



October 9, 2013  
Armando Sarasua, P.E., Supervisor  
Florida Department of Environmental Protection  
Waste Management/Air Resource Program  
Northwest District  
160 W. Government Street, Suite 308  
Pensacola, Florida 32502

RE: UPDATE TO COMPLIANCE MONITORING PLAN FOR PERMIT NO. 0630058-014-AC  
GREEN CIRCLE BIO ENERGY, INC. – COTTONDALE, FL

Dear Mr. Sarasua,  
Green Circle Bio Energy, Inc. (Green Circle) is submitting this revised Compliance Monitoring Plan (CMP) to satisfy Permit No. 0630058-014-AC Specific Condition Nos. A.7. and B.5. Green Circle was issued Air Constriction Permit No. 0630058-014-AC on August 27, 2013 and given 120 days to include changes into the CMP. This revised CMP incorporates modifications established in Permit Nos. 0630058-011-AC and 0630058-014-AC.  
Please feel free to call (850-819-8449) or email ([gmartin@greencirclebio.com](mailto:gmartin@greencirclebio.com)) me if you need any additional information.

Sincerely,  
Green Circle Bio Energy, Inc.

Greg Martin  
Vice President

cc: Scott McCann (Golder Associates Inc.)

Attachments or Enclosures  
GM/

**RECEIVED**

OCT 17 2013

**NORTHWEST FLORIDA  
DEP**

# COMPLIANCE MONITORING PLAN/COMPLIANCE ASSURANCE MONITORING PLAN

**Green Circle Bio Energy, Inc.  
Cottondale Wood Pellet Plant  
Jackson County, Florida**

**Prepared For:** Green Circle Bio Energy, Inc.  
2500 Green Circle Parkway  
Cottondale, Florida 32431

**Submitted To:** Florida Department of Environmental Protection  
Northwest District Office, Pensacola, Florida

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Florida Department of Environmental Protection  
Green Circle Bio Energy, Inc.  
Golder Associates Inc.

October 2013

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## Table of Contents

1.0	INTRODUCTION.....	1
2.0	SOURCE DESCRIPTIONS AND PERMIT LIMITS.....	4
3.0	COMPLIANCE MONITORING PLAN PARAMETERS.....	6
3.1	Dryer Lines.....	6
3.1.1	Dryer Heat Input Rate.....	6
3.1.2	Wet Electrostatic Precipitators.....	7
3.1.3	Regenerative Thermal Oxidizer.....	8
3.1.4	Nitrogen Oxide Emissions Control.....	9
3.1.5	Bypass Stacks.....	9
3.2	Pelletizing Lines.....	9
3.3	Bulk Load-Out Area.....	10

## List of Tables

Table 1	Compliance Monitoring Plan Summary
Table 2	Wet Electrostatic Precipitator

## 1.0 INTRODUCTION

Green Circle Bio Energy, Inc. (Green Circle) owns and operates a wood pelletizing operation located south of Cottondale, Jackson County, Florida. The address of the facility is 2500 Green Circle Parkway, Cottondale, Florida. The Florida Department of Environmental Protection (FDEP) issued an Air Construction Permit (Permit No. 0630058-001-AC) to Green Circle for construction and initial operation of the facility. Permit No. 0630058-001-AC requires submittal of a Compliance Monitoring Plan (CMP) detailing the procedures that would be used to demonstrate compliance with the production and emission limits in the permit. The initial CMP was submitted to FDEP in July 2008.

The FDEP issued Green Circle's initial Title V Air Operation Permit (Permit No. 0630058-005-AV) on March 16, 2011. This permit incorporated the previous four Air Construction Permits issued by the FDEP:

- Air Construction Permit No. 0630058-001-AC authorized the initial construction of the facility.
- Air Construction Permit No. 0630058-002-AC authorized the installation of four new hammer mills (two each on Pelleting Line Nos. 1 and 3) in an effort to attain permitted production capacity.
- Air Construction Permit No. 0630058-003-AC authorized modification of the aspiration system servicing the hammer mills and pelletizers and clarified the averaging times used to demonstrate compliance with some of the specific permit conditions in Air Construction Permit No. 0630058-001-AC.
- Air Construction Permit No. 0630058-004-AC authorized installation and temporary operation of a horizontal hammer mill on Pelleting Line No. 3 to evaluate this technology.

Additionally, the initial Title V Air Operation Permit incorporated Air Construction Permit No. 0630058-006-AC, which established an annual pellet production limit of 554,304 tons per year (TPY) and a volatile organic compounds (VOC) emission factor of 0.639 pound of VOCs per ton of pellets produced.

The purpose of this Air Construction Permit was to limit facility-wide VOC emissions to 226.2 TPY (sum of the permitted annual emission rates for the dryers and pelletizing lines of 49.1 TPY and 177.1 TPY, respectively), to allow the facility to remain a minor source (annual emissions less than 250 TPY) with regard to Prevention of Significant Deterioration (PSD) regulations. This permit was processed by the FDEP concurrently with the initial Title V Air Operation Permit Application.

