Facility Name: **SEGA Biofuels, LLC**
City: Nahunta
County: Brantley
AIRS #: 04-13-02500005

Application #: TV-22518
Date Application Received: April 1, 2014
Date Application Deemed Administratively Complete:
Date of Draft Permit:
Permit No: 2499-025-0005-V-04-0

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Toxics	N/A	N/A
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Introduction

This narrative is being provided to assist the reader in understanding the content of the attached draft Part 70 operating permit. Complex issues and unusual items are explained in simpler terms and/or greater detail than is sometimes possible in the actual permit. This permit is being issued pursuant to: (1) Georgia Air Quality Act, O.C.G.A § 12-9-1, et seq. and (2) Georgia Rules for Air Quality Control, Chapter 391-3-1, and (3) Title V of the Clean Air Act Amendments of 1990. Section 391-3-1-.03(10) of the Georgia Rules for Air Quality Control incorporates requirements of Part 70 of Chapter I of Title 40 of the Code of Federal Regulations promulgated pursuant to the Federal Clean Air Act. The primary purpose of this permit is to consolidate and identify existing state and federal air requirements applicable to SEGA Biofuels, LLC and to provide practical methods for determining compliance with these requirements. The following narrative is designed to accompany the draft permit and is presented in the same general order as the permit. It initially describes the facility receiving the permit, the applicable requirements and their significance, and the methods for determining compliance with those applicable requirements. This narrative is intended as an adjunct for the reviewer and to provide information only. It has no legal standing. Any revisions made to the permit in response to comments received during the public participation and EPA review process will be described in an addendum to this narrative.

I. Facility Description

The Facility Description may be presented in outline or narrative form. It must contain the information contained in each of the following subsections, preferably in a similar order.

A. Facility Identification

1. Facility Name: SEGA Biofuels, LLC (SEGA)

2. Parent/Holding Company Name

SEGA Biofuels, LLC (SEGA)

3. Previous and/or Other Name(s)

Nahunta Facility

4. Facility Location

15333 U.S. Highway 82 East, Nahunta (Brantley County)

5. Attainment or Non-attainment Area Location

Attainment area.

B. Site Determination

There are no other facilities which could possibly be contiguous or adjacent and under common control.

C. Existing Permits

Table 1: List of Current Permits as Amended

Permit Number and/or Purpose of Issuance	Date of Issuance and Date of Amendments (if any)	Comments	
		Yes	No
2411-025-0005-E-03-0	January 9, 2012	X	
2411-025-0005-E-03-1	February 17, 2014	X	
2411-025-0005-E-03-2	October 17, 2014	X	

Table 2: Comments on Specific Permits

Permit Number	Comments
2411-025-0005-E-03-0	Construction and operation of a wood pellet manufacturing facility.
2411-025-0005-E-03-1	Replacement of Multiclone (MC01) receiving exhaust from the Heat Source (HS01)/Wood Dryer (WD01) with two cyclones that operate in parallel (CY02 and CY03) and for incorporating the existing Dry Hammermill Cyclone (CY04) and the Refining Hog Cyclone (CY05).

Permit Number	Comments
2411-025-0005-E-03-2	Modification of the Existing Wood Dryer (WD01); Installation of: A New Wood Dryer (WD02), including Cyclones (CY06 and CY07); Two (2) New Wood Burners (HS01 and HS02); Two (2) New Pellet Mills (PS01); Material Handling Equipment including Hammermill (HM02); New Refining Hog Baghouses (BH03 and BH04); New Exhaust from the Dryers, Pellet Mills, and Pellet Cooler, and Rerouting to the Dryer Burners for Incineration. Also: Repurposing of the Fines Return Cyclone.

D. Process Description

1. SIC Codes(s)

2499, *Wood Products-Not Elsewhere Classified*

2. Description of Product(s)

SEGO owns and Enova operates a wood pellet manufacturing facility in Nahunta, Brantley County, Georgia. The Nahunta facility processes wood pellets to produce a source of alternative renewable fuel.

3. Overall Facility Process Description

Current Application Nos. TV-22518, TV-22643, and SIP Application 22986

SEGA Biofuels, LLC (SEGA) owns and E-Pellets, LLC (E-Pellets) operates the wood pellet manufacturing facility in Nahunta, Brantley County, Georgia, (Nahunta facility). The operations are categorized under Standard Industrial Classification (SIC) code 2499, Wood Products – Not Elsewhere Classified. The Nahunta facility processes wood chips into fuel pellets to produce a source of alternative renewable fuel.

The facility operates under Air Quality Permit No. 2411-025-0005-E-03-0, effective January 9, 2012, Air Permit Amendment No 2411-025-0005-E-03-1, effective February 17, 2014, and Air Permit Amendment No 2411-025-0005-E-03-2, effective October 17, 2014. The Nahunta facility is presently considered a major source with respect to the Title V permitting program, as potential criteria pollutant emissions of at least one pollutant exceed the major source threshold of 100 tons per year (tpy) for criteria pollutants. The facility is a minor source with respect to emissions of hazardous air pollutants (HAPs), as potential emissions of individual HAP, and total HAPs are below the major source thresholds of 10 tpy and 25 tpy, respectively.

The facility's initial Title V Operating Permit Application No. 22518 was submitted in March 2014. Permit Application No. 22643 was received on June 6, 2014 to expand the existing facility, including adding a second Dryer, and Wood-fired Burner; replacing the Wood-fired Burner on the existing Dryer; adding two (2) new Pellet Mills; adding new Material Handling Equipment; and routing exhaust from the Dryers, Pellet Mills, and Pellet Cooler to the Dryer Burners for incineration. Since the facility's Title V permit has not yet been issued, this application will be processed as a SIP Permit Amendment. In June 2014, the facility also updated the Title V Permit Application, to incorporate the

expansion project. On December 2, 2014, the Division received Application No. 22986 to revise the Fines Return Cyclone (CY05) design.

The facility operations currently include separate Green and Dry Wood Receiving Areas and Storage Piles, a Green Hammermill, a Dry Hammermill, a Wood Chips Dryer with associated Dry Wood-fired Burner, a Refining Hog, four (4) Pellet Mills, a Pellet Cooler, Pellet Silos, and Pellet Loadout. The Dryer currently has a production capacity of 14 oven dried tons per hour (ODT/hr). Each of the Pellet Mills, which receive both Dried Wood from the Dryer, and Dry Wood Chips trucked to the facility from outside sources, has a production capacity of 5 ODT/hr. Thus, the facility currently has a pellet production capacity of 20 ODT/hr, or 175, 200 ODT/yr based on maximum operation of 8,760 hours per year (hr/yr). After the proposed changes the production capacity will be 20.67 ODT/hr, or 181,055 ODT/yr based on maximum operation of 8,760 hours per year (hr/yr).

The facility operation is as follows:

Wood Receiving and Processing

Green and dry wood chips, and green sawdust (southern yellow pine) are trucked to the facility on paved roadways to the Wood Receiving Area, which is located on a concrete pad. There are separate receiving areas for green and dry wood. After being weighed, the trucks are unloaded via the Truck Dump System into Green Wood or Dry Wood Live Bottom Feed Bins. The Live Bottom Feed Bins deposit the wood chips into the Green Feed or Dry Feed Screw Conveyors, that transfer materials to the Feedstock Conveyance System. Wood Chips, and Sawdust are gravity fed into the outdoor on-site Wood Storage Pile. There are separate Receiving Areas, Feed Bins, Screw Conveyors, and Storage Piles for green and dry wood chips. The moisture content of the green wood chips and sawdust received is approximately 45-50%.

In the Green Wood Handling Area, material is transferred to the Green Raw Material Hammermill and then fed to a Metering Bin. The Hammermill enhances the in-feed quality of the wood chips prior to the drying process. Emissons from the Green Hammermill are currently uncontrolled. In the Dry Wood Handling Area, dry wood chips are fed directly from the Dry Wood Storage Pile to the Dry Hammermill. The materials then bypass the drying process, and are fed directly into the Pellet Mills. Particulate matter (PM) emissions from the Dry Raw Material Hammermill are currently controlled by a Cyclone (CY04).

The “oversized material” separated in the Screening System is transferred to the Wood Grinder (aka “Wood Hog”), which assures that material to be dried is less than ½” in size. The Hog Discharge Screw then transports the unprocessed wood chips and sawdust into the Hogged Material Surge Bin.

