TECHNICAL EVALUATION
&
PRELIMINARY DETERMINATION

APPLICANT

Green Circle Bio Energy, Inc.
2500 Green Circle Parkway
Cottondale, Florida 32431

Cottondale Wood Pellet Plant
Facility ID No. 0630058

PROJECT

Project No. 0630058-014-AC
Application for Title V Source Air Construction Permit
To Modify 0630058-011-AC

COUNTY

Jackson, Florida

PERMITTING AUTHORITY

Florida Department of Environmental Protection
Air Resource Section
Northwest District Office
160 W. Government Street, Suite 308
Pensacola, Florida 32502-5740

August 6, 2013

1. GENERAL PROJECT INFORMATION

Air Pollution Regulations

Projects at stationary sources with the potential to emit air pollution are subject to the applicable environmental laws specified in Section 403 of the Florida Statutes (F.S.). The statutes authorize the Department of Environmental Protection (Department) to establish regulations regarding air quality as part of the Florida Administrative Code (F.A.C.), which includes the following applicable chapters: 62-4 (Permits); 62-204 (Air Pollution Control – General Provisions); 62-210 (Stationary Sources – General Requirements); 62-212 (Stationary Sources – Preconstruction Review); 62-213 (Operation Permits for Major Sources of Air Pollution); 62-296 (Stationary Sources - Emission Standards); and 62-297 (Stationary Sources – Emissions Monitoring). Specifically, air construction permits are required pursuant to Rules 62-4, 62-210 and 62-212, F.A.C.

In addition, the U. S. Environmental Protection Agency (EPA) establishes air quality regulations in Title 40 of the Code of Federal Regulations (CFR). Part 60 specifies New Source Performance Standards (NSPS) for numerous industrial categories. Part 61 specifies National Emission Standards for Hazardous Air Pollutants (NESHAP) based on specific pollutants. Part 63 specifies NESHAP based on the Maximum Achievable Control Technology (MACT) for numerous industrial categories. The Department adopts these federal regulations on a quarterly basis in Rule 62-204.800, F.A.C.

Glossary of Common Terms

Because of the technical nature of the project, the permit contains numerous acronyms and abbreviations, which are defined in Appendix A of this permit.

Facility Description and Location

Green Circle Bio Energy, Inc. is an existing facility which processes wood chips into wood fuel pellets. It is categorized under Standard Industrial Classification Code No. 2499, Wood Products, Not Elsewhere Classified. The Cottondale Wood Pellet Facility is located in Jackson County at 2500 Green Circle Parkway in Cottondale, Florida. The UTM coordinates of the existing facility are Zone 16, 653.89 km East, and 3401.68 km North. This site is in an area that is in attainment (or designated as unclassifiable) for all air pollutants subject to state and federal Ambient Air Quality Standards (AAQS).

Facility Regulatory Categories

- The facility is a major source of hazardous air pollutants (HAP).
- The facility has no units subject to the acid rain provisions of the Clean Air Act.
- The facility is a Title V major source of air pollution in accordance with Chapter 213, F.A.C.
- The facility is a major stationary source in accordance with Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality.

Project Description

This project modifies permit 0630058-011-AC to address VOC and PM emissions identified during recent stack testing of hammer mills and pellet mills. The project will control VOC and PM emissions from the hammer mill and pellet mill aspiration systems by routing these emissions to the Dryer Line Furnaces (90% VOC destruction efficiency) and then to the WESPs (97% PM removal efficiency) and finally to the RTOs (95% VOC destruction efficiency.) The woodyard operations remain unchanged. Dryer 3 remains in the permit and will be constructed if supplemental dry wood chips are insufficient to attain the desired hourly and annual pellet production rates. The additional 10 horizontal hammer mills authorized by permit 0630058-011-AC will not be installed. One of three new proposed pellet mills authorized by permit 0630058-011-AC has been installed. The other two pellet mills are to be installed later.

Processing Schedule

June 27, 2013 Received the application for a Title V source air pollution construction permit.

July 3, 2013 Requested additional information.

July 23, 2013 Received additional information; application complete.