A revised CMP was submitted to FDEP in support of the initial Title V Air Operation Permit Application. Some sources at the facility are subject to the U.S. Environmental Protection Agency (EPA) Compliance Assurance Monitoring (CAM) regulations, codified as part of EPA's Clean Air Act, and located in Title 40, Part 64 of the Code of Federal Regulations (40 CFR 64). A CAM Plan was submitted to FDEP in support of Green Circle's initial Title V Air Operation Permit Application.

Subsequent to issuance of the initial Title V Air Operation Permit and Air Construction Permit No. 0630058-006-AC, the FDEP issued three additional Air Construction Permits (Permit Nos. 0630058-008-AC, 0630058-009-AC, and 0630058-010-AC).

Air Construction Permit No. 0630058-008-AC authorized the construction of a new dry wood truck dump and two new pelletizers (one each on Pelleting Line Nos. 1 and 3), allowed the horizontal hammer mill allowed by Air Construction Permit No. 0630058-004-AC to operate continuously, and allowed the use of natural gas as fuel for the regenerative thermal oxidizer (RTO) combustion chambers.

Air Construction Permit No. 0630058-009-AC increased the railcar loading rate of the Bulk Load Out System to 88.8 tons per hour (TPH) (compliance determined on a daily average basis) to make it consistent with the pellet production rate allowed by Air Construction Permit No. 0630058-008-AC.

Air Construction Permit No. 0630058-010-AC increased annual pellet production to 610,000 TPY and modified a number of permit conditions associated with the methodologies used to demonstrate compliance.

Green Circle revised their Title V Air Operation Permit (Permit No. 0630058-012-AV) to incorporate the terms and conditions of Air Construction Permit Nos. 0630058-008-AC, 0630058-009-AC, and 0630058-010-AC. A revised CMP was submitted to FDEP in support of changes established in the three construction permits. Prior to issuing Permit No. 0630058-012-AV, the FDEP issued Air Construction Permit No. 0630058-011-AC. At the time of the FDEP's issuance of Permit No. 0630058-012-AV, construction to accommodate changes established in Permit No. 0630058-011-AC were not complete. Therefore, modifications outlined in Permit No. 0630058-011-AC were not incorporated into Permit No. 0630058-012-AV.

Air Construction Permit No. 0630058-011-AC increased hourly and annual wood pellet production from 88 TPH and 610,000 TPY to 121 TPH and 827,000 TPY, respectively. Wood yard truck traffic was authorized to increase from 180 to 305 trucks per day on a rolling monthly average to accommodate higher production capacities.

Air Operation Permit No. 0630058-013-AV revised their previous Title V Air Operation Permit to incorporate a diesel-fueled emergency fire pump engine.

Subsequent to issuance of Permit No. 0630058-013-AV, the FDEP issued Air Construction Permit No. 0630058-014-AC to address VOC and particulate matter (PM) emissions identified during stack testing of the hammer mills and pellet mills.

Green Circle is revising their CMP to incorporate Air Construction Permit Nos. 0630058-011-AC, 0630058-014-AC, and Air Operation Permit No. 0630058-013-AV. Since Permit Nos. 0630058-11-AC and 0630058-014-AC resulted in the facility becoming a major source under PSD regulation, the FDEP

removed many of the emission limits from these permits that were established in previous permits to classify the facility as a minor source. The result of the removal of these emission limits was that many sources were no longer subject to CAM regulations. Additionally, Permit No. 0630058-014-AC reduced the number of emission sources as it authorized venting the existing hammer mills and the aspiration systems of the pellet mills to the dryer furnaces which eventually exhaust through the two regenerative thermal oxidizer stacks. Subsequently, this CMP is substantially reduced compared to the volume of previous versions.

In accordance with Permit No. 0630058-014-AC, a revised CMP must be submitted to the FDEP within 120 days of issuance of that permit. Green Circle is submitting this revised CMP to the FDEP to satisfy this requirement.

## 2.0 SOURCE DESCRIPTIONS AND PERMIT LIMITS

The facility receives raw pine logs or sawmill residuals (chips, sawdust, and shavings) and processes the wood into wood pellets to be sold as product. Green Circle is currently permitted for the following emissions units (production limits set by the air construction permit are included in parentheses):

- EU 001 Wood Fiber Receiving and Storage Area [305 incoming trucks per day (monthly average)]
- EU 002 Dryer Line No. 1 [maximum heat input rate of 125 million British thermal units per hour (MMBtu/hr) daily average]
- EU 003 Dryer Line No. 2 [maximum heat input rate of 125 MMBtu/hr (daily average)]
- EU 004 Pelletizing Line No. 1 [121 TPH total pellet production (all three pellet lines)]
- EU 005 Pelletizing Line No. 2 [121 TPH total pellet production (all three pellet lines)]
- EU 006 Pelletizing Line No. 3 [121 TPH total pellet production (all three pellet lines)]
- EU 007 Pellet Load-out Area (121 TPH pellets)
- EU 008 Unregulated Emissions Unit – 2,000-gallon diesel storage tank
- EU 009 Dryer Line No. 3 [maximum heat input rate of 125 MMBtu/hr (daily average)]