Fugitive Material Handling Emissions

Fugitive particulate emissions arise from fuel and material receiving, handling, processing, and storage sources, including Truck Dumps, Feed and Storage Bins, and the Bark Hog.

With the exception of the Bark Hog, the emission rates of these drop points were estimated based on the drop point equation in AP-42, Section 13.2.4, *Aggregate Handling and Storage Piles* (September 2006). Fugitive emissions from the Bark Hog, and the two Green Material Hammermills were calculated using the PM emission factor for "log debarking" from AP-42, Section 10.3-1, *Wood Products Industry*, Table 10.3-1 (September 1985). PM_{10} emissions are assumed to be equal to 60% of PM, based on the Bay Area Air Quality Management District (BAAQMD) Permit Handbook. $PM_{2.5}$ emissions conservatively are assumed to be equal to the PM_{10} emissions.

Dry Raw Material Hammermill Emissions

Emissions from existing Dry Hammermill is controlled by a Cyclone (CY04). PM emissions were calculated using the PM emission factor for "log debarking" from Table 10.3-1 of AP-42. PM_{10} emissions are assumed to be equal to 60% of PM, based on the Bay Area Air Quality Management District (BAAQMD) Permit Handbook. $PM_{2.5}$ emissions conservatively are assumed to be equal to the PM_{10} emissions.

The potential controlled emissions were calculated by applying a control efficiency for the Cyclone to the uncontrolled emissions. The cyclone control efficiencies were based on AP-42, Appendix B.2, Table B.2-3 for a single cyclone (September 1990). Since the emissions conservatively assume that PM $_{2.5}$ emissions are equal to PM_{10}, the cyclone control efficiencies for $PM_{2.5}$ were the same as for PM_{10}. Since it was assumed that 40% of the particles emitted are greater than 10 microns in diameter, the following equation was used to calculate the PM control efficiency.

PM control efficiency (%)
= 0.6 x [$PM_{2.5}$ control efficiency (%)]
+ 0.4 X [PM control efficiency for particles > 10 microns in diameter (%)]

The PM control efficiency for particles greater than 10 microns in diameter was conservatively set equal to the AP-42 data for PM_{10} control efficiency.

Fines Return Cyclones Emissions

The Fines Return Cyclone will have emissions of PM, PM_{10}, and $PM_{2.5}$. PM emissions are calculated using an exit grain loading methodology based on an exit grain loading of no more than 0.04 grains per standard cubic feet (gr./scf) for a conventional cyclone, which is a conservative estimate for this type of control device. This emissions calculation method uses the exhaust air flow rate and estimated mass concentration as opposed to control device efficiency. Potential annual PM emissions are calculated using the potential hourly emission rate and multiplying by the maximum annual operation (8,760 hr/yr). Note that for conservative emission estimates $PM_{2.5}$, and PM_{10} emissions are assumed to be equal to PM.

Wood Chips Drying

The Dryer Feed Belt Conveyor transfers the wood from the Hogged Material Surge Bin to the Triple Pass Dryer. Inside the Dryer, the wood chips and sawdust are carried along by the flow of air. While in the Dryer, the wood material is mixed with hot gases from the Heat Source. The Dryer is designed to ensure good mixing of wood chips with hot gases and sufficient retention time to achieve the target moisture content of the wood. After being dried, the wood chips and sawdust contain approximately 10% moisture. Since the drying is co-current, the temperatures of the chips and emissions at the outlet are relatively cool. The Dryer currently has a maximum production capacity of 14 ODT/hr, or 122,640 ODT/yr based on maximum annual operations of 8,760 hrs/yr.

The exhaust gases and dried wood are blown into Dryer Cyclones, which separate wood chips from the exhaust gas. The dried hot chips are fed to Conveyors for transport to the pelletizing process. The gases continue to the two Cyclones (CY02 and CY03) to remove PM.

The Direct-fired Furnace will be fired with wood chips from the Dryer Out-feed, at a maximum rate of 2.35 tph of chips. A Propane Burner is used during start-up and to maintain the Refractory at a constant temperature. Note that a separate Wood Fuel Grinder is used at the facility to grind received "dried" wood chips and sawdust for an auxiliary fuel feed source to the Furnace.

As well as PM, the exhaust gases from the Dryer and Furnace contain volatile organic compounds (VOC) and hazardous air pollutants (HAP), including formaldehyde, which is mostly generated during the wood drying process. Also in that exhaust stream is CO, NOx, and a small amount of sulfur dioxide (SO_2).

The ground chips are then fed into one of the four (4) Pelletizers. A Pelletizer includes a die that physically presses the dry wood dust into pellets. The pressing is completed by three rollers on the inside of the die that feed the ground material into the holes of the die, thus creating a high pressure. The resultant heat of friction activates the wood lignin as the wood is compressed, bonding the wood fiber into durable pellets. No steam, adhesives, or bonding agents are used in the Pelletizers. In the Pellet Mills, circulating air is in a closed loop system; it is designed to not exhaust to the atmosphere.

Pellets exiting the Pelletizer Mill are conveyed to a counter-flow Pellet Cooler. The Pellet Cooler uses outside air to rapidly cool the pellets. Pellet cooling is necessary to ensure good pellet structural stability. Hot exhaust air from the Pellet Cooler is ducted to a control system including a combined high efficiency Cyclone (CY01) for PM emissions control. The Cyclone is a Kice CK-126 with an expected exit flow rate of 16,000 ACFM. The dust controlled by this Cyclone is to be coarse with moderate loadings due to the slow mechanical handling and transport of the finished pellets. The pellets cannot be subjected to aggressive tumbling or pneumatic transport; that would tend to break the pellets which would result in dust generation.

Pellets produced are transferred via Bucket Elevator into three (3) Storage Silos. The pellets feed via gravity out of the Storage Silos onto a Conveyance, and Bucket Elevator System. After the pellets pass through the Vibrating Screen, the pellets feed by gravity into open top trucks for transfer off-site. Displaced air and exhaust from the Pellet Silos, Vibrating Screen, and Truck Loadout is controlled by a Baghouse (BH02). The Baghouse will have an estimated exit flow rate of 20,000 ACFM; the temperature of the exhaust is ambient.

Fines collected from the Baghouse (BH02), the Pellet Cooler, the Pellet Cooler Shaker Screen, and plant-wide operations are currently gathered in the Hammermill Baghouse (BH01), which are fed to the Dry Fuel Surge Bin for the Heat Source (Dryer Burner).

Wood Dryer Emissions

The total emissions from the Wood Dryers include both the drying process of wood chips, and combustion emissions from the two (2) Direct Wood-fired Burners. Emission factors are in terms of pounds of pollutant emitted per amount of wood production from the Dryers (lb/ODT) or pounds of pollutant emitted per heat input of the Heat Source (Burners) in lb/MMBtu. Emissions of production-based emission factors are calculated by multiplying the lb/ODT emission rate by the maximum production capacities of the Dryers (8.82 ODT/hr for Dryer No. 1, and 11.85 ODT/hr for Dryer No. 2). Emissions of heat input-based emission factors were calculated by multiplying the lb/MMBtu emission rate by the combined design heat input capacities of the burners (30 MMBtu/hr for Dryer Burner No. 1, and 40 MMBtu/hr for Dryer Burner No. 2). Annual emissions conservatively assume maximum operation for 8,760 hours per year for both dryers.

Emission factors for total PM, VOC, CO, NOx, and formaldehyde are based on the emissions guarantees from M-E-C Company (M-E-C), which will be manufacturing the new Dryer and modifying the existing Dryer. The total PM emission factor is the sum of the tested filterable, and condensable PM emission rates. $PM_{2.5}$ and PM_{10} emissions are assumed to be equal to PM. Emissions of VOC were determined as total gaseous organic compounds that are not considered VOC, such as methane, and ethane.

M-E-C contracted to design the new Dryer, and make the modifications to the existing Dryer. Guaranteed formaldehyde emissions from both Dryers were estimated to be 4.52 tons per year (tpy), based on maximum hourly production from both Dryers, and 8,760 hours of operation per year. Later in June 2014, the facility conducted additional formaldehyde performance testing on the existing Dryer. Based on these test results, M-E-C has revised its emission guarantee to 9.45 tpy, based on the same production assumptions. The facility is classified as an area source with regards to emissions of hazardous air pollutants (HAP) after the project, due to potential emissions of each individual HAP (including formaldehyde) to be less than 10 tpy, and the potential emissions of total HAP being below 25 tpy.