2. PSD APPLICABILITY

General PSD Applicability

For areas currently in attainment with the state and federal AAQS or areas otherwise designated as unclassifiable, the Department regulates major stationary sources of air pollution in accordance with Florida's PSD preconstruction review program as defined in Rule 62-212.400, F.A.C. Under preconstruction review, the Department first must determine if a project is subject to the PSD requirements ("PSD applicability review") and, if so, must conduct a PSD preconstruction review. A PSD applicability review is required for projects at new and existing major stationary sources. In addition, proposed projects at existing minor sources are subject to a PSD applicability review to determine whether potential emissions *from the proposed project itself* will exceed the PSD major stationary source thresholds. A facility is considered a major stationary source with respect to PSD if it emits or has the potential to emit:

- 250 tons per year or more of any regulated air pollutant; or
- 100 tons per year or more of any regulated air pollutant and the facility belongs to one of the following 28 PSD-major facility categories: fossil fuel-fired steam electric plants of more than 250 million British thermal units per hour heat input, coal cleaning plants (with thermal dryers), Kraft pulp mills, portland cement plants, primary zinc smelters, iron and steel mill plants, primary aluminum ore reduction plants, primary copper smelters, municipal incinerators capable of charging more than 250 tons of refuse per day, hydrofluoric, sulfuric, and nitric acid plants, petroleum refineries, lime plants, phosphate rock processing plants, coke oven batteries, sulfur recovery plants, carbon black plants (furnace process), primary lead smelters, fuel conversion plants, sintering plants, secondary metal production plants, chemical process plants, fossil fuel boilers (or combinations thereof) totaling more than 250 million British thermal units per hour heat input, petroleum storage and transfer units with a total storage capacity exceeding 300,000 barrels, taconite ore processing plants, glass fiber processing plants and charcoal production plants.

Once it is determined that a project is subject to PSD preconstruction review, the project emissions are compared to the "significant emission rates" defined in Rule 62-210.200, F.A.C. for the following pollutants: carbon monoxide (CO); nitrogen oxides (NO_X); sulfur dioxide (SO_2); particulate matter (PM); particulate matter with a mean particle diameter of 10 microns or less (PM_{10}); volatile organic compounds (VOC); lead (Pb); fluorides (Fl); sulfuric acid mist (SAM); hydrogen sulfide (H_2S); total reduced sulfur (TRS), including H_2S; reduced sulfur compounds, including H_2S; municipal waste combustor organics measured as total tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans; municipal waste combustor metals measured as particulate matter; municipal waste combustor acid gases measured as SO_2 and hydrogen chloride (HCl); municipal solid waste landfills emissions measured as non-methane organic compounds (NMOC); and mercury (Hg). In addition, significant emissions rate also means any emissions rate or any net emissions increase associated with a major stationary source or major modification which would construct within 10 kilometers of a Class I area and have an impact on such area equal to or greater than 1 $\mu g/m^3$, 24-hour average.

If the potential emission exceeds the defined significant emissions rate of a PSD pollutant, the project is considered "significant" for the pollutant and the applicant must employ the Best Available Control Technology (BACT) to minimize the emissions and evaluate the air quality impacts. Although a facility or project may be *major* with respect to PSD for only one regulated pollutant, it may be required to install BACT controls for several "significant" regulated pollutants.

PSD Applicability for Project

As provided in the application, the following table summarizes potential emissions and PSD applicability for the project.

Table A. Potential Emissions (Tons/Year) and PSD Applicability

Pollutant (TPY)	Pre-Project Potential Emissions*	Contempo-raneous Emissions	Post Project Potential Emissions	Total Emissions Change	Significant Emissions Rate	Subject to PSD
CO	22.20	N.A.	33.30	11.10	100	N.A.
NO_X**	245.30	N.A.	367.95	122.65	40	N.A.
PM/PM_{10}	222.37	N.A.	228.51	5.14	25/15	N.A.
SO_2	0.34	N.A.	0.51	0.17	40	N.A.
VOC	1369.71	N.A.	439.72	(929.99)	40	NO

* emissions from permit 0630058-010-AC. PM and VOC emissions adjusted based on 2012 engineering-level VOC and PM stack testing for hammer mill and pellet mill aspiration systems, and pellet mill 2 pellet cooler cyclone exhaust.