CAM regulations have been adopted by the state of Florida in Rule 62-204, Florida Administrative Code (F.A.C.). The CAM rule is applicable to emission units, on a pollutant-by-pollutant basis, at major sources that meet the following criteria:

- The pre-control device emissions from the emission unit are greater than major source thresholds
- The emission unit is subject to emission limits or standards
- Pollution control equipment is used to meet emission limits or standards
- The emission unit is not subject to a post-1990 New Source Performance Standard or National Emission Standard for Hazardous Air Pollutants for a given pollutant
- The control equipment is not inherent to the process

Green Circle has made the following conclusions regarding the various emission sources at the site with regard to CAM applicability:

- The wood fiber receiving and storage area (EU 001) does not have permitted emissions limits or a control device to achieve compliance. Therefore, the wood fiber receiving and storage area is not subject to CAM.
- Dryer Line Nos. 1, 2, and 3 (EU 002, EU 003, and EU 009) are subject to air emission limits for PM (40 CFR 60, Subpart Db- Standards of Performance for Industrial-Commercial Institutional Steam Generating Units). Currently, Permit Nos. 0630058-011-AC and 0630058-014-AC do not include emission limits for any other pollutants. The dryer lines are therefore subject to CAM for PM only.
- Pelletizing Line Nos. 1, 2, and 3 (EU 004, EU 005, and EU 006) do not have permitted emissions limits for PM or VOC. VOC and PM emissions from the hammer mill and pellet mill aspiration systems are diminished through a series of control devices. Emissions are first routed through the Dryer Line Furnaces (VOC destruction), then to the wet electrostatic precipitators (WESPs) (PM removal), and finally to the RTOs (VOC

destruction). Pellet mill coolers will continue to vent to the twin cyclone systems, but there are no permitted emission limits associated with these sources. The pelletizing lines are therefore not subject to CAM.

- The Pellet Load-out Area (EU 007) does not have a permitted emission limit. Therefore, the pellet load-out area is not subject to CAM.

Green Circle has developed this CMP in anticipation of satisfying CAM requirements for PM from the dryers, as well as satisfying other compliance requirements specified by applicable permits.

Green Circle performed emissions stack testing during initial operations to establish correlations between monitored and recorded control parameters and stack emission rates for the dryers. Data collected during stack testing was used to support the use of specific control parameters, control parameter ranges, and recordkeeping procedures as indicators of compliance with permitted emissions limits. The following sections describe compliance monitoring procedures established following initial stack testing. In addition, general operating condition restrictions/limitations, as described in the most recent Title V Air Operation Permit or as modified in subsequent Air Construction Permits, are addressed in the following sections.

A summary of the compliance monitoring parameters is included as Table 1.

### 3.0 COMPLIANCE MONITORING PLAN PARAMETERS

#### 3.1 Dryer Lines

Three rotary drum dryers (EU 002, EU 003, and EU 009) will be used to reduce the moisture content of the wood chips to approximately 9 percent in preparation for grinding and pelletizing. Heat for each dryer is provided by a 125-MMBtu/hr bark-fired furnace. High-humidity exhaust gases from each dryer are recirculated back to their respective furnace to temper the combustion within the chamber and control the generation of nitrogen oxide (NO<sub>x</sub>). Gases from the furnace are drawn through a 6,900 pounds per hour (lb/hr) steam generator. Up to 50 percent of the gases leaving each dryer's ID fan are re-circulated to the dryer furnace. The remaining gases are directed to a WESP for PM emissions control and the RTO for VOC emissions control.

The WESP inlet gases are quenched with a recirculating water system. Gas exiting the WESP is routed to the RTO, where exhaust gas VOC emissions are controlled. Propane gas and natural gas are used as supplemental fuels to maintain RTO efficiency.

Exhaust gas from each RTO is vented to the atmosphere through a stack (one stack for each RTO). Each dryer includes two additional stacks used during bypass operations. Bypass operations include periods during startup and during process malfunctions. Bypass operations during malfunctions are limited in the Air Construction Permit to 50 hours per year (hr/yr) for each dryer bypass stack and each furnace bypass stack. The permit allows the bypass stack for each furnace to operate for 1,500 hours in "idle mode," which is defined as operation up to a maximum heat input rate of 5 MMBtu/hr. If at any time during normal operations the exhaust gases to either RTO are routed to a bypass stack, the facility records the reason for the bypass conditions; the period of time when the bypass stack was used; in the case of the furnace stack, the operating mode (malfunction or idle); and the corrective action performed, if applicable.

##### 3.1.1 Dryer Heat Input Rate

Air Construction Permit No. 0630058-011-AC requires Green Circle to record the heat input of each dryer line. As previously indicated, each dryer line is limited to a heat input of 125 MMBtu/hr, averaged over a 24-hour period. Using an average heating value for southern yellow pine of 4,600 British thermal units per pound (Btu/lb) of fuel, as specified by FDEP, this heat input rate equates to approximately 13.6 TPH of bark fuel. In order to demonstrate compliance, the facility monitors and records the fuel delivery parameters as specified in the following paragraph.

