COMPLIANCE ASSURANCE MONITORING PLAN
(CAM Plan)

for

RIO BRAVO ROCKLIN

Prepared for:
Rio Bravo Rocklin
3100 Thunder Valley Court
Lincoln, CA 95648

Prepared by:
Constellation Power Generation
95 Enterprise
Aliso Viejo, CA 92656

May 2008

Compliance Assurance Monitoring Plan (CAM Plan)
Rio Bravo Rocklin

I. Emission Unit Description

Description: Circulating fluidized bed combustion boiler (biomass fuel)
Identification: Boiler
Facility: Rio Bravo Rocklin
Rocklin, California

II. Applicable Regulations, Limits, and Monitoring Requirements

Regulations: 40 CFR 70
Placer County APCD Rule 507

Emission Limits: 0.02 grains/dscf @ 12% CO2
0.10 lbs/MMBtu

Monitoring Requirements:
PM: Stack test every year or when directed by District

Control Technology:
ESP Manufactured by Hamon Research-Cottrell

III. Additional Information

The facility is a major source for NO_x emissions and thus triggers the applicability of the CAM requirements. However, the CAM requirements are not applicable to the NO_x emissions because the facility utilizes a continuous emission monitoring system (CEMS) to monitor NO_x emissions. The facility follows the requirements in 40 CFR Part 60 to ensure that the CEMS meets all applicable operating standards, including an annual Relative Accuracy Test Audit (RATA), quarterly cylinder gas audits (except when the RATA performed), daily calibration checks, and the recommended manufacturer's maintenance practices.

The CAM requirements are applicable for PM emissions, since PM is limited and since a CEMS is not utilized to monitor this constituent. The ESP is the control technology for PM_{10}. The Electrostatic Precipitator (ESP) is controlled by an automatic controller that maximizes voltage and amperage while not exceeding a set spark rate. The spark rate threshold is set by the manufacturer.

The facility is a Circulating Fluidized Bed (CFB) boiler. The exhaust gases pass through a multiclone after the economizer section of tubes prior to entering the ESP. The multiclone removes large particulates (PM) from the exhaust gas stream. The multiclone is inspected semi-annually by entering the exhaust section and parts that are identified to be showing

wear are ordered and replaced during the next scheduled outage. The exhaust gases continue through the exhaust ducting and pass through into the ESP for particulate removal. The most practical method to monitor the wear in the multiclone is by the semi-annual interior visual inspections.

IV. Monitoring Approach

The monitoring approach is to track indicators of the electrostatic precipitator (ESP) performance. The indicators chosen are the secondary current and secondary amperage. These operating values are used by the automatic control system to maintain proper ESP performance and each has a range of values which describe the normal operating range. The automatic control system adjusts the secondary current and secondary voltage to maximize the potential for particles to be attracted to the collection plates. Generally speaking, the control system has been designed to maximize the voltage drop while maintaining an acceptable spark rate. The key elements of the monitoring approach are presented in Table 1.

Table 1
Monitoring Approach Data

Description	Indicator 1	Indicator 2
A. Indicator	Secondary Current	Secondary Voltage
Measurement Approach	Maintain secondary current within operating window of system	Maintain secondary voltage within operating window of system
B. Indicator Range	10 milliamps to 750 milliamps	10 kilovolts to 85 kilovolts
C. Performance Criteria	Spark rate and Opacity trend	Spark rate and Opacity Trend
Data Representativeness	The secondary current is monitored continuously by the ammeter after the transformer and before the electrode	The secondary voltage is monitored continuously by the voltmeter after the transformer and before the electrode
Verification of Operational Status	ESP automatic controller is controlling ESP based on source tests	ESP automatic controller is controlling ESP based on source tests
QA/QC Practices and Criteria	Monthly, quarterly, and annual QA/QC checks are made in accordance with the manufacturer's recommendations as described in the Operations and Maintenance (O&M) Plan	Monthly, quarterly, and annual QA/QC checks are made in accordance with the manufacturer's recommendations as described in the O&M Plan
Monitoring Frequency	Record data twice daily during normal operation	Record data twice daily during normal operation

Description	Indicator 1	Indicator 2
Data Collection Procedure	Results of inspections and maintenance activities are recorded in a maintenance management system	Results of inspections and maintenance activities are recorded in a maintenance management system
Averaging Period	NA	NA

V. Justification for Monitoring Approach

Background

The emission unit is the 357 MMBtu/hr circulating fluidized bed (CFB) combustion boiler, which has a nameplate rating of 28 MW (gross). The boiler is permitted to combust biomass and natural gas. The particulate matter (PM) emissions from the CFB boiler are controlled by an ESP. The CAM Plan applies during normal operations, the maintenance section of the O&M Plan will be followed during maintenance periods. The boiler was put into service in 1989.

Rationale for Selection of Performance Indicators

The secondary voltage and secondary amperage were selected as performance indicators because they are indicative of good operation and maintenance of the ESP. When the ESP is operating properly, the secondary voltage and secondary amperage will be maintained within the operating parameters specified by the manufacturer and will adequately control the PM emissions. If the secondary voltage and/or secondary amperage are outside of the operating parameters, it is indicative that the ESP may not be performing at its optimal rate of particulate capture and will be evaluated to determine what if any actions are necessary.

Rationale for Selection of Indicator Ranges

The selected indicator range is secondary voltage and secondary amperage within the operating parameters specified by the ESP manufacturer. When a deviation is identified, an evaluation of the event will be conducted to determine what corrective action will be initiated. All deviations will be documented in the facilities maintenance management system and reported as required to the appropriate local and state agencies. The manufacturer's operating parameters for secondary voltage and secondary amperage ensures that the ESP is performing at its optimal rate of particulate capture. During normal operation of the ESP the automatic control will "quench" to control the spark rate. During this process power levels are reduced and amperage may fall below 10 milliamps. The process of ESP field quenching will last less than 60 seconds. Although the ESP may control emissions to an acceptable level while operating outside of the normal parameter ranges, it is expected that corrective actions will be required to maintain appropriate ESP performance.

APPENDIX A

EMISSION CALCULATIONS

CAM Plan Calculations for Rocklin

1. Stack Particulate Emissions

2008 source Tests Results show

PM	5.40	lbs/hr (controlled)
Operating data	7,884	hours per year operation (assumes 90% operating time)
PM annual emissions	42,574	lbs/yr (controlled)
Control efficiency	99	percent (multiclone and ESP combination)
Uncontrolled emissions	4,257,360	lbs/yr (uncontrolled)
	2,129	tons/yr (uncontrolled)
PM10 fraction	50	percent (estimate)
PM10 emissions	1,064	tons/yr (estimate based on PM10 fraction)

This is above the major source threshold, therefore a CAM plan is needed
for PM10 emissions from the boiler stack.