CAM PLAN

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1.0 EMISSION UNITS REQUIRING CAM PLANS

1.1 CAM Rule Applicability Definition

As part of the Title V renewal application, a Compliance Assurance Monitoring (CAM) Plan must be submitted as required by regulations adopted in Title 40, Part 64 of the Code of Federal Regulations (40 CFR 64). This regulation has been incorporated by reference in Rule 62-204.800(12) of the Florida Administrative Code (F.A.C.), and implemented in Rule 62-213.440(4)(b)(3), F.A.C.

CAM plans are required for all Title V permitted emissions units using control devices to meet federally enforceable emission limits or standards, and that have pre-control emissions greater than “major” source thresholds. The term “major” is defined as in the Title V regulations (40 CFR 70.2), but applied on a source-by-source basis. For most non-hazardous pollutants, the major source threshold is 100 tons per year (TPY). For hazardous air pollutants (HAPs), the threshold is 10 TPY for an individual HAP, and 25 TPY for total HAPs combined.

The CAM rules contain specific exemptions from applicability of CAM. Specifically exempted from CAM are emission limitations or standards promulgated under the following: Stratospheric Ozone Regulations contained in 40 CFR 82, the Acid Rain Program contained in 40 CFR 72, or those that are part of an emissions cap included in the Title V permit. Also exempt are emission limitations or standards proposed after November 15, 1990, under the following: New Source Performance Standards (NSPS) contained in 40 CFR 60 and National Emission Standards for Hazardous Air Pollutants (NESHAPs) promulgated in 40 CFR 63. These limitations and standards have monitoring requirements equivalent to CAM included as part of the standard.

Inherent process equipment (IPE), or equipment that may have the effect of controlling emissions but is installed for the primary purpose of product recovery or raw material recovery, is also exempt from CAM (40 CFR 64.1). In addition, CAM does not apply to any emission limit or standard for which the Title V permit specifies a continuous compliance determination method [40 CFR 64.2(b)(1)(vi)], provided that the method does not include an assumed control device emission reduction factor that could be affected by the actual operation and maintenance of the control device.

The Carbonaceous Boiler is an emissions unit that requires a CAM Plan. The Plan has already been submitted to FDEP.

2.0 PARTICULATE MATTER EMISSIONS FROM THE CARBONACEOUS BOILER

2.1 Emissions Unit Identification

Carbonaceous Boiler — EU ID 001

2.2 Applicable Regulations, Emissions Limits, and Monitoring Requirements

The Carbonaceous Boiler is subject to 40 CFR Part 60, Subpart Db—Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units. The boiler has a particulate matter (PM) emission limit of 0.05 pounds per million British thermal units (lb/MMBtu) for carbonaceous fuel. [Rule 40 CFR 60.43b (f), Rule 62-204.800 (8) (b) 3., F.A.C.,]. Total PM emissions are limited to 11.5 pounds per hour (lb/hr). The current visible emissions (VE) limit is 20-percent opacity, with an exception of up to 27-percent opacity for 6 minutes per hour [Rule 40 CFR 60.63b (f)].

PM and VE compliance testing is required annually on the Carbonaceous Boiler. In addition, a continuous opacity monitoring system (COMS) is required to be used to record the opacity of the stack flue gas. For compliance purposes, continuous opacity monitoring system (COMS) data results produced during any performance test for particulate matter may be submitted in lieu of method 9 observation data, except for the one VE test required during each permitting cycle. The COMS must be properly calibrated, operated, and maintained in accordance with Section 62-297.520, F.A.C.

2.3 Control Technology Description

PM emissions from the Carbonaceous Boiler are controlled by an electrostatic precipitator (ESP). The effectiveness of the ESP is evaluated with an annual stack test and continuous opacity measurements. A detailed description of the control equipment was included in the Title V renewal application (Attachment TP-EU1-I3).

2.4 Monitoring Approach

The CAM rule, in 40 CFR 64.3(d)(1), states that if a COMS is required pursuant to other authority under the Act or state or local law (as is the case for the boiler), the owner or operator shall use such system to satisfy the requirements of this part. However, note that per EPA guidance, a COMS need not be specified as part of CAM for PM. The guidance states:

> "It should be emphasized that even in cases where a COMS is required for opacity, the COMS need not be specified as part of CAM for particulate matter. Other appropriate indicators may be selected to satisfy CAM. The above discussion applies only in cases where a facility chooses to use a COMS to monitor opacity as an indicator of compliance with a particulate matter standard." [Section 2.2.2.3 of EPA's "Technical Guidance Document: Compliance Assurance Monitoring" (Revised Draft Aug. 1998), at pp. 2-13 to 2-14].

Furthermore, the criteria in 40 CFR 64.3(a) must be met before a COMS may be used.

The monitoring approach is to use ESP power, instead of opacity, as the indicator of PM emissions. The monitoring approach is summarized in the following table:

	Indicator No. 1
Indicator	ESP secondary voltage and current are measured for each field to determine the total power input to the ESP.
Measurement Approach	The secondary voltage is measured using a voltmeter, and the secondary current is measured using an ammeter. The total power [P expressed as kilowatts (kW)] input to the ESP is the sum of the products of the secondary voltage (V) and current (I) in each field. ($P = V_1I_1 + V_2I_2 + \ldots + V_nI_n$).
Indicator Range	An excursion is defined as an ESP power input less than a 14 kW. Excursions trigger an inspection, corrective action, and a reporting requirement.
Data Representativeness	The voltage and current are measured using the instrumentation the manufacturer provided with the ESP.
Verification of Operational Status	NA
QA/QC Practices and Criteria	Confirm the meters read zero when the unit is not operating. Compare continuous monitoring opacity readings with power input.
Monitoring Frequency	The secondary voltage and current are monitored every 2 hours and used to calculate the average power input over a 24-hour period.
Data Collection Procedures	The average power input for each 24-hour period is calculated and recorded.
Averaging Period	24-hour period.

