage for this source.
- b. The location(s) at which the equipment was operated for more than 72 consecutive hours including the dates operated at each location.
- c. Diesel sulfur records required in Part 4, above.

9. Reporting

The Permit Holder shall notify the District, in writing, as soon as practicable, of the new location in which they intend to operate for longer than 72 consecutive hours. The notification shall include: [Basis: Regulation 1-441]

- a. Brief description of the general nature of the operation.
- b. The estimated duration of the operation at this site.
- c. The name and phone number of a contact person where the equipment will be operated.

Condition 19184 for Source S-52

Condition 19184 was established in loss of exemption application #4078, which permitted the portable emergency diesel engine powered generator S-52. This condition establishes the time limits for portability, the maximum hours of operation in the proximity of a school, fuel sulfur content limitations, and other appropriate specifications as well as monitoring, recordkeeping and reporting. .

S-52 Portable Standby Generator: Diesel Fired, Generac 280 HP, Installed before May 17, 2000

1. This portable equipment shall operate at all times in conformance with the eligibility requirements set forth in BAAQMD Regulation 2-1-220 for portable equipment. [Basis: Regulation 2-1-220]
2. If the portable equipment remains at any fixed location in the Bay Area Air Basin for more than 12 months, the portable permit will automatically revert to a conventional permanent location BAAQMD permit and will lose its portability. [Basis: Regulation 2-1-220]
3. Any violation of Part #1, above, shall be reported to the Director of the Compliance and Enforcement Division no later than two business days after the incidence. In addition, any loss of portability per Part #2 shall be reported to the Director of the Compliance and Enforcement Division no later than 30 days after the loss of its portability. [Basis: Regulation 2-1-403]
4. This source shall only be fired on diesel fuel with a sulfur content not to exceed 0.5% by weight. [Basis: Regulation 9-1-304]

To demonstrate compliance with the above sulfur limit, the Permit Holder shall secure and maintain onsite, for at least 5 years, one of the following records: [Basis: Regulations 2-6-409.2, 2-6-501]

- a. A written statement, as applicable, received from the diesel fuel supplier(s) certifying that the diesel fuel purchased from the supplier does not exceed 0.5% by weight or meets the sulfur limitations for CARB Vehicular Diesel Fuel as specified in 13 CCR, Section 2281, California Code of Regulations, or
- b. A vendor certification of sulfur content, or
- c. Fuel test results showing the sulfur content from a District-approved test.

5. ~~No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than 3 minutes in any one hour that is as dark or darker than Ringelmann 1 or equivalent to 20% opacity. [Basis: Regulation 6-301] Deleted 12-15-2004~~

Part 5 has been deleted since the engine is an emergency backup engine and is therefore subject to the Ringelmann 2 requirements of Regulation 6-303.

6. This source shall not emit emissions in sufficient quantities as to cause a public nuisance under Regulation 1-301. [Basis: Regulation 1-301]
7. This source shall not be operated for longer than 72 consecutive hours within 1,000 feet of a school. To operate for longer than 72 consecutive hours within 1,000 feet of a school, the Permit Holder must submit an application to the District so that proper notification of your intended operation can be made known to the affected public in advance of any continued usage of the equipment. [Basis: Regulation 2-1-412]
8. Recordkeeping

The following records shall be kept in a District approved logbook and retained for a period of at least five years following the date of entry. The log shall be kept with the equipment and made available to District staff upon request. [Basis: Regulations 1-441, 9-8-530]

- a. Monthly hours of operation or monthly fuel usage for this source.
- b. The location(s) at which the equipment was operated for more than 72 consecutive hours including the dates operated at each location.
- c. Diesel sulfur records required in Part 4, above.

9. Reporting
The Permit Holder shall notify the District, in writing, as soon as practicable, of the new location in which they intend to operate for longer than 72 consecutive hours. The notification shall include: [Basis: Regulation 1-441]
 - a. Brief description of the general nature of the operation.
 - b. The estimated duration of the operation at this site.
 - c. The name and phone number of a contact person where the equipment will be operated.

Condition 19534 for Source S-53

Engine generator S-53 was permitted under loss of exemption permit application #4062 to operate as an emergency backup generator under template condition 19534. Since the template condition only requires the keeping of records for 2 years, a new condition was necessary- condition 21924. Condition 19534 has been archived for this source.

~~— REQUIREMENTS FOR ESSENTIAL EMERGENCY ENGINES:~~

~~— An essential emergency engine is one that is used in
— the service of an essential public service. An
— essential public service is defined in Reg. 9-8-233
— as: a sewage treatment facility, and associated
— collection system, which is publicly owned and
— operated; water treatment and delivery operations;
— public transit; police or fire fighting facility;
— airport runway lights; or a hospital or other medical
— emergency facility.~~

~~— 1. Hours of Operation: The owner/operator shall
— operate the emergency standby engine(s) only to
— mitigate emergency conditions or for reliability-
— related activities. Operating while mitigating
— emergency conditions is unlimited. Operating for
— reliability related activities is limited to 200
— hours per any calendar year. [Basis: Reg. 9-8-331]~~

~~— "Emergency Conditions" is defined as any of the
— following:~~

- ~~— a. Loss of regular natural gas supply.~~
- ~~— b. Failure of regular electric power supply.~~
- ~~— c. Flood mitigation.~~
- ~~— d. Sewage overflow mitigation.~~
- ~~— e. Fire.~~
- ~~— f. Failure of a primary motor, but only for such time
— as needed to repair or replace the primary motor.~~

~~— [Basis: Reg. 9-8-231]~~

~~— "Reliability related activities" is defined as any
— of the following:~~

- ~~— a. Operation of an emergency standby engine to test
— its ability to perform for an emergency use, or~~
- ~~— b. Operation of an emergency standby engine during
— maintenance of a primary motor.~~

~~— [Basis: Reg. 9-8-232]~~

~~— 2. The owner/operator shall equip the emergency
— standby engine(s) with either:~~

- ~~— a. a non-resettable totalizing meter that measures
— the hours of operation for the engine; or~~

~~— b. a non-resettable fuel usage meter, the maximum hourly
— fuel rate shall be used to convert fuel usage to hours of
— operation.~~

~~— [Basis: Reg. 9-8-530]~~

~~— 3. Records: The owner/operator shall maintain the
— following monthly records in a District approved
— log for at least 2 years and shall make the log
— available for District inspection upon request:~~

~~— a. Hours of operation (total).~~

~~— b. Hours of operation (emergency).~~

~~— c. For each emergency, the nature of the emergency
— condition.~~

~~— d. Fuel usage for engine(s) if a non-resettable fuel usage
— meter is utilized.~~

~~— [Basis: Reg. 9-8-530, 1-441]~~

Condition 20296 for S-5, S-37, S-38, and S-39

Condition #20296 (established in AN 3694) replaces Condition 278 (original condition for the above sources). The following underline identifies the new requirements established as part of AN 3694. The struck portions indicate the parts removed as part of AN 7012 (final condition 20651)

S-5 Hot Water Boiler

S-37, Multi-Fuel Cogeneration Engine #1

S-38, Multi-Fuel Cogeneration Engine #2

S-39, Multi-Fuel Cogeneration Engine #3

Conditions For S-5 Hot Water Boiler

1. Boiler S-5 shall be fired only on sewage sludge digester gas. (Basis: Regulation 9-7-304)
2. EBMUD shall not operate S-5 hot water boiler simultaneously with more than two of the three cogeneration engines S-37, S-38, or S-39 (Basis: Cumulative Increase)
3. Gross thermal input to S-5 shall not exceed 9.87 million Btu/hr. (Basis: Regulation 9-7-304)
4. The owner/operator of the hot water boiler S-5 shall perform an inspection and tune up of the combustion section at least annually to ensure the proper air-to-fuel ratio is being used which maximizes efficiency and minimizes the production of nitrogen oxides and carbon monoxide, following the procedure of Regulation 9, Rule 7, Section 604 (CARB BARCT tune up procedure). The time interval between boiler tune-ups shall not exceed 12 months. (Basis: Regulation 9-7-304)

5. In order to demonstrate compliance with the requirements of part 4, the owner/operator of the hot water boiler S-5 shall document each tune up as follows: (Basis: Regulation 9-7-503.1)
 - a. Time and date of the tune up and the identity of the qualified technician.
 - b. Firing rate (MMBTU/hr), stack gas flow rate (scfm), and temperature (degrees F).
 - c. Stack gas oxygen concentrations (ppm dry) and carbon monoxide concentrations (ppm dry) before and after any adjustments are made.