In the Initial SIP Permit Application No. 20790 for the facility, potential hourly carbon monoxide (CO) emissions for the Heat Source (Dryer Burner), and Dryer combined were estimated by SEGA Biofuels to be 54.6 lb/hr, based on emission factors from the EPA AP-

42 Section 1.6 and 10.6.2. Therefore, Air Quality Permit No. 2411-025-0005-E-03-0, includes an emission limit of 56 lb/hr of CO from the Wood Dryer/Heat Source (WD01/HS01) stack for PSD permitting avoidance. Furthermore, the SIP permit required the facility to conduct a compliance test for CO emissions from the Wood Dryer/Heat Source (WD01/HS01) and continuously monitor the temperature at the exit of the Heat Source.

The facility completed the required CO compliance test in December 2013, during which the facility continuously monitored the temperature at the exit of the Heat Source, and determined a minimum three-hour average operating temperature. The facility currently monitors the temperature continuously during operation of the Heat Source for comparison to the minimum temperature. The tested emission rate for CO during the December 2013 testing was 0.22 lb/ODT, resulting in potential hourly emission of 3.1 lb/hr from the Wood Dryer/Heat Source (WD01/HS01), or 13.5 tpy assuming continuous operations at the maximum capacity. Thus the potential annual CO emissions from the facility are significantly below the PSD major source threshold of 250 tpy.

After the completion of the expansion project, the facility has determined that the potential emissions from both Dryers (new Dryer and modified existing Dryer) will be 64.05 tpy, and therefore well below the PSD major source threshold after the installation of the second Dryer. In the current permit application, the facility requested that the CO emission limit, and continuous temperature monitoring requirement not be included in SIP permit. Also, the facility requested that no further CO performance testing be required.

See the Emission Factor Comparison between Manufacturer, Testing, and EPD Recommended Emission Factors in Table 1 below.

Table 1. Emission Factor Comparison

Equipment	Pollutant	December 2013 Testing Result	Previous Permit Limit	Emission Factor (EF) Provided by M.E.C. guarantee	EPD Default EFs[1]	Basis of EPD EF	Facility EF used
Dryer Burner No. 1 Heat Input Capacity 30 MMBtu/hr Dryer No. 1 Production Capacity 8.82 ODT/hr Annual Operation 8,760 hrs/yr Dryer Burner No. 2 Heat Input Capacity 40 MMBtu/hr Dryer No. 2 Production Capacity 11.85 ODT/hr Annual Operation 8,760 hrs/yr	CO	2.05 lb/hr or 0.099 lb/ODT	56 lbs/hr	0.71 lb/ODT	5.3 lb/ODT	AP-42 Table 10.6.2-3 SCC-3-07-006-25 (Adjusted)	M.E.C. Guarantee
	VOC	9.116 lb/hr or 0.441 lb/ODT	53 lbs/hr	2.06 lb/ODT[2]	6.0 lb/ODT	AP-42 Table 10.6.2-3 SCC-3-07-006-25 (Adjusted)	M.E.C. Guarantee
	Formaldehyde	4.320 lb/hr or 0.209 lb/ODT	10 tons/yr	1.04E-1 lb/ODT[4]	0.14 lb/ODT	AP-42 Table 10.6.2-3 SCC-3-07-006-25	M.E.C. Gurantee
	Methanol	0.569 lb/hr or 0.028 lb/ODT	10 tons/yr	5.00E-2 lb/ODT[5]	0.11 lb/ODT	AP-42 Table 10.6.2-3 SCC-3-07-006-25	GA EPD Emission Factor

1. GA EPD RECCOMMENDED EMISSION FACTORS FOR WOOD PELLLET MANUFACTURING
2. VOC is conservatively assumed to be equal to the emissions of total gaseous organics (TGO). This is a conservative approach, as TGO includes organic compounds that are not considered organic VOCs, such as methane and ethane.
3. Except for Formaldehyde, Methanol and Acetaldehyde, HAP Emission factors for wood combustion are per the AP-42, Section 1.6, Wood Residue Combustion in Boilers, Tables 1.6-3 and 1.6-4 (9/03)
4. Guaranteed dryer emissions provided by M-E-C. The guaranteed emissions already account for the control efficiency from recycling a portion of the of the dryer exhaust back to the burner system; therefore, an additional control efficiency was not applied to these emissions.
5. The acetaldehyde, and methanol emission factors are based on the emission factors from the Georgia EPD for the facility dryer in the permit narrative for SEGA Biofuels Permit No. 2411-025-0005-E-03-0, written by John Yntema of EPD on December 20, 2011. Emission factors for direct heated drying include both the emissions from drying and the emissions from wood combustion in the burner.

Greenhouse Gas (GHG) and HAP Emissions

The emission rates of GHG and HAP were estimated based on AP-42 emission factors. The emission factor for carbon dioxide (CO_2) was taken from AP-42 Section 10.6.1, *Waferboard/Oriented Strandboard Manufacturing*, Table 10.6.1-1 (March 2002) for a Rotary Dryer, Direct Wood-fired Softwood Unit (SCC 3-07-010-09). The emission factor is in terms of lb/ODT, and includes both emissions from drying, and wood combustion (Burners). Emission factors of SO_2, methane (CH_4), and nitrous oxide (N_2O) are based on the emission factors for wood combustion in AP-42 Section 1.6, *Wood Residue Combustion in Boilers*, Tables 1.6-2, 1.6-3, and 1.6-4 (September 2003). The emission factors are in terms of lb/MMBtu heat input.

Emissions of GHG in the form of CO_2e were calculated by multiplying each GHG pollutant by its respective global warming potential from 40 CFR Part 98, Subpart A, Table A-1, effective January 1, 2014. The facility has calculated CO_2e emissions without the use of the biomass deferral, which allows for the exclusion of biogenic CO_2 emissions. CO_2e emissions from the dryers, and dryer burners are below the major source threshold of 100, 000 tpy.

With the exception of formaldehyde, methanol, and acetaldehyde, HAP emission factors are based on AP-42 Section 1.6, Tables 1.6-3, and 1.6-4 for wood combustion emissions (lb/MMBtu). A control efficiency of 80% was applied to metal HAP emissions, based on a typical control efficiency of 70 to 90% for particulate emissions from conventional single cyclones. As previously discussed, the emission factor for formaldehyde is based on M-E-C's guarantee for the dryers, and burners. The acetaldehyde, and methanol emission factors are based on the emission factors from the Division for the existing facility Dryer No. 1 in the permit narrative for SEGA Biofuels Permit No. 2411-025-0005-E-03-0 dated December 20, 2011.

Refining Hogs, Pellet Cooler, and Pellet Silos Emissions

After the completion of the proposed project, the facility will operate two Refining Hogs, one (1) Pellet Cooler, and three (3) Pellet Silos. Each Refining Hog will have a new Baghouse to control PM emissions (BH03 and BH04). Emissions from the existing Pellet Cooler will continue to be controlled by the existing Pellet Cooler Cyclone (CY01). The existing Pellet Silos Baghouse (BH02) will continue to control PM emissions from the Silos, and Product Loadout activities.

PM emissions from these units were calculated using an exit grain loading rate methodology. The exit grain loading rates used for each of the three Baghouses were based on manufacturer provided data. The exit grain loading of the Cyclone was based on an exit grain loading of no more than 0.04 gr/scf for a conventional cyclone, which is a conservative estimate for this type of control device. This emissions calculation method uses the exhaust air flow rate, and estimated mass concentration as opposed to control device efficiency. Potential annual PM emissions are calculated using the potential hourly emission rate, and multiplying by the maximum annual operation (8,760 hrs/yr). Note

that for conservative emission estimates, $PM_{2.5}$, and PM_{10} emissions are assumed to be equal to PM.