The facility will monitor the number of strokes of the hydraulic ram feeder per hour and will determine an average hourly rate for each day. From this the tons per hour of bark fuel will be calculated and recorded, and a heat input in MMBtu/hr determined by assuming each "stroke" of the hydraulic ram equals

approximately 20 cubic feet (cf) of bark fuel, a bulk density of wood waste/bark of 11 pounds per cubic foot (lb/cf), and a heat content of the bark/wood waste of 4,600 Btu/lb.

### **3.1.2 Wet Electrostatic Precipitators**

In an electrostatic precipitator (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 (collection plates). The PM is separated from the gas stream by retention on the collection plates. The WESP control device uses a quench water spray to cool and saturate dryer exhaust gases prior to their entry into the electrical fields of the WESP. As particles accumulate on the collector plates of the WESP, the plates are cleaned by a spray of water.

The primary indicators of WESP performance include opacity, secondary voltage, secondary current, and secondary corona power. Other indicators of WESP performance include the spark rate, primary current, primary voltage, inlet gas temperature, gas flow rate, inlet water flow rate, solids content of flush water, and field operations.

The secondary voltage on the collector plates drops when a malfunction, such as grounded electrodes, occurs in the WESP. When the secondary voltage drops, fewer particles are charged and collected. Also, the secondary voltage can remain high but fail to perform its function if the collection plates are not cleaned. If the collection plates are not cleaned, the current drops. Since power is the product of voltage and current, monitoring the power input will provide a reasonable assurance that the WESP is functioning properly. The manufacturer of the WESP provided the following secondary voltage and current design parameters.

- Minimum secondary voltage (24-hour average): 30 kilovolts (kV)
- Minimum secondary current (24-hour average): 250 milliamps (mA)

The values for these parameters were verified during initial compliance testing. During normal drying operations, Green Circle monitors the secondary voltage and secondary current. The monitoring system consists of a voltmeter and an ammeter, parts of the WESP instrumentation.

For the WESP to operate within design parameters, the gas stream needs to be cooled in order for some of the pollutants to condense. High quench inlet temperatures can indicate the quench water spray prior to the electrostatic field is not functioning as designed. In addition, high WESP outlet temperatures can indicate that the gas stream has not been sufficiently saturated to provide for efficient particle removal. High outlet temperatures could be the result of plugged nozzles, malfunctioning pumps, or broken or plugged piping.

The manufacturer of the WESP provided the following WESP inlet and outlet quench temperatures:

- Maximum inlet quench temperature: 210 degrees Fahrenheit (°F)
- Maximum outlet quench temperature: 210°F

The values for these parameters were verified during initial compliance testing. Green Circle measures the WESP quench inlet temperature and the WESP outlet temperature to demonstrate continuous operation of the WESP in accordance with design parameters.

As PM emissions from the WESP/RTO stacks are limited to 0.030 lb/MMBtu by 40 CFR 60, Subpart Db, and the WESP is the primary PM control device, the WESP parameters specified above will be monitored to satisfy both CMP and CAM requirements. The CMP requirements are summarized in Table 1. CAM requirements are summarized in Table 2.

### **3.1.3 Regenerative Thermal Oxidizer**

The facility RTO is used to control VOC emissions in the dryer exhaust gas streams by combusting emissions to carbon dioxide (CO<sub>2</sub>) and water. Important design factors of the RTO include maintaining high enough temperatures within the RTO to ignite the organic constituents of the exhaust gas stream, residence time to allow the combustion reaction to occur, and turbulence or mixing of the combustion air with the exhaust gas stream. The rate at which VOCs are oxidized is affected by temperature; the higher the temperature, the faster the oxidation reaction proceeds. Thermal destruction of most organics occurs at combustion temperatures between 800°F and 2,000°F.

For VOC control, the primary indicators of RTO performance include the outlet VOC concentration and outlet or combustion chamber temperature. Other indicators include the outlet carbon monoxide (CO) concentration, outlet CO<sub>2</sub> concentration, outlet oxygen concentration, exhaust gas flow rate, and auxiliary fuel line pressure.

From normal drying operations, Green Circle established a minimum combustion chamber temperature of 1,440°F. Green Circle verified this minimum temperature during initial compliance testing. The monitoring system consists of a thermocouple device installed in the thermal oxidizer chamber as part of the RTO instrumentation.

In addition, it is necessary to ensure a proper residence time to allow temperatures within the RTO to ignite the organic constituents of the exhaust gas stream. The RTO manufacturer's design residence time in the combustion chamber is approximately 1.39 seconds at the design gas flow rate. Each of the two RTO combustion chambers is approximately 3,377 cf in volume. The design gas flow rate through the RTO is approximately 92,797 actual cubic feet per minute (acfm) at 176°F. Fan speed and back pressure are monitored to demonstrate that this exhaust flow is not exceeded and chamber residence time is maintained.

As currently applicable permits do not include VOC emission limits, the RTO parameters specified above will be monitored to satisfy CMP requirements only. The CMP requirements are summarized in Table 1.