Conditions Specific to Cogeneration Engine S-38

6. NOx emissions, calculated as NO₂, shall not exceed 1.25 g/hp-hr, except during transient periods or in the event of catastrophic damage to the natural gas fuel supply, when the engine may be fired solely on diesel fuel.

If a source test demonstrates nitrogen oxide Emissions greater than 1.0 g/hp-hr, but less than 1.25 g/hp-hr, the operator shall either conduct a second source test to verify the results of the first test, or shut down the engine for necessary maintenance. In the event the retest confirms an emission level greater than 1.0 g/hp-hr, the operator shall immediately shut down the engine for maintenance. (Basis: BACT)

This part was established as part of AN 3694 to set BACT-based NO_x limits on engine S-38. See the earlier discussion on NO_x from S-38, in this Statement of Basis for a detailed explanation.

7. The total POC emissions from S-38 shall not exceed 0.6 g/hp-hr, except during transient periods or in the event of catastrophic damage to the natural gas fuel supply, when the engine may be fired solely on diesel fuel.. (Basis: BACT)

This part was established as part of AN 3694 to set a BACT-based POC limit on engine S-38. See the earlier discussion on POC from S-38, in this Statement of Basis for a detailed explanation.

8. The total CO emissions from S-38 shall not exceed 3.0 g/hp-hr, except during transient periods or in the event of catastrophic damage to the natural gas fuel supply, when the engine may be fired solely on diesel fuel. (Basis: BACT)

This part was established as part of AN 3694 to set a BACT-based CO limit on engine S-38. See the earlier discussion on CO from S-38, in this Statement of Basis for a detailed explanation.

9. Filterable particulate emissions from S-38 shall not exceed 0.085 g/hp-hr, except during transient periods or in the event of catastrophic damage to the natural gas fuel supply, when the engine may be fired solely on diesel fuel. (Basis: BACT)

This part was established as part of AN 3694 to set a BACT-based PM limit on engine S-38. See the earlier discussion on PM from S-38, in this Statement of Basis for a detailed explanation.

Conditions Specific to Engines S-37 and S-39

10. The total nitrogen oxide emissions from each of the engines S-37 and S-39, shall not exceed 140 ppmvd @ 15% Oxygen. (Basis: Regulation 9-8-302)
11. The total carbon monoxide emissions from each of the engines, S-37 and S-39 shall not exceed 2000 ppmvd @ 15% Oxygen. (Basis: Regulation 9-8-302)

Conditions Specific to Engines S-37, S-38, S-39

12. Cogeneration engines S-37, S-38, and S-39 shall be fired on sewage sludge digester gas, natural gas, or a blend of the two fuels, with a diesel pilot fuel. The engines may be fired solely on diesel fuel only during transient or emergency periods as defined below. (Basis: Cumulative Increase)

Transient Periods are defined as any of the following:

- a. Engine startup and/or engine shutdown.
- b. Post overhaul break-in periods.
- c. Preventative maintenance periods to prevent injector fouling as per engine manufacturer recommendations.

This part was established in AN 3694 to clarify the allowable fuels for the engines as well as specifying when 100% diesel fuel may be fired in the engines. See the detailed discussion on AN 3694 in this Statement of Basis.

13. Total thermal throughput shall not exceed 19.8 MM Btu/hr per engine. (Basis: Cumulative Increase)

Condition 278 did not include a thermal limitation on the heat input to any of the engines. This thermal limitation is based on the engine capacity, 2980 BHP(output) horsepower of each individual engine.

14. Total combined hours of operation of engines S-37, S-38, and S-39 shall not exceed 25,316 hours in any rolling 365 day period. (Basis: Cumulative Increase)

This condition specifies the maximum annual hours of operation of all three engines combined –effectively setting the boundaries of all three engines operating simultaneously (the purpose of AN 3694). The 25,316 hours per year is based on 100% operation of engines S-37 and S-39 and operation of engine S-38 at 7,796 hr/yr (the basis of AN 3694). The emissions resulting from AN 3694 are a worst case scenario; engine S-38 may be operated up to 8760 hours per year, requiring the other engines S-37 and S-39 to limit their cumulative operation to a maximum of 16556 (0.945 operating factor). Further explanation is provided previously in this Statement of Basis under the discussion on AN 3694.

15. The total diesel fuel fed to engines S-37, S-38, and S-39 combined shall not exceed 150,000 gallons in any rolling 365 day period. (Basis: Cumulative Increase)

This Part was added along with Part 12 to clarify diesel fuel operation. See the detailed discussion on AN 3694 in this Statement of Basis.

16. Sulfide content of the gaseous feed to engines S-37, S-38, and S-39 shall not exceed 340 ppmv at 0% O₂. (Basis: BACT)

This sulfide content was established on the gaseous fuel feed to the engines in order to meet the 0.3 g/bhp-hr BACT limit for engine S-38. Since all three engines fire the same feed, this limit becomes the effective limit for all of the engines.

17. The diesel fuel sulfur content shall not exceed 0.05% by weight. (Basis: Cumulative Increase, BACT)

Clarification: Added to address BACT for SO₂ for engine S-38. SO₂ BACT for diesel is use of 500 ppm or less CARB diesel.

To demonstrate compliance with the above sulfur limit, the Permit Holder shall maintain a written statement, as applicable, received from the diesel fuel supplier(s) certifying that the diesel fuel purchased from the supplier is less than 0.05% by weight or meets the sulfur limitations for CARB Vehicular Diesel Fuel as specified in 13 CCR Section 2281, California Code of Regulations. (Basis: Regulations 2-6-409.2, 2-6-501)

18. To determine compliance with the above conditions, the Permit Holder shall maintain the following records and provide all of the data necessary to evaluate compliance with the above conditions, including the following information:
- a. Daily records of the hours of operation of engines S-37, S-38, S-39 and boiler S-5.
 - b. Total digester gas, natural gas, and/or diesel consumption for the engines and boiler S-5.
 - c. Records of hours of operation during transient periods with an explanation of the nature of the transient period.
19. The owner/operator shall ensure that an annual performance test is conducted on each engine in accordance with the District test procedures to demonstrate compliance with the NO_x, CO, POC, and particulate limits, where applicable, as required by Conditions 6 – 11, respectively.

~~The owner/operator may submit an alternative monitoring plan to the District for approval. If the alternative monitoring plan is approved, the plan shall supersede the annual source test requirement. Approvals shall be processed using the permit modification procedure contained in Regulation 2, Rule 6.~~

(Basis: Regulation 2-6-409.2)

20. Records associated with the above requirements shall be maintained for a period of at least 5 years from the date of the inspection or test and be available for review by District personnel upon request. (Basis: Regulation 2-6-501)

Condition 20651 for S-5, S-37, S-38, and S-39

Condition #20651 (established in AN 7012) replaces Condition 20296 (established in AN 3694).

S-5 Hot Water Boiler

S-37, ~~Dual~~ Multi-Fuel Cogeneration Engine #1

S-38, ~~Dual~~ Multi-Fuel Cogeneration Engine #2

S-39, ~~Dual~~ Multi-Fuel Cogeneration Engine #3

Conditions For S-5 Hot Water Boiler

1. Boiler S-5 shall be fired only on sewage sludge digester gas. (Basis: Regulation 9-7-304)

Boiler S-5 is subject to an exemption from meeting the NOx and CO standards of Regulation 9-7 by maintaining a gross BTU limit less than 10 MM Btu/hr on gaseous fuel. The boiler is currently only piped to feed digester gas at a capacity of 9.87 MM Btu/hr based on mechanical limits. This federally enforceable permit condition is necessary since the firing of a higher BTU content gas could violate Part 3, following, and therefore disqualify the source from the low usage exemptions of Regulation 9-7-304 and 9-7-111. For further discussion see the detailed explanation on AN 7012 in this Statement of Basis.

2. EBMUD shall not operate S-5 hot water boiler simultaneously with more than two of the three cogeneration engines S-37, S-38, or S-39. (Basis: Cumulative Increase)

The establishment of Part 2 was the reason for AN 7012. The operation of all three engines simultaneously amounts to the emissions cap for the combined engines and boiler S-5. The simultaneous operation of the boiler S-5 with any 2 of the engines results in emissions well below the 3-engine based emissions "cap". For further discussion see the detailed explanation on AN 7012 in this Statement of Basis.

3. Gross thermal input to S-5 shall not exceed 9.87 million Btu/hr. (Basis: Regulation 9-7-304)

This limit is the mechanical limit of S-5 boiler fired by digester gas. This limit is necessary to meet the exemption requirements of 9-7-111 and 9-7-304.