**NO_X emissions increase with addition of Dryer Line 3.

Refer to project 0630058-011-AC for background information. The facility is not being considered an existing major stationary source with respect for PSD because based on the knowledge at the time the existing potential emissions did not exceed the 250 tons per year threshold for this type of facility. The recent VOC and PM stack testing for hammer mill and pellet mill aspiration systems, and pellet mill 2 pellet cooler cyclone exhaust revealed very large amounts of VOC were being emitted from these emissions points. This is consistent with the knowledge recently gained by our sister agency, Georgia Department of Natural Resources Environmental Protection Division, where a similar facility also tested at these process steps. The testing showed that Green Circle was actually a major stationary source with respect for PSD from its initial construction due to revised estimated emissions of over 757 TPY of VOC because of the uncontrolled emissions from the hammer mills and pellet mills . The Department is willing to approve this project because: (1) the original and subsequent applications were submitted in good faith based on emissions factors widely accepted at the time, (2) the applicant took the initiative to test upon learning of the Georgia facility's test results, and, (3) the control systems proposed in this revision; incineration by furnace followed by WESP and RTO, are considered BACT for the VOC and PM that will be collected from the hammer mill and pellet mill aspiration systems.

As in project 0630058-011-AC, source Obligation Rule 62-212.400(12)(b), FAC, is not deemed applicable in this case because, although a number of emissions units' emissions and operational limits are being increased, the resulting emissions increases can also be ascribed to increasing the facility annual production rate and not solely by relaxing any emissions and operational limits.

The emissions increases from this project do not trigger a PSD preconstruction review because the potential emissions increases from the proposed project as revised are less than the PSD major stationary source threshold for this type of facility. After this project is completed, Green Circle will be categorized as a major stationary source for NO_X and VOC with respect to PSD.

3. APPLICATION REVIEW

Application Fee

Title V Facility - no permit processing fee.

Discussion of Emissions

2010 Testing

VOC stack testing was conducted on January 25-29, 2010 on Pelletizing Lines 1, 2, and 3 (EU's 004, 005, and 006). Results were 42.8 lb/hr or 177.10 tons per year for all three pelletizers total.

VOC stack testing was conducted on January 26-27, 2010 on Dryer Lines 1 and 2, (EU's 002 and 003). Results were 1.8 lb/hr or 7.9 tons per year for Dryer Line 1 and 2.6 lb/hr or 11.4 tons per year for Dryer Line 2.

With the wood pellet production rate of 66.4 tons per hour (permit limit is 77 tons per hour, 554,304 tpy), a VOC emission factor of 0.639 pounds of VOC per ton of pellets produced.

2013 Testing

VOC stack testing was conducted on April 23-25, 2013 on the hammer mill line 2 and lines 3-10 aspiration systems with and without shavings. Results were 56.5 lb/hr with shavings and 47.4 lb/hr without shavings for line 2, and 17.0 lb/hr with shavings and 16.0 lb/hr without shavings for lines 3-10.

VOC stack testing was conducted on April 23-25, 2013 on the pellet mill line 2 aspiration system with and without shavings. Results were 13.9 lb/hr with shavings and 14.6 lb/hr without shavings.

VOC stack testing was conducted on April 23-25, 2013 on the pellet mill line 2 cooler stack with and without shavings. Results were 17.7 lb/hr with shavings and 20.6 lb/hr without shavings.

Testing established a VOC emissions factor of 0.87 pounds per ton of pellets produced from the pellet cooler with a pellet production permit limit of 121 tons per hour and 827,000 tpy.

The substantial increase in VOC emissions initiated the modification of permit 0630058-011-AC to route all gases from the hammer mill and pellet mill aspiration systems to the Dryer Furnaces.

