Bay Area Air Quality Management District

939 Ellis Street
San Francisco, CA 94109
(415) 771-6000

Permit Evaluation
and
Statement of Basis
for
RENEWAL of

MAJOR FACILITY REVIEW PERMIT

for

City of Santa Rosa Wastewater Treatment
Facility #A1403

Facility Address:
4300 Llano Road
Santa Rosa, CA 95407

Mailing Address:
4300 Llano Road
Santa Rosa, CA 95407

Application Engineer: Yu Zhang Liu
Site Engineer: Eric Y. Chan

Applications: 23555, 21686

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Title V Statement of Basis

A. Background

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

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

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

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 A1403.

This facility received its initial Title V permit on July 1, 1997. The permit was renewed on Janaury 8, 2007. This application is for the second permit renewal. Although the current permit expired on Jan 7, 2012, it continues in force until the District takes final action on the permit renewal. This "application shield" applies since the permit holder submitted a complete renewal application to the District on 7/12/11, which is more than six months prior to the permit expiration date. The proposed permit shows all changes to the permit in strikeout/underline format.

B. Facility Description

The City of Santa Rosa Wastewater Treatment Plant, (aka City of Santa Rosa – Laguna Subregional Wastewater Reclamation Facility; or Laguna Wastewater Reclamation) is a publicly owned treatment works (POTW) facility that provides wastewater collection, treatment and

disposal services to the residents and businesses of Santa Rosa, Sebastopol, Cotati and Rohnert Park. The sources that are permitted include liquid and semi-liquid wastewater process sources, 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, flow equalization, secondary treatment, secondary clarification, disinfection by UV light, sludge handling, and sludge digestion. Combustion operations include three (3) existing cogeneration engines, a digester gas emergency flare, and two (2) emergency standby diesel fired generators. In addition, the plant plans to install four (4) non-emergency/emergency dual-use cogeneration engines

Average dry weather wastewater flow capacity is approximately 17,600,000 gal/day. Average wet weather flow capacity is approximately 22,740,000 gal/day. The wastewater processes at Laguna 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 the need for a Federal Title V Major Facility Permit.

There has been no significant change in emissions since the last Title V renewal permit issuance.

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.

The dates of adoption and approval of rules in Standard Condition I.A have been updated.

BAAQMD Regulation 2, Rule 5 – New Source Review of Toxic Air Contaminant and SIP Regulation 2, Rule 6 – Permits, Major Facility Review have been added to Standard Condition I.A.

The following language was added to Standard Condition I.B.1: "If the permit renewal has not been issued by [ ], but a complete application for renewal has been submitted in accordance with the above deadlines, the existing permit will continue in force until the District takes final action on the renewal 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.

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.

"Regulation 3" was deleted from the basis of Standard Condition I.E.2 and Standard Condition I.F since Regulation 3 is not relevant to these two Standard Conditions

II. Equipment

This section of the permit lists all permitted or significant sources. Each source is identified by 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.

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 "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 District is adding an exempt equipment list to this section to clarify the status of various sources and operations. Table II-C will identify any equipment or operations that are located at this facility but that are exempt from Title V permitting requirements. Typically, this table will include equipment or operations that are exempt from the District requirement to have a permit to operate pursuant to BAAQMD Regulation 2, Rule 1, Sections 103, 105, or 113-128 and that are not significant sources. However, it may also include equipment or operations that are required to have a District permit to operate but that are exempt from BAAQMD Regulation 2, Rule 6, Major Facility Review pursuant to Regulation 2, Rule 6, Sections 110-114. The applicable exemption will be identified in Table II-C. Although equipment listed in Table II-C is

not required to be identified in the Title V permit, this exempt equipment must still comply with any applicable District, state, or federal regulations.

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.

The equipment list has been revised to clarify the equipment names or description. For example, "S-3, Compost Facil, 31E3 sq ft" was revised to "S-3, Compost Facility, 31000 sq ft" to clarify the equipment description.
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 that the current Permit was issued and the renewal permit proposal date:

Changes to permit:

Devices Removed from Service or Archived since current Major Facility Review permit was issued:

Source #	Description	Application Number	Explanation
S-5	Trommel Screen, Portable Diesel	15555	Replaced with S-40, Portable Diesel Powered Compost Mixer in Application 15555
S-32	Recycle Grinder, Portable Diesel	N/A	Removed by the Facility

Devices Permitted Since current Major Facility Review permit was issued:

Source #	Description	Application Number	Explanation
S-200	Internal combustion engine #1	21686	Permitted under NSR
S-201	Internal combustion engine #2	21686	Permitted under NSR
S-202	Internal combustion engine #3	21686	Permitted under NSR
S-203	Internal combustion engine #4	21686	Permitted under NSR

S-200, S-201, S-202, and S-203 is permitted to replace S-29, S-31, and S-35; However, S-200, S-201, S-202, and S-203 has not started in service at the time of this Renewal.

Devices Permitted as Non-road Engine Since the current Major Facility Review permit was issued:

Source #	Description	Application Number	Explanation
S-40	Portable Diesel Powered Compost	15555	Exempt from Major Facility Review Permit per

Source #	Description	Application Number	Explanation
	Mixer		Regulation 2-6-114, since S-40 is a non-road engine; However, S-40 is subject to District's Permitting Requirement.

Devices with Changed Permit Status Since the current Major Facility Review permit was issued

Source #	Description	Application Number	Explanation
S-28	Hot water Boilers (2) (natural gas)	N/A	S-28 has been severed from the digester gas system and only be fired on natural gas, and exempt from the District's Permitting Requirements. S-28 is considered to be a Significant Source per Regulation 2-6-239 and therefore listed in Table II-D since it has a Potential to Emit over 2 tons of NOx and/or POC

Devices Moves from Permitted Sources (Table IIA) to Exempt Equipment (Table IIC):

Source #	Description	Application Number	Explanation
S-37	Diesel Engine Pump, portable	4855	Exempt from Major Facility Review Permit per Regulation 2-6-114, since S-37 is a non-road engine
S-38	Diesel Engine Pump, portable	4855	Exempt from Major Facility Review Permit per Regulation 2-6-114, since S-37 is a non-road engine

Abatement Device Added Since the current Major Facility Review Permit was issued:

Source #	Description	Application Number	Explanation
A-2	Cummins Passive Particulate Filter	15555	Permitted to Abate Particulate Matters from S-40
A-200	Iron Sponge	21686	Remove H_2S (Hydrogen Sulfide) from digester gas from S-190
A-201	Activated carbon	21686	Remove Particulates, H_2S (Hydrogen Sulfide), and NMHC from S-190

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.

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.

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

- BAAQMD Regulation 2, Rule 1, Permits - General Requirements
- SIP Regulation 2, Rule 1, Permits – General Requirements
- BAAQMD 2-1-429, Federal Emissions Statement
- SIP Regulation 2, Rule 1, General Requirements
- BAAQMD Regulation 2, Rule 5, New Source Review of Toxic Air Contaminants
- BAAQMD Regulation 6, Particulate Matter and Visible Emissions has been designated as SIP Regulation 6, since the rule has been renamed and renumbered as Regulation 6, Rule 1, Particulate Matter, General Requirements
- BAAQMD Regulation 8, Rule 2, Miscellaneous Operations
- SIP Regulation 8, Rule 2, Miscellaneous Operations
- BAAQMD Regulation 8, Rule 3, Organic Compounds – Architectural Coatings
- BAAQMD Regulation 8, Rule 15, Organic Compounds - Emulsified and Liquid Asphalts
- BAAQMD Regulation 8, Rule 40 Aeration of Contaminated Soil and Removal of Underground Storage Tanks
- SIP 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 47, Air Stripping and Soil Vapor Extraction Operations
- SIP Regulation 8, Rule 51, Adhesive and Sealant Products
- California Health and Safety Code Section 41750 et seq., Portable Equipment
- California Health and Safety Code Section 44300 et seq., Air Toxics "Hot Spots" Information and Assessment Act of 1987
- California Code of Regulations, Title 17, Section 93115, Airborne Toxic Control Measure for Stationary Compression Ignition Engines
- California Code of Regulations, Title 17, Section 93116, Airborne Toxic Control Measure for Diesel Particulate Matter from Portable Engines: Rated at 50 Horsepower and Greater
- 40 CFR Part 61, Subpart M, National Emission Standards for Hazardous Air Pollutants – National Emission Standard for Asbestos
- EPA Regulation 40 CFR 82: Protection of Stratospheric Ozone

- Subpart F, 40 CFR 82.156: Recycling and Emissions Reductions – Required Practices
- Subpart F, 40 CFR 82.161: Recycling and Emission Reductions – Technician Certification
- Subpart F, 40 CFR 82.166: Recycling and Emission Reductions – Reporting and Recordkeeping Requirements

Regulation 2 Rule 5 was removed from Table III since Regulation 2 Rule 5 is appropriately listed in section I.A.

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 Determinations

POTW NESHAP: 40 CFR Part 63, Subpart VVV, promulgated October 26, 1999, contains the NESHAP standards for POTWs. This NESHAP was evaluated to determine if Laguna 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 concludes that City of Santa Rosa-Laguna Wastewater Reclamation Facility 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 Laguna Wastewater Reclamation Facility's maximum design dry weather flow rate is 21.3 million gallons per day and the average dry weather flowrate is 17.6 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, Laguna is not an Industrial POTW as defined by 40 CFR 63.1595. Laguna processes strictly domestic wastewater streams.