4. The owner/operator of the hot water boiler S-5 shall perform an inspection and tune up of the combustion section at least annually to ensure the proper air-to-fuel ratio is being used which maximizes efficiency and minimizes the production of nitrogen oxides and carbon monoxide, following the procedure of Regulation 9, Rule 7, Section 604 (CARB

BARCT tune up procedure). The time interval between boiler tune-ups shall not exceed 12 months. (Basis: Regulation 9-7-304)

5. In order to demonstrate compliance with the requirements of part 4, the owner/operator of the hot water boiler S-5 shall document each tune up as follows: (Basis: Regulation 9-7-503.1)
 - a. Time and date of the tune up and the identity of the qualified technician.
 - b. Firing rate (MMBTU/hr), stack gas flow rate (scfm), and temperature (degrees F).
 - c. Stack gas oxygen concentrations (ppm dry) and carbon monoxide concentrations (ppm dry) before and after any adjustments are made.

Conditions Specific to Cogeneration Engine S-38

6. NOx emissions, calculated as NO2, shall not exceed 1.25 g/hp-hr, except during transient periods or in the event of catastrophic damage to the natural gas fuel supply, when the engine may be fired solely on diesel fuel.

If a source test demonstrates nitrogen oxide Emissions greater than 1.0 g/hp-hr, but less than 1.25 g/hp-hr, the operator shall either conduct a second source test to verify the results of the first test, or shut down the engine for necessary maintenance. In the event the retest confirms an emission level greater than 1.0 g/hp-hr, the operator shall immediately shut down the engine for maintenance. ~~Upon completion of the maintenance actions, the operator shall conduct a District approved source test to demonstrate that emission levels are less than 1.0 g/hp-hr.~~ (Basis: BACT)

The limit is 1.25 g/bhp-hr. The trigger level requiring maintenance is 1.0 g/bhp-hr. There is no need for a further source test at that time.

7. The total POC emissions from S-38 shall not exceed 0.6 g/hp-hr, except during transient periods or in the event of catastrophic damage to the natural gas fuel supply, when the engine may be fired solely on diesel fuel. (Basis: BACT)
8. The total CO emissions from S-38 shall not exceed 3.0 g/hp-hr, except during transient periods or in the event of catastrophic damage to the natural gas fuel supply, when the engine may be fired solely on diesel fuel. (Basis: BACT)
9. Filterable particulate emissions from S-38 shall not exceed 0.085 g/hp-hr, except during transient periods or in the event of catastrophic damage to the natural gas fuel supply, when the engine may be fired solely on diesel fuel. (Basis: BACT)

Conditions Specific to Engines S-37 and S-39

10. The total nitrogen oxide emissions from each of the engines S-37 and S-39, shall not exceed 140 ppmvd @ 15% Oxygen. (Basis: Regulation 9-8-302)
11. The total carbon monoxide emissions from each of the engines, S-37 and S-39 shall not exceed 2000 ppmvd @ 15% Oxygen. (Basis: Regulation 9-8-302)

Conditions Specific to Engines S-37, S-38, S-39

12. Cogeneration engines S-37, S-38, and S-39 shall be fired on sewage sludge digester gas, natural gas, or a blend of the two fuels, with a diesel pilot fuel. The engines may be fired solely on diesel fuel only during transient periods or in the result of catastrophic damage to the natural gas fuel supply, if insufficient sewage sludge digester gas exists, or emergency periods as defined below. (Basis: Cumulative Increase)

Transient Periods are defined as any of the following:

- a. Engine startup and/or engine shutdown.
- b. Post overhaul break-in periods.
- c. Preventative maintenance periods to prevent injector fouling as per engine manufacturer recommendations.

Emergencies are defined as loss of electrical power to the plant combined with a catastrophic damage to or interruption of the natural gas or digester gas fuel supplies to the extent that the engines are unable to continue operation.

This part was modified to provide clarification on the emergency situations which would require the ongoing operation with 100% diesel fuel.

13. Total thermal throughput shall not exceed 19.8 MM Btu/hr per engine. (Basis: Cumulative Increase)
14. Total combined hours of operation of engines S-37, S-38, and S-39 shall not exceed 25,316 hours in any rolling 365 day period. (Basis: Cumulative Increase)
15. The total diesel fuel fed to engines S-37, S-38, and S-39 combined, during normal operation including transient periods, shall not exceed 150,000 gallons in any rolling 365 day period. Diesel fuel usage during periods of catastrophic damage to the natural gas fuel supply, where insufficient digester gas exists, is unlimited. (Basis: Cumulative Increase)

The above changes are necessary to avoid a diesel fuel throughput limit during emergency periods when the operator has no choice but to operate the engines on diesel fuel to continue plant operation.

16. Total sulfur content of the gaseous feed to engine S-38 shall not exceed 340 ppmv at 0% O₂ (Basis: BACT)

The Permit Holder shall demonstrate compliance with the above limit by weekly sampling and testing of either the digester gas or gaseous feed to the engines according to the following methodologies:

- 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 of 200 ppmv or less shall be deemed to demonstrate compliance with the above 340 ppmv limit. An H2S measurement by Draeger Tube exceeding 200 ppmv shall not be deemed a violation of the 340 ppmv limit, 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 ppmv, 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 fuel gas for sulfides shall be handled as a minor revision to the Title V Permit.

17. The diesel fuel sulfur content shall not exceed 0.05% by weight. (Basis: Cumulative Increase, BACT)

~~To demonstrate compliance with the above sulfur Limit for diesel every delivery of diesel fuel received onsite shall be accompanied by a vendor certification of sulfur content or shall be tested for sulfur content using a District approved method. The vendor certifications or lab results shall be maintained onsite for at least 5 years and shall be made available to the District upon request. (Basis: Regulations 2-6-409.2, 2-6-501)~~

To demonstrate compliance with the above sulfur limit for diesel, the Permit Holder shall maintain a written statement, as applicable, received from the diesel fuel supplier(s) certifying that the diesel fuel purchased from the supplier is less than 0.05% by weight or meets the sulfur limitations for CARB Vehicular Diesel Fuel as specified in 13 CCR, Section 2281, California Code of Regulations. (Basis: Regulations 2-6-409.2, 2-6-501)

The above change is made since all diesel fuel purchased is CARB vehicular diesel and the CARB Diesel fuel standard specifies a maximum of 500 ppm sulfur, hence testing or certification of each and every single load of diesel is unnecessary.

18. To determine compliance with the above conditions, the Permit Holder shall maintain the following records and provide all of the data necessary to evaluate compliance with the above conditions, including the following information:

5.
 - a. Daily records of the hours of operation of engines S-37, S-38, S-39 and boiler S-
 - b. Total digester gas, natural gas, and/or diesel consumption (where applicable, during normal operation including transient periods) for the engines and boiler S-5.
 - c. Records of hours of operation during transient ~~periods~~ and during periods of catastrophic damage to the natural gas fuel supply with an explanation of the nature of the ~~transient~~ respective operating period.

The above changes are made to ensure that adequate operating records are kept to demonstrate compliance with the diesel fuel limits, expressed in part 15.

19. The owner/operator shall ensure that an annual performance test is conducted on each engine in accordance with the District test procedures to demonstrate compliance with the NOx, CO, POC, and particulate limits, where applicable, as required by parts 6 – 11, respectively. (Basis: Regulation 2-6-409.2)
20. Records associated with the above requirements shall be maintained for a period of at least 5 years from the date of the inspection or test and be available for review by District personnel upon request. (Basis: Regulation 2-6-501)

Condition 21663 (For Source S-48 GDF G-9008)

Condition 21663 replaces Condition 7523, as a result of Application #10237 (NSR Portion) and #10353 (Title V- Minor Modification). See the earlier discussion in this Statement of Basis for a detailed explanation.

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: Toxic Risk Management Policy)

Condition 21759 for Source S-100

Condition 21759 is a new condition for S-100. There was no existing permit condition for this source, therefore condition 21759 has been established for source S-100. This new condition will establish a maximum dry weather flow limit, a maximum wet weather flow limitation as well as address issues of public nuisance (odors) and monitoring, recordkeeping and reporting.

S-100 Conditions

1. Flowrate

Total wastewater flow shall not exceed 120 million gallons per day on a calendar month average during dry weather periods or 325 million gallons per day on a calendar month average during wet weather periods. For the purposes of these limits, wet weather is defined as the months of October through May. [Basis: Cumulative Increase]

2. Nuisance

In the event that a public nuisance odor source is identified at this facility, the Permit Holder shall employ all measures, practices, or modifications necessary to abate the nuisance. [Basis: 1-301]

3. Records

To demonstrate compliance with Part 1, above, the Permit Holder shall maintain the following records: [Basis: 2-6-409.2]

- a. Daily (24 consecutive hour basis) and calendar month records of the quantity of wastewater processed at this source.
- b. Monthly records shall be totaled for each consecutive 12-month period.
- c. All records shall be retained onsite for five years from the date of entry, and made available for inspection by District staff upon request.
- d. These recordkeeping requirements do not replace the recordkeeping requirements contained in any applicable District Regulations.

