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Compliance Assurance Monitoring (CAM) Plan  
Particulate Matter Controlled  
Using an Electrostatic Precipitator

Viking Energy of Lincoln, LLC  
509 W State St.  
Lincoln, Michigan 48742

Renewable Operating Permit No. MI-ROP-N0890-2008

March 1, 2014

# Compliance Assurance Monitoring (CAM) Plan Viking Energy of Lincoln

## I. Background

### A. Emission Unit

Description: Wood and alternate fuel-fired boiler

Source ID: EUBOILER

Facility: Viking Energy of Lincoln, LLC  
509 W. State St.  
Lincoln, Michigan 48742

### B. Applicable Regulation, Emissions Limit and Monitoring Requirements

Permit No. MI-ROP-N0890-2008

Applicable Regulation: 40 CFR 60 Subpart Db

Emission Limit:  $PM_{10} = 0.10$  lb/MMBTU  
Opacity: 20% opacity on six minute average, up to 27% on six minute average once per hour

Monitoring Requirements: Continuous opacity monitoring with certified COMS system

### C. Control Technology:

Multiple cyclonic collector (DVMCC) and 3-field electrostatic precipitator (DVESP). Pre-control emissions of  $PM_{10}$  are more than 100 tons per year. Post-control emissions are limited to 98.9 tons per year. Results from Stack Testing of Post-control  $PM_{10}$  emissions are approximately 27 TPY.

## II. Monitoring Approach

The key elements of the monitoring approach for PM, including parameters to be monitored, parameter ranges and performance criteria are presented in Table I. The primary performance indicators will be opacity, which is currently being monitoring with a continuous opacity monitoring system (COMS). The secondary criteria to be examined in the event of a COMS excursion will be the secondary voltage for the precipitator.

**Table 1 Monitoring Approach**

	<b>Primary Indicator</b>	<b>Secondary Indicator</b>
<b>I. Indicator</b>	Opacity	ESP Voltage and Current
Measurement Approach	The opacity is continuously monitored using a COMS	These parameters are monitored and recorded for each field.
<b>II. Indicator Range</b>	An excursion is defined as two consecutive 1-hour block average opacity values greater than 15%. Excursions trigger an evaluation of the secondary indicators, which is secondary voltage.	If the opacity threshold is exceeded, voltage and current will be examined and corrections made. Corrections will be made if not in normal operating range.
QIP Threshold	A QIP will be required if the total duration of opacity excursions is greater than 5% of the total boiler operating time during the reporting period (excluding startup and shutdown).	A QIP will be required if the total duration of opacity excursions is greater than 5% of the total boiler operating time during the reporting period (excluding startup and shutdown).
<b>III. Performance Criteria</b>		
A. Data Representativeness	The COMS is located on the exhaust stack downstream of the ESP.	The secondary voltage is monitored using equipment provided with the ESP.
B. Verification of Operational Status	The COMS is installed and operational.	The gauges are installed and operational.
C. QA/QC Practices	The COMS has been certified in accordance with 40 CFR 60, PS-1. Accuracy is verified during daily calibration checks and during annual audits conducted in accordance with the permit conditions.	Facility personnel verify daily that the readings drop to zero during calibration cycling on the COMS.
D. Monitoring Frequency	The COMS provides continuous opacity readings.	Voltage and current readings are recorded.
Data Collection Procedures	The COMS shall be used to assure compliance with the PM limit. An excursion for PM shall be 2 consecutive 1-hour block average opacity values greater than 15% opacity.	Voltage and current reading are recorded and saved.
Averaging Period	6-minute	NA

#### **IV. Justification**

The pollutant-specific emission unit is a 230 mmBtu/hr wood and alternate fuel fired boiler. The exhaust from the boiler passes through a multiple cyclonic collector to remove larger-size particulate, then through a 3-field electrostatic precipitator (ESP). The boiler is not a "large" CAM source (post-control PM emissions are less than 100 tons per year) so continuous monitoring is not required. However, the opacity is currently monitored using a COMS, so the monitoring approach in this CAM Plan expands the existing COMS monitoring approach to evaluate ESP parameters in the event of an opacity excursion. The facility also maintains an Emissions Minimization Plan that describes the pollution control equipment and provides procedures for minimizing the pollutants addressed in the air permit.

##### **A. Rationale for Selection of Performance Indicators**

Opacity from a fuel burning device is an indicator of PM control device performance. Additionally, the language in 40 CFR 64 (CAM rules) presumes the use of an opacity monitor as indicative of PM emissions rates. The vacated boiler MACT standard also used opacity as the performance indicator of continuous compliance for ESPs. The use of a COMS represents presumptively acceptable monitoring for PM limits.

The other parameter that is most indicative of the performance of an ESP is the voltage and current ranges. When the voltage drops, less particulate is charged and collected and more work is required of the following fields, thus decreasing the secondary voltage in those fields. Ensuring that the voltage and current do not deviate from the normal operating range will provide a reasonable assurance that the ESP is functioning properly. The Emissions Minimization Plan will also specify operator actions to minimize emissions during startup/shutdown and malfunction modes. Operator actions to minimize emissions during normal operation include basic actions such as responding to opacity alarms and taking corrective action to minimize emissions.

##### **B. Rationale for Selection of Indicator Ranges**

The facility already has internal criteria in place that trigger an evaluation of ESP control parameters when two consecutive 1-hour block average opacity reading of 15% is observed. If an excursion above 15% opacity is observed, an evaluation of the ESP voltage and current will be conducted and corrections will be made.

The selected QIP threshold for Opacity excursions is 5% of the operating time during the reporting period, exempting startups and shutdowns. If this QIP threshold is exceeded in a semiannual reporting period, a QIP will be developed and implemented.

##### **C. Performance Test**

Performance testing was done one October 12, 2010.

Test data results for PM-10: .028 Lbs/MMBTU. Well below the limit of .1 Lbs/MMBTU

**Review and updates on CAM Plan**

Date	Updated Info	Signature
January 18, 2013	Per Gloria Torello: changed Data Collection Procedures from (The COMS collects opacity Readings continuously and compiles this data Into 6 minute average values. Any 6 minute ave Above 15% will be flagged and reported as an Excursion.)	