Additionally, each of these units is a source of VOC emissions. The VOC emission rates for the Refining Hogs and, Pellet Cooler are based on the engineering testing of the total gaseous organics emissions from the Hammermill Baghouse (BH01), and Pellet Cooler Cyclone (CY01) stacks at the facility, conducted in December 2013. All of the steam extraction from the pellet mills, and 97.6% of the exhaust from the Pellet Cooler will be routed to the Heat Sources (Dryer Burners). It is conservatively assumed that the Dryer Burners will incinerate 90% of the VOC in the exhaust streams, and none of the PM. As such, VOC emissions from the Pellet Cooler were calculated using the following equation:

$$\begin{aligned} &Potential\ Pellet\ Cooler\ VOC\ Emissions\ (tpy) \\ &= \left\{\left[VOC\ Emission\ Factor\ \left(\frac{lb}{ODT}\right) \times Potential\ Throughput\ \left(\frac{ODT}{hr}\right)\right.\right. \\ &\left.\times\ Percentage\ of\ Exhaust\ Routed\ to\ Dryer\ Burners\ (\%) \times (100\% - 90\%)\right] \\ &+ \left[VOC\ Emission\ Factor\ \left(\frac{lb}{ODT}\right) \times Potential\ Throughput\ \left(\frac{ODT}{hr}\right)\right. \\ &\left.\left.\times\ (100\% - Percentage\ of\ Exhaust\ Routed\ to\ Dryer\ Burners\ (\%))\right]\right\} \\ &\times 8{,}760\frac{hr}{yr} \div 2{,}000\frac{lb}{ton} \end{aligned}$$

The VOC emission factor for the Pellet Silos is based on the emission factor for Pellet Storage/Handling from the document entitled, "*GA Division Recommended Emission Factors for Wood Pellet Manufacturing*," issued by the Division. The emission factors in that document are derived from testing done at the Georgia Biomass facility in Waycross, Georgia. The operations at the Georgia Biomass facility are not indicative of the operations at the facility. Operations at the facility are similar to those at the Varn Wood Products facility in Hoboken, Georgia. As such, VOC emissions testing at the Varn Wood Products facility are a better indicator of emissions that would arise from the facility than the emissions testing data from Georgia Biomass. Varn Wood Products has completed VOC performance testing for its Post-Dryer Hammermill and its Pellet Cooler, but not the Pellet Storage Silos. The VOC testing results for the Post-Dryer Hammermill at Varn Wood Products are 78.6% lower than Division's recommended emission factor for a Wood Pellet Mill Hammermill, based on Georgia Biomass testing results. As such, the facility has calculated the VOC emission factor for the Pellet Silos as the Division recommended emission factor for Pellet Storage/Handling reduced by 78.6% to account for the difference in operations between the two facilities. The storage volume of the Silos, and the duration the pellets are stored is significantly less at the facility than for the processes for which the Division recommended emission factors were developed, resulting in the lower VOC emissions from pellets storage at the facility.

Annual emissions calculations assume operation at the maximum capacity of 8,760 hrs/yr.

2499-025-0005-V-03-0

United BioMass LLC submitted Application No. 19029, dated June 9, 2009, to construct and operate a wood briquette manufacturing plant at 15333 US Hwy. 82 East, Nahunta (Brantley County). This location is in one of the attainment counties, which has Title V major source thresholds of 100 tons per year for VOC, NOx, CO, SO_2 and PM; 10 tpy for any single Hazardous Air Pollutant (HAP); and 25 tpy for total HAPs. The facility included a 35 MMBtu/hr wood-fired heat source (HS01) and a 14 oven-dried ton per hour (ODT/hr) wood dryer (WD01). Potential PM_{10} emissions were determined to exceed 100 tpy; however, the permit limited the facility's hours of operation to make it a synthetic minor source in regards to Title V.

After the facility was built and operating, the facility tested the dryer for emissions of particulate matter (PM), volatile organic compounds (VOC), carbon monoxide (CO), and formaldehyde (a toxic which is a hazardous air pollutant). The permit required this to assure that the facility was a Title V minor source.

Testing showed that the VOC emission rate from the dryer was 4.95 lb/hr. Since the production rate was 5.36 ODT/hour that is 0.9 pounds per ODT (lb/ODT). This was less that the VOC emission rate indicated in the application (1.5 lb/ODT), which had been assumed in the permit review. Using a 15% uncertainty factor, the tested rate yields an emission factor of 1.06 lb/ODT. If the actual production capacity of the equipment is 14 ODT/hour[1], the emission rate would be 14.8 lb/hr. At the allowed 8400 hours per year, that is 62.3 tons VOC per year from the dryer. Even though VOC is emitted from other processes at this facility, VOC emissions could not exceed 100 tpy.

Testing showed that the CO emission rate from the dryer was 12.91 lb/hr. Since the production rate was 5.36 ODT/hr, that is 2.41 lb/ODT. Using a 15% uncertainty factor, the emission factor would be 2.8 lb/ODT. At 14 ODT/hr, the emission rate would be 39 lb/hr CO. At 8400 hours per year, that is 165 tons CO per year, which is well above the Title V major source threshold. However, if the actual capacity of the plant is 6 ODT/hr, the annual rate would be 70 tons/yr, which is close to the rate calculated in the permit review which was 61.3 tpy.

Testing showed that the PM emission rate (including the condensable PM) from the dryer was 1.24 lb/hr. Since the production rate was 5.36 ODT/hr, which is 0.23 lb /ODT. Using a 15% uncertainty factor, the emission factor would be 0.27 lb/ODT. At 14 ODT/hr, the emission rate is 3.8 lb/hr. The allowable Rule(e) emission rate at 14 tons per hour dry input is 24 lb/hr.

[1] If the actual production capacity of the equipment is 6 ODT/hr, the emission rate would be 6.4 lb/hr. At the allowed 8400 hours per year, that is only 26.8 tons VOC per year. On the other hand, it is noted that the tested rate of 1.06 lb/ODT is significantly lower than the VOC AP-42 emission factors for OSB (6.7 lb THC per ODT and 8.1 lb VOC "as propane" per ODT. It is also noted, that a VOC test in 2008 was done on a facility in south Georgia that dries green softwood for use as animal bedding, it had emissions of 4.6 lb/ODT. Using an uncertainty factor of 15%, the VOC emission factor would be 5.3 lb/ODT. Using that factor at this site, at 8400 hours per year and 6 ODT/hr, that would be 134 tons VOC per year, over the Title V major source threshold but well under the 250 tpy PSD threshold. If 14 ODT/hr, that would be 313 tons VOC per year.

Testing showed that the formaldehyde emission rate from the dryer was 0.022 lb/ODT. Using a 15% uncertainty factor, the emission factor is 0.025 lb/ODT. At 14 ODT/hr, the emission rate would be 0.35 lb/hr. At 8400 hrs /year, the annual formaldehyde emission rate is therefore 1.47 tpy, well under 10 tpy. This indicates that total HAP emissions are also below 25 tpy. Therefore the source was established as minor for Title III.

Application No. 19866 was received on August 27, 2010 for a name and ownership change. No other changes were proposed. The new facility name was Biomass Innovations, LLC. Permit No. 2411-025-0005-S-02-0 was issued on September 24, 2010.

SEGA Biofuels, LLC submitted an air quality permit application, which was received on November 1, 2011 and assigned Application No. 20790. A public advisory expired on December 2, 2011, with no comments received. According to their application, SEGA proposed to modify the existing Nahunta facility operations to produce wood pellets. The facility previously produced wood briquettes. To facilitate the change, SEGA proposed to install wood pelletizing equipment, including four (4) pelletizers, a pellet cooler, and two (2) pellet storage silos. A new cyclone will control emissions from the new pellet cooler. The pellet storage silos, screening, and truck loadout will be controlled by a new baghouse (BH02). The facility will produce up to 156,000 tons per year (tpy) of wood pellets."

4. Overall Process Flow Diagram (optional)

A process flow diagram of the facility was included with the application.

E. Regulatory Status

1. PSD/NSR

Table 3-1 of Section 3.7 of the Permit Application, includes the facility-wide controlled criteria pollutants, GHG, and HAP emissions. Detailed potential emissions calculations are included as Appendix B of the Permit Amendment Application. The potential emissions calculations in Table 3-1 of Section 3.7 of the application, include point source emissions only, and exclude fugitive emissions. The fugitive emissions are excluded because the wood pellet production operation is not on the list of 28 categories with a lower major source threshold for criteria pollutants (100 tpy), which requires subject source categories to include fugitive emissions for permitting applicability determinations.

The facility is a Title V major source for VOC (222.19 tpy), and PM (211.86). The facility is a minor source with respect to PSD since potential emissions of all criteria pollutants are less than 250 tpy. Pelletmills are not on the list of 28 source categories where the PSD major source threshold is 100 tpy. The facility is a minor source of HAPs. The facility is a minor source of GHG emissions (55,690 tpy).