Digester Gas Combustion, Applicable Regulation 8: The anaerobic digesters S-190 produce digester gas, which is principally combusted in the digester gas engines and secondarily in the digester gas flare. The composition of the digester gas is roughly 59% methane, 41% carbon dioxide, with about 20 ppmv of non-methane organic compounds as hexane. The District evaluated whether the digester S-190 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. Laguna has estimated a maximum daily digester gas production rate (highest month average) of 365,000 cu ft, with a conservative maximum concentration of 100 micro-grams NMOC per liter of digester gas (20 ppmv). While the expected combustion destruction efficiency of NMOC in a well-mixed combustible fuel stream should easily exceed 90%, this abatement efficiency cannot be assured for digester gas combustion, due to the high concentrations of non-combustible gas (CO2). Further, the very low average digester gas inlet concentration (20 ppmv) of NMOC would, upon combustion at 90% efficiency result in an outlet concentration of 2 ppm NMOC, makes measurement and continued verification problematic, due to the error limits of the testing methods. Based on these findings the District concludes 8-1-110.3 may not be applicable for digester gas combustion, since 90% destruction efficiency cannot be reasonably expected at all times.

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 2.3 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-190 and the respective digester gas fired engines, boilers and flare are subject to and will comply with Reg 8-2-301. Regulation 8-2-301 will be included in Table IV, Applicable Requirements for S-190 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 device in use is flare A-35. In addition, the current cogeneration engines S-29, S-31, and S-35 and the future cogeneration engines S-200, S-201, S-202, and S-203 burn digester gas to make power and heat and therefore control the emissions of digester gas. All of these devices control emissions from the anaerobic digesters S-190, 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. Laguna has a historical maximum daily digester gas production rate of 365,000 cu ft with an estimated maximum concentration of 100 micro-grams NMOC per liter (20 ppmv), of digester gas. Assuming all digester gas is vented at the maximum NMOC concentration gives a daily uncontrolled emission rate of approximately 4.6 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 0.84 ton (1,679 lb/yr), CAM is not required.

NESHAP/NSPS for Combustion Engines:
The existing Cogeneration Engines S-29, S-31, and S-35 is subject to the Code of Federal Regulation, Title 40, Part 63, subpart ZZZZ – NESHAP for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. Per 40 CFR 63.6590(a)(1)(iii), the subpart ZZZZ applies to existing stationary RICE located at an area source of HAP emissions, and a stationary RICE is existing if construction or reconstruction of the stationary RICE is commenced before June 12, 2006.
The future cogeneration engines S-200, S-201, S-202, and S-203 are subject and expected to comply with Subpart JJJJ of 40 CFR 60 (NPSP) - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines, and S-200, S-201, S-202, and S-203 meets NESHAP by complying with 40 CFR 60 (NSPS) per 40 CFR 63.6590(c)(1).

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:

S-5, S-28, S-32, S-36, S-37, S-38 will be removed from Table IV since these sources were either removed from service or considered to exempt from Major Facility Review Permit per Regulation 2-6-114.

District Regulations and SIP Regulations are updated in Table IV.

S-29, S-31, and S-35 Cogeneration Units:
Recordkeeping and Compliance Demonstration Requirements per District's Regulation 9 Rule 8 and Subpart ZZZZ, 40 CFR 63: NESHAP for Stationary Reciprocating Internal Combustion Engines requirements were added to the Source-specific Applicable Requirement. The fuel sulfur content requirement of BAAQMD Regulation 9-1-304 was removed for S-35 since S-35 does not burn Liquid nor Solid Fuels.

S-33 and S-34 Standby Diesel Fired Generators: Regulation 9-8-503 Recordkeeping for Emergency Engine and California Code of Regulation, Title 17, Section 93115 were added to the two sources.

Table for S-200, S-201, S-203, and S-204 was added to the Major Facility Review Permit since these four sources were permitted since the previous renewal. S-200, S-201, S-202, and S-203 is subject to BAAQMD Regulation 6, Rule 1: Particulate Matter, Regulation 8 Rule 2: Organic Compounds Miscellaneous Operations, Regulation 9 Rule 1: Inorganic Gaseous Pollutants, and Code of Federal Regulation, Title 40, Part 60, Subpart A, General Provision and Subpart JJJJ: Standards of Performance for New Stationary Sources, Spark Ignition Engines.

V. Schedule of Compliance

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

"409.10 A schedule of compliance containing the following elements:

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

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

The BAAQMD Compliance and Enforcement Division conducted a review of compliance over the past year and has determined that for the period of March 6, 2005 through March 6, 2006, one violation notice was issued to the facility - for submitting the semi-annual Title V monitoring report late. The facility came into compliance by submitting the report by the end of the period. There have been no other violations, no on-going non-compliance, and no recurring patterns of violations. The compliance report is contained in Appendix A of this permit evaluation and statement of basis.

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 and all "underline" language will be retained, subject to consideration of comments received.

The existing permit conditions are derived from previously issued District Authorities to Construct (A/C) or Permits to Operate (P/O). Permit conditions may also be imposed or revised as part of the annual review of the facility by the District pursuant to California Health and Safety Code (H&SC) § 42301(e), through a variance pursuant to H&SC § 42350 et seq., an order of abatement pursuant to H&SC § 42450 et seq., or as an administrative revision initiated by

District staff. After issuance of the Title V permit, permit conditions will be revised using the procedures in Regulation 2, Rule 6, Major Facility Review.

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

Conditions have also been deleted due to the following:
- Redundancy in 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 which 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.

Summary of Changes to Operating Conditions

The following table lists the conditions in order with the respective sources as well as the condition status.

Condition Number(s)	Source Number(s)	Comment/Changes/Status
784	S-110, S-120, S-130, S-140, S-140, S-150, S-160, and S-170	Add to the permit, omitted in the previous permits.
947	S-100	To be revised
1541	S-28	Deleted for Title V permit
12848	S-3, S-4	To be revised
17392	S-32	Deleted for Title V permit
18867	S-29, S-31	To be revised
18856	S-33, S-34	To be revised
18871	S-190	To be revised
19750	S-35	To be revised
24751	S-200, S-201, S-202, S-203	New Condition

Condition Discussion

Condition 784

For S-110, S-120, S-130, S-140, S-150, S-160, and S-170

1. If the District receives more than five confirmed complaints in a week, the City of Santa Rosa WWTP shall take immediate action to abate the odor. [Basis: Regulation 1-301]

Condition 947 for source S-100

1. Flowrate

The owner/operator shall ensure that the total wastewater flow to S-100 shall not exceed 21.3 million gallons per day on a calendar month average during dry weather periods or 42 million gallons per day on a calendar month average during wet weather periods. For the purposes of this limit, wet weather is defined as the months from 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~~ owner/operator shall employ all measures, practices, or modifications necessary to abate the nuisance. [Basis: Regulation 1-301]

3. Records

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

a. Daily and monthly (calendar basis) 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 1541 for source S-28

Condition 1541 is deleted from the Title V permit since S-28 is exempt from District permit requirements per District's Regulation 2-1-114.

Condition #12848 for S-3 and S-4

S-5 Compost Screens is removed from the condition since S-5 is removed from service and is replaced by S-40 portable diesel fired compost mixer. The section for the initial source test requirement is removed

For S-3 Composting Bay, S-4 Stockpiles, ~~S-5 Screens,~~ A-1 Biofilter

1. The owner/operator shall ensure that visible particulate emissions from this source ~~shall~~ does not exceed Ringelmann 0.5 or result in fallout on adjacent property in such quantities to cause a public nuisance per Regulation 1-301. (Basis: BACT, Regulation 1-301)

~~2. The facility shall conduct a District approved source test on A-1 Biofilter within 60 days of start-up to ensure that this facility is in compliance with Regulation 7, Section 303 for the following compounds: (Basis: Regulation 7)~~

~~a. Dimethylsulfide (CH3)2S~~
~~b. Mercaptans, calculated as methylmercaptan CH3SH~~
~~c. Ammonia NH3~~

~~The samples shall be collected as prescribed in the Manual of Procedures, Volume IV and submitted to the District.~~

2. The owner/operator shall ensure that the throughput of sludge and yard waste mixture shall not exceed 36,500 tons in any consecutive 12 month period. (Basis: cumulative increase)

3. For the compost that is stockpiled, both in the curing pile and storage piles, the owner/operator shall add water ~~shall be added~~ manually as needed to reduce particulates. (Basis: Regulation 6-1-301)

4. The owner/operator shall process the stockpile of shredded screen yard waste (i.e., green tree trimmings, green leaves, brushes) ~~shall be processed~~ no later than 5 days from the time they are received to prevent wood decomposition and odors. (Basis: Reg. 7)

5. If the facility receives 2 or more Violation Notices from the District for "Public Nuisance" in any consecutive 12 month period, the owner/operator of this facility shall submit to the District within 30 days, an application to modify the Permit to Operate to include the following control measures as applicable or any other that the District deems necessary and appropriate. (Basis: Reg. 7)

   a. Reduce holding time of yard waste from 5 days to 3 days.
   b. Replace biofilter media with new material if it no longer is effective and decomposition has set it, or increase the biofilters thickness so that no odors are detected.