Condition 21921 for Source S-51

Engine generator S-51 was permitted under loss of exemption permit application 4064 to operate as an emergency backup generator although no permit conditions were established. (Although the BAAQMD Databank indicated Condition 19041 was established for this engine, there is no record of Condition 19041) Since the engine is larger than 250 hp, S-51 has been conditioned to operate for a maximum of 200 hours per year and for unlimited hours during actual emergencies according to permit condition 21921. This condition establishes conditions on the type of operation, diesel fuel sulfur content limitations, as well as monitoring, recordkeeping and recording.

S-51 Emergency Backup Generator: Diesel Fired, Generac, 268 HP, Installed before May 17, 2000

1. Hours of Operation

The emergency standby engine shall only be operated to mitigate emergency conditions or for reliability-related activities. Operation for reliability-related activities shall not exceed 200 hours in any calendar year. Operation while mitigating emergency conditions is unlimited. [Basis: Regulation 9-8-331]

2. Emergency Conditions is defined as any of the following: [Basis: Regulation 9-8-231]
 - a. Loss of regular natural gas supply.
 - b. Failure of regular power supply.
 - c. Flood mitigation.
 - d. Sewage overflow mitigation.
 - e. Fire.
 - f. Failure of a primary motor, but only for such time as needed to repair or replace the primary motor.

3. Reliability-related activities is defined as any of the following: [Basis: Regulation 9-8-232]
 - a. Operation of an emergency standby engine to test its ability to perform for an emergency use, or
 - b. Operation of an emergency standby engine during maintenance of a primary motor.

4. Monitoring
The Permit Holder shall equip and operate the emergency standby engine with either: [Basis: Regulation 9-8-530]
 - a. A non-resettable totalizing meter that measures and records the hours of operation, or
 - b. A non-resettable totalizing meter that measures and records the fuel usage.

5. This source shall only be fired on diesel fuel with a sulfur content not to exceed 0.5% by weight. [Basis: Regulation 9-1-304]

To demonstrate compliance with the above sulfur limit, the Permit Holder shall secure and maintain onsite, for at least 5 years, one of the following records: [Basis: Regulations 2-6-409.2, 2-6-501]

- a. A written statement, as applicable, received from the diesel fuel supplier(s) certifying that the diesel fuel purchased from the supplier does not exceed 0.5% by weight or meets the sulfur limitations for CARB Vehicular Diesel Fuel as specified in 13 CCR, Section 2281, California Code of Regulations, or
- b. A vendor certification of sulfur content, or
- c. Fuel test results showing the sulfur content from a District-approved test.

6. Recordkeeping

The following monthly records shall be maintained in a District-approved log for at least 5 years from the date of entry, and shall be made available for District inspection upon request. [Basis: Regulations 1-441, 9-8-530]

- a. Hours of operation (total)
- b. Hours of operation (emergency).
- c. For each emergency, the nature of the emergency condition.
- d. Monitoring records as noted in Part 4, above.
- e. Diesel sulfur records required in Part 5, above.

Condition 21924 for Source S-53

Engine generator S-53 was permitted under loss of exemption permit application #4062 to operate as an emergency backup generator under template condition 19534. Since the template condition only requires the keeping of records for 2 years, a new condition was necessary—condition 21924. This condition establishes conditions on the type of operation, diesel fuel sulfur content limitations, as well as monitoring, recordkeeping and recording. Since the engine is larger than 250 hp, S-53 has been permitted to operate for a maximum of 200 hours per year and for unlimited hours during actual emergencies.

S-53 Emergency Backup Generator: Diesel Fired, 277 HP, Installed before May 17, 2000

1. Hours of Operation

The emergency standby engine shall only be operated to mitigate emergency conditions or for reliability-related activities. Operation for reliability-related activities shall not exceed 200 hours in any calendar year. Operation while mitigating emergency conditions is unlimited. [Basis: Regulation 9-8-331]

2. Emergency Conditions is defined as any of the following: [Basis: Regulation 9-8-231]

- a. Loss of regular natural gas supply.
- b. Failure of regular power supply.
- c. Flood mitigation.
- d. Sewage overflow mitigation.
- e. Fire.
- f. Failure of a primary motor, but only for such time as needed to repair or replace the primary motor.

3. Reliability-related activities is defined as any of the following: [Basis: Regulation 9-8-232]

- a. Operation of an emergency standby engine to test its ability to perform for an emergency use, or
- b. Operation of an emergency standby engine during maintenance of a primary motor.

4. Monitoring

The Permit Holder shall equip and operate the emergency standby engine with either:
[Basis: Regulation 9-8-530]

- a. A non-resettable totalizing meter that measures and records the hours of operation, or
- b. A non-resettable totalizing meter that measures and records the fuel usage.

5. This source shall only be fired on diesel fuel with a sulfur content not to exceed 0.5% by weight. [Basis: Regulation 9-1-304]

To demonstrate compliance with the above sulfur limit, the Permit Holder shall secure and maintain onsite, for at least 5 years, one of the following records: [Basis: Regulations 2-6-409.2, 2-6-501]

- a. A written statement, as applicable, received from the diesel fuel supplier(s) certifying that the diesel fuel purchased from the supplier does not exceed 0.5% by weight or meets the sulfur limitations for CARB Vehicular Diesel Fuel as specified in 13 CCR, Section 2281, California Code of Regulations, or
- b. A vendor certification of sulfur content, or
- c. Fuel test results showing the sulfur content from a District-approved test.

6. Recordkeeping

The following monthly records shall be maintained in a District-approved log for at least 5 years from the date of entry, and shall be made available for District inspection upon request. [Basis: Regulations 1-441, 9-8-530]

- a. Hours of operation (total)
- b. Hours of operation (emergency).
- c. For each emergency, the nature of the emergency condition.
- d. Monitoring records as noted in Part 4, above.
- e. Diesel sulfur records required in Part 5, above.

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 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 only when it can support a conclusion that existing monitoring is inadequate.

NOX Sources

# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Periodic Monitoring
S-37 Multi-Fuel Cogeneration Engine #1 S-38 Multi-Fuel Cogeneration Engine #2 S-39 Multi-Fuel Cogeneration Engine #3	Regulation 9-8-302.1	140 ppm at 15% Oxygen	Condition 20651, part 19 (annual source test)
S-37 Multi-Fuel Cogeneration Engine #1 S-39 Multi-Fuel Cogeneration Engine #3	Condition 20651, part 10	140 ppm at 15% Oxygen (Regulation 9-8-302)	Condition 20651, part 19 (annual source test)
S-38 Multi-Fuel Cogeneration Engine #2	Condition 20651, part 6	1.25 g/bhp-hr (BACT)	Condition 20651, part 19 (annual source test)

NOx Emissions Discussion

The sources of NOx at EBMUD include the hot water boiler S-5, the cogeneration engines S-37, S-38 and S-39, the digester gas flares A-190, 191, 192, and 193 and the standby diesel generators S-49, S-50, S-51, S-52 and S-53. There are no NOx standards for the digester gas flare or for the standby diesel generators, permitted under loss of exemption.

The hot water boiler is only permitted to be fired on digester gas. The cogeneration engines can be fired on any combination of digester gas and/or natural gas with a diesel fuel pilot fuel. The engines may also be fired solely on diesel fuel during transient periods or in the result of a

catastrophic damage to the natural gas supply system. The NO_x requirements of each source will be discussed in turn. In general, the flares are only operated when the other combustion sources are unable to burn the available digester gas. The NO_x emissions discussion will address PTE from the standpoint of digester gas combustion in the cogeneration engines and/or digester gas boiler S-5.