2. Title V Major Source Status by Pollutant

Table 3: Title V Major Source Status

Pollutant	Is the Pollutant Emitted?	If emitted, what is the facility's Title V status for the pollutant?		
		Major Source Status	Major Source Requesting SM Status	Non-Major Source Status
PM	✓	✓		
PM_{10}	✓	✓		
$PM_{2.5}$	✓	✓		
SO_2	✓			✓
VOC	✓	✓		
NO_x	✓			✓
CO	✓			✓
TRS	n/a			
H_2S	n/a			
Individual HAP	✓			✓
Total HAPs	✓			✓
Total GHGs	✓			✓

3. MACT Standards

The facility is a minor source of HAP emissions and therefore is an area source. The facility is not subject to 40 CFR 63 Subpart JJJJJJ – Industrial, Commercial, and Institutional Boilers (Area Sources). The facility heat sources and dryers are not defined as boilers per 40 CFR 63.11237, because no portion of the heat from the furnace or the dryer is used to generate steam at the facility.

"Boiler means an enclosed device using controlled flame combustion in which water is heated to recover thermal energy in the form of steam or hot water. Controlled flame combustion refers to a steady-state, or near steady state, process wherein fuel and/or oxidizer feed rates are controlled. Waste heat boilers are excluded from this definition."

The facility is also not subject to 40 CFR 63 Subpart QQQQQQ – Wood Preserving (Area Sources). This regulation applies to area sources of HAP that conduct wood preserving operations.

"A wood preserving operation is defined by the subpart as a pressure treatment process with the use of a wood preservative containing chromium, arsenic, dioxins, or methylene chloride, where the preservative is applied to the wood product inside a retort or similarly closed vessel."

The Nahunta facility does not used any wood preservatives in the production of the wood pellets. Therefore, this regulation is not applicable.

The Emergency Fire Pump (Source Code: FP01) is a diesel-fired engine, and was manufactured in 2014, with a maximum design capacity of 86 bhp. It is a compression ignition internal combustion engine and is subject to 40 CFR 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines and 40 CFR 63 Subpart ZZZZ - NESHAP for Stationary Reciprocating Internal Combustion Engines. The engine is a new stationary RICE under these regulations. The engine will meet the requirements of 40 CFR 63, Subpart ZZZZ by meeting the requirements of 40 CFR 60, Subpart IIII.

4. Program Applicability

Program Code	Applicable (y/n)
Program Code 6 - PSD	n
Program Code 8 – Part 61 NESHAP	n
Program Code 9 - NSPS	y
Program Code M – Part 63 NESHAP	y
Program Code V – Title V	y

II. Facility Wide Requirements

A. Emission and Operating Caps:

The facility has taken 249 tpy pollutant emissions cap for VOC and CO, and 25 tpy for Combined HAPs, and 10 tpy for a single HAP.

B. Applicable Rules and Regulations

There are no applicable facility-wide rules.

C. Compliance Status

The facility is currently in compliance.

D. Operational Flexibility

The facility did not request operational flexibility in the application.

E. Permit Conditions

Condition 2.1.1 contains the pollutant emissions cap of 249 tpy for VOC for the entire facility.

Condition 2.1.2 contains the pollutant emissions cap of 249 tpy for CO for the entire facility.

Condition 2.1.3 contains the the pollutant emissions cap of 25 tpy for Combined Total HAPs and 10 tpy for a single HAP for the entire facility.

III. Regulated Equipment Requirements

A. Brief Process Description

The facility is a wood pellet manufacturing facility in Nahunta, Brantley County, Georgia. The operations are categorized under Standard Industrial Classification (SIC) code 2499, *Wood Products – Not Elsewhere Classified*. The Nahunta facility processes wood chips into fuel pellets to produce a source of alternative renewable fuel.

B. Equipment List for the Process

Emission Units		Specific Limitations/Requirements		Air Pollution Control Devices	
ID No.	**Description**	**Applicable Requirements/Standards**	**Corresponding Permit Conditions**	**ID No.**	**Description**
CY05	Fines Return Cyclone	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(n)	3.4.1, 3.4.2, 3.4.4, 3.4.5, 4.2.5, 5.2.1, 5.2.2, 5.2.5	None	None
FP01	Emergency Fire Water Pump	40 CFR 60 Subpart A 40 CFR 60 Subpart IIII 40 CFR 63 Subpart A 40 CFR 63 Subpart ZZZZ	3.3.1, 3.3.2, 4.2.9	None	None
HM02	Dry Hammermill	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(n)	3.4.1, 3.4.2, 3.4.4, 3.4.5, 4.2.2, 4.2.3, 4.2.6, 5.2.2, 5.2.3, 5.2.5, 6.2.2	CY04	Cyclone
PC01	Pellet Cooler	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(n)	3.4.1, 3.4.2, 3.4.4, 3.4.5, 3.5.5, 4.2.8, 5.2.6, 6.2.4, 6.2.5, 6.2.6, 6.2.8,6 2.12	CY01	Cyclone, 97.6% of the exhaust is rerouted to the HS01/HS02 for incineration and VOC control and organic HAP control..
PM01	Pellet Mill No. 1	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(n)	3.4.2, 3.4.4, 3.4.5, 3.5.5, 4.2.2	None	100% of the steam extraction is rerouted to the HS01/HS02 for incineration and VOC control and Organic control
PM02	Pellet Mill No. 2	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(n)	3.4.2, 3.4.4, 3.4.5, 3.5.5, 4.2.2	None	100% of the steam extraction is rerouted to the HS01/HS02 for incineration and VOC control and Organic control
PM03	Pellet Mill No. 3	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(n)	3.4.2, 3.4.4, 3.4.5, 3.5.5, 4.2.2	None	100% of the steam extraction is rerouted to the HS01/HS02 for incineration and VOC control and Organic control
PM04	Pellet Mill No. 4	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(n)	3.4.2, 3.4.4, 3.4.5, 3.5.5, 4.2.2	None	100% of the steam extraction is rerouted to the HS01/HS02 for incineration and VOC control and Organic control

Emission Units		Specific Limitations/Requirements		Air Pollution Control Devices	
ID No.	Description	Applicable Requirements/Standards	Corresponding Permit Conditions	ID No.	Description
PM05	Pellet Mill No. 5	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(n)	3.4.2, 3.4.4, 3.4.5, 3.5.5, 4.2.2	None	100% of the steam extraction is rerouted to the HS01/HS02 for incineration and VOC control and Organic control
PM06	Pellet Mill No. 61	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(n)	3.4.2, 3.4.4, 3.4.5, 3.5.5, 4.2.2	None	100% of the steam extraction is rerouted to the HS01/HS02 for incineration and VOC control and Organic control
PS01	Pellet Silos, Loadout (Two pellet storage silos, screening, truck loadout)	391-3-1-.02(2)(b) 391-3-1-.02(2)(d) 391-3-1-.02(2)(e) 391-3-1-.02(2)(n)	3.4.1, 3.4.2, 3.4.4, 3.4.5, 4.2.2, 4.2.3, 4.2.6, 5.2.2, 5.2.3, 5.2.5, 6.2.2, 6.2.12	BH02	Baghouse
RH01	Refining Hog	391-3-1-.02(2)(b) 391-3-1-.02(2)(d) 391-3-1-.02(2)(e) 391-3-1-.02(2)(n)	3.4.1, 3.4.2, 3.4.4, 4.2.3, 5.2.2, 5.2.3, 5.2.5, 6.2.2, 6.2.4, 6.2.5, 6.2.6, 6.2.8, 6.2.12	BH03	Baghouse
RH02	Refining Hog	391-3-1-.02(2)(b) 391-3-1-.02(2)(d) 391-3-1-.02(2)(e) 391-3-1-.02(2)(n)	3.4.1, 3.4.2, 3.4.4, 3.4.5, 4.2.3, 5.2.2, 5.2.3, 5.2.5, 6.2.2, 6.2.4, 6.2.5, 6.2.6, 6.2.8, 6.2.12	BH04	Baghouse
WD01 /HS01	Wood Dryer/Heat Source – Westec Triple-Pass Rotary Dryer with 14 oven-dried ton/hr capacity (30 MMBtu/hr Solgen Suspension Direct-Fired Wood Burner)	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(g)(2) 391-3-1-.02(2)(n)	3.4.1, 3.4.3, 3.4.4, 3.4.5, 3.5.1, 3.5.2, 4.2.2, 4.2.3, 4.2.4, 4.2.5, 4.2.6, 4.2.7, 4.2.8, 4.2.10, 5.2.2, 5.2.3, 5.2.4, 5.2.5, 5.2.6, 6.2.2, 6.2.4, 6.2.5, 6.2.6, 6.2.8, 6.2.12, 6.2.13, 6.2.14	CY02, CY03	Cyclones, 50% of the exhaust is rerouted to the HS01 for incineration and VOC and organic HAP control.
WD02 /HS02	Wood Dryer/Heat Source (40 MMBtu/hr Solgen Suspension Direct-Fired Wood Burner)	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(g)(2) 391-3-1-.02(2)(n)	3.4.1, 3.4.3, 3.4.4, 3.4.5, 3.5.1, 3.5.2, 4.2.2, 4.2.3, 4.2.4, 4.2.5, 4.2.6, 4.2.7, 4.2.8, 4.2.10, 5.2.2, 5.2.3, 5.2.4, 5.2.5, 5.2.6, 5.2.9, 5.2.10, 6.2.2, 6.2.4, 6.2.5, 6.2.6, 6.2.8, 6.2.12, 6.2.13, 6.2.14	CY06, CY07	Cyclones, 50% of the exhaust is rerouted to the HS02 for incineration and VOC control and organic HAP control.