6. In order to demonstrate compliance with the above conditions, the owner/operator of sources S-3and S-4 shall maintain the following records in a District approved log. These records shall be kept on facility and made available for District inspection for a period of five years from the date that the record was made. (Basis: Cumulative Increase, BAAQMD Regulation 2-6-501)

   a. Daily throughput of sludge/yard waste material being processed summarized on a monthly basis.

b. Cubic yards of stockpiled yard waste received in stockpiled area and removed for processing during a 5 day time period.
c. Daily hours of operation, summarized on a monthly basis.

Condition 17392 for sources S-32
The condition 17392 for S-32 was deleted since S-32 has been removed from service.

Condition 18856 for sources S-33 and S-34
The Condition 18856 for S-33 and S-34 will be substituted by the District's template condition #22820 for existing emergency diesel generators.

Condition 22820 for sources S-33 and S-34 is added to replace Condition 18856

1. The owner/operator shall not exceed 20 hours per year per engine for reliability-related testing.
[Basis: Regulation 2-5]

2. The owner/operator shall operate each emergency standby engine only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, State or Federal emission limit, or for reliability-related activities (maintenance and other testing, but excluding emission testing). Operating while mitigating emergency conditions or while emission testing to show compliance with District, State or Federal emission limits is not limited.
[Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

3. The owner/operator shall operate each emergency standby engine only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine is installed, operated and properly maintained.
[Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

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

5. At School and Near-School Operation:

If the emergency standby engine is located on school grounds or within 500 feet of any school grounds, the following requirements shall apply:

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

Condition 18867 for sources S-29 and S-31

More stringent requirements from the District's Regulation 9 Rule 8 is updated to this condition.

For Sources S-29, ~~and~~ S-31

1. The owner/operator shall ensure that emissions of NOx from this source ~~shall~~ does not exceed:
   a. ~~140~~ 65 ppmv as corrected to 15% oxygen, dry basis, when fired with natural gas
   b. 70 ppmv as corrected to 15% oxygen, dry basis, when fired with digester gas.
   (Basis: BAAQMD 9-8-301.2, 302.1, cumulative increase)

2. The owner/operator shall ensure that emissions of CO from this source ~~shall~~ does not exceed 2000 ppmv as corrected to 15% oxygen, dry basis. (Basis: BAAQMD 9-8-301.3, 302.3)

3. The owner/operator shall ensure that District approved flowmeters ~~shall be~~ are installed on each engine, to measure the respective digester gas and natural gas flow. The owner/operator shall install these flowmeters shall be installed prior to any operation and maintain~~ed~~ in good working order. (Basis: BAAQMD 1-441, cumulative increase)

4. The owner/operator ~~City of Santa Rosa~~ shall ensure that a performance test is conducted at least once during each calendar quarter in which a source test is not performed in accordance with the District test procedures to demonstrate compliance with the NOx and CO limits. City of Santa Rosa 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: BAAQMD 2-6-409.2, BAAQMD Regulation 9-8-503)

5. The owner/operator shall maintain a ~~A~~ District approved engine log ~~shall be maintained~~ to record the hours of operation, amount of digester gas and natural gas combusted to produce the power. The owner/operator shall maintain this log ~~shall be maintained~~ for a period of at least five years and shall be made available to District personnel upon request. (Basis: BAAQMD 2-6-501, Cumulative Increase)

Condition 18871 for source S-190
Condition 18871 has been updated in application #21686.

Source S-190 Anaerobic Digesters

1. The owner/operator shall ensure that emissions from S-190 ~~shall be~~ are abated at all times by combustion at any or all of the following engines: S-29, S-31, S-35, S-200, S-201, S-202, & S-203 except as specified in Part 2
(Basis: Regulation 1-301)

2. The owner/operator shall ensure that emissions from S-190 ~~shall be~~ are abated by A-35 only when equipment failure or other emergencies require the flaring of digester gas. (Basis: Cumulative Increase)

3. The owner/operator shall ensure that digester gas total sulfur content shall not exceed 1500 ppm for digester gas going to A-35. (Basis: Reg. 9-1)

4. To demonstrate compliance with the 1500 ppm limit, the owner/operator shall monitor and record the sulfur content of the digester gas upstream of A-200 at a frequency of at least once every calendar week. If the permit holder can demonstrate 3 months of digester gas sulfur results lower than 1000 ppm the monitoring frequency for sulfur analysis may be reduced to at least once every calendar month. (Basis: Regulation 9-1-302)

5. The owner/operator shall ensure that the d~~D~~igester gas going to engines S-200 & S-201, S-202, & S-203 ~~shall be~~is abated by A-200 Iron Sponge / Water Removal and then by A-201 Activated Carbon/Particle Removal. The owner/operator shall monitor the H_2S content at least weekly with a portable analyzer and replace the iron sponge material and/or the activated carbon material before the digester gas H_2S content downstream of A-201 reaches 5 ppm.

Condition 19192 for sources S-37, and S-38
Condition 19192 will be deleted from this Title V Review Permit since S-37 and S-38 is exempt from Title V Review per Regulation 2-6-114 (non-road engine)

Condition 19750 for source S-35
This is a new condition for the cogeneration engine S-35 which replaced S-30, which failed and had to be replaced.
For Source S-35, Cogen Engine #4, 1160 BHP, 800 KW

1. The owner/operator shall ensure that the ~~This~~ engine ~~shall be~~ is fired on digester gas and/or natural gas only.
[Basis: Cumulative Increase]

2. Thermal Capacity Limitation: The owner/operator shall ensure that the total ~~Total~~ thermal input ~~shall~~ does not exceed 56,772 MM Btu in any 12 month period. [Basis: Cumulative Increase]

3. The owner/operator shall operate S-35 so that the NOx emissions, calculated an NO_2, ~~shall~~ do not exceed ~~95~~ 70 ppm at 15 percent oxygen~~, or 0.35 lb/MM Btu fuel input~~
[Basis: BACT, Cumulative Increase]

4. The owner/operator shall operate S-35 so that the CO emissions ~~shall~~ do not exceed 410 ppm at 15 percent oxygen, or 0.94 lb/MM Btu fuel input. [Basis: BACT, Cumulative Increase]

5. The owner/operator shall operate S-35 so that the NMHC emissions, calculated as methane, ~~e~~ do not exceed 270 ppm at 15 percent oxygen, or 0.35 lb/MM Btu fuel input.
[Basis: BACT, Cumulative Increase]

6. The owner/operator shall install District approved flowmeters ~~shall be installed~~ on this engine to measure the respective digester gas and natural gas flow. The owner/operator shall install these flowmeters ~~shall be installed~~ prior to any operation and maintained in good working order. [Basis: Cumulative Increase]

~~7. To demonstrate compliance with the limits specified in Parts 3, 4, and 5, above, the permit holder shall conduct a District-approved performance test within 60 days of startup. [Basis: BAAQMD 2-6-409.2]~~

7~~8~~. ~~City of Santa Rosa~~ The owner/operator shall ensure that ~~an annual~~ quarterly performance test is conducted on this engine in accordance with District-approved test procedures to demonstrate ongoing compliance with the NOx, CO and NMHC limits specified in Parts 3, 4, and 5, above.
[Basis: BAAQMD 1-441]

8~~9~~. To determine compliance with the above Parts, the owner/operator ~~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:
[Basis: Regulation 2-6-409.2]

a. Monthly records of the quantity of digester gas and natural gas burned at this source.
b. Monthly records of the total thermal input in BTU.
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 Regulation.

Permit Condition #24751 for S-200, S-201, S-202, S-203 (Cogenerators) is added to this permit application.

Permit conditions for S-200, 201, 202, and 203 -1537 bhp Engines, A/N # 21686

1. The owner/operator shall ensure that Cogeneration Engines S-200, 201, 202, 203 are fired only by one of the following fuels: sewage sludge digester gas, natural gas, or a combination of digester gas and natural gas, and in accordance with the following requirements.
   [Basis: Cumulative Increase]
   a. At any one time, up to two engines may be running for routine use (non-emergency, non-testing/maintenance). The routine use engine(s) running will fire digester gas, with up to 10% by volume natural gas to smooth out the fuel flow.
   b. The engines not running to produce power will function as emergency use generators.
   c. Each engine may fire natural gas for up to 100 hours/yr for maintenance and testing.
   d. Each engine may fire 100% natural gas during emergency situations.