Hot Water Boiler S-5, Digester Gas Fired: This boiler is subject to Regulation 9-7, Inorganic Pollutants, Industrial Boilers. This regulation sets the NO_x and CO standards for boilers. In general, this boiler is used only when absolutely needed to provide additional hot water for the digester process. Although the nameplate heat input capacity of S-5 Boiler is 10 MM Btu/hr based on natural gas fuel, there is no physical natural gas connection to the boiler. Digester gas is the only fuel that is piped to the boiler, therefore the boiler can only be operated on digester gas. Digester gas has a heating value approximately 60% of that of natural gas. From a hydraulic standpoint it would be expected that the boiler would have a lower heat input capacity on digester gas (as compared with natural gas) due to the reduced heat content of digester gas. This expectation was confirmed in 2 separate test runs on May 1, 2003 and on May 8, 2003. Both test runs confirmed a maximum feedrate of digester gas to the boiler of 228 scfm. Assuming a 3% instrument error gives $1.03(228 \text{ scfm}) = 235 \text{ scfm}$ maximum digester gas flow to S-5. The measured digester gas heat content (per during the same tests gave a result of 687.4 Btu/scf. The heat content evaluation was based on ASTM Method D-1945-81, in conjunction with ASTM D-3588-89 as specified by 9-7-605. This value is on the upper end of an expected heat content range for digester gas. To be conservative, a value of 700 Btu/scf will be used in this analysis. Digester gas is typically 60 – 65% methane and 35 – 40% CO₂, producing a more typical heating value of 600 – 650 Btu/scf. Based on 235 scfm at 700 Btu/scf gives the following modified maximum heat input for boiler S-5:

$$\text{Modified Maximum Heat Input} = (235 \text{ scf/min})(700 \text{ Btu/scf})(60 \text{ min/hr})(\text{MM Btu}/1,000,000 \text{ Btu}) = 9.87 \text{ MM Btu/hr.}$$

Since the capacity of the boiler is less than 10 MM Btu/hour, this boiler is required (per 9-7-304) to either operate with a stack gas oxygen content not to exceed 3% or to have an annual tuning by a technician according to the requirements of 9-7-604. There is no NO_x limit for boiler S-5. EBMUD has chosen to perform the annual tuning, which has been written into the new operating conditions.

$$\text{NO}_x \text{ PTE, S-5: } (100 \text{ lb NO}_x/1\text{E}6 \text{ scf})(\text{scf}/1013 \text{ Btu})(9.87\text{E}6 \text{ Btu/hr})(8760 \text{ hr/yr}) = 8,535 \text{ lb/yr}$$

Cogeneration Engines S-37 and S-39, Digester Gas, Natural Gas Fired with Diesel Pilot: The NO_x emission standard for these engines is based on BARCT Regulation 9-8-302, with annual source testing to demonstrate compliance. The engines were retrofitted in 1995 to achieve the controlled NO_x emission level of 140 ppm at 15% oxygen as specified in 9-8-302. The potential to emit will be calculated based on recent (6/21/2004) source test based exhaust flowrates as follows:

$$\text{Stack Gas: } 6,841 \text{ dscf/min @ } 11.3\% \text{ O}_2 \text{ (average, 3 source tests)}$$

Conversion from 11.3% to 0%: 2.171 scf exhaust gas (EG) @ 11.3 % O₂ per scf EG @ 0% O₂
 Conversion from 15% to 0%: 3.521scf EG @ 11.6 % O₂ per scf EG @ 0% O₂
 Conversion from 11.3% to 15% : 3.521/2.171 = 1.622 scf EG @ 15% O₂ per scf EG @ 11.3% O₂ (See Appendix C for calculations showing flue gas oxygen correction factors)

NO_x PTE, S-37, 39 (BARCT Limited): [6,841 dscf EG/min][1.622][60 min/hr][24 hr/day][mole EG/386 dscf EG][140 mole NO₂/1E6 mole EG][46.01 lb NO₂/mole NO₂][365 day/yr] = 97,314 lb/yr-engine (267 lb/day per engine)

Cogeneration Engine S-38, Digester, Natural Gas Fired with Diesel Pilot: The NO_x emission standard for this engine is based on BACT2 (achieved in practice), and as with engines S-37 and S-38 annual source testing is required to demonstrate compliance.

NO_x PTE, S-38, theoretical: ([1.25 g/bhp-hr][2980 bhp][lb/454 g][7,796 hr/yr] = 63,965 lb/yr (197 lb/day)

NO_x PTE, S-38, source test based: (2,609)(1.25)(1/454)(7796) = 56,002 lb/yr (172 lb/day)

NO_x PTE, S-37, S-38, S-39 combined: (2 engines)(267 lb/day-engine) + 197 lb/day + 23.3 = 731 lb/day (133.4 TPY), all cogeneration engines combined

The actual combined NO_x emissions from these engines, based on source tests, are typically less than 25 tpy. An annual source test is the standard District method for monitoring NO_x emissions from digester gas (multi-fuel) fired engines at POTWs.

CO Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-37 Multi-Fuel Cogeneration Engine #1 S-38 Multi-Fuel Cogeneration Engine #2 S-39 Multi-Fuel Cogeneration Engine #3	Regulation 9-8-302.3	2000 ppm at 15% Oxygen (Regulation 9-8-302.3)	Condition 20651, part 19 (annual source test)
S-37 Multi-Fuel Cogeneration Engine #1 S-39 Multi-Fuel Cogeneration Engine #3	Condition 20651, part 11	2000 ppm at 15% Oxygen (Regulation 9-8-302)	Condition 20651, part 19 (annual source test)
S-38 Multi-Fuel Cogeneration Engine #2	Condition 20651, part 8	3.0 g/bhp-hr (BACT)	Condition 20651, part 19 (annual source test)

CO Emissions Discussion

The sources of CO at EBMUD include the hot water boiler S-5, the cogeneration engines S-37, S-38 and S-39, the digester gas flares A-190, 191, 192, and 193 and the standby diesel generators S-49, S-50, S-51, S-52 and S-53. There are no CO standards for the digester gas flare or for the standby diesel generators, permitted under loss of exemption.

Standby Hot Water Boiler S-5, Digester Gas Fired: This boiler is subject to Regulation 9-7, Inorganic Pollutants, Industrial Boilers. This boiler is used only when the waste heat from the cogeneration engines is insufficient or otherwise unavailable. The boiler has a maximum heat input of each having a heat input 9.87 MM Btu/hr fired with 100% digester gas. Due to the relatively small size, this boiler is only required to either operate with a stack gas oxygen content not to exceed 3% or to have an annual tuning by a technician according to the requirements of 9-7-604. EBMUD has chosen to perform the annual tuning, based on 9-7-304.2, a requirement which has been written into the new operating condition 20651 for this source. The potential to emit CO from this boiler if fired 100% of the time is as follows.

$$\text{CO PTE: } (84 \text{ lb/1E6 scf}) (\text{scf/1013 Btu})(9.87 \text{ E6 Btu/hr})(8760 \text{ hr/yr}) = 7,169 \text{ lb/yr (3.6 tpy)}$$

Cogeneration Engines S-37 and S-39, Multi-Fuel Fired: The CO emission standard for these engines is based on BARCT as the engines were originally permitted in the 1980s and retrofitted to comply with Regulation 9-8 in the 1990s. The engines are subject to 9-8-302.3, CO maximum 2000 ppm @ 15% oxygen.. The regulation 9 Rule 8 CO emission standard is 2000 ppm at 15% O₂ and is based on Best Available Retrofit Control Technology (BARCT). The BARCT limit is listed in Condition 20651, part 11. An annual source test is required to demonstrate compliance with this limit. A recent source test of engines S-37 and S-39 demonstrated an average CO concentration of 276 ppm at 15% oxygen which equates to an average daily emission of 320 lb/day per engine. The potential to emit, per engine S-37 or S-38, based on the permitted level is:

$$\text{CO PTE: } (320 \text{ lb/day-engine})(2000 \text{ ppm}/276 \text{ ppm})(365 \text{ day/yr}) = 846,377 \text{ lb/yr (423 tpy per engine S-37 or S-39)}$$

Cogeneration Engine S-38, Multi-Fuel Fired: The CO emission standard for this engine is based on BACT established in AN 3694 as 3.0 g/bhp-hr. An annual source test is required to demonstrate compliance with this limit. A recent source test of engine S-38 demonstrated an average CO emission factor of 2.39 g/bhp-hr which equates to approximately 330 lb/day. The potential to emit for engine S-38, on a permitted level is:

$$\text{CO PTE: } [(330 \text{ lb/day})(3.0\text{g/bhp-hr}/2.39 \text{ g/bhp-hr})/24](7,796\text{hr/yr})= 134,554 \text{ lb/yr (67.3 tpy)}$$

$$\text{CO PTE, S-37, S-38, S-39 Combined: } (2 \text{ engines})(846,377 \text{ lb/yr-engine}) + 134,554 \text{ lb/yr} \\ = 1,827,308 \text{ lb/yr (914 tpy)}$$

The actual combined CO emissions from these engines, based on source tests, are typically less than 200 tpy. An annual source test is the standard District method for monitoring CO emissions from digester gas (multi-fuel) fired engines at POTWs.

