Air Resources Board

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Winston H. Hickox
Secretary for Environmental Protection

Gray Davis
Governor

April 16, 1999

Ms. Ellen Garvey
Air Pollution Control Officer
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, California 94109

Dear Ms. Garvey:

We have reviewed your March 19, 1999, Preliminary Determination of Compliance for the Pittsburgh District Energy Facility. Our review has resulted in comments relating to the potential air quality impacts of the proposed project which are outlined below. We have discussed our comments with Mr. Dennis Jang of your staff.

PROJECT DESCRIPTION

Enron Capital & Trade Resources Group is proposing to site the Pittsburgh District Energy Facility (PDEF) at Pittsburgh, California, within the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). The BAAQMD is currently nonattainment for federal and State ambient air quality standards for ozone, and State ambient air quality standards for PM10.

The PDEF consists of a combined-cycle merchant power plant producing a nominal electric output of 520 megawatts (MW). Process steam at 75,000 pounds per hour will be produced for its primary customer, USS POSCO Industries. The power plant will have two 170 MW natural gas-fired F-class combustion turbine generators with associated 90 MW heat recovery steam generators, one auxiliary boiler, and either a shared or dedicated steam turbine for each combustion turbine. Proposed Best Available Control Technology (BACT) and annual emissions limits are summarized in the following table:

Air Pollutant	Proposed Best Available Control Technology	Emissions (tpy)
NOx	Dry low-NOx combustors and selective catalytic reduction with controlled emissions of 2.5 ppmvd @ 15% O_2 averaged over 3 consecutive hours	153.2
CO	Dry low-NOx combustors and catalytic oxidation with controlled emissions of 6.0 ppmvd @ 15% O_2 averaged over 3 consecutive hours	487.5
POC	Dry low-NOx combustors and emissions of 0.004 lb/MMBtu	125.3
PM10	Natural gas	123.55
SO_2	Natural gas	39.86

Required emission offsets will be obtained from within the BAAQMD. Precursor organic compound (POC) emission reduction credits are proposed for mitigation of POC. Nitrogen oxide (NOx) emission reduction credits are proposed for mitigation of NOx. Particulate matter of 10 microns or less (PM10) and sulfur dioxide (SO_2) emission reduction credits are proposed for mitigation of PM10. Emission offsets are not required for carbon monoxide (CO) and SO_2.

GENERAL COMMENTS

We are concerned about the completeness of the emission offset package. It is our understanding that several emission credits proposed for use to mitigate the PDEF project are still going through the BAAQMD's banking process. All emission reductions used as offsets should be specifically identified and quantified in accordance with applicable federal, state, and district requirements. The BAAQMD's Determination of Compliance should evaluate whether or not the applicant's emissions offset package is complete and that the proposed emission reduction credits are real, quantifiable, surplus, permanent, and enforceable. The applicant should demonstrate, through letters of intent, option to purchase contracts, or the equivalent, the ability to secure the required emission offsets prior to commencement of construction of the power plant.

SPECIFIC COMMENTS

1. <u>BACT for NOx</u>: BAAQMD is proposing 2.5 ppmvd NOx at 15% oxygen with a 3-hour averaging time as BACT for NOx from each combined-cycle gas turbine and its associated duct burner. The South Coast Air Quality Management District (SCAQMD) has determined BACT for natural gas turbines of 3 MW and greater as a NOx emission rate of 2.5 ppmvd at 15% oxygen with a 1-hour averaging time. In addition, the United States Environmental Protection Agency (U.S. EPA) has recognized 2.0 ppmvd at 15% oxygen averaged over 3 hours as demonstrated in practice, and has recommended the level as Lowest Achievable Emission Rate (LAER) for natural gas-fired combined-cycle turbines. U.S. EPA has accepted the SCAQMD determination as equivalent to their LAER recommendation.