2. The owner/operator shall install and maintain District approved totalizing, non-resettable hour meters on S-200, S-201, S202, and S-203. The ratio of natural gas to digester gas shall be monitored and recorded for the engine(s) running for routine use. If the gases are mixed centrally and then distributed to the engines, the owner/operator shall install and maintain District approved totalizing non-resettable flow meters for digester gas and natural gas at the mixer and totalizing, non-resettable flow meters for the mixed gas at each engine. [Basis: Cumulative Increase]

3. The owner/operator shall ensure that emissions of Precursor Organic Compounds (POC) from S-200, S-201, S-202, and S-203 each do exceed:
   a. 0.55 g/bhp-hr when fired with digester gas with up to 10% by volume natural gas.
   b. 1.0 g/bhp-hr when fired with 100% natural gas.
   [Basis: BACT]

4. The owner/operator shall ensure that emissions of Nitrogen Oxides (NOx) from S-200, S-201, S202, and S-203 each do not exceed 0.75 g/bhp-hr.
   [Basis: BACT]

5. The owner/operator shall ensure that emissions of Carbon Monoxide (CO) from S-200, S-201, S-202, S-203 each do not exceed:
   a. When fired with 100% natural gas: 2.3 g/hp-hr source test limit.

b. Within 360 hours of Initial and/or Post Maintenance Start-up: 2.55 g/hp-hr source test limit.
c. Not to Exceed (NTE) limits: 3.10 g/hp-hr for ongoing operation. The owner/operator may demonstrate compliance with this part by having a portable analyzer CO concentration at the engine exhaust of not more than 378 ppm of CO, corrected to 15% oxygen, dry basis. An exhaust concentration of more than 378 ppm of CO shall not be deemed a violation of this part, if the owner/operator complies with one of the following requirements within 30 days or measuring the concentration excursion.
   i. Conduct a Part 6a Complaince Demonstration Source Test, which demonstrates that CO emissions do not exceed 3.10 g/bhp-hr during the test period, or
   ii. Shutdown the engine as soon as possible, but within 30 days and perform a maintenance event to achieve an emission level of less than or equal to 2.55 g/hp-hr.

6. In order to demonstrate compliance with part 3 through 5, the owner/operator shall conduct a District-approved source testing as follows:
[Basis: 2-1-403, 9-8-501, and 9-8-503]

a. Compliance Demonstration Source Test (initial, annual and post maintenance source tests:): The owner or operator shall ensure that a District approved compliance demonstration source test is conducted within 360 hours of each initial startup or post maintenance startup of each engine and annually thereafter. Annual source tests shall be conducted no later than 12 calendar months after the previous source test, shall be conducted while the engine is operating at conditions representative of normal operation, and shall determine all item identified in Parts 6a (i-vi), below. The owner or operator shall notify the District Source Test Section at least 7 days in advance of each source test. Compliance demonstration test reports shall be submitted to the Source Test Section within 60 days of the test date. Since these units are similar, for the initial source test, two engines may be tested running digester gas with 10% natural gas and two engines with 100% natural gas. For annual source test, at least two of the four engines shall be tested annually for compliance with parts 3-5 above. One engine may be tested firing digester gas with up to 10% by volume natural and the other engine firing 100% natural gas. The testing shall also satisfy the requirements of 40 CFR 60 subpart JJJJ 60.4244. The compliance demonstration source test shall determine and report the following information:
   i. Total flow rate of gaseous fuel to each IC Engine (dry basis);
   ii. Concentrations (dry basis) of carbon dioxide (CO2), nitrogen (N2), oxygen (O2), methane (CH4), and total non-methane organic compounds (NMOC) in the combined gaseous fuel burned in each IC Engine;
   iii. Exhaust gas flow rate from each IC Engine (dry basis);
   iv. Concentration (dry basis) of NOx, CO, CH4, NMOC, and O2 in the exhaust gas from each IC Engine;

v. Emissions rate of NOx and CO in units of grams of pollutant/brake horsepower-hour.
vi. CO, NOx and O2 concentration in the exhaust from each engine shall be measured in tandem using the portable gas analyzer method used for the monthly emission monitoring required by Part 6b

b. Monthly (Portable Analyzer) Emission Monitoring Test: The owner or operator shall conduct an emissions monitoring test on a calendar month basis on the engines that are running on routine use (non-emergency, non-testing/maintenance). The interval between required monthly monitoring events shall be at least 15 days. This monthly test shall determine concentration of NOx and CO in units of ppmv @ 15% oxygen using a District approved portable analyzer. All emission monitoring tests shall be conducted with the engine operating at conditions representative of normal operation unless otherwise specified. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations. NOx and CO reading at 15% oxygen shall be averaged over a consecutive 15-munite period.

c. The owner or operator may elect to perform a part 6a compliance demonstration source test in lieu of or in addition to any monthly monitoring test.

d. The owner/operator shall ensure that monitoring and testing analytical accuracy is within ten percent. [Basis: Source Test Section Policy]

7. Maintenance Requirements: The owner or operator shall conduct an engine maintenance event in accordance with the following maintenance frequencies:

a. Overhaul Frequency when portable CO analyzer readings exceed the "Action Limit" of 348 @ 15% oxygen (2.85 g/bhp-hr equivalent): In the event that the monthly emission monitoring test indicates emission levels greater than 348 ppm action limit ppm equivalent, the owner or operator may either accept the test result and comply with the maintenance event frequency in this subpart, or elect to perform a compliance demonstration source test to determine the engine emission levels in g/bhp-hr. If a compliance demonstrate source is performed, the results in units of g/bhp-hr shall be used in preference to monthly ppm monitoring results for determining if engine emission levels exceed the action limit.

b. If the engine emissions are determined to exceed the action limit, the owner or operator shall perform an engine maintenance event to return the engine to the initial CO limit of 2.55 g/bhp-hr within 12 calendar months of the source test date (or monthly monitoring test date) showing CO emissions exceeded the action limit.

c. Overhaul frequency when CO emissions do not exceed the "Action Limit" of 348 ppm @15% oxygen (2.85 g/bhp-hr equivalent). The owner or operator shall perform an engine maintenance event to return the engine to the initial CO limit of 2.55 g/bhp-hr at a frequency not to exceed 43,000

hours or 60 calendar months of operation, whichever comes first. For the purposes of complying with this part, the engine shall be considered to operate for a calendar month if the engine is operated with digester gas feed for more than 372 hours in any calendar month.
[Basis: Regulation 2-1-403]

8. The owner/operator shall report any non-compliance with the above parts to the Director of the Compliance & Enforcement Division at the time that it is discovered. The submittal shall detail the corrective action taken and shall include the data showing the exceedance as well at time of occurrence.
[Basis: Cumulative Increase, BACT/TBACT)

9. The owner or operator of S-200, S-201, S-202, and S-203 shall keep the following records on site in a District approved log:

   a. Monthly (calendar) records of the amount of each type of fuel combusted at the source and the natural gas/digester gas volumetric ratio at the engine firing to produce power (non-emergency, non-testing-maintenance)
   b. Monthly monitoring test results including, date, averaging time and NOx, CO concentrations converted to 15% oxygen basis.
   c. Record of all compliance source tests performed including the instrument calibration and comparative handheld monitoring testing results.

   These records shall be kept on site and made available for inspection by District personnel for a period of at least 5 years from the date on which a record is made. [Basis Cumulative Increase]

VII. Applicable Limits and Compliance Monitoring Requirements

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

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

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

Monitoring decisions are typically the result of a balancing of several different factors including: 1) the likelihood of a violation given the characteristics of normal operation, 2) degree of

variability in the operation and in the control device, if there is one, 3) the potential severity of impact of an undetected violation, 4) the technical feasibility and probative value of indicator monitoring, 5) the economic feasibility of indicator monitoring, and 6) whether there is some other factor, such as a different regulatory restriction applicable to the same operation, that also provides some assurance of compliance with the limit in question.

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

NOx Sources

S# & Description	Emission Limit Citation	Emission Limit	Monitoring
S-29. S-31, S-35, S-200, S-201, S-202, and S-203, 4-Stroke Lean Burn Engines	SIP Regulation 9-8-301.2 & 9-8-302.1	140 ppmv @ 15% O_2, dry	Annual Source Tests or alternate monitoring plan
S-29. S-31, S-35, S-200, S-201, S-202, and S-203, 4-Stroke Lean Burn Engines	BAAQMD Regulation 9-8-301.2 & 9-8-302.1.	65 ppmv @ 15% O_2 dry when fired with natural gas; 70 ppmv @ 15% O_2 dry when fired with digester gas	Quarterly Source Test or alternate monitoring plan
S-200, S-201, S-202, and S-203 4-Stroke Lean Burn Engines	NSPS 40 CFR 60 subpart JJJJ, section 60.4243(b)(2)(ii)	200 ppmv @ 15%O_2 or 3.0 g/hp-hr.	Annual Source Tests or alternate monitoring plan
S-200, S-201, S-202, and S-203 4-Stroke Lean Burn Engines	BAAQMD Condition 24751 part 4	0.75 g/hp-hr	Monthly Source Tests or alternate monitoring plan

NOx Discussion:

S-29, S-31, S-35, S-200, S-201, S-202, and S-203 4-Stroke Lean Burn Cogeneration Sets are limited to a Federally Enforceable Limit of 140 ppmv @ 15% O_2 Dry. The current BAAQMD regulation imposes a more stringent but non-federally enforceable emissions limit which requires quarterly demonstration of compliance per BAAQMD Regulation 9-8-503.

Since S-200, S-201, S-202, and S-203 are new sources, they are also subject to NSPS 40 CFR 60 emission standards.