SO₂ Sources

# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-5 Hot Water Boiler, S-37 Multi-Fuel Cogeneration Engine #1, S-38 Multi-Fuel Cogeneration Engine #2, S-39 Multi-Fuel Cogeneration Engine #3 Digester Gas Flare A-190 Digester Gas Flare A-191 Digester Gas Flare A-192	Regulation 9-1-301	GLC 0.5 ppm (3 min) Or 0.25 ppm (60 min)	none
S-5 Hot Water Boiler, S-37 Multi-Fuel Cogeneration Engine #1, S-38 Multi-Fuel Cogeneration Engine #2, S-39 Multi-Fuel Cogeneration Engine #3, Digester Gas Flare A-190 Digester Gas Flare A-191 Digester Gas Flare A-192	Regulation 9-1-302	300 ppm SO ₂ from any source	Digester gas sulfur monitoring
S-37 Multi-Fuel Cogeneration Engine #1, S-38 Multi-Fuel Cogeneration Engine #2, S-39 Multi-Fuel Cogeneration Engine #3, S-49 Diesel Engine BUG, 134 HP S-50 Diesel Engine BUG, 238 HP S-51 Diesel Engine BUG, 268 HP S-52 Diesel Engine BUG, 280 HP S-53 Diesel Engine BUG, 277 HP	Regulation 9-1-304	0.5% liquid fuel sulfur content	Vendor Certification of diesel sulfur content or statement of CARB Certified Diesel
S-49 Diesel Engine BUG, Portable, 134 HP	Condition 19058, part 4	0.5% Diesel Sulfur Content (Regulation 9-1-304)	Vendor Certification of diesel sulfur content or statement of CARB Certified Diesel or fuel test results
S-50 Diesel Engine BUG,	Condition 190404,	0.5% Diesel Sulfur Content	Vendor Certification of

SO₂ Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
238 HP	part 4	(Regulation 9-1-304)	diesel sulfur content or statement of CARB Certified Diesel or fuel test results
S-51 Diesel Engine BUG, 268 HP	Condition 21921, part 5	0.5% Diesel Sulfur Content (Regulation 9-1-304)	Vendor Certification of diesel sulfur content or statement of CARB Certified Diesel or fuel test results
S-52 Diesel Engine BUG, 280 HP	Condition 19184, part 4	0.5% Diesel Sulfur Content (Regulation 9-1-304)	Vendor Certification of diesel sulfur content or statement of CARB Certified Diesel or fuel test results
S-53 Diesel Engine BUG, 277 HP	Condition 21924, part 5	0.5% Diesel Sulfur Content (Regulation 9-1-304)	Vendor Certification of diesel sulfur content or statement of CARB Certified Diesel or fuel test results
S-38 Multi-Fuel Cogeneration Engine #2	Condition 20651, part 16	340 ppm @ 0% Oxygen, S-38 Fuel Gas Standard (BACT)	Condition 20651, part 16 (weekly testing)
S-37 Multi-Fuel Cogeneration Engine #1, S-38 Multi-Fuel Cogeneration Engine #2, S-39 Multi-Fuel Cogeneration Engine #3,	Condition 20651, part 17	0.05% Diesel Fuel Content (Cumulative Increase, BACT)	Written Statement certifying less than 0.05% sulfur or Equivalent to CARB Vehicular Diesel
S-180 Anaerobic Digesters	Condition 18860, part 3	1500 ppm (Regulation 9-1-302)	Condition 18860, part 4 (weekly monitoring)

SO₂ Emissions Discussion

Cogeneration Engine S-38: The overwhelming source of SO₂ emissions at EBMUD is from the combustion of digester gas containing sulfides. AN 3694 required the application of BACT for this mixed fuel (digester gas + natural gas w/diesel slipstream) fired IC engine. BACT for SO₂ from a digester gas fired engine has been identified as 0.3 g/bhp-hr that is approximately equivalent to 340 ppmv sulfide level in the fuel gas feed to engine S-38. This engine is not exclusively fired with digester gas, hence the fuel gas has been conditioned to a sulfur content limit. Since all of the cogeneration engines are fed from a common header, this effectively becomes a requirement for engines S-37 and S-39 along with S-38, although it is not appropriate to limit S-37 and S-39 to the same degree as S-38. Engines S-37 and S-39 are subject to BARCT requirements of Regulation 9-1-302.

S-180 Anaerobic Digesters: The digesters are subject to Regulation 9-1-302, limiting emissions of SO₂ from any stream exceeding 300 ppmv. The upstream digester gas composition which would produce a 300 ppmv exhaust (after combustion) is 1545 ppm—therefore a limit of 1500 ppmv has been included in the new Condition 18860 for S-180 digester. This limit effectively establishes compliance for any source subject to 9-1-302, including S-5 hot water boiler, and the digester gas flares A-190, A-191, A-192, and A-193.

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

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.

Diesel Fuel Combustion: The maximum current BAAQMD regulated diesel sulfur content is 0.5% or 5000 ppm (9-1-304). Although the maximum permitted diesel sulfur content is 0.5%, the typically available diesel is CARB diesel, which is 500 ppm or 0.05% sulfide level. The engines are operated on a standby emergency basis or rather infrequently for testing purposes only. It should be noted that source S-38 requires BACT for SO₂ emissions. Since the engine burns a small slipstream of diesel BACT is a maximum of 500 ppm sulfur diesel. Hence CARB vehicular diesel is required by condition for engine S-38. This diesel is the same fuel purchased for all other diesel combustion sources. Due to the dilution effects, the infrequent usage, and the fact that the diesel that is purchased is CARB diesel, we conclude that ground level monitoring to show compliance with 9-1-301 is unnecessary.

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).

Digester Gas Combustion: The digester gas is limited to 1500 ppm H₂S (sulfide). 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.

BAAQMD Regulation 9-1-304 (Sulfur Content of Liquid & Solid Fuels)

This section establishes sulfur limits for liquid and solid fuels. The only liquid fuels at this facility is diesel fuel, hence the rule is applicable only to those sources burning diesel fuel. References to 9-1-304 applicability for all other sources have been removed.

PM Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-5 Hot Water Boiler, S-37 Multi-Fuel Cogeneration Engine #1, S-38 Multi-Fuel Cogeneration Engine #2, S-39 Multi-Fuel Cogeneration Engine #3, A-190, A-191, A-192, A-193 Digester Gas Flares	BAAQMD Regulation 6-301	Ringelmann 1.0	None
S-49, S-50, S-51, S-52, S-53 Diesel Fired Emergency Backup Generators	BAAQMD Regulation 6-303	Ringelmann 2.0	None, operated infrequently
S-5 Hot Water Boiler, S-37 Multi-Fuel Cogeneration Engine #1, S-38 Multi-Fuel Cogeneration Engine #2, S-39 Multi-Fuel Cogeneration Engine #3, A-190, A-191, A-192, A-193 Digester Gas Flares	BAAQMD Regulation 6-310	0.15 gr/dscf	None
S-38 Multi-Fuel Cogeneration Engine #2	Condition 20651, part 9	0.085 g/bhp-hr (BACT)	Condition 20651, part 19 (annual source test)

PM Emissions Discussion

Regulation 6-301 Visible Emissions

BAAQMD Regulation 6-301 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 cogeneration engines S-37, S-38, and S-39, as well as the digester gas fired boiler S-5. 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 6-303 Visible Emissions

BAAQMD Regulation 6-303 applies to sources S-49, S-50, S-51, S-52, and S-53 diesel fired emergency standby generators. 6-301 (Ringelmann 1.0) does not apply since 6-303 applies to

these engines due to their use in emergency standby service (6-303.1) 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. No monitoring for visible emissions from or diesel combustion sources is necessary.

Particulate Weight Limitation (Regulation 6-310)

BAAQMD Regulation 6-310 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% O₂. 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 S-49, S-50, S-51, S-52, S-53 as well as the cogeneration engines S-37, S-38, and S-39, which would be operated as emergency backup generators in the event of an emergency.

