DRAFT
ENGINEERING EVALUATION REPORT
CITY OF HERCULES
PLANT NUMBER 24186
APPLICATION NUMBER 29362

2001 Refugio Valley Road
Hercules, CA 94547

Background

On behalf of the City of Hercules, Valley Air Conditioning & Repair has applied to obtain an Authority to Construct and a Permit to Operate for a natural gas fired emergency generator set at the above referenced site in Hercules, CA.

The application covers the following source:

S-1 Emergency Standby Engine Generator Set, General Motors, Vortec 5.7L, 155 hp, 2018 yr, natural gas fired, abated by A-1.
A-1 NSCR or 3-way catalyst, GM75660.

Emission Calculations

Emissions are calculated on the basis of the emission factors provided by the manufacturer (EPA certified) for NOx (oxides of nitrogen), CO (carbon monoxide), POC (precursor organic compounds), and AP-42 for SO2 (sulfur dioxide), PM-10 (particulate matter), standby engine rating of 1.4 MMBTU/hr (155 hp equivalent), and 50 operating hours in a year. Refer to the attached spreadsheet for emission calculations. Emission factors for the toxic compounds are taken from the CARB database of "California Air Toxics Emissions Factors" (CATEF) for natural gas fired 4 stroke rich burn IC engines <650 hp.

Emission Factors:

PM10 (filterable + condensable)		= 1.94E-02 lb/MMBTU
CO	= 0.7084 g/hp-hr (abated)	= 1.73E-01 lb/MMBTU (abated)
NOx	= 0.0149 g/hp-hr (abated)	= 3.64E-03 lb/MMBTU (abated)
POC	= 0.4772 g/hp-hr (abated)	= 1.17E-01 lb/MMBTU (abated)
SO2		= 5.88E-04 lb/MMBTU

Operating Time = 50 hours/year

Emissions (Ref: attached spreadsheet):

PM10 = 1.36 lb/yr
= 0.65 lb/day @24 hrs/day
= 0.0007 tpy
CO = 12.1 lb/yr
= 5.81 lb/day @24 hrs/day
= 0.0061 tpy
NOx = 0.25 lb/yr
= 0.12 lb/day @24 hrs/day
= 0.0001 tpy

POC	= 8.16 lb/yr
	= 3.92 lb/day @24 hrs/day
	= 0.0041 tpy
SO2	= 0.04 lb/yr
	= 0.02 lb/day@24 hrs/day
	= 2E-5 tpy

Plant Cumulative Increase

POC = 0.0041 tpy
NOx = 0.0001 tpy
CO = 0.0061 tpy
PM10 = 0.0007 tpy
SO2 = 0.00002 tpy

Toxics Emissions and Health Risk Screening Analysis

The engine-generator set will emit toxic compounds such as benzene, formaldehyde, PAH, 1,3 butadiene, etc. None of the toxic compound emissions (Ref: attached spreadsheet) exceed the respective chronic and acute toxic trigger levels given in the Table 2-5-1 of Regulation 2, Rule 5. Therefore, a toxic risk screening analysis is not required.

Best Available Control Technology (BACT)

BACT requirements of Regulation 2-2-301 are not triggered for NOx, POC, SO2, and PM-10 emissions less than 10 lb per highest day for engine generator. However, CO emissions of 12.1 lb/day are greater than 10 lb/day when the engine gen-set operates 24 hours a day during emergency thereby triggering BACT. Per BACT/TBACT Workbook (Document #96.3.4), BACT2 for CO is 2.75 g/hp-hr. The use of 3-way catalyst with the emission factor of 0.7084 g/hp-hr for CO demonstrates compliance with BACT2.

2-2-301 Best Available Control Technology Requirement: An applicant for an authority to construct or a permit to operate shall apply BACT to any new or modified source:
301.1 Which results in an emission from a new source or an increase in emissions from a modified source and which has the potential to emit 10.0 pounds or more per highest day of precursor organic compounds (POC), non-precursor organic compounds (NPOC), nitrogen oxides (NOx), sulfur dioxide (SO2), PM10 or carbon monoxide (CO). BACT shall be applied for any of the above pollutants which meets both criteria. *(Amended 6/15/94; 10/7/98; 5/17/00)*

Offsets

Offsets requirements of Regulation 2-2-302 are not triggered for facility wide or permitted POC and NOx emissions < 10 tpy.

California Environmental Quality Act (CEQA)

The project is considered 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. This project is evaluated in accordance with Permit Handbook Chapter 2.3.2.

Statement of Compliance

Natural gas fired internal combustion engines are subject to Air District Regulation 6, Rule 1. Natural gas fired engines have low particulate emissions and are expected to meet the Ringelmann No. 2 limitation of Regulation 6-1-303.1. The total particulate emission rate of 1.94E-02 lb/MMBTU is equivalent to an exhaust emission rate of 0.016 grains/dscf at 0% oxygen. Therefore, this engine will comply with Regulation 6-1-310.1.

6-1-303 Ringelmann No. 2 Limitation: A person shall not emit for a period or periods aggregating more than three minutes in any hour, a visible emission which is as dark or darker than No. 2 on the Ringelmann Chart, or of such opacity as to obscure an observer's view to an equivalent or greater degree, nor shall said emission, as perceived by an opacity sensing device in good working order, where such device is required by District regulations, be equal to a greater than 40% opacity, from the following sources:
303.1 Internal combustion engines of less than 25 liters (1500 in3) displacement, or any engine used solely as a standby source of motive power

6-1-310 Total Suspended Particulate (TSP) Concentration Limits:
310.1 No person shall emit TSP from any source in excess of 343 mg per dscm (0.15 gr per dscf) of exhaust gas volume.