* Generally applicable requirements contained in this permit may also apply to emission units listed above. The lists of applicable requirements/standards and corresponding permit conditions are intended as a compliance tool and may not be definitive.

C. Equipment & Rule Applicability

Applicable Rules and Regulations -

Federal Rules

New Source Review (NSR), 40 CFR 52.21

The federal New Source Review (NSR) program is applicable to new major source modifications to existing minor sources, such as the facility. The facility is located in Brantley County, which

has been classified as in attainment with the National Ambient Air Quality Standards (NAAQS), or unclassified for all regulated pollutants. Therefore, the facility is not subject to Nonattainment New Source Review (NNSR) permitting requirements for any criteria pollutants. The facility is potentially subject to Prevention of Significant Deterioration (PSD) permitting requirements, but is categorized as a minor source with respect to the PSD permitting, due to both pre-project and post-project facility-wide potential criteria pollutant emissions are less than 250 tpy, and greenhouse gas (GHG) emissions less than 100,000 tpy of carbon dioxide equivalents (CO_2e). Therefore the proposed project expansion is not subject to PSD review.

Wood pellet production is not on the list of 28 categories detailed in 40 CFR §52.21 with a lower threshold of 100 tpy for criteria pollutants. As shown in Table 3-1 of Section 3.7 of the application, the potential non-fugitive emissions from the facility are below the major source thresholds for all regulated pollutants. The fugitive emissions are excluded, because the wood pellet production operation is not on the list of 28 categories with a lower threshold, which requires subject source categories to include fugitive emissions for permitting applicability determinations.

Applicable MACT Standards (40 CFR Part 63) are discussed in Section I.E.3. above.

Compliance Assurance Monitoring (CAM):

Under 40 CFR Part 64, Compliance Assurance Monitoring (CAM), facilities are required to prepare, and submit monitoring plans for certain emission units with the Initial or Renewal Title V Operating Permit Application.

As part of the proposed project, the facility is installing multiple Cyclones, and Baghouses providing control of particulate from several process sources, and all emission sources at the facility are subject to a PM emission limit through GRAQC 391-3-1-.02(2)(e), as discussed later in this report. However, no individual emission unit has post-control PM emissions exceeding the Title V major source threshold of 100 tpy. As such, the facility is not required to address CAM for its control devices until the facility's Initial Title V Permit Renewal Application

NSPS and NESHAP for Diesel-Fired Engines

All sources subject to a source specific NSPS are also subject to the general provisions of NSPS Subpart A, unless specifically excluded. In addition to the performance testing requirements of 40 CFR 60.8, 40 CFR 60.7(a)(4) requires notification to the state and federal authorities 60 days before the modification takes place. 40 CFR 60.7(a)(3) similarly requires notification of startup no later than 15 days after modified operations commence. Finally, 40 CFR 60.7(b) requires the facility to maintain records of the occurrence and duration of any startup, shutdown, or malfunction in the operation of an affected facility.

40 CFR 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

This subpart applies to emergency stationary CI ICE for model year 2007 and later.

The facility proposes to operate 1 internal combustion engine as an Emergency Firewater Pump (FP01) at a facility that has HAP emissions under the major source threshold, classifying it as an area source, therefore the Emergency Firewater Pump is subject to 40 CFR 63 Subpart ZZZZ.

The Emergency Firewater Pump (FP01) meets the criteria established by 40 CFR 63.6590(c)(1) because the engine is classified as a new or reconstructed stationary RICE located at an area source. The engine will demonstrate compliance with 40 CFR 63 Subpart ZZZZ by meeting the requirements of 40 CFR 60 Subpart IIII for compression ignition engines, therefore no further requirements apply for the Emergency Firewater Pump.

Georgia State Rules

GRAQC 391-3-1-.02(2)(b) – "*Visible Emissions*"

This regulation limits the opacity from all sources to 40%, provided that the source is not subject to some other opacity limitation under GRAQC 391-3-1-.02(2). This regulation is applicable to the operations at the facility and applies to the Heat Source/Dryer, Dry Fiber Hammermills, Pelletmills, Pellet Coolers, and the Refining Hog Cyclones.

GRAQC 391-3-1-.02(2)(e) – "*Particulate Matter*"

This regulation, commonly known as the process weight rule (PWR), establishes PM limits for all sources if not specified elsewhere. The PM emissions are limited based on the following equations (for equipment constructed or modified after July 2, 1968), where equation (a) applies to sources with a process input rate of less than or equal to 30 tph, while equation (b) applies to sources with a process input rate of more than 30 tph.

(a) $E = 4.10 \times P^{0.67}$ (b) $E = 55.0 \times P^{0.11} - 40$

where: E = allowable PM emission rate (lb/hr)
P = process input weight rate (tons/hr)

This rule is applicable to the facility operations such as chip drying, hammermilling, pelleting, and pellet cooling.

GRAQC 391-3-1-.02(2)(g) – "*Sulfur Dioxide*"

This regulation establishes SO_2 emission limits for fuel-burning sources, not "equipment". The proposed Dryer burners, and the proposed fire water pump engine each have a maximum heat input capacity less than 100 MMBtu/hr, and are subject to a fuel sulfur content limit of 2.5%, by weight, for any fuel fired. The Dryer Burners will comply with this rule through the combustion of biomass as the sole fuel in the units. The Emergency Fire Water Pump will be subject to a more stringent fuel sulfur standard of 15 ppm through NSPS Subpart IIII, thereby subsuming the Rule (g) sulfur limit.

GRAQC 391-3-1-.02(2)(n) – "*Fugitive Dust*"

This regulation requires facilities to take reasonable precautions to prevent fugitive dust from becoming airborne. Operations at the facility, including the wood chips and pellets handling, and storage systems, are covered by this generally applicable rule. The appropriate precautions are currently, and will continue to be taken to prevent fugitive dust from becoming airborne, and ensure that opacity from fugitive dust sources is less than 20%, as required by this rule.

Applicability to specific emissions sources:

Heat Sources (HS01 and HS02)

The 30 and 40 MMBtu/hr heat sources, which supply heat directly to the wood dryers, do not meet the definition of "fuel-burning equipment" according to the Georgia Rules for Air Quality Control. Therefore, the emissions from these units, when discharged directly to the atmosphere, are not subject to Georgia Rule 391-3-1-.02(2)(d) - "Fuel Burning Equipment."

The heat sources (HS01 and HS02) are subject to Georgia Rule 391-3-1-.02(2)(g) - "Sulfur Dioxide." Since the heat sources burn dried wood, the sulfur content will always be much less than 2.5 percent with no controls; therefore, no monitoring is needed.

With regard to applicability to GA Rule(b) and GA Rule(e), emissions from the combined operation of the wood dryers (WD01 and WD02) and the heat sources (HS01 and HS02) are subject.