### **3.1.4 Nitrogen Oxide Emissions Control**

Currently applicable permits do not include emission limits for NO<sub>x</sub> nor require monitoring of NO<sub>x</sub>-related compliance parameters. Accordingly, this CMP does not include additional discussions of NO<sub>x</sub>-related compliance issues.

### **3.1.5 Bypass Stacks**

As previously discussed, the bypass stacks are used during periods of startup and during process malfunctions. The number of hours the bypass stacks can be used are limited by the current Title V Air Operation Permit to 50 hours for malfunction operation of the dryer and furnace bypass stack and 1,500 hours of operation for the furnace bypass stack during idle mode.

Green Circle monitors the use of the bypass stacks and records the reason for the bypass conditions, the period of time and duration when the bypass stack was used, the operating mode during the time the bypass stack was operating, and the corrective action performed, if applicable.

Monitoring the use of the bypass stacks is a CMP requirement only. CMP requirements are summarized in Table 1.

## **3.2 Pelletizing Lines**

Dry wood chips (approximately 9 percent moisture, by weight), stored in the Grinding Storage Bin, are conveyed to the Grinding Building along three incline conveyors. From the incline conveyors, the wood chips are metered to three grinding infeed conveyors that feed the three hammer mill lines. The three conveyors exiting the hammer mill lines each have separate aspiration systems to remove excess moisture and separate dust collectors. These three outfeed conveyors transport the ground wood to the three Pelleting Storage Bins. As allowed by Permit No. 0630058-014-AC, the exhaust from these dust collectors is vented back to the dryer furnaces.

Three incline conveyors are used to transport ground wood from the Pelleting Storage Bins to the Pelleting Building. From the incline conveyors, the ground wood is transferred to three conveyors that feed the three Pelletizing Lines. Three conveyors are used to transport the pellets from the Pelletizing Lines to a bucket elevator. The aspiration systems for each pelletizing line are vented to their respective dust collectors. The exhaust from these dust collectors are vented back to the dryer furnaces and eventually through the RTO stacks. Each bucket elevator is used to transfer the pellets to the top of a counter current flow Pellet Cooler. From the Pellet Coolers, the flows of pellets are fed to a single bucket elevator and vibrating screen. From the vibrating screens the pellets are transferred to the railcar loading system.

PM emissions from each cooler are controlled by two parallel high-efficiency cyclones and then vented to the atmosphere. VOC emissions from each cooler are also vented to the atmosphere without control. Since there are no PM or VOC emission limits associated with the pelletizing lines, CAM does not apply to the pelletizing lines.

The only other compliance requirement for the pelletizing lines specified by the current air permit is for the combined production rate. Total pellet production from Pelletizing Line Nos. 1, 2, and 3 are limited in Air Construction Permit No. 0630058-011-AC to 121 TPH (daily average). Compliance with this requirement will be demonstrated using information from the Bulk Load-Out area as described in the following section.

### **3.3 Bulk Load-Out Area**

Pellets are transported to two sets of storage bins, each set with a capacity of 94 tons, and located above the rail car loading area. The bins provide up to approximately 2 hours of pellet storage and uniformly meter the pellets out for rail car loading. The pellet conveyors are sealed and equipped with continuous air aspiration for dust control. All aspirated air is drawn through dust filters that are designed with an air-to-cloth ratio less than 15 actual cubic feet per minute per square foot (acfm/sf).

The maximum rate of pellets processed by the Load-Out Area is limited by Air Construction Permit No. 0630058-014-AC to 121 TPH (24-hour average). The load-out area is equipped with two load-out lines; each line is equipped with four storage bins. In addition, each line includes a scale. One line at a time will receive pellets for load-out. Once the four bins are filled, the load-out equipment switches to the second line and starts filling the second four bins. The filled bins are weighed before discharging into the rail car. Once the weight has been recorded, the scales are reset to zero. Green Circle records the weight of each load-out bin and at the end of the day will compute an hourly average to ensure compliance with the conditions of the permit.

This is a CMP-only requirement, as pre-control emissions from the Bulk Load-Out System are not in excess of major source thresholds, and therefore, are not subject to CAM. CMP requirements are summarized in Table 1.

