

DOCKETED

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Document Title:	Pastoria Energy Facility Response to SJVAPCD Notice of Incomplete Application
Description:	Pastoria Energy Facility's Response to SJVAPCD's Notice of Incomplete Application
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CALPINE CORPORATION

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April 21, 2016

Arnaud Marjollet
Director of Permit Services
SJVAPCD
34946 Flyover Court
Bakersfield, CA 93308-9725

Attn: Mr. Homero Ramirez

Subject: Pastoria Energy Facility, LLC, Response to Notice of Incomplete Application
Facility Number: S-3636
Project Number: S-1160793

Dear Mr. Ramirez:

In response to your March 30, 2016, letter, we are providing the following requested information.

1. Please identify the manufacturer and model number of the proposed burner.

The burners will be provided by the boiler supplier (Rentech or equivalent) as part of the package water tube boilers. Rentech indicates that the burners will be John Zink Hamworthy Combustion ECOjet burners, model number JZHC ECOjet E22.

2. Provide manufacturer's guarantees of the emission rates for the new boilers.

Please see the attached Emissions Data page provided by Rentech.

3. Provide justification for the proposed start-up duration longer than two hours pursuant to District Rule 4320 Section 5.6.3.2.

The applicant is requesting SJVAPCD's approval of a startup time of up to three hours for each boiler during cold starts. As discussed in Section 3.1.2.3 of the application support document, each auxiliary boiler is expected to require up to three hours to come into compliance with the proposed NOx limit of 5.0 ppmvd because boiler load and exhaust temperature must be high enough for the selective catalytic reduction (SCR) control system to be effective in reducing NOx exhaust concentrations. In accordance with District Rule 4320 Section 5.6.3.2, the following information is being provided to allow the APCO to approve a startup duration in excess of two hours:

- *Clearly identify the control technologies or strategies to be used:* The boilers will use low-NOx burners and SCR to control NOx emissions.

- *Describe the physical conditions that prevail during start-up or shutdown periods that prevent the controls from being effective:* The low-NOx burners will be effective in reducing NOx emissions once the boiler load reaches 25% of rated load. However, below 25% load the boilers are tuned for combustion stability and not for emissions performance, so uncontrolled emissions at loads below 25% will be higher than uncontrolled emissions at typical operating loads (25 to 100%). The allowable rate of temperature increase in the boilers is the limiting factor in determining how quickly the boilers can achieve higher loads.

In addition, the time prior to initiation of ammonia flow to the SCR system depends on the temperature of the SCR catalyst. The catalyst bed is warmed by the exhaust flow from the boiler. The total mass of metal and water in the boiler tubes, piping, and drums removes heat from the exhaust as it warms. This extends the time required to heat the SCR catalyst to the minimum temperature at which ammonia may be injected upstream of the catalyst bed to begin reducing NO_x to N₂.

- *Provide a reasonably precise estimate as to when the physical conditions will have reached a state that allows for the effective control of emissions:* The boiler vendor indicated that if the boiler is cold, a gradual startup time of approximately three hours is recommended. At the end of the three-hour startup period, the boiler load will be above the minimum compliant load of 25%, and the catalyst temperature will have reached the minimum temperature at which ammonia may be injected so that NOx emissions will be fully controlled. If the boiler is not cold, the boilers will achieve fully controlled NOx emission rates in less than three hours.

I hope this provides the additional information you need to determine that the permit application is complete. If you have any questions or need additional information regarding these or other issues related to the permit, please do not hesitate to call Nancy Matthews of Sierra Research at (916) 273-5124.

Sincerely,



Michael Rinehart
Plant Manager

Attachment

cc: Barbara McBride, Calpine
Mary Dyas, CEC CPM
Nancy Matthews, Sierra Research



"RENTECH Boilers for people who know and care."®

Emissions Data

DESCRIPTION	UNITS	Natural Gas
System Performance		
Steam Flow	Lb/hr	75,000
Steam Pressure	PSIG	300
Steam Temperature	°F	Saturated
System Efficiency (HHV)	%	83.7
Stack Gas Temperature	°F	300
Stack Gas Flow	Lbs/hr	80,913
Stack Gas Flow	ACFM	27,067
Stack Diameter	in	38
Stack Exit Velocit	Ft/sec	57.3
Stack Height	Ft	50
Furnace Volume	Ft ³	1174
Total Heat Input (HHV)	MMBtu/Hr	91.38
Fuel Flow	Lbs/Hr	4185
Fuel Higher Heating Value	Btu/SCF	1015
	Btu/lb	23235
Emissions		
NOx	Lbs/MMBtu	0.006
	PPM	5
	Lbs/hr	0.55
CO	Lbs/MMBtu	0.037
	PPM	50
	Lbs/hr	3.38
PM/PM-10/PM-2.5	Lbs/MMBtu	0.007
	Lbs/hr	0.64
VOC	Lbs/MMBtu	0.004
	PPM	10
	Lbs/hr	0.36
SOx	Lbs/MMBtu	0.003

Notes:

1. Feedwater temperature to boiler is 227°F.
2. Ambient temperature is 80°F.
3. Emissions guarantees are from 25% to 100% MCR only.