Natural gas fired internal combustion engines are subject to Air District and Regulation 9, Rules 1 and 8. Based on the sulfur content in natural gas, the sulfur dioxide concentration in the exhaust from natural gas fired engines is < 1 ppm. Therefore, natural gas fired engines will comply with Regulation 9-1-302.

Based on the information submitted, this engine-generator set is exempt from the requirements of Regulations 9-8-301 through 305, 501, and 503 as per Regulation 9-8-110.5. However, it will comply with Regulations 9-8-330 and 9-8-530.

9-1-302 General Emission Limitation:
A person shall not emit from any source, other than a ship, a gas stream containing sulfur dioxide in excess of 300 ppm (dry). This section shall not apply to the following sources:
302.1 Any source which is subject to any of the limitations in Sections 9-1-304 through 9-1-312.
302.2 Any source which satisfies the conditions in Sections 9-1-110.
(Amended February 16, 1983)

9-8-110 Exemptions: The requirements of Sections 9-8-301 through 305, 501 and 503 shall not apply to the following:
110.5 Emergency standby engines.
(Amended 8/1/01; 7/25/07)

9-8-330 Emergency Standby Engines, Hours of Operation: A person may only operate an emergency standby engine under the following circumstances:
330.1 For emergency use for an unlimited number of hours; and
330.2 Until January 1, 2012, for reliability-related activities so long as total hours of operation for this purpose do not exceed 100 hours in a calendar year, or limitations contained in a District permit, whichever is lower.
330.3 Effective January 1, 2012, for reliability-related activities so long as total hours of operation for this purpose do not exceed 50 hours in a calendar

year, or limitations contained in a District permit, whichever is lower. Hours of operation for reliability-related activities may exceed these limits only as necessary to comply with testing requirements of National Fire Protection Association (NFPA) 25 – "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems," 1998 edition.
(Adopted 8/1/01; Amended 7/25/07)

9-8-530 Emergency Standby and Low Usage Engines, Monitoring and Recordkeeping:
Each emergency standby and low usage engine shall be equipped with a non-resettable totalizing meter that measures hours of operation or fuel usage. All records shall be kept for at least two years, and shall be available for inspection by District staff upon request. The operator shall keep a monthly log of usage that shall indicate the following:
530.1 Hours of operation (total)
530.2 Hours of operation (emergency)
530.3 For each emergency, the nature of the emergency condition.
Bay Area Air Quality Management District July 25, 2007
9-8-8
For low usage engines, these provisions become effective on January 1, 2012.
(Adopted 8/1/01; Amended 7/25/07)

New Source Performance Standards (NSPS)

The engine-generator set is subject to 40 CFR Part 60 Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines per section 60.4230(a)(4)(iii). The gen-set was manufactured after July 1, 2008. The engine is EPA certified and therefore meets the requirements of Subpart JJJJ.

National Emission Standards of Hazardous Air Pollutants (NESHAPS)

The engine generator is considered an area source for the purpose of NESHAP (Subpart ZZZZ) applicability. Since the engine meets the requirements of 40 CFR part 60 subpart JJJJ and 40 CFR part 63 subpart ZZZZ (section 63.6590(c)(1)), no further requirements of subpart ZZZZ apply.

Requirements of Prevention of Significant Deterioration are not triggered.

Public Notification, Schools

The project is located within 1000 feet of the nearest K-12 school Hercules High/Middle Schools and therefore is subject to the public notice requirements of Regulation 2-1-412. A public notice will be distributed to the parents/guardians of students in all the K-12 schools within ¼ mile and all addresses within 1000 feet of the project.

Permit Conditions

The template condition ID# 23107 applies to the engine generator.

COND# 23107 ----------

1. The owner or operator shall operate the stationary emergency standby engine only to mitigate emergency conditions or for reliability-related activities (maintenance and testing). Operating while mitigating emergency conditions and while emission testing to show compliance with this part is unlimited. Operating for reliability-related activities are limited to 50 hours per year. (Basis: Emergency Standby Engines, Hours of Operation Regulation 9-8-330)

2. The Owner/Operator shall equip the emergency standby engine(s) with: a non-resettable totalizing meter that measures hours of operation or fuel usage. (Basis: Emergency Standby Engines, Monitoring and Record keeping 9-8-530)

3. The Owner/Operator shall not operate unless the natural gas fired engine is abated with a Catalytic Converter. (Basis: Cumulative Increase)

4. Records: The Owner/Operator shall maintain the following monthly records in a District-approved log for at least 24 months from the date of entry. Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.

   a. Hours of operation (maintenance and testing).
   b. Hours of operation for emission testing.
   c. Hours of operation (emergency).
   d. For each emergency, the nature of the emergency condition.
   e. Fuel usage or operating hours for engine.

(Basis: Emergency Standby Engines, Monitoring and Recordkeeping 9-8-530)

Recommendations

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

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

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A-1 NSCR or 3-way catalyst, GM75660.

By:_____
Dharam Singh, PE
Air Quality Engineer II