The backup diesel engines operate infrequently and we do not expect any periodic monitoring to be required. AP-42 gives a factor of 0.31 lb/MM Btu for diesel engines. The flue gas factor for diesel combustion is 9190 dscf/MM Btu at 0% oxygen. At typical oxygen levels of 15% in the flue gas, the factor becomes 32,358 dscf/MM Btu. Converting the AP-42 factor into a grain loading and then an exhaust concentration gives the following[(0.31 lb/MM Btu)(7000 grain/lb)]/32,358 dscf flue gas = 0.067 gr/dscf. The calculated compliance margin is greater than 2.2. Periodic monitoring is not necessary for these sources since their operation is intermittent and since it is expected the engines will easily meet the 0.15 gr/scf standard of 6-310.

$$\text{PM PTE, S-38 PM: } (0.085 \text{ g/bhp-hr})(2980 \text{ bhp})(7,796 \text{ hr/yr})(\text{lb}/454 \text{ g}) = 4,350 \text{ lb/yr} \\ (2.2 \text{ tpy})$$

POC Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-5 Hot Water Boiler, S-37 Multi-Fuel Cogeneration Engine #1, S-38 Multi-Fuel Cogeneration Engine #2, S-39 Multi-Fuel Cogeneration Engine #3, S-100 Wastewater Plant, S-180 Anaerobic Digesters A-190, A-191, A-192, A-193 Digester Gas	8-2-301	15 lb/day and greater than 300 ppm total carbon	none

POC Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
Flares, S-49, S-50, S-51, S-52, S-53 Diesel Fired Emergency Backup Generators			
S-38 Multi-Fuel Cogeneration Engine #2	Condition 20651, part 7	0.6 g/bhp-hr (BACT)	Condition 20651, part 19 (annual source test)

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 159,000 cu ft/hr (maximum digester production rate)

$$\text{PTE, organics from digester gas, uncontrolled} = (159,000 \text{ scf DG/hr})(8760 \text{ hr/yr})(5.1 \text{ lb}/1\text{E}6 \text{ scf DG}) = 7,103 \text{ lb/yr} (19.5 \text{ lb/day})$$

$$\text{PTE, organics from digester gas, after abatement} = (7,103 \text{ lb/yr})(0.1) = 710 \text{ lb/yr} (1.9 \text{ lb/day})$$

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:

$$\text{PTE} = (120 \text{ E}6 \text{ gpd})(243 \text{ lb/yr-}1\text{E}6 \text{ gpd}) = 29,160 \text{ lb/yr} (80 \text{ lb/day throughout wastewater sources, all locations combined})$$

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.

Other changes to permit

A note has been added at the beginning of the section to clarify that this section is a summary of the limits and monitoring, and that in the case of a conflict between Sections I-VI and Section VII, the preceding sections take precedence.

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.

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

Changes to permit

BAAQMD Regulation 6-303, Ringelmann No. 2 limitation, has been added because it applies to the emergency generators.

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

Initial Issuance:

July 1, 1997

Minor Modification (AN 1209, 1068, 27693)

November 9, 2000

Minor Modification (AN 10353/10237):

July 14, 2004

The minor modification of November 9, 2000 was based on applications 1068, 1209, and 27693. These applications as well as several others since that time have been addressed in detail in the Statement of Basis. The minor modification of July 14, 2004 was to convert the underground storage tanks into above-ground tankage.

XI. Glossary

The glossary was updated.

D. Alternate Operating Scenarios:

No alternate operating scenario has been requested for this facility.

E. Compliance Status:

A November 1, 2004 office memorandum, from the Director of Compliance and Enforcement to the Director of Permit Services, presents a review of the compliance record of East Bay Municipal Utility District (Site #A0591). The Compliance and Enforcement Division staff has reviewed the records for Site #A0591 for the period between October 1, 2003 to October 31, 2004. This review was initiated as part of the District evaluation of an application by East Bay Municipal Utility District for a Title V permit. During the review period:

- The East Bay Municipal Utility District received one Notice of Violation for increased hydrogen sulfide in the feed gas to the three IC engines.
- The East Bay Municipal Utility District filed for a variance on March 18, 2004, due to a leak in the Dystor (digester gas) membrane cover. This variance was dismissed when the BAAQMD and the EBMUD reached an Enforcement Agreement to resolve the matter.
- The East Bay Municipal Utility District experienced an incidence of digester gas venting on March 31, 2004 at digester #2. EBMUD is operating the digesters under the aforementioned Enforcement Agreement, and plans (within the next several years) to completely redesign the digester gas production and distribution system.

The Compliance and Enforcement Division finds that on-going compliance can be reasonably assured for East Bay Municipal Utility District, due to the above record.

F. Differences between the Application and the Proposed Permit:

The application was correct at the time it was originally submitted, which was prior to AN 3694, AN 7012, as well as the backup generator permit applications and prior to the removal, consolidation and renaming of a number of the sources noted in the opening sections of this permit. To list all the differences between the original application and the proposed permit would effectively double the size of this Statement of Basis, in effect creating another Statement of Basis to address the Differences between the Application and the Proposed Permit. The many

Permit Evaluation and Statement of Basis: Site #A0591, East Bay Municipal Utility District,
2020 Wake Avenue, Oakland, CA 94607

changes are due to the fact that Title V renewal process is extremely lengthy—and since the original submittal, there have been numerous changes in the permit structure of the facility.

G. Permit Shield:

This facility has no permit shields.

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APPENDIX A
BAAQMD COMPLIANCE REPORT

APPENDIX B

GLOSSARY

ACT

Federal Clean Air Act

APCO

Air Pollution Control Officer

ARB

Air Resources Board

BAAQMD

Bay Area Air Quality Management District

BACT

Best Available Control Technology

Basis

The underlying authority that allows the District to impose requirements.

BHP (bhp)

Brake Horsepower, see Units of Measure

BTU

British Thermal Unit. See units of measure.

BUG

Backup Generator (Emergency)

CAA

The federal Clean Air Act

CAAQS

California Ambient Air Quality Standards

CAPCOA

California Air Pollution Control Officers Association

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.

CO

Carbon Monoxide

Cu Ft

Cubic foot = ft³, see Units of Measure

Cu M

Cubic meter = m³, see Units of Measure

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). Cumulative increase is used to determine whether threshold-based requirements are triggered.

DG

Digester Gas

District

The Bay Area Air Quality Management District

DSCF (dscf)

Dry Standard Cubic Feet, see Units of Measure

EPA

The federal Environmental Protection Agency.

Excluded

Not subject to any District regulations.

Federally Enforceable, FE

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 (MACT), and Part 72 (Permits Regulation, Acid Rain), 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.

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.

HHV

Higher Heating Value: The heat extracted by a reaction assuming all water vapor is condensed within the process, and the resulting heat of condensation recovered for useful work.

LHV

Lower Heating Value: The heat extracted by a reaction assuming all water vapor goes out the

exhaust stack with none of the heat of condensation recovered for useful work.

Mole

Quantity of a compound. One mole of a compound is estimated to have 6.023×10^{23} molecules ($6.023 \text{ E } +23$) of the respective compound.

Major Facility

A facility with potential emissions of: (1) at least 100 tons per year of regulated air pollutants, (2) at least 10 tons per year of any single hazardous air pollutant, and/or (3) at least 25 tons per year of any combination of hazardous air pollutants, or such lesser quantity of hazardous air pollutants as determined by the EPA administrator.

MFR

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

Microgram

Unit of weight. 1 microgram (μg) = $1/1,000,000^{\text{th}}$ of a gram or 1 millionth of a gram.

MM Btu/hr

Million BTU per hour.

MW

Molecular Weight. The weight of one mole or $6.023 \text{ E}23$ molecules of a compound.

PPM

Unit of concentration. Part Per Million. For vapor ppm is equivalent to a molar or volumetric concentration. For liquids and solids ppm is essentially equivalent to a weight fraction. See Units of Measure.

MOP

The District's Manual of Procedures.

NAAQS

National Ambient Air Quality Standards

NESHAPS

National Emission Standards for Hazardous Air Pollutants. See in 40 CFR Parts 61 and 63.

NMHC

Non-methane Hydrocarbons (Same as NMOC)

NMOC

Non-methane Organic Compounds (Same as NMHC)

NO_x

Oxides of nitrogen.

NOV

Notice of Violation

NSPS

Standards of Performance for New Stationary Sources. Federal standards for emissions from new stationary sources. Mandated by Title I, Section 111 of the Federal Clean Air Act, and implemented by 40 CFR Part 60 and District Regulation 10.

NSR

New Source Review. A federal program for pre-construction review and permitting of new and modified sources of pollutants for which criteria have been established in accordance with Section 108 of the Federal Clean Air Act. Mandated by Title I of the Federal Clean Air Act and implemented by 40 CFR Parts 51 and 52 and District Regulation 2, Rule 2. (Note: There are additional NSR requirements mandated by the California Clean Air Act.)

Offset Requirement

A New Source Review requirement to provide federally enforceable emission offsets for the emissions from a new or modified source. Applies to emissions of POC, NOx, PM10, and SO2.

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.

POC

Precursor Organic Compounds

PM

Particulate Matter

PM10

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

POTW

Publicly Owner Treatment Works. Also known as wastewater treatment plant (WWTP) or sewage treatment plant (STP)

PPMV

Parts Per Million, by Volume. See Units of Measure.

PSD

Prevention of Significant Deterioration. A federal program for permitting new and modified sources of those 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

SIP

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

SO2

Sulfur dioxide

STP

Sewage Treatment Plant. Also known as a publicly owned treatment works (POTW) or wastewater treatment plant (WWTP).