Wood Dryers (WD01 and WD02)

As indicated above, the wood dryers (WD01 and WD02) are subject to GA Rules (b) and (e). The application indicates that the process input rate is 12.2 and 16.4 tons per hour respectively on a dry basis for Dryers WD01 and WD02. Therefore:

$E = 4.1(12.2)^{0.67} = 21.9$ lb/hr : $E = 4.1(16.4)^{0.67} = 26.7$ lb/hr

Actual emissions from the wood dryers (WD01 and WD02) are calculated as shown below.

$$PM = \left(\frac{12.2ODT}{hr}\right)\left(\frac{0.5lb}{ODT}\right) = \frac{6.1lb}{hr} : PM = \left(\frac{16.4ODT}{hr}\right)\left(\frac{0.5lb}{ODT}\right) = \frac{8.2lb}{hr}$$

As indicated, the actual PM emissions are estimated to be 14.3 lb/hr, which is less than the allowable limit, so compliance with GA Rules (e) is expected.

Compliance with Rule(b) is more complicated. If only PM emissions from the combustion of the wood were emitted, proper operation of the burners would ensure that the opacity would be less than 40%. However, the process of drying wood also generates visible emissions in the form of condensable particulate matter. Such emissions generally exit the stack as invisible vapor but then condense when hitting the ambient air. Under some operating conditions, this type of facility will cause excess visible emissions. Therefore, periodic opacity testing will be required for this stack.

Other Sources
Truck Dump / Feeder Bins (MH01)
Green Wood Chips Storage Pile (MH02)
Vibrating Screen (PS02)
Hog Discharge Screw (MH03)
Hogged Material Storage Bin (MH04)
Hammermill (HM02)*
Dry Fuel Surge Bin (MH05)
Wood Fuel Grinder (FG01)
6 Pellet Mills
Pellet Cooler (CY01)*
2 Pellet Silos (PS01)*
Refining Hog (RH01)*
Refining Hog (RH02)*
Vibrating Screen (PS02)*
Truck Loadout (PS03)*

These sources all have the potential to emit particulate matter. [Asterisked facilities are controlled.]

The Truck Dump / Feeder Bins (MH01), the Green Wood Chips Storage Pile (MH02), the Vibrating Screen (PS02), the Hog Discharge Screw (MH03), and the Hogged Material Storage Bin (MH04) are used in the processing of green wood and have no stacks. The application quantifies the emission rates from these points, but since they emit only fugitive emissions, they do not count towards any emission threshold. Therefore, these emissions are subject to Rule(n) with regard to fugitive dust.

Pellet Mills are listed in the narrative because pellet mills can be a source of PM emissions. However, the application indicates that there are no emissions from the proposed pellet mills. It is therefore presumed that any emissions would exhaust through the pellet cooler cyclone.

Emissions from the Pellet Cooler exhaust through a cyclone. Because a cyclone is inherently less efficient than a baghouse, the emissions are expected to be higher than from the other equipment. Note that the facility could not use a baghouse for this equipment. With high moisture content and low temperature, bags would become blinded. For that reason, a cyclonic device is installed on almost all (if not all) pellet mills. As discussed above, the applicant calculated PM emissions based upon an outlet concentration of 0.02 gr/dscf. However, this review calculated emissions based on a more conservative 0.03 gr/dscf. Compliance with this limit is expected. Compliance with Rule(b) and Rule(e) is considered very likely.

Emissions from the Hammermills are controlled by Baghouses BH03 and BH04. Emissions from the Pellet Silos, Vibrating Screen and Truck Loadout are controlled by Baghouse BH02. Being controlled by baghouses, most of the filterable PM emissions will be captured. However, any condensable PM will not be captured. The process that is considered most likely to emit condensibles is the Hammermill, since crushing wood releases some condensable PM. However, the quantities are likely to be very low because most of the condensibles that could be released by wood will have already been released during drying. It is likely that the Pellet Silos, Vibrating

Screen, and Truck Loadout will not produce much condensable PM, so compliance with Rule(b), and Rule(e) is considered almost certain.

Emission and Operating Caps –

The total emissions from the heat sources (HS01 and HS02), and wood dryers (WD01 and WD02) are limited by Condition Nos. 2.1.1, and 2.1.2 of the current air quality permit to limit volatile organic compounds (VOC), and carbon monoxide (CO) in excess of 249 tons per year.

The total emissions from the heat sources (HS01 and HS02) and wood dryers (WD01 and WD02) are limited by Condition 2.1.3 of the current air quality permit to less than 10 tpy of each individual HAP and less than 25 tpy of total HAPs, making the facility an area source of HAPs.

D. Compliance Status

The facility is currently in compliance.

E. Operational Flexibility

Operational flexibility was not requested in the application.

F. Permit Conditions

New Condition 3.2.1 limits the facility wood pellet-production capacity to 181,000 tons per year.

Condition 3.4.1 includes the Rule(e) requirements for stack emissions and is amended to include the new Wood Dryer/Heat Source (WD02/HS02), the Fines Return Cyclone (CY05), and the Wood Refining Hogs (RH01 and RH02). The units which emit from stacks are listed.

Condition 3.4.2 includes the Rule(b) requirements for stack emissions.

Condition 3.4.3 includes the Rule(g) requirements for combustion of fuel which, per the application, only occurs in the Heat Source or Burner which provides heat to the Wood Dryer (WD01), and is amended to include the new Heat Source (HS02) for the new Wood Dryer (WD02).

Conditions 3.4.4 and 3.4.5 specify the Rule(n) requirements for fugitive emissions. This essentially applies to all processes (but not emissions from stacks). It is the only applicable requirement for processes which have no stacks. Any emissions would be fugitive.

Condition 3.5.1 requires the exhaust of the Dryers, and the Pellet Cooler to be vented to the Heat Sources (i.e. Wood Burners) because the Burner is used as a control device for these emission sources.

New Condition 3.5.2 requires at least 50% of the Dryers emissions, and 97.6% of the Pellet Cooler exhaust to be recycled to the Burner.

New Condition 3.5.3 requires the facility to operate the control devices while operating the associated emission units.

Condition 3.5.4 requires the facility to not adjust the damper positions established during initial performance testing required by Condition 4.2.3.

Condition 3.5.5 requires that the Permitte shall not operate the Pellet Mills (PM01 through PM06), and the Pellet Cooler (PC01), if the wood burners (HS01/HS02) are not operating.

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IV. Testing Requirements (with Associated Record Keeping and Reporting)

A. General Testing Requirements

Conditions 4.1.1 through 4.1.4 contains EPD's standard requirements for performance testing.

Condition 4.1.3 was modified to add OTM 26 for determining VOC. Method 25A picks up some methanol, so the Division is recommending using OTM 26 to combine results from Method 25A calibrated on propane with Methanol, Formaldehyde, and Acetaldehyde, to get an approximate VOC emission rate.

B. Specific Testing Requirements

Condition 4.2.1 contains EPD's specific testing requirements.

Condition 4.2.2 requires an initial performance test for PM, NOx and CO emissions from the Wood Dryers/Heat Sources (WD01/HS01/WD02/HS02). This condition is amended to include the new Wood Dryer No. 2 (WD02). These results will be used in the emission calculations and to minimize NOx and CO emissions by establishing a range of oxygen levels. This test is only required for the Wood Dryers/Heat Sources(WD01/HS01/WD02/HS02) because this emission unit has combustion and is being used as a control device for the other emission sources. PM emissions from the baghouse and the cyclones are already determined from the manufacturer's specifications and production throughput, therefore testing is not necessary. This is also to determine compliance with Rule (e) and Rule (b).

Conditions 4.2.3 and 4.2.6 currently requires performance tests for VOC, Formaldehyde, Acetaldehyde, and Methanol emissions from the Dryer exhaust every 4 years. Condition 4.2.7 contained a requirement to determine a furnace temperature that represents compliance with the carbon monoxide emission limit in Condition 2.1.2. The facility requested that the Division remove both the requirement for CO compliance testing, and for continuous temperature monitoring at the exit of the heat source. The Division disagrees. See the response to the request in Condition 2.1.2. However the temperature monitoring and ranges determinations are now in new Condition 4.2.7.

Condition 4.2.4 was modified to currently require performance tests for NOx and CO emissions every 2 years. Condition 4.2.4 contained a requirement to test emissions of CO from the combination of the Heat Source, and Wood Dryer No. 1. This is to determine compliance with the limit in Condition 2.1.2, to assure PSD minor source status. The facility requested that the

Division remove any future requirement for CO compliance testing from the Wood Dryer No. 1/Heat Source stack. The Division disagrees. See the response to the request in Condition 2.1.2.

Condition 4.2.5 contains a requirement to determine a pressure drop that represents compliance with the Rule(e) emission standard. This condition was also amended to include the new Wood Dryer No. 2/Heat Source (WD02/HS02) and it's Cyclones (CY06 and CY07).