   As further support for a more stringent NOx limit, two recent large power plant projects have proposed 2.5 ppmvd at 15% oxygen with 1-hour averaging as BACT for NOx. The first project, Sutter Power Plant, has been approved by the California Energy Commission. The Sutter Power Plant is a 500 MW natural gas-fired facility consisting of identical sized turbines to the PDEF. The second project is the approximately 700 MW High Desert Power Project located in Victorville, California. The Mojave Desert Air Quality Management District has proposed the 2.5 ppmvd at 15% oxygen with a 1-hour

average NOx level as BACT in their revised Preliminary Determination of Compliance. We believe the SCAQMD, U.S. EPA, Sutter Power Plant, and High Desert Power Project BACT/LAER NOx emission levels are consistent with BAAQMD BACT requirements as defined in BAAQMD Rule 2-2-206. Therefore, in proposing a NOx emission level of 2.5 ppmvd at 15% oxygen over 3 hours, we believe that the applicant has failed to comply with BACT as required by BAAQMD rule. We believe BAAQMD rules require NOx emissions of 2.5 ppmvd at 15% oxygen over a 1-hour average; or if the BAAQMD requires 3-hour averaging, a NOx limit of 2.0 ppmvd at 15% oxygen averaged over 3 hours.

2. BACT for POC: BAAQMD is proposing low-NOx burners together with good combustion practices to minimize POC emissions from the combustion turbine/heat recovery steam generator and anticipates a baseload emission rate of 0.004 lb/MMBtu (equivalent to approximately 3.5 ppmvd at 15% oxygen). The applicant is not considering the affect of the oxidation catalyst on POC emissions since the catalyst proposed is designed to primarily abate CO. Based on source tests at Crockett Cogeneration on a natural gas-fired combined-cycle General Electric Frame 7FA gas turbine, it appears that lower POC emissions have been achieved in practice. Our calculations indicate POC emissions below 1 ppmvd at 15% oxygen (from 0.007 to 0.085 ppmvd at 15% oxygen). The Crockett facility consists of a 1780 MMBtu/hr General Electric Frame 7FA combustion turbine generator with dry low-NOx combustors and selective catalytic reduction. The associated heat recovery steam generator is equipped with low-NOx burners. PDEF is proposing similar equipment and controls. Also, the Feather River Air Quality Management District has determined a POC BACT level of 1 ppmvd at 15% oxygen for the Sutter Power Plant project, with expectation of considerably lower concentrations. Therefore we believe the applicant has not proposed BACT in accordance with BAAQMD Rule 2-2-206. We believe the BAAQMD rule requires a POC BACT emission concentration limit of 1 ppmvd at 15% oxygen with a 1-hour averaging time, consistent with what has been demonstrated in practice at the Crockett facility.

3. Define Startup and Shutdown Periods: We suggest that permit conditions be included which define cold startup, warm startup, hot startup, and shutdown operations in terms of maximum length of time and establishing when these periods commence and end. The duration of turbine startup is driven by steam turbine temperature. Although the applicant anticipates that at least one turbine will be in operation at all times and that the majority of turbine startups will be hot, this may not always be the case. The time to cold start one turbine would be increased if the second turbine was not already online.

4. Startup and Shutdown Conditions: Assumptions used to calculate startup and shutdown emissions in the Preliminary Determination of Compliance should be documented as

permit conditions. Operational assumptions used for emission calculations are provided in the application materials for the number of startups and shutdowns and hours of online operation; however these assumptions are not documented as permit conditions. Rather, BAAQMD is proposing to regulate hourly, daily, and annual emissions with facility-wide emission caps in order to provide PDEF with maximum operational flexibility. In order to ensure that emission limits are not exceeded, more restrictive permit conditions should be included in the permit such as:

a. Daily and annual limitations on the number of hot and cold startups, and shutdowns. These daily and annual limitations should correspond with assumptions used for worst-case emissions.
b. The annual hours of operation for both combustion turbines should be limited consistent with assumptions used to calculate annual emissions.

Due to problems we anticipate occurring with continuous emission monitoring during startup and shutdown, we believe emission limits alone are an unreliable method for adequately assessing emissions on a daily and annual basis. Also, because not all air pollutant emissions are monitored with continuous emissions monitors, we are not satisfied that compliance with daily and annual emission limits will be ensured without including operational limits in the permits.

Thank you for providing us with the opportunity to comment on the PDEF project. If your staff has any questions, or needs further clarification on any of our comments, please contact Ms. Stephanie Nakao, Air Resources Engineer, of my staff at (916) 322-6456.

Sincerely,

Raymond E. Menebroker, Chief
Project Assessment Branch
Stationary Source Division

cc: Mr. Michael Kenny, EO
Mr. Michael Scheible, EO
Mr. Peter Venturini, SSD
Mr. Chris Tooker, CEC
Mr. Guido Franco, CEC
Mr. Matt Haber, US EPA