DRAFT
ENGINEERING EVALUATION REPORT
FREEDOM HIGH SCHOOL
PLANT NUMBER 17727
APPLICATION NUMBER 14446

Background:

Liberty Union High School District has applied to obtain an Authority to Construct, and a Permit to Operate the following equipment:

S-1 Cogeneration Engine-Generator Set, GM, Model 454, 108 hp, 454 cu.in., natural gas fired, abated by A-1

A-1 Non-selective catalytic reduction, Sud-Chemix Protech Inc., EnviCat Type #7319.

The generator set will be sited at 1050 Neroly Road, Oakley, CA 94561. It will be used for cogeneration of continuous electric power for the high school, and heat to heat the swimming pool water.

Emission Calculations:

Emissions are calculated on the basis of the emission factors, engine rating (hp or BTU/hr), and operating hours (8760 hrs/yr). Refer to the health risk screening analysis memo table 1 for toxic air contaminants emissions.

Emission factors (after abatement w/catalyst) are taken from the data form (provided by the vendor) for NOx, CO, and POC. Emission factor for PM10 is taken from AP-42. 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.

PM10 = 0.01941 lb/MMBTU
CO = 1.6 g/bhp-hr
NOx = 1.6 g/bhp-hr
POC = 1.6 g/bhp-hr
Operating hours = 8760/yr

PM10

PM10 = (0.01941 lb/MMBTU)(0.973 MMBTU/hr)(8760 hrs/yr)
= 166 lb/yr
PM10 = 0.083 TPY

Carbon Monoxide (CO)

CO = (1.6 g/hp-hr)(108 hp)(8760 hrs/yr)(1/453.6 lb/g)
= 3340 lb/yr
CO = 1.67 TPY

Nitrogen Oxide (NOx)

NOx = (1.6 g/hp-hr)(108 hp)(8760 hrs/yr)(1/453.6 lb/g)
= 3340 lb/yr
NOx = 1.67 TPY

Precursor Organic Compound (POC)

POC = (1.6 g/hp-hr)(108 hp)(8760 hrs/yr)(1/453.6 lb/g)
= 3340 lb/yr
POC = 1.67 TPY

Sulfur Dioxide (SO2)

Negligible.

Plant Cumulative Increase:

PM10 = 0.083 tpy
CO = 1.67 tpy
NOx = 1.67 tpy
POC = 1.67 tpy

Toxics Emissions And Risk Screening Analysis:

Engine-generator will emit toxic compounds such as benzene, formaldehyde, PAH, 1,3 butadiene etc. and because it will be located at the school site a toxic risk screening analysis is required. Results from the risk screen indicate that the maximum cancer risk is 0.4 in a million. In accordance with the District's Regulation 2-5, this risk level is considered acceptable. TBACT is not required.

Statement of Compliance:

The engine-generator is expected to comply with the requirements of Regulation 9-8-301, emission limits for NOx (56 ppmv @15% oxygen), and CO (2000 ppmv @15% oxygen), and Ringelmann No. 2 limitation of Regulation 6-303.

NOx, POC, PM10, and CO emissions with the catalyst do-not exceed 10 lb/day and therefore BACT requirements of Regulation 2-2-301 are not triggered

Regulation 10 - New Source Performance Standard, and Regulation 11 - Hazardous Pollutants requirements are not triggered.

This project is considered to be ministerial under the District's CEQA guidelines (Regulation 2-1-312), the requirements of the California Environmental Quality Act (CEQA) are not triggered. The engineering review for this project requires only the application of standard permit conditions and standard emission factors in accordance with Permit Handbook Chapter 2.3

The engine-generator is located at a school site and therefore is subject to the public notification requirements of Regulation 2-1-412. A public notice was distributed on 9/22/06 to the parents and guardians of the school and all addresses within 1000 feet of the source. The comment period ended on 10/23/06 and ***to be determined*** comments were received. The comments and District responses are summarized below:

To be determined

Offset requirements of Regulation 2-2-302 are not triggered for NOx and POC emissions less than 10 tpy.

PSD, NSPS, and NESHAPS do not apply.

Permit Conditions

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Conditions for S-1, Engine-Generator Set:

1. The owner/operator shall fire the engine-generator with natural gas or equivalent only.
   [basis: cumulative increase]
2. The owner/operator shall abate the engine generator, S-1, by A-1, NSCR at all times it is operated. [basis: cumulative increase]
3. The owner/operator of S-1 shall not exceed the following emission limits:

   NOx (as NO2) = 1.6 g/hp-hr.
   CO = 1.6 g/hp-hr
   POC = 1.6 g/hp-hr
   [basis: cumulative increase]

4. The owner/operator shall equip the engine-generator with fuel flow meter, which record fuel usage. [basis: Record keeping]
5. The owner/operator shall perform quarterly testing with a District approved portable instrument and perform District approved bi-annual source tests for NOx, CO, POC , and Oxygen to demonstrate compliance with conditions 3, 4, and 5, and District Regulation 9-8-301. [basis: cumulative increase; Regulation 9-8-301]
6. The owner/operator shall maintain the following records in a District-approved log for at least 2 years and shall make them available to the District staff upon request:
   a. monthly total hours of operation for the engine-generator
   b. monthly fuel usage at the engine-generator
   c. bi-annual source tests or quarterly monitoring reports for NOx, CO, and Oxygen.
   [basis: Record keeping]
7. The owner/operator shall perform a District approved source test within 30 days of the start-up to demonstrate compliance with conditions 3, 4, 5, and Regulation 9-8-301. District approval shall be obtained before performing the test. Source test section of the District shall be notified at least 7 days in advance of the test date. A copy of the source test report shall be submitted to the District within 30 days of the test. [basis: start-up]

Recommendations:

I recommend issuing an Authority to Construct to Freedom High School District for the source described in the background section of this report.

Exemptions:

None.

BY:_____

Dharam Singh, PE

Air Quality Engineer

9/5/06