## TABLES

**TABLE 1  
COMPLIANCE MONITORING PLAN SUMMARY  
GREEN CIRCLE BIO ENERGY, INC., COTTONDALE WOOD PELLET PLANT**

Emission Unit No.	Emission Unit Name	Permit 0630058-011-AC Condition Nos.	Permit Condition	CAM Applicable? (Y/N)	Monitored Parameter	Compliance Value	Action Value	Action Response	Comment
002	Dryer Line No. 1	B.1.	The maximum operation capacity for each Dryer Line combustor shall not exceed 125 MMBtu/hr heat input averaged over a 24-hour period.	N	Number of strokes of hydraulic ram feeder to combustor.	51 strokes/hr on a daily average basis.	51 strokes on an hourly basis.	Operations Manager notified that continued operation at or above this rate may exceed allowable heat input limit of 125 MMBtu calculated on a daily average basis.	Based on 4,600 Btu per pound of wood and 2.43 MMBtu/stroke as determined during compliance testing. Compliance is demonstrated when the result of dividing the daily number of strokes by 24 hours is less than or equal to 51 strokes.
		B.1.	Excess emissions resulting from startup, shutdown, or malfunctions, using the Dryer Line and furnace bypass stacks shall be permitted provided that best operational practices to minimize emissions are adhered to and the duration of excess emissions shall be minimized but in no case exceed 2 hours in any 24-hour period, nor exceed 50 hours per 12-month rolling total for each Dryer Line.	N	Number of hours of operation where dryer and furnace bypass stacks are utilized, and for the furnace, whether the bypass stack is being used during malfunction or idle mode operation.	Dryer Bypass Stack: 50 hours Furnace Bypass Stack (malfunction): 50 hours Furnace Bypass Stack (idle mode): 1,500 hours	Dryer Bypass Stack: 12-month rolling total exceeds 40 hours Furnace Bypass Stack (malfunction): 12-month rolling total exceeds 40 hours Furnace Bypass Stack (idle mode): 12-month rolling total exceeds 1,400 hours	Operations Manager notified that permit limits are being approached for operation of the bypass stacks.	Compliance is demonstrated when the dryer bypass stack are used 50 hours or less on a 12-month rolling total basis, and the furnace bypass stack are used no more than 50 hours at full capacity, or no more than 1,500 hours in idle mode.
		B.1. B.21.	Records of the date, time, hours, total running hours, hydraulic ram feed strokes per hour on a daily average basis for each combustor, hourly WESP gas stream inlet and outlet quench temperatures, and hourly RTO combustion chamber temperatures as a three hour average shall be kept.	Y	Hourly temperature of RTO chamber (3-hr avg.), flow rate through the RTO chamber (fan speed), back pressure, and residence time. WESP secondary voltage, secondary current, and quench inlet and outlet temperature.	Temperature: Minimum of 1,440°F (when operating) (3-hour average); Fan Speed: ≤99% with corresponding back pressure of less than 10 inches of water (1-hour average). Secondary Voltage: minimum of 30 kV (1-hr avg.) Secondary Current: minimum of 250 mA (1-hr avg.) Quench Inlet Temperature: Maximum of 210°F (3-hr avg.) Quench Outlet Temperature: Maximum of 210°F (3-hr avg.)	Temperature: Minimum of 1,475°F (when operating) (3-hour average); Fan Speed: ≤95% with corresponding back pressure of less than 8 inches of water (1-hour average). Secondary Voltage: minimum of 40 kV (1-hr avg.) Secondary Current: minimum of 325 mA (1-hr avg.) Quench Inlet Temperature: Maximum of 200°F (3-hr avg.) Quench Outlet Temperature: Maximum of 200°F (3-hr avg.)	Operations Manager notified that RTO operating parameters are approaching design limits for proper operation. Should consider checking the quench water flow, RTO fan speed, propane supply, dryer recirculation rate and the thermocouple used to measure quench water temperature, WESP operating parameters are approaching design limits for proper operation. Should consider increased unit flushing, cleaning, and inspection of the flow line.	The RTO is designed for 1.39 second residence time at 100% fan speed. At stated fan speeds, back pressures in excess of those presented can indicate plugging of RTO chambers and require investigation. Compliance is demonstrated when the temperature of the RTO chamber is greater than 1,440°F, the fan speed and corresponding back pressures are within the specified parameters, which indicate the minimum residence time is met. Compliance demonstrated when indicated parameters are within the specified ranges.