CO Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-29. S-31, S-35, S-200, S-201, S-202, and S-203, 4-Stroke Lean Burn Engines	SIP Regulation 9-8-301.3 & 9-8-302.3	2000 ppmv @ 15% O_2, dry	Annual Source Test or alternate monitoring plan
S-29. S-31, & S-35 4-Stroke Lean Burn Engines	NESHAP 40 CFR 63.6603(a)	47 ppmv @ 15%O_2, dry	Annual Source Test or alternate monitoring plan
S-29. S-31, & S-35 4-Stroke Lean Burn Engines	Condition 18867, Part 2	2000 ppmv @ 3%O2, dry, 3-hr average	Annual Source Test or alternate monitoring plan
S-200, S-201, S-202, and S-203 4-Stroke Lean Burn Engines	NSPS 40 CFR 60 subpart JJJJ, section 60.4243(b)(2)(ii)	610 ppmv @ 15%O_2 or 5.0 g/hp-hr.	Annual Source Tests or alternate monitoring plan
S-200, S-201, S-202, and S-203 4-Stroke Lean Burn Engines	BAAQMD Condition 24751 part 4	410 ppm @ 15 % O_2 or 0.94 lb/MM btu fuel	Monthly Source Tests or alternate monitoring plan

CO Discussion:

S-29, S-31, and S-35 4-Stroke Lean Burn Cogeneration Sets are limited to a Federally Enforceable Limit of 47 ppmv @ 15% O_2 Dry (NESHAP).

S-200, S-201, S-202, and S-203 4-Stroke Lean Burn Cogeneration Sets are limited to a Federally Enforceable Limit of 610 ppmv @ 15% O_2 Dry (NSPS).

SO_2 Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-29. S-31, S-35, S-200, S-201, S-202, and S-203, 4-Stroke Lean Burn Engines	BAAQMD 9-1-301	Ground level concentrations of SO2 shall not exceed: 0.5 ppm for 3 consecutive minutes AND 0.25 ppm averaged over 60 consecutive minutes AND 0.05 ppm averaged over 24 hours	None
	BAAQMD 9-1-302	300 ppm (dry)	Monitoring of digester gas hydrogen sulfide
S-33 and S-34 Emergency Standby Diesel Generatot	BAAQMD 9-1-304	Sulfur content of fuel < 0.5% by weight	Fuel Oil Certification

SO_2 Discussion:

Area monitoring to demonstrate compliance with the ground level SO_2 concentration requirements of Regulation 9-1-301 is at the discretion of the APCO (per BAAQMD Regulation 9-1-501). This facility does not have equipment that emits large amounts of SO_2 and therefore is not required to have ground level monitoring by the APCO.

All facility combustion sources are subject to the SO_2 emission limitations in District Regulation 9, Rule 1 (ground-level concentration and emission point concentration). In EPA's June 24, 1999 agreement with CAPCOA and ARB, "Periodic Monitoring Recommendations for Generally Applicable Requirements in SIP", EPA has agreed that natural-gas-fired combustion sources do not need additional monitoring to verify compliance with Regulation 9, Rule 1, since violations of the regulation are unlikely. Therefore, no monitoring is necessary for this requirement.

All facility internal combustion engines are subject to the SO_2 emission limitations in District Regulation 9, Rule 1 (ground-level concentration and emission point concentration), including Regulation 9-1-304, Sulfur Content of Fuel Oil < 0.5 wt%. These engines are required to be fueled with CARB Diesel, which is limited to 0.05 wt% sulfur. Fuel oil sulfur content certification is required. These combustion sources do not need additional monitoring to verify compliance with Regulation 9, Rule 1, since violations of the regulation are unlikely. Therefore, no additional monitoring is necessary for this requirement.

PM Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
All sources except standby engines	BAAQMD Regulation 6-1-301	Ringelmann 1.0	Visible Emissions Check
S-33 and S-34 emergency standby engines	BAAQMD Regulation 6-1-303	Ringelmann 2.0	Visible Emissions Check
All sources except heat transfer operations	BAAQMD Regulation 6-1-310	0.15 gr/dscf	None
S-29. S-31, S-35, S-200, S-201, S-202, and S-203, 4-Stroke Lean Burn Engines – Heat Transfer Process (cogeneration)	BAAQMD Regulation 6-1-310.3	0.15 gr/dscf at 6% O2	None

PM Discussion:

BAAQMD Regulation 6, Rule 1 "General Requirements"

Visible Emissions

BAAQMD Regulation 6-1-301 limits visible emissions to no darker than 1.0 on the Ringelmann Chart (except for periods or aggregate periods less than 3 minutes in any hour). Visible emissions are normally not associated with combustion of gaseous fuels, such as digester gas and natural gas. Therefore, per the EPA's June 24, 1999 agreement with CAPCOA and ARB titled "Summary of Periodic Monitoring Recommendations for Generally Applicable Requirements in SIP", no monitoring is required to assure compliance with this limit for these sources.

BAAQMD Regulation 6-1-303 limits visible emissions from standby engines to no darker than 2.0 on the Ringelmann Chart (except for periods or aggregate periods less than 3 minutes in any hour). For the emergency standby engines, exceedances of the visible emission standards are not expected because the engines are required to burn only CARB specified fuel that contains less than 0.05 wt% sulfur.

Particulate Weight Limitation

BAAQMD Regulation 6-1-310 limits filterable particulate (FP) emissions from any source to 0.15 grains per dry standard cubic foot (gr/dscf) of exhaust volume. Section 310.3 limits filterable particulate emissions from "heat transfer operations" to 0.15 gr/dscf @ 6% O_2. These are the "grain loading" standards.

Exceedances of the grain loading standards are normally not associated with combustion of gaseous fuels, such as digester gas and natural gas. Sources S-29, S-31, S-35, S-200, S-201, S-202, and S-203 are permitted to burn 90% digester gas and 10% natural gas except during periods of natural gas curtailment. Per the EPA's July 2001 agreement with CAPCOA and ARB entitled "CAPCOA/CARB/EPA Region IX Recommended Periodic Monitoring for Generally Applicable Grain Loading Standards in the SIP: Combustion Sources: Summary of Periodic Monitoring Recommendations for Generally Applicable Requirements in SIP", no monitoring is required to assure compliance with this limit for these sources.

For the emergency standby engines, exceedances of the grain loading standards are not expected because the engines are required to burn only CARB specified fuel that contains less than 0.05 wt% sulfur.

POC Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-3 Compost Facility, S-4 Stockpiles, S-17, S-18 Reclaimed Water Pond, S-100 through S-190 Water Treatment	BAAQMD 8-2-301	15 lb/day and greater than 300 ppm total carbon	None

POC Discussion:

Miscellaneous Operations Standards

BAAQMD Regulation 8, Rule 2 Miscellaneous Operations is the 'back-stop' organic compound emission regulation in that if no other rule in Regulation 8 applies, Rule 2 does. The emissions of POC from the facility is expected to be very low since the wastewater treatment sources are abated by A-1, Biofilter and also A-35 emergency digester flare

Hydrogen Sulfide Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-190 Anaerobic Digesters	BAAQMD 9-2-301	0.06 ppm H2S over 3 min or 0.03 ppm H2S over 60 min	None

Discussion of Hydrogen Sulfide:

BAAQMD Regulation 9, Rule 2 “Hydrogen Sulfide”

Area monitoring to demonstrate compliance with the ground level H_2S concentration requirements of Regulation 9-2-301 is at the discretion of the APCO (per BAAQMD Regulation 9-2-501). The source of the H_2S at this facility is the digester gas from S-190. Digester gas is abated by A-200 and A-201 Iron Sponge and Activated Carbon, where the H_2S is efficiently absorb prior to combustion process. Permit Condition 18871, Part 4 requires weekly testing of the digester gas to ensure the H_2S content does not exceed this limit. Therefore, this facility does not have equipment that emits large amounts of H_2S and therefore is not required to have ground level monitoring by the APCO.

Changes to permit:

1. BAAQMD and SIP Regulations have been updated in most of the monitoring requirements table
2. Deleted Table IV for S-28 Water Boiler, S-32, S-36, and S-37 Diesel Fired Portable Compressor and Pump since those sources were removed from the Title V permitting requirements as discussed in Section II of Statement of Basis.
3. NESHAP 40 CFR 63 subpart ZZZZ National Emission Standards for Hazardous Air Pollutants monitoring requirements were added to S-29, S-31, and S-35 Internal Combustion Engines, 4-stroke Lean Burn Cogeneration monitoring requirements table.
4. New table VII-J for S-200, S-201, S-202, and S-203 Internal Combustion 4-Stroke Lean Burn Cogeneration Set were added with BAAQMD, SIP and NSPS 40 CFR 60 subpart JJJJ Standards of Performance for Stationary Spark Ignition Internal Combustion Engines monitoring requirements.

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 Regulations 6-301, 6-303, 6-310 have been updated to BAAQMD Regulation 6-1-301, 6-1-303, and 6-1-310

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
First Title V Renewal	January 8, 2007

XI. Glossary

The glossary was updated.

D. Alternate Operating Scenarios:

No alternate operating scenario has been requested for this facility.

E. Compliance Status:

A December 13, 2012 office memorandum from the Director of Compliance and Enforcement to the Director of Permit Services, presents a review of the compliance record of City of Santa Rosa Wastewater Treatment. The Compliance and Enforcement Division staff has reviewed the records for the period from January 7, 2007 through November 30, 2012. This review was initiated as part of the District evaluation of an application by City of Santa Rosa Wastewater Treatment for a renewal Title V permit. During the period subject to review, activities known to the District include:

There were no Notices of Violation issued during this review period.