THC

Total Hydrocarbons (NMHC + Methane)

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

VOC

Volatile Organic Compounds

Units of Measure:

bhp	=	brake-horsepower
btu	=	British Thermal Unit
cfm	=	cubic feet per minute
dscf	=	dry standard cubic feet
g	=	grams
gal	=	gallon
gpm	=	gallons per minute
hp	=	horsepower
hr	=	hour
lb	=	pound
in	=	inches
max	=	maximum
m ²	=	square meter
m ³	=	cubic meter
min	=	minute
mm	=	million
MMbtu	=	million btu
MMcf	=	million cubic feet

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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 cubic feet per minute
yr	=	year

EBMUD

East Bay Municipal Utility District

WWTP

Wastewater Treatment Plant. Also known as publicly owned treatment works (POTW) or sewage treatment plant (STP).

APPENDIX C CALCULATIONS

1. NMOC Compound Concentrations in Digester Gas

Average MW of NMOC: 113 lb/lb-mole (113 g/g-mole)

Concentration of NMOC: 82 $\mu\text{g/l}$ = 82 E-06 g/l (taken from EBMUD Source Tests, based on highest observed concentration; μg = microgram = 1,000,000th of a gram; average measured concentration = 50 $\mu\text{g/l}$)

EBMUD Digester Gas Production Rate, estimated: 3,800,000 cu ft/day (158,333 cu ft/hr)

(Note: Highest monthly average, actual = 2,160,000 cu ft/day)

Digester Gas Typical Composition:

Methane: 59% (typical, dry basis)

CO₂: 41%

(Average DG Density = 1.22 g/l at STP)

Nitrogen + Oxygen: <1%

NMOC Emissions, maximum-Uncontrolled = (3,800,000 cu ft/day)(82 E-06 g NMOC/liter)(1000 liter/cu m)(cu m/35.314cu ft)(lb/454 g) = 19 lb/day (7,094 lb/yr)

Conversion of 82 $\mu\text{g/l}$ 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 monthly average digester gas production rate: 2,160,000 cu ft/day

Total carbon (NMOC) emitted @ 300 ppm = [2,160,000 cu ft/day][300 cu ft NMOC as methane/1E6 cu ft DG][lb-mole/386 cu ft][16.1 lb/lb-mole] = 27 lb/day

2. Flue Gas Oxygen Correction Factors

Oxygen Correction, scf @ 3% O₂ per scf @ 0% O₂ = (20.95 - 0)/(20.95 - 3) = 1.167

Oxygen Correction, scf @ 15% O₂ per scf @ 0% O₂ = (20.95 - 0)/(20.95 - 15) = 3.521

Oxygen Correction, scf @ 11.3% O₂ per scf @ 0% O₂ = (20.95 - 0)/(20.95 - 11.3) = 2.171

3. Conversion of 0.3 g/hp-hr SO₂ (BACT) to ppm H₂S in Digester Gas (S-38 Engine feed)

Basis:

1 Hour operation

19.8E6 Btu/hr

2980 BHP

Diesel Usage: 2% (ht value) = 396,000 Btu/hr (2.8 gph)

Digester Gas (98%, conservative) = 19.404E6 Btu/hr (34,695 scf/hr @ 560 Btu/scf)

Total Sulfur Out = (0.3 g/hp-hr) = (0.3 g SO₂/bhp-hr)(2980)(1/454) = 1.97 lb/hr SO₂

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$$\begin{aligned} &= 0.031 \text{ mole/hr SO}_2 \\ &= 11.9 \text{ scf/hr SO}_2 \end{aligned}$$

SO₂ from Diesel: (2.8 gal/hr)(6.11 lb diesel/gal)(500 lb S/MM lb diesel)(mole S/32.1 lb)(386 cu ft/mole SO₂) = 0.103 scf SO₂/hr

SO₂ from Fuel Gas: 11.9 scf/hr – 0.103 scf/hr = 11.797 scf/hr
(11.797 scf SO₂/hr)(mole SO₂/386 scf)(mole H₂S/mole SO₂) = 3.056E-2 mole H₂S/hr

Fuel Gas Rate = 34,695 scf/hr

$$\text{Ppm H}_2\text{S in Digester Gas} = 3.056\text{E-}02 \text{ mole}/[(34,695 \text{ scf})(\text{mole}/386 \text{ scf})/1\text{E}6] = 340 \text{ ppm}$$

4. SO₂ Emission based on Digester Gas Sulfide Concentration of 300 ppm

Basis: 1 hour

MW: SO₂ = 64.05 lb/lb-mole

SO₂ emissions = (300 cu ft sulfur/1E6 cu ft DG)(159,000 cu ft DG/hr)(lb-mole/386.8 scf)(1 mole SO₂/mole S)(64.05 lb SO₂/lb-mole SO₂) = 7.9 lb/hr (34.6 tpy)

5. Conversion of 300 ppm sulfur dioxide in flue gas to H₂S level in digester gas.

H₂S in Digester Gas = (300E-6 cu ft SO₂/cu ft flue gas)[1 cu ft S/cu ft SO₂][5.1506 cu ft FG./cu ft digester gas][1E6] = 1545 ppmv of total reduced sulfur in digester gas.

APPENDIX D

EMISSIONS INCREASES

The following table lists the emissions increases from the eleven permit applications processed since the original Title V Permit Issuance

East Bay Municipal Utility District (plant A0591)							
Emission Increases Since Initial Title V Permit			NOx (tpy)	CO (tpy)	POC (tpy)	SO2 (tpy)	PM10 (tpy)
AN 27693		MM Btu/hr					
S-171		N/A	-	-	-	-	-
S-172		N/A	-	-	-	-	-
AN 1068							
A-461, A-462 (S-110)		N/A	-	-	-	-	-
AN 1209							
S-173		N/A	-	-	-	-	-
AN3694							
S-5 Boiler, Digester Gas		9.87	-	-	-	-	-
S-37 Cogen Engine, Multi-Fuel		19.8	-	-	-	-	-
S-38 Cogen Engine, Multi Fuel		19.8	32	76.8	15.4	7.7	2.2
S-39 Cogen Engine, Multi Fuel		19.8	-	-	-	-	-
AN 7012							
S-5, S-37, S-38, S-39			-	-	-	-	-
AN 4077 , S-49 Diesel BUG, Portable		1.0	0.12	0.03	0.0036	0.002	0.004
AN 4063 , S-50 Diesel BUG		1.8	0.6	0.2	0.02	0.01	0.02
AN 4064 , S-51 Diesel BUG		2.0	0.6	0.15	0.02	0.01	0.02
AN 4078 , S-52 Diesel BUG, Portable		2.1	0.24	0.06	0.007	0.004	0.007
AN 4062 , S-53 Diesel BUG		2.1	0.7	0.2	0.02	0.01	0.02
AN 10353 (Title V), AN 10237 (NSR)							

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**East Bay Municipal Utility District (plant A0591)
 Emission Increases Since Initial Title V Permit**

		NOx (tpy)	CO (tpy)	POC (tpy)	SO2 (tpy)	PM10 (tpy)
S-48 GDF G-9008	N/A	-	-	-	-	-
Total Permitted Emissions Increases, tpy		34.3 tpy	77.4	15.5	7.7	2.3
Actual Plant Emissions, Initial Title V Permit (12/95)		221.2 tpy	94.4 tpy	74 tpy	28.2 tpy	20.3 tpy
Actual Plant Emissions, Current Level (11/2005)		43.4 tpy	145.8 tpy	35.7 tpy	22.1 tpy	4.0 tpy

APPENDIX E

PERMIT APPLICATION ENGINEERING EVALUATIONS

Engineering Evaluations for the following permit applications are attached to the Statement of Basis in this Appendix.

<u>AN</u>	<u>TITLE</u>
27693	S-171, S-172 Gravity Belt Thickeners
1068	A-461, A-462 Carbon Adsorption Scrubbers abating S-110
1209	S-173 Gravity Belt Thickener, Abated by A-7
3694	S-5, S-37, S-38, S-39 Change of Condition; Operate 3 Engines Simultaneously
7012	S-5, S-37, S-38, S-39 Change of Condition: Operate 2 Engines + S-5 Boiler Simultaneously
4077	S-49 Portable Emergency Backup Generator
4063	S-50 Emergency Backup Generator, Diesel, 238 HP
4064	S-51 Emergency Backup Generator, Diesel, 268 HP
4078	S-52 Portable Emergency Backup Generator, 280 HP
4062	S-53 Emergency Backup Generator, Diesel, 277 HP
10237	S-48 GDF Change of Condition
10353	S-48 GDF Change of Condition (Title V)