2.5 Rationale for Selection of Performance Indicators

Telogia monitors total ESP power, which provides the best correlation with PM emissions. ESP total power input is a recognized indicator of PM emissions for ESPs. In an ESP, electric fields are established by applying a direct-current voltage across a pair of electrodes, a discharge electrode and a collection electrode. PM suspended in the gas stream is electrically charged by passing through the electric field around each discharge electrode (the negatively charged electrode). The negatively charged particles then migrate toward the positively charged collection electrodes. The PM is separated from the gas

stream by retention on the collection electrode. Particulate is removed from the collection plates by shaking or rapping the plates.

Generally, ESP performance improves as total power input increases. This relationship holds true when PM and gas stream properties (such as PM concentration, size distribution, resistivity, and gas flow rate) remain stable and all equipment components (such as rappers, plates, wires, hoppers, and transformer-rectifiers) operate satisfactorily. In an EPS with many fields, the power distribution also plays a key role in the performance of the ESP. In this case, however, measurement of the total power input is acceptable because the ESP has only two fields.

The secondary voltage drops when a malfunction, such as ground electrodes, occurs in the ESP. When the secondary voltage drops, less particulate is charged and collected. Also, the secondary voltage can remain high but fail to perform its function if the collection plates are not cleaned, or rapped, appropriately. If the collection plates are not cleaned, the current drops. Thus, since the power is the product of the voltage and the current, monitoring the power input will provide a reasonable assurance that the ESP is functioning properly. Problems that may not be detected by monitoring other parameters individually will be manifested in the total power input.

2.6 Rationale for Selection of Indicator Ranges

The total power input to the ESP is the sum of the products of the secondary voltage and secondary current for each field. Currently, an excursion is defined as an average ESP power input less than 15 kW. When an excursion occurs, corrective action will be initiated, beginning with an evaluation of the occurrence, to determine the action required (if any) to correct the situation. All excursions will be documented and reported.

Telogia has sufficient historic data necessary to establish indicator ranges for ESP total power for the Carbonaceous Boiler. Initial testing was performed to determine the minimum power required to demonstrate compliance with the PM standard. Annual testing has been conducted since that time while the ESP was operating normally (two fields operating).

The requested indicator range of 14 kW for the ESP power was selected based on recent operation data. The normal operating voltage is set at the highest level achievable without having an excessive spark rate. It is anticipated that power levels less than 5 kW during normal operations will result in opacity readings that approach 20 percent (under normal operations at a power input of over 14 kW, the opacity of the ESP exhaust is less than 5 percent). During abnormal operation or malfunction, the ESP power levels are appreciably lower than normal operational levels. Table 1 shows that even during annual compliance test for the 2009-2013 period when the boiler has to operate at capacity the PM emissions

are below 0.020 lb/MMBtu which is well below the permit limit of 0.050 lb/MMBtu. The ESP power during the compliance tests for the evaluated period ranged from 10 kW to 26 kW.

The opacity during that time is below 5 percent, with an average of 1.88 percent. Opacities are measured using a continuous opacity monitor installed in the ESP boiler exhaust stack. This equipment meets the criteria in 40 CFR 60, Appendix B, Performance Specification 1, and is used for compliance monitoring. Compliance with the boiler's 20 percent opacity limit would not necessarily indicate compliance with the PM limit, although continuous opacity monitoring is required at this source.

Due to the low opacity and PM emissions obtained during the 2009-2013 compliance test period, Telogia is requesting the ESP power indicator range to be 14 kW. Therefore, an excursion would be defined as an ESP power input less than 14 kW.

Table 1 – Compliance Emission Testing (2009-2013) - Carbonaceous Boiler (EU001)

Test Date	Test Run	Total ESP Power (kW)	Steam Rate (lb/hr)	Opacity Percent (%)	PM Emissions (lb/MMBtu)
12/16/09	1	11.93	144,000	2.38	0.015
12/16/09	2	10.20	144,000	2.28	0.015
12/16/09	3	10.01	144,000	2.31	0.016
09/29/10	1	26.04	147,000	1.22	0.011
09/29/10	2	26.43	146,900	1.11	0.007
09/29/10	3	26.12	147,000	1.08	0.007
12/06/11	1	16.24	145,000	4.93	0.019
12/06/11	2	N/A	N/A	N/A	0.018
12/06/11	3	N/A	N/A	N/A	0.020
11/29/12	1	N/A	N/A	N/A	0.012
11/29/12	2	N/A	N/A	N/A	0.008
11/29/12	3	18.15	146,000	2.52	0.009
12/04/13	1	18.85	139,000	1.02	0.013
12/04/13	2	21.62	139,000	0.89	0.010
12/04/13	3	20.85	139,000	0.94	0.015

N/A= Not available.

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