- The District issued one (1) Notice to Comply (NTC#A42635) to City of Santa Rosa Wastewater Treatment during the review period. The violation was for the late submittal of their semi-annual monitoring report. The District may use the NTC to achieve compliance by using enforcement action appropriate to the severity of the violation. In most cases, these violation involve procedural, administrative, or recordkeeping omissions that did not conceal a more significant violation or involved de minimis emissions. During this reporting period the NTC was corrected and did not result in the issuance of a NOV for failure to correct a minor violation.
- The District did not receive an air pollution complaint during the review period.
- The facility is not operating under a Variance or an Order of Abatement from the District Board.
- The District did not receive any notifications for Reportable Compliance Activities.

The owner certified that all equipment was operating in compliance on 7/12/11.

F. Differences between the Application and the Proposed Permit:

The Title V permit application was originally submitted on 7/12/11. This version is the basis for constructing the proposed Title V permit.

APPENDIX A

BAAQMD COMPLIANCE REPORT

COMPLIANCE & ENFORCEMENT DIVISION

Inter-Office Memorandum

December 13, 2012

TO: JIM KARAS - DIRECTOR OF ENGINEERING

FROM: WAYNE KINO - DIRECTOR OF COMPLIANCE & ENFORCEMENT

SUBJECT: REVIEW OF COMPLIANCE RECORD OF:

CITY OF SANTA ROSA WASTEWATER TREATMENT; SITE #A1403

Background

This review was initiated as part of the District evaluation of an application by the City of Santa Rosa Wastewater Treatment for a Title V Permit Renewal. It is standard practice of the Compliance and Enforcement Division to undertake a compliance record review in advance of a renewal of a Title V Permit. The purpose of this review is to ensure that any non-compliance problems identified during the prior five-year permit term have been adequately addressed, or, if non-compliance persists, that a schedule of compliance is properly incorporated into the Title V permit compliance schedule. In addition, the review checks for patterns of recurring violation that may be addressed by additional permit terms. Finally, the review is intended to recommend, if necessary, any additional permit conditions and limitations to improve compliance.

Compliance Review

Compliance records were reviewed for the time period from January 1, 2007 through November 30, 2012. The results of this review are summarized as follows.

1. Violation History

Staff reviewed the City of Santa Rosa Wastewater Treatment Plant's Annual Compliance Certifications for January 1, 2007 to November 30, 2012 and found no ongoing non-compliance and no recurring pattern of violations.

Staff also reviewed the District compliance records for the review period of January 1, 2007 to November 30, 2012. During this period City of Santa Rosa Wastewater Treatment Plant's activities known to the District include:

District-issued 0 Notice of Violation(s):
District-issued 1 Notice(s) to Comply:

District Staff issued 1 Notice to Comply (NTC # A42653) to City of Santa Rosa Wastewater Treatment during the review period. The violation was for the late submittal of their semi-annual monitoring report. The District may use the NTC to achieve compliance by using enforcement action appropriate to the severity of the violation. In most cases, these violations involve procedural, administrative, or recordkeeping omissions that did not conceal a more significant violation or involved de minimis emissions. During this reporting period the NTC was corrected and did not result in the issuance of a NOV for failure to correct a minor violation.

2. Complaint History

The District received 0 air pollution complaints alleging the City of Santa Rosa Wastewater Treatment Plant as the source, during the review period.

3. Reportable Compliance Activity

Reportable Compliance Activity (RCA), also known as "Episode" reporting, is the reporting of compliance activities involving a facility as outlined in District Regulations and State Law. Reporting covers breakdown requests, indicated monitor excesses, pressure relief device releases, inoperative monitor reports and flare monitoring.

Within the review period, the District received 0 notifications for RCA's. 0 NOV's were issued as a result of these RCA's.

4. Enforcement Agreements, Variances, or Abatement Orders

There were no enforcement agreements, variances, or abatement orders during the review period.

Conclusion

Following its review of all available facility and District compliance records from January 1, 2007 through November 30, 2012, the District's Compliance and Enforcement Division has determined that the City of Santa Rosa Wastewater Treatment Plant was in intermittent compliance from the initial permit period through the present. The City of Santa Rosa Wastewater Treatment Plant has demonstrated no evidence of ongoing noncompliance and no recurring pattern of violations that would warrant consideration of a Title V permit compliance schedule for this facility.

Based on this review and analysis of all the violations for the review period, the District has concluded that no schedule of compliance or change in permit terms is necessary beyond what is already contained in the facility's current Title V permit.

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 which allows the District to impose requirements.

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

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.

District

The Bay Area Air Quality Management District

dscf
Dry Standard Cubic Feet

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.

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.

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)

NOx
Oxides of nitrogen.

NSPS
Standards of Performance for New Stationary Sources. Federal standards for emissions from new stationary sources. Mandated by Title I, Section 111 of the 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

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.

RICE
Reciprocating Internal Combustion Engine(s)

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
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

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 foot
dscfm	=	day standard cubic foot per minute
g	=	grams
gal	=	gallon
gpm	=	gallons per minute
hp	=	horsepower
hr	=	hour
lb	=	pound
in	=	inches
max	=	maximum
m^2	=	square meter
min	=	minute
mm	=	million
MMbtu	=	million btu
MMcf	=	million cubic feet
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
tpy	=	tons per year
yr	=	year

APPENDIX C

CALCULATIONS

1. NMOC Compound Concentrations in Digester Gas

Estimated Average MW of NMOC*: 113 lb/lb-mole (113 g/g-mole)
Estimated Concentration of NMOC*: 100 µg/l = 82 E-06 g/l (µg = microgram = 1,000,000th of a gram; average measured concentration = 50 µg/l)
Laguna Maximum Digester Gas Production Rate: 365E3 cu ft/day (15,208 cu ft/hr)
(Note: Highest monthly average, actual = 365,000 cu ft/day, August 2004)
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 = (365,000 cu ft/day)(100 E-06 g NMOC/liter)(1000 liter/cu m)(cu m/35.314 cu ft)(lb/454 g) = 2.3 lb/day (831 lb/yr)

Conversion of 100 µg/l to ppmv, basis 1,000,000 liter digester gas: (100 E-06 g NMOC/liter DG)(1,000,000 liter DG)(g-mole NMOC/113 g NMOC)(22.4 liter NMOC/g-mole NMOC) = 19.8 liter NMOC per 1,000,000 liter DG = 20 ppmv

300 ppm Carbon in Digester Gas (DG):
MW, Methane: 16.1 lb/mole
Highest monthly average digester gas production rate: 365,000 cu ft/day

Total carbon (NMOC) emitted @ 300 ppm = [365,000 cu ft/day][300 cu ft NMOC as methane/1E6 cu ft DG][lb-mole/386 cu ft][16.1 lb/lb-mole] = 4.6 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. 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)(15,208 cu ft DG/hr)(lb-mole/386.8 scf)(1 mole SO2/mole S)(64.05 lb SO2/lb-mole SO2) = 0.755 lb/hr (3.31 tpy)

4. Conversion of 300 ppm sulfur dioxide in flue gas to H2S level in digester gas.
H2S in Digester Gas = (300E-6 cu ft SO_2/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.

*Concentrations based on highest concentration sampled at East Bay Municipal Utility District (82 µg/l), highest observed concentration

APPENDIX E

PERMIT APPLICATION ENGINEERING EVALUATIONS

Application 21686
City of Santa Rosa Wastewater Treatment; Plant #1403
4360 Llano Road, Santa Rosa 95407

BACKGROUND

City of Santa Rosa Wastewater Treatment is applying to install the following four digester fired generators:

S-200 Engine Generator #1, Digester gas w/ Natural Gas makeup; 1573 bhp
S-201 Engine Generator #2, Digester gas w/ Natural Gas makeup; 1573 bhp
S-202 Engine Generator #3, Digester gas w/ Natural Gas makeup; 1573 bhp
S-203 Engine Generator #4, Digester gas w/ Natural Gas makeup; 1573 bhp

The plant will also install the following abatement devices to remove siloxane, sulfur and NMHC from its digester gas:

A-200 Iron Sponge/Water Removal – abating digester gas from S-190 Anaerobic Digesters
A-201 Activated Carbon/Particle Removal - abating gas from A-200 Iron Sponge

The new engines will replace the following three existing engines:

S-29 Engine Generator #1, Digester gas & Natural Gas; 1160 bhp
S-31 Engine Generator #1, Digester gas & Natural Gas; 1160 bhp
S-35 Engine Generator #1, Digester gas & Natural Gas; 1160 bhp

The 4 new engines are lean burn engines that will run primarily on digester gas with up to 10% by volume natural gas to smooth out short term variations in the digester gas volume. The actual ratio of natural gas (NG) to digester gas (DG) will vary continuously, with up to 0.1:1.0 NG:DG by volume.

At any time, up to two of the four engines will be running with the 90/10 DG/NG fuel mixture to produce power. The other two engines will function as emergency backup engines. During an emergency, the engines running at the 90/10 DG/NG fuel mixture may be brought to full capacity using supplemental natural gas. The plant is requesting 100 hr/yr usage for maintenance and testing during which the engines will run on 100% natural gas.