Condition 4.2.7 requires the facility to measure and record the temperature of the Wood Dryers/Heat Sources (WD01/HS01/WD02/HS02) during the performance test VOC, formaldehyde, acetaldehyde, and methanol emissions in order to establish a minimum operating temperature of the Burner/Dryer because it is being used a control device for other emission sources.

New Condition 4.2.8 requires the facility to measure and establish a pressure range for the monitors required by Condition 5.2.6. The facility shall mark the damper positions that were used to establish a recycle rate from the Dryers, Pellet Mills, and Pellet Cooler.

New Condition 4.2.9 states the operating and maintenance requirements per 40 CFR 60 Subpart IIII and 40 CFR 63 Subpart ZZZZ.

New Condition 4.2.10 requires the facility to demonstrate operating conditions prior to, during, and after adjustments of operating parameters, and applies to any engineering testing, burner tuning, or other pre/post-test sampling conducted for the source test required by Conditions 4.1.1, 4.2.2, 4.2.4, 4.2.5, and 4.2.6.

V. Monitoring Requirements (with Associated Record Keeping and Reporting)

A. General Monitoring Requirements

This section states the standard general monitoring requirements.

B. Specific Monitoring Requirements

Condition 5.2.1 requires maintenance checks for the cyclones and provides guidance and is modified to include the new Wood Dryer No. 2 Cyclones (CY06 and CY07), and update the new name for CY05 to the Fines Return Cyclone.

Condition 5.2.2 contains the Division's standard requirement to monitor, and daily record the pressure drop across baghouses and cyclones, and is modified to include the new Wood Dryer No. 2 Cyclones (CY06 and CY07), update the new name for CY05 to the Fines Return Cyclone, and delete BH01, which was replaced by BH03 and BH04.

Condition 5.2.3 contains the Division's standard requirement for a Preventive Maintenance Program for Baghouses, and is modified to include the new Refining Hog No. 1, and No. 2 Baghouses (BH03 and BH04), and delete BH01 which was replaced by BH03 and BH04.

Condition 5.2.4 contained the requirement to monitor, and record the temperature of the Heat Source (HS01). The facility requested that the Division remove the requirement for continuous temperature monitoring at the exit of the Heat Source. However, the Division does not agree. See the explanation given in response to the request to delete Condition 2.1.2 above.

Condition 5.2.5 requires visible emission checks from the baghouse and the cyclones.

Condition 5.2.6 requires a pressure monitoring device for each recycled air duct for the Dryers (WD01/HS01/WD02/HS02), the Pellet Mills (PM01 through PM06), the Hammermill (HM02), and the Pellet Cooler (PC01). These will monitor the air pressure from these sources to the Burner.

Condition 5.2.7 requires the performance of routine maintenance and keeping of records for all air pollution control equipment.

Condition 5.2.8 requires the facility to keep spare parts inventory for all control equipment in addition to baghouses.

VI. Other Record Keeping and Reporting Requirements

A. General Record Keeping and Reporting Requirements

Template Conditions 6.1.1 through 6.1.7 contain the general record keeping and reporting requirements.

Template Conditions 6.1.3 and 6.1.4 were updated in September 2011 to allow ~60 days to submit periodic reports. Alternative reporting deadlines are allowed per 40 CFR 70.6, 40 CFR 60.19(f) and 40 CFR 63.10(a).

B. Specific Record Keeping and Reporting Requirements

Condition 6.2.1 contains the Division's notification requirement of startup of the proposed equipment at the site within fifteen days after such date.

Condition 6.2.2 requires the facility to calculate monthly VOC, formaldehyde, acetaldehyde, and methanol emissions from the Wood Dryer No. 1 (WD01/HS01), the Hammermills (HM02), and the Pellet Cooler (PC01). The condition also provides guidance for these calculations. This condition was modified to include the new Wood Dryer No. 2/Heat Source (WD02/HS02).

Condition 6.2.3 is modified to revert to the reports being postmarked by the previous period deadline of July 30 and January 30, respectively.

Condition 6.2.3b. required semiannual reporting of any three-hour average in which the average temperature of the Heat Source (HS01) is out of the range established by Condition 5.2.4 The facility requested that the Division remove the requirement for continuous temperature monitoring at the exit of the heat source. The Division disagrees. See the response to the request in Condition 5.2.5. As such, this condition, which requires the facility to certify compliance with

the continuous temperature monitoring requirements as part of the semi-annual compliance report remains.

Condition 6.2.3c. required semiannual reporting of the visual emission reading of the sawdust-fired burner required by Condition 5.2.5, is above the action level of that condition for two consecutive days.. The facility has requested that the Division remove the requirement for daily visible emissions observations from the heat source/dryer stack. The Division disagrees. See the response to the request in Condition 5.2.5. As such, this condition, which requires the facility to certify compliance with daily visible emissions observations requirements as part of the semi-annual compliance report, is retained.

Condition 6.2.4 requires the facility to calculate monthly CO and PM emissions from the Dryers (WD01/HS01/WD02/HS02), Hammermill (HM02), and the Pellet Cooler (PC01). The condition also provides guidance for these calculations.

Condition 6.2.5 requires the facility to calculate monthly VOC, formaldehyde, acetaldehyde, and methanol emissions from the Dryers (WD01/HS01/WD02/HS02), Hammermill (HM02), and the Pellet Cooler (PC01). The condition also provides guidance for these calculations.

Condition 6.2.6 requires the monthly CO and PM emissions to be used to calculate 12 month rolling emission totals.

Condition 6.2.7 requires the facility to notify the Division if any one month of CO or PM/PM_{10} /$PM_{2.5}$ emissions exceeds 20.75 tons.

Condition 6.2.8 requires the monthly VOC, formaldehyde, acetaldehyde, and methanol emissions to be used to calculate 12 month rolling emission totals.

Condition 6.2.9 requires the facility to notify the Division if any one month of VOC emissions exceeds 20.75 tons, if any month of a single HAP emission exceeds 0.83 tons or if any one month of combined HAP emissions exceeds 2.08 tons.

Condition 6.2.10 requires notifications if any twelve month emission total for a single HAP exceeds 10 tpy or if any twelve month emissions total for the combined HAPs exceeds 25 tpy.

Condition 6.2.11 requires notifications if CO, PM/PM_{10} /$PM_{2.5}$ or VOC emissions exceed 249 tpy during any twelve consecutive months.

Condition 6.2.12 requires the facility to maintain records of the amount of wet wood chips processed in the Dryer, the amount of dried wood chips processed in the Hammermill (HM02), the amount of dried wood chips processed in the Pellet Mills (PS01) and the amount of dried wood chips processed in the Pellet Cooler (PC01).

Condition 6.2.13 states the monthly recordkeeping requirements for HAPs from the stack of the heat sources (HS01 and HS02) and the wood dryers (WD01 and WD02).

Condition 6.2.14 states the semiannual reporting requirements.

VII. Specific Requirements

A. Operational Flexibility

There are no requirements for operational flexibility in the application.

B. Alternative Requirements

There are no alternative requirements requested in this application.

C. Insignificant Activities

Refer to http://airpermit.dnr.state.ga.us/GATV/default.asp for the Online Title V Application.

Refer to the following forms in the Title V permit application:

- Form D.1 (Insignificant Activities Checklist)
- Form D.2 (Generic Emissions Groups)
- Form D.3 (Generic Fuel Burning Equipment)
- Form D.6 (Insignificant Activities Based on Emission Levels of the Title V permit application)

D. Temporary Sources

There are no requirements for temporary sources in the application.

E. Short-Term Activities

There are no requirements for short-term activities in the application.

F. Compliance Schedule/Progress Reports

Not applicable.

G. Emissions Trading

The Facility does not participate in any emissions trading program.

H. Acid Rain Requirements

Not applicable.

I. Prevention of Accidental Releases

Not applicable

J. Stratospheric Ozone Protection Requirements

None applicable.

K. Pollution Prevention

Not applicable.

L. Specific Conditions

None applicable.

VIII. General Provisions

Generic provisions have been included in this permit to address the requirements in 40 CFR Part 70 that apply to all Title V sources, and the requirements in Chapter 391-3-1 of the Georgia Rules for Air Quality Control that apply to all stationary sources of air pollution.

Template Condition 8.14.1 was updated in September 2011 to change the default submittal deadline for Annual Compliance Certifications to February 28.