003	Dryer Line No. 2	B.1.	The maximum operation capacity for each Dryer Line combustor shall not exceed 125 MMBtu/hr heat input averaged over a 24-hour period.	N	Number of strokes of hydraulic ram feeder to combustor.	51 strokes/hr on a daily average basis.	51 strokes on an hourly basis.	Operations Manager notified that continued operation at or above this rate may exceed allowable heat input limit of 125 MMBtu calculated on a daily average basis.	Based on 4,600 Btu per pound of wood and 2.43 MMBtu/stroke as determined during compliance testing. Compliance is demonstrated when the result of dividing the daily number of strokes by 24 hours is less than or equal to 51 strokes.
		B.1.	Excess emissions resulting from startup, shutdown, or malfunctions, using the Dryer Line and furnace bypass stacks shall be permitted provided that best operational practices to minimize emissions are adhered to and the duration of excess emissions shall be minimized but in no case exceed 2 hours in any 24-hour period, nor exceed 50 hours per 12-month rolling total for each Dryer Line.	N	Number of hours of operation where dryer and furnace bypass stacks are utilized, and for the furnace, whether the bypass stack is being used during malfunction or idle mode operation.	Dryer Bypass Stack: 50 hours Furnace Bypass Stack (malfunction): 50 hours Furnace Bypass Stack (idle mode): 1,500 hours	Dryer Bypass Stack: 12-month rolling total exceeds 40 hours Furnace Bypass Stack (malfunction): 12-month rolling total exceeds 40 hours Furnace Bypass Stack (idle mode): 12-month rolling total exceeds 1,400 hours	Operations Manager notified that permit limits are being approached for operation of the bypass stacks.	Compliance is demonstrated when the dryer bypass stack are used 50 hours or less on a 12-month rolling total basis, and the furnace bypass stack are used no more than 50 hours at full capacity, or no more than 1,500 hours in idle mode.
		B.1. B.21.	Records of the date, time, hours, total running hours, hydraulic ram feed strokes per hour on a daily average basis for each combustor, hourly WESP gas stream inlet and outlet quench temperatures, and hourly RTO combustion chamber temperatures as a three hour average shall be kept.	Y	Hourly temperature of RTO chamber (3-hr avg.), flow rate through the RTO chamber (fan speed), back pressure, and residence time. WESP Secondary voltage, secondary current, and quench inlet and outlet temperature.	Temperature: Minimum of 1,440°F (when operating) (3-hour average); Fan Speed: ≤99% with corresponding back pressure of less than 10 inches of water (1-hour average). Secondary Voltage: minimum of 30 kV (1-hr avg.) Secondary Current: minimum of 250 mA (1-hr avg.) Quench Inlet Temperature: Maximum of 210°F (3-hr avg.) Quench Outlet Temperature: Maximum of 210°F (3-hr avg.)	Temperature: Minimum of 1,475°F (when operating) (3-hour average); Fan Speed: ≤95% with corresponding back pressure of less than 8 inches of water (1-hour average). Secondary Voltage: minimum of 40 kV (1-hr avg.) Secondary Current: minimum of 325 mA (1-hr avg.) Quench Inlet Temperature: Maximum of 200°F (3-hr avg.) Quench Outlet Temperature: Maximum of 200°F (3-hr avg.)	Operations Manager notified that RTO operating parameters are approaching design limits for proper operation. Should consider checking the quench water flow, RTO fan speed, propane supply, dryer recirculation rate and the thermocouple used to measure quench water temperature, WESP operating parameters are approaching design limits for proper operation. Should consider increased unit flushing, cleaning, and inspection of the flow line.	The RTO is designed for 1.39 second residence time at 100% fan speed. At stated fan speeds, back pressures in excess of those presented can indicate plugging of RTO chambers and require investigation. Compliance is demonstrated when the temperature of the RTO chamber is greater than 1,440°F, the fan speed and corresponding back pressures are within the specified parameters, which indicate the minimum residence time is met. Compliance demonstrated when indicated parameters are within the specified ranges.
009	Dryer Line No. 3	B.4. B.5.	The maximum operation capacity for each Dryer Line combustor shall not exceed 125 MMBtu/hr heat input averaged over a 24-hour period.	N	Number of strokes of hydraulic ram feeder to combustor.	51 strokes/hr on a daily average basis.	51 strokes on an hourly basis.	Operations Manager notified that continued operation at or above this rate may exceed allowable heat input limit of 125 MMBtu calculated on a daily average basis.	Based on 4,600 Btu per pound of wood and 2.43 MMBtu/stroke as determined during compliance testing. Compliance is demonstrated when the result of dividing the daily number of strokes by 24 hours is less than or equal to 51 strokes.