Prior to combustion, any siloxane in the DG will be removed by A-200 Iron Sponge/Water Removal and by A-201 Activated Carbon/Particle Removal. A-200 is specified to remove 95% of hydrogen sulfide in the digester gas. A-201 is specified to remove 99.9% of hydrogen sulfide and 99.9% of non-methane hydrocarbons (NMHC). The resulting digester gas sent to the new engines will be essentially free of hydrogen sulfide. It will consist of mostly methane and carbon dioxide.

EMISSIONS SUMMARY

Basis: Use NOx, CO, NMHC, and SO2 emission factors (e.f.) listed in engine specification package

Use PM10 e.f. from AP-42 table 3.2-2 for natural gas 4-stroke engines

Engine data:

Single engine running 90% DG & 10% NG, 8660 hours

	g/bhp-hr	lb/day	tpy
NOx	0.75	62.42	11.262
CO	2.55	212.23	38.290
NMHC	0.55	45.78	8.259
	g/mmbtu		
SO2	1.0	0.52	0.094
PM10	0.03	0.02	0.003

Single engine running 100% NG, 100 hours

	g/bhp-hr	lb/day	tpy
NOx	0.75	62.42	0.130
CO	2.3	191.42	0.399
NMHC	1.0	83.23	0.173
	g/mmbtu		
SO2	1.0	0.52	0.094
PM10	0.03	0.03	0.000

2 engines @ 90/10, 8660 hours plus 4 engines @ 100% NG, 100 hours

	tpy
NOx	**23.044**
CO	**78.175**
NMHC	**17.211**
SO2	**0.566**
PM10	**0.007**

Compare with existing emissions:

Use average of fuel data from last 3 years of annual update submittal

	S29	S30	S35
	25288	29722	
2009 NG, therms/yr	7	7	230331
2009 DG, 000cf/yr	36168	43227	32787
	27443	19007	
2008 NG, therms/yr	0	0	276617
2008 DG, 000cf/yr	42449	42271	29426
	36753	33009	
2007 NG, therms/yr	5	5	306315
2007 DG, 000cf/yr	51385	50132	30632

MMBTU/yr

	S29	S30	S35
2009 NG	25289	29723	23033
2009 DG	21701	25936	19672
2009 NG	27443	19007	27662
2009 DG	25469	25363	17656
2009 NG	36754	33010	30632
2009 DG	30831	30079	18379

Average MMBTU/yr

	mmbtu/yr		
	S29	S30	S35
2009	46990	55659	42705
2008	52912	44370	45317
2007	67585	63089	49011
average	**55829**	**54372**	**45678**

The plant originally had three 1160 bhp engines, S-29, S-30, and S-31. Per A/N 4928, these 3 engines have been retrofitted to meet Reg 9-8's NOx requirements. S-35 replaced S-30 in A/N 4928. It is also an 1160 bhp engine. Due to lack of emission factors for digester gas engines, assume S-29 and S-30 have the same CO emission factor as S-35 since it is not realistic to use the 2000 ppmv CO limit in Reg 9-8. Use Reg 9-8 limit of 140 ppmv for NOx. Use EPA AP-42 Table 3.2-2 PM10 and POC emission factors for natural gas combustion.

Use EPA Method 19 to convert from 140 ppmv to lb/mmbtu

$E = C_d F_d (20.9 / (20.9-\%O_2))$

Use F_d = 8710 scf/mmbtu in table 19-2 of EPA Method 19 for gaseous fuels

For NOx, C_d = (conc in ppmv) (46 lb/lbmol) (scf/387 lb/mol)/ 10^6 = (conc in ppmv/10^6) (0.119 lb/scf)

NOx e.f. = (140/10^6) (0.119 lb/scf) (20.9 / (20.9-15)) (8710 scf/mmbtu)

NOx e.f. = 0.513 lb/mmbtu

Combined emission from S-29 and S-31

	lb/mmbtu	lb/day	tpy
NOx	0.513	155.02	28.291
CO	0.940	283.81	51.795
NMHC	0.220	66.42	12.122
PM10	7.71E-05	0.02	0.004

S-35 was permitted in 2002 under A/N 4928. Use e.f. from A/N 4928 except for PM10 (AP42 3.2-2)

	lb/mmbtu	lb/day	S-35 tpy
NOx	0.350	43.80	7.994
CO	0.940	117.64	21.469
NMHC	0.350	43.80	7.994
PM10	7.71E-05	0.01	0.002

	3 engines combined tpy
NOx	**36.284**
CO	**73.263**
NMHC	**20.116**
PM10	**0.007**

Comparison of existing emission from S-29, 31, and 35 from average of last 3 year's actual throughput with emission from the 4 new engines at maximum permitted throughput. The existing SO2 emission is not calculated due to lack of information on the sulfur content of the digester gas. However, it should be much higher than SO2 emission from the new engines since the plant will install A-200 Iron Sponge/Water Removal and A-201 Activated Carbon/Particle Removal to remove sulfur in the DG.

	Existing S-29, S-31 and S-35 tpy	4 new engines tpy
NOx	**36.284**	**23.044**
CO	**73.263**	**78.175**
NMHC	**20.116**	**17.211**
SO2	**>0.566**	**0.566**
PM10	**0.007**	**0.007**

TOXIC RISK SCREENING ANALYSIS

Use California Air Toxics Emission Factors for 4 stroke natural gas engine > 650 bhp. The digester gas will pass though A-200 Iron Sponge/Water Removal and A-201 Activated Carbon/Particle Removal to remove sulfur and NMHC, making it mostly methane and carbon dioxide. Its combustion toxic emission should be similar to that of natural gas, which is mostly methane.

PAH weighing factor	CAS	SUBSTANCE	MEAN lb/mmcf NG	lb/mmbtu	4 engines running same time Max, lb/hr	at 17720 engine hours, lb/yr	Acute Trigger lb/hr	Chronic Trigger lb/yr	Over Acute Trigger	Over Chronic Trigger
	100-41-4	Ethylbenzene	7.11E-02	6.77E-05	2.68E-03	1.19E+01		4.30E+01		no
	206-44-0	Fluoranthene	2.91E-04	2.77E-07	1.10E-05	4.85E-02				
	86-73-7	Fluorene	4.36E-04	4.15E-07	1.64E-05	7.27E-02				
	50-00-0	Formaldehyde	4.71E+00	4.49E-03	1.77E-01	7.85E+02	1.20E-01	1.80E+01	yes	yes
	91-20-3	Naphthalene	2.51E-02	2.39E-05	9.45E-04	4.18E+00		3.20E+00		yes
	85-01-8	Phenanthrene	1.85E-03	1.76E-06	6.96E-05	3.08E-01				
	115-07-1	Propylene	5.38E+00	5.12E-03	2.02E-01	8.97E+02				
	115-07-1	Propylene	5.38E+00	5.12E-03	2.02E-01	8.97E+02				

	129-00-0	Pyrene	1.87E-04	1.78E-07	7.04E-06	3.12E-02				
	108-88-3	Toluene	2.39E-01	2.28E-04	8.99E-03	3.98E+01	8.20E+01	1.20E+04	no	no
	1330-20-7	Xylene (Total)	6.46E-01	6.15E-04	2.43E-02	1.08E+02				
	106-99-0	1,3-Butadiene	3.67E-01	3.50E-04	1.38E-02	6.12E+01		6.30E-01		yes
	83-32-9	Acenaphthene	1.51E-04	1.44E-07	5.68E-06	2.52E-02				
	208-96-8	Acenaphthylene	5.25E-04	5.00E-07	1.98E-05	8.75E-02				
	75-07-0	Acetaldehyde	5.29E-01	5.04E-04	1.99E-02	8.82E+01	1.00E+00	3.80E+01	no	yes
	107-02-8	Acrolein	5.90E-02	5.62E-05	2.22E-03	9.84E+00	5.50E-03	1.40E+01	no	no
	120-12-7	Anthracene	1.19E-04	1.13E-07	4.48E-06	1.98E-02				
	71-43-2	Benzene	2.18E-01	2.08E-04	8.20E-03	3.63E+01	2.90E+00	3.80E+00	no	yes
	56-55-6	Benzo(a)anthracene	5.88E-05	5.60E-08	2.21E-06	9.80E-03				
	191-24-2	Benzo(g,h,i)perylene	7.54E-06	7.18E-09	2.84E-07	1.26E-03				
1	50-32-8	Benzo(a)pyrene	2.70E-06	2.57E-09	1.02E-07	4.50E-04				
0.1	205-99-2	Benzo(b)fluoranthene	4.09E-05	3.90E-08	1.54E-06	6.82E-03				
0.1	207-08-9	Benzo(k)fluoranthene	7.83E-06	7.46E-09	2.95E-07	1.31E-03				
0.01	218-01-9	Chrysene	1.43E-05	1.36E-08	5.38E-07	2.38E-03				
1.05	53-70-3	Dibenz(a,h)anthracene	2.70E-06	2.57E-09	1.02E-07	4.50E-04				
0.1	193-39-5	Indeno(1,2,3-cd)pyrene	7.17E-06	6.83E-09	2.70E-07	1.20E-03				
		(PAH) (as B(a)P-equiv	1.13E-05	1.07E-08	4.24E-07	1.88E-03		6.90E-03		no

A Toxic Risk Screen was performed in accordance with the District's Toxic Risk Screen Policy since the highlighted compounds in the table above exceed their respective risk trigger levels in Regulation 2, Rule 5, Table 2-5-1. Per Toxic Section's 7/20/10 Risk Screen Memo, the project has a risk of 5.1 in a million residential cancer risk and 0.5 in a million for worker cancer risk. Since the engines meet the POC BACT requirement of 0.55 g/bhp-hr for DG engines, it meets TBACT and the project meets the 10 in a million risk limit.

BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

Per Regulation 2-2-301, BACT is triggered for any source that emits 10 lbs or more per highest day of POC, NOx, NPOC, CO, SO2, and PM10. At the permitted levels, each engine by itself would exceed 10 lb/day POC, CO and NOx. BACT1 technology has not been specified in BACT handbook chapter 96.5.2. These engines meet the BACT2 limits for DG engines. (SO2 is specified at 0.1 g/mmbtu: convert to g/bhp-hr: (0.1 g/mmbtu) (9.878 mmbtu/hr) / 1573 bhp = 0.01 g/bhp-hr)).

Digester Gas Engine BACT (g/bhp-hr)

	BACT2 Handbook 96.5.2	Engine Spec for 90%DG/10%NG
POC	1.0	0.55
NOx	1.25	0.75
CO	2.65 to 3.77	2.55
SO2	0.3	0.01

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When used as backup emergency engines running on 100% natural gas, these engines also meet the BACT2 limit for natural gas emergency engines. BACT1 technology has not been specified for these engines.

Natural Gas Emergency Engine BACT (g/bhp-hr)

	BACT2 Handbook 96.5.2	Engine Spec for 100%NG
POC	1.0	1.0
NOx	1.0	0.75
CO	2.75	2.30

OFFSET ANALYSIS

The NOx, POC, and SO2 emission from the new engines will be less than the emission from the existing engines. The PM10 emission from the new engines will be the same as from the existing engines. Only CO emission is expected to increase from 73.263 to 78.175 tpy and CO offsets are not required per Reg 2-2.

PSD

The CO emission increase (78.175 – 73.263= 4.912 tpy) is less than 100 tpy at this major facility and is less than the 100 tpy increase PSD modeling requirement of Reg 2-2-305.2. The PM10 emission stays the same and the other criteria pollutant emission decrease in this project. The PSD requirement of Reg 2-4-304 is not triggered.

STATEMENT OF COMPLIANCE

These engines (S-200, 201, 202, 203) meet the current (140 ppmv) and future (70 ppmv) NOx limits of Reg 9-8. Using EPA method 19 to calculate the engine emissions in term of ppmv, assuming an engine specification of 37% efficiency (lower efficiency will result in lower ppmv values)

Engine is specified at 37% efficiency

(0.75 g/hp-hr) (0.37)(lb/454 g) (hp-hr/2544 btu) (10^6 btu/mmbtu) = 0.24 lb NOx/mmbtu

Use EPA Method 19: $E = C_d F_d (20.9 / (20.9-\%O_2)$

For NOx, C_d = (conc in ppmv) (46 lb/lbmol) (scf/387 lb/mol)/ 10^6 = (conc in ppmv) (0.119 lb/scf)/ 10^6

(NOx in ppmv @ 15% O_2) = (0.24 lb/mmbtu) ((20.9-15)/20.9) (mmbtu/8710 scf) (scf/0.119 lb) (10^6)

= 66 ppmv @ 15 $\%O_2$

Similarly, for CO (28 lb/mol) the emission is 366 ppmv and for SO2 (64 lb/mol) the emission is 63 ppmv.

	Engine Specification	Reg 9-8-302 pre 1/1/2012 (> 250 bhp)	Reg 9-8-302 1/1/2012 (> 50 bhp)
	ppmv @ 15% O2		
NOx	66	140	70
CO	366	2000	2000

The SO2 emission meets the 300 ppm limit of Reg 9-1-302.

The Owner/Operator should comply with Regulation 6, "Particulate Matter and Visible Emissions". Visible emissions should be less than Ringelmann 2 (Regulation 6-303).

This project is considered to be ministerial under the District's CEQA Regulation 2-1-311 and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emission factors and therefore is not discretionary as defined by CEQA (MOP Chapter 2.3).

This project is over 1000 feet from the nearest school and is therefore not subject to the public notification requirements of Reg 2-1-412. Since the engines are more than 500 feet from a school, the ATCM limitation on when the engine can be operated does not apply [Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)1]].

Offsets, PSD, NSPS, and NESHAPS are not triggered or do not apply to this project.

CONDITIONS

Permit conditions for S-200, 201, 202, and 203 -1537 bhp Engines

A/N # 21686

1. Cogeneration Engines S-200, 201, 202 and 203 shall be fired only by one of the following fuels: sewage sludge digester gas, natural gas, or a combination of digester gas and natural gas. (Basis: Cumulative Increase)
   a. At any one time, up to two engines may be running for routine use (non-emergency, non-testing/maintenance). The routine use engine(s) running will fire digester gas, with up to 10% by volume natural gas to smooth out the fuel flow.
   b. The engines not running to produce power will function as emergency use generators.
   c. Each engine may fire natural gas for up to 100 hours/year for maintenance and testing
   d. Each engine may fire 100% natural gas during emergency situations.

2. District approved totalizing, non-resettable flow meters and totalizing, non-resettable hour meters for digester gas and natural gas shall be installed and maintained on S-200, S-201, S-202, and S-203. The ratio of natural gas to digester gas shall be recorded for the engine(s) running to produce power. (Basis: Cumulative Increase)

3. Emissions of Precursor Organic Compounds (POC) from S-200, 201, 202, and 203 shall not exceed (Basis: BACT):
   a. 0.55 g/bhp-hr when fired with digester gas with up to 10% by volume natural gas.
   b. 1.0 g/bhp-hr when fired with 100% natural gas

4. Emissions of Nitrogen Oxides (NOx from S-200, 201, 202, and 203 shall not exceed 0.75 g/bhp-hr (Basis: BACT)

5. Emissions of Carbon Monoxide (CO) from S-200, 201, 202, and 203 shall not exceed (Basis: BACT):
   a. 2.55 g/bhp-hr when fired with digester gas with up to 10% by volume natural gas.
   b. 2.3 g/bhp-hr when fired with 100% natural gas

6. In order to demonstrate compliance with parts 3 through 5, the owner or operator shall conduct a District-approved source test as follows (Basis: Regulations 2-1-403, 9-8-501, and 9-8-503):

   a. Initial Start-up Source Test: The initial District-approved source test to demonstrate compliance with parts 3-5 above, shall be conducted within 60 days of engine startup and shall determine and report the emission factors for non-methane hydrocarbons (NMHC), NOx, and CO in units of g/bhp-hr and ppm @ 15% oxygen. Since these units are similar, two engines maybe be tested running digester gas with 10% natural gas and two engines tested with 100% natural gas.
   b. Annual Source Test: At least two of the four engines shall be tested annually for compliance with parts 3-5 above. One engine may be tested firing digester gas with up to 10% by volume natural gas and the other engine firing 100% natural gas.
   c. Monthly (Portable Analyzer) Emission Monitoring Test: The owner or operator shall conduct an emissions monitoring test on a calendar month basis on the engines that are running to produce power (non-emergency, non-testing/maintenance). The interval between required

monthly monitoring events shall be at least 15 days. This monthly test shall determine concentrations of NOx and CO in units of ppmv @ 15% oxygen using a District approved portable analyzer. All emission monitoring tests shall be conducted with the engine operating at conditions representative of normal operation unless otherwise specified. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations. NOx and CO readings at 15% oxygen shall be averaged over a consecutive 15-minute period.

d. The owner or operator may elect to perform a part 6b compliance demonstration source test in lieu of or in addition to any monthly monitoring test.

7. The owner or operator of S-200, 201, 202 and 203 shall keep the following records on site in a District-approved log:

a. Monthly (calendar) records of the amount of each type of fuel combusted at the source and the natural gas/digester gas volumetric ratio at the engines firing to produce power (non-emergency, non testing-maintenance)

b) Monthly monitoring test results including, date, averaging time and NOx, CO concentrations converted to 15% oxygen basis.

c) Records of all compliance source tests performed including the instrument calibrations and comparative handheld monitoring test results.

These records shall be kept on site and made available for inspection by District personnel for a period of at least 5 years from the date on which a record is made. (Basis: Cumulative Increase)

RECOMMENDATION

Issue an Authority to Construct for the following sources:

S-200 Engine Generator #1, Digester gas w/ Natural Gas makeup; 1573 bhp
S-201 Engine Generator #2, Digester gas w/ Natural Gas makeup; 1573 bhp
S-202 Engine Generator #3, Digester gas w/ Natural Gas makeup; 1573 bhp
S-203 Engine Generator #4, Digester gas w/ Natural Gas makeup; 1573 bhp

By: _____ **_____**

Eric Y. W. Chan
Air Quality Engineer II **Date**