From permit application 0630058-014-AC, uncontrolled gas flow rates, VOC, and PM emissions from the pellet mill and hammer mill aspiration systems are as follows:

Aspiration System Process Description	**Gas Flow (dry standard cubic feet per minute)**	**VOC (pounds per hour)**	**PM (pounds per hour)**
Pellet Mill Line 1	6,600	20.5	0.70
Pellet Mill Line 2	6,600	20.5	0.70
Pellet Mill Line 3	6,600	20.5	0.70
Hammer Mill Line 1	2,200	74.6	0.28
Hammer Mill Line 2	2,200	74.6	0.28
Hammer Mill Line 3	9,500	96.1	1.11
TOTAL	33,700	306.8	3.77

VOC: (306.8 pounds per hour) X (8760 hours per year) X (1 ton per 2000 pounds) = 1344 tons per year

PM: (3.77 pounds per hour) X (8760 hours per year) X (1 ton per 2000 pounds) = 16.5 tons per year

The Teaford direct fired 125 MMBtu/hr biomass furnaces have 25,000 dscfm for the under grate air fan and 34,000 dscfm for the over fire air fan. The Permittee proposes to vent 33,700 DSCFM from the hammer mill aspiration systems and the pellet mill aspiration systems to either or both of the Dryer Furnaces to replace some of the combustion air currently drawn from ambient.

The following table shows an emissions history from all the permits, including updated uncontrolled VOC and PM emissions from the hammer mill and pellet mill aspiration systems and the pellet cooler cyclones exhaust.

History of Facility-Wide Potential Emissions						
Permit Number	**Issued/Effective Date**	**PM/PM_{10}* (tons per year)**	**NO_X (tons per year)**	**CO (tons per year)**	**VOC* (tons per year)**	**SO_2 (tons per year)**
0630058-001-AC	July 13, 2007	216.98	247.96	25.61	757.52	0.32
0630058-002-AC	September 29, 2008	217.65	247.96	25.61	1044.81	0.32
0630058-003-AC	July 13, 2009	218.45	245.30	22.20	1195.90	0.34
0630058-004-AC	June 14, 2010	220.66	245.30	22.20	1259.00	0.34
0630058-005-AC	March 16, 2011	220.66	245.30	22.20	1259.00	0.34
0630058-006-AC	January 4, 2011	220.66	245.30	22.20	1259.00	0.34
0630058-008-AC	April 12, 2011	221.34	245.30	22.20	1278.86	0.34
0630058-009-AC	July 14, 2011	221.34	245.30	22.20	1278.86	0.34
0630058-010-AC	March 23, 2012	222.37	245.30	22.20	1369.71	0.34
0630058-011-AC	April 18, 2012	244.53	367.95	33.30	1776.08	0.51
0630058-012-AV	May 16, 2012	246.97	245.30	22.20	1369.71	0.34
0630058-013-AV	July 8, 2013	246.97	245.30	22.20	1369.71	0.34
0630058-014-AC	IN PROCESS	228.51	367.95	33.30	1777.08	0.51

*VOC and PM emissions estimates include uncontrolled emissions based on stack testing done in 2012 after issuance of permit 0630058-011-AC.

Hammer mill and pellet mill aspiration system emissions of VOC and PM are routed to the Dryer Line Furnaces. The Dryer Line Furnaces remove 90% of VOC emissions. Dryer Line Furnace exhaust gas is run through the Dryer, with 50% of the gas recirculating through the Dryer Line. The remainder of the gas is routed to the WESP, which removes 97% of PM emissions and then to the RTO, which has a 95% VOC removal efficiency.

State Requirements

Rules 62-4.070(3), 62-210.200(PTE) and 62-297.310(2), F.A.C.

Federal NSPS Provisions

40 CFR 60 Subpart Db for the Dryer Line Furnaces

Federal NESHAP Provisions

N.A.

Other Draft Permit Requirements

N.A.

4. PRELIMINARY DETERMINATION

The Department makes a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations as conditioned by the draft permit. This determination is based on a technical review of the complete application, reasonable assurances provided by the applicant, and the conditions specified in the draft permit. Rick Prusa is the project engineer responsible for reviewing the application and drafting the permit. Additional details of this analysis may be obtained by contacting the project engineer at 850.595.0634 or rick.prusa@dep.state.fl.us.