**TABLE 1  
COMPLIANCE MONITORING PLAN SUMMARY  
GREEN CIRCLE BIO ENERGY, INC., COTTONDALE WOOD PELLET PLANT**

Emission Unit No.	Emission Unit Name	Permit 0630058-011-AC Condition Nos.	Permit Condition	CAM Applicable? (Y/N)	Monitored Parameter	Compliance Value	Action Value	Action Response	Comment
		B.7. B.8. B.21.	Records of the date, time, hours, total running hours, hydraulic ram feed strokes per hour on a daily average basis for each combustor, hourly WESP gas stream inlet and outlet quench temperatures, and hourly RTO combustion chamber temperatures as a three hour average shall be kept.	Y	Hourly temperature of RTO chamber (3-hr avg.), flow rate through the RTO chamber (fan speed), back pressure, and residence time. WESP Secondary voltage, secondary current, and quench inlet and outlet temperature.	Temperature: Minimum of 1,440°F (when operating) (3-hour average); Fan Speed: ≤99% with corresponding back pressure of less than 10 inches of water (1-hour average). Secondary Voltage: minimum of 30 kV (1-hr avg.) Secondary Current: minimum of 250 mA (1-hr avg.) Quench Inlet Temperature: Maximum of 210°F (3-hr avg.) Quench Outlet Temperature: Maximum of 210°F (3-hr avg.)	Temperature: Minimum of 1,475°F (when operating) (3-hour average); Fan Speed: ≤95% with corresponding back pressure of less than 8 inches of water (1-hour average). Secondary Voltage: minimum of 40 kV (1-hr avg.) Secondary Current: minimum of 325 mA (1-hr avg.) Quench Inlet Temperature: Maximum of 200°F (3-hr avg.) Quench Outlet Temperature: Maximum of 200°F (3-hr avg.)	Operations Manager notified that RTO operating parameters are approaching design limits for proper operation. Should consider checking the quench water flow, RTO fan speed, propane supply, dryer recirculation rate and the thermocouple used to measure quench water temperature, WESP operating parameters are approaching design limits for proper operation. Should consider increased unit flushing, cleaning, and inspection of the flow line.	The RTO is designed for 1.39 second residence time at 100% fan speed. At stated fan speeds, back pressures in excess of those presented can indicate plugging of RTO chambers and require investigation. Compliance is demonstrated when the temperature of the RTO chamber is greater than 1,440°F, the fan speed and corresponding back pressures are within the specified parameters, which indicate the minimum residence time is met. Compliance demonstrated when indicated parameters are within the specified ranges.
		B.14. B.15.	Excess emissions resulting from startup, shutdown, or malfunctions, using the Dryer Line and furnace bypass stacks shall be permitted provided that best operational practices to minimize emissions are adhered to and the duration of excess emissions shall be minimized but in no case exceed 2 hours in any 24-hour period, nor exceed 50 hours per 12-month rolling total for each Dryer Line.	N	Number of hours of operation where dryer and furnace bypass stacks are utilized, and for the furnace, whether the bypass stack is being used during malfunction or idle mode operation.	Dryer Bypass Stack: 50 hours Furnace Bypass Stack (malfunction): 50 hours Furnace Bypass Stack (idle mode): 1,500 hours	Dryer Bypass Stack: 12-month rolling total exceeds 40 hours Furnace Bypass Stack (malfunction): 12-month rolling total exceeds 40 hours Furnace Bypass Stack (idle mode): 12-month rolling total exceeds 1,400 hours	Operations Manager notified that permit limits are being approached for operation of the bypass stacks.	Compliance is demonstrated when the dryer bypass stack are used 50 hours or less on a 12-month rolling total basis, and the furnace bypass stack are used no more than 50 hours at full capacity, or no more than 1,500 hours in idle mode.
007	Bulk Load-Out Area	D.2.	The permitted maximum allowable facility production rate is 827,000 tons of pellets per year. The permitted maximum allowable hourly rate for testing purposes is 121 tons of pellets per hour averaged over the testing period.	N	Weight of each load-out storage bin discharge, and record cumulative amount each day.	Total pellet production for all three pellet lines of 121 TPH on a 24-hour average basis calculated daily and 827,000 TPY on a 12 month rolling average.	Total daily pellet production rate for all three pellet lines of 121 TPH and 12 month rolling average of 827,000 TPY.	Operations Manager notified that continued operation at this rate will exceed the permitted daily production limit of 121 TPH on a 24-hour average basis calculated daily.	Compliance is demonstrated when the result of dividing the daily amount of pellets loaded by 24 hours is 121 tons or less.

NA = not applicable.

<b>Table 2: Wet Electrostatic Precipitator</b>				
	<b>Indicator No. 1</b>	<b>Indicator No. 2</b>	<b>Indicator No. 3</b>	<b>Indicator No. 4</b>
<b>Indicator</b>	Secondary Voltage.	Secondary Current.	Quench Air Inlet Temperature.	Quench Air Outlet Temperature.
<b>Measurement Approach</b>	Continuous measurement of secondary voltage.	Continuous measurement of secondary current.	Continuous measurement of the quench air inlet temperature.	Continuous measurement of the quench air outlet temperature.
<b>Indicator Range</b>	An excursion is defined as an average measured secondary voltage for the three chambers of less than 30 kilovolts (1-hr avg.). Excursions trigger an inspection, corrective action, and a reporting requirement.	An excursion is defined as an average measured secondary current of less than 250 milliamps (1-hr avg.). Excursions trigger an inspection, corrective action, and a reporting requirement.	An excursion is defined as a measured air temperature greater than 210 deg. F (3-hr avg.). Excursions trigger an inspection, corrective action, and a reporting requirement.	An excursion is defined as a measured air temperature greater than 210 deg. F (3-hr avg.). Excursions trigger an inspection, corrective action, and a reporting requirement.
<b>Data Representativeness</b>	The secondary voltage is measured using a volt meter.	The secondary current is measured using an amp meter	The inlet quench air temperature is measured with a thermocouple.	The outlet quench air temperature is measured with a thermocouple.
<b>Verification of Operational Status</b>	NA	NA	NA	NA
<b>QA/QC Practices and Criteria</b>	Confirm the volt meter reads zero when the unit is not operating. Calibrate unit annually.	Confirm the amp meter reads zero when the unit is not operating. Calibrate unit annually.	Calibrate the thermocouple unit annually.	Calibrate the thermocouple unit annually.
<b>Monitoring Frequency</b>	The voltage will be measured every 5 seconds.	The current will be measured every 5 seconds.	The temperature will be measured every 5 seconds.	The temperature will be measured every 5 seconds.
<b>Data Collection Procedures</b>	Hourly averages are computed for each chamber from readings every hour and then averaged together.	Hourly averages are computed for each chamber from readings every hour and then averaged together.	Hourly averages are computed from readings every hour.	Hourly averages are computed from readings every hour.
<b>Averaging Period</b>	1-hour block average.	1-hour block average.	3-hour block average.	3-hour block average.