Attachment N

Facility Name: **Appling County Pellets LLC**
City: Baxley
County: Appling
AIRS #: 04-13-001-00032

Application #: TV-40489
Date Application Received: October 19, 2015
Date Application Deemed Administratively Complete: December 19, 2015
Date of Draft Permit:
Permit No: 2499-001-0032-V-02-0

Program	Review Engineers	Review Managers
SSPP	S. Ganapathy	Manny Patel
ISMP	Bob Scott	Dan McCain
SSCP	Peter Nguyen	Farhana Yasmin/Bruce Foisy
Toxics	N/A	N/A
Permitting Program Manager		Eric Cornwell

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 **Appling County Pellets** 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: Appling County Pellets

2. Parent/Holding Company Name: Appling County Pellets

3. Previous and/or Other Name(s)

   None.

4. Facility Location

   248 Sweet Water Drive, Baxley, GA 31513 (Appling County).

5. Attainment or Non-attainment Area Location

   The facility is located in an 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 below lists all current permits (including Part 71 permits), as amended, issued to the facility. Based on a comparative review of Item 19 in Section 1.10 of the Title V application and the "Permit" file(s) on the facility found in the Air Branch office, comments are listed in Table 2 below."

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
2499-001-0032-B-01-0	July 16, 2007	yes	
2499-001-0032-B-01-1	September 2, 2009	yes	

Table 2: Comments on Specific Permits

Permit Number	Comments
2499-001-0032-B-01-0	Initial Minor Source Permit for the Pelletmill
2499-001-0032-B-01-1	Administrative permit amendment for mailing address change.

D. Process Description

1. SIC Codes(s)

2499 – Wood Product not elsewhere classified

The SIC Code(s) identified above were assigned by EPD's Air Protection Branch for purposes pursuant to the Georgia Air Quality Act and related administrative purposes only and are not intended to be used for any other purpose. Assignment of SIC Codes by EPD's Air Protection Branch for these purposes does not prohibit the facility from using these or different SIC Codes for other regulatory and non-regulatory purposes.

Should the reference(s) to SIC Code(s) in any narratives or narrative addendum previously issued for the Title V permit for this facility conflict with the revised language herein, the language herein shall control; provided, however, language in previously issued narratives that does not expressly reference SIC Code(s) shall not be affected.

2. Description of Product(s)

The facility makes wood pellets from wood chips and sawdust.

3. Overall Facility Process Description

The facility receives wood furnish (a mixture of hardwood and softwood species), normally at a maximum moisture content of 50 percent. The wood furnish will be dried in one large rotary wood dryer with heat source/dryer burner to a 10 percent moisture content. The wood chips are then hammermilled, and put through a pelletizer with a capacity of 20 tons/hour of wood pellets. The wood pellets are then loaded on to rail cars or trucks for sale to customers. The pellets loaded on to cargo ships destined for Europe to be fired in the boilers. A 62.4 MMBtu/hr wood-fired heat source, combusting bark and sawdust, supplies heat for the wood dryer. A PM emission from the dryer exhaust is controlled by high efficiency quad pack cyclones.

The hammermill PM emissions are controlled by bin vent filters and the pellet cooler PM emission exhaust is controlled by a baghouse.

4. Overall Process Flow Diagram (optional)

There is no change to the process flow diagram submitted by the permit with its previous permit application.

E. Regulatory Status

1. PSD/NSR

The facility is a synthetic minor source under PSD/NSR regulations. Potential Particulate matter emissions from the facility can exceed 250 tons per year for unlimited/uncontrolled operation. The proposed Title V permit has a PSD avoidance limit of 1.8 pound per hour from the hammer mill bin vent filter and the pellet mill baghouse in order to avoid the facility being a PSD major source for PM.

Emissions from the facility were estimated using emission factors from the 2016 source tests for the dryer for VOC, CO, NOx and PM. Emission factors from the most recent source test for VOC, Formaldehyde, Methanol and Acetaldehyde were used to estimate VOC and HAPs emissions from the facility. The VOC (WPP1) emission factor for the dryer was based on the source test results from the July 2016 source tests. The average VOC emission factor from these two tests was 2.63 lb VOC/ODT. Potential VOC emissions for 120,000 tpy production are 158 tons per year which is well below the PSD major source threshold of 250 ton/year. In the 2016 source the average emission rate of methanol (over three test runs) was 2.59 lb/hr or 11.3 tons/year at a production rate of 18 ODT/hour. This rate amounts to 157,680 tons/year. The facility is thus a major source of methanol for uncontrolled operation. For a production rate of 120,000 tons/year the Methanol emission is 8.6 tons/year. The facility is thus a synthetic minor source of HAPs emission.

For CO the 2011 source tested emission factor of 3.6 lb/hr at a production rate of 17.1 ODT/hr and the production limit of 120,000 tons/year gives CO emission of 12 ton/year which is much lower than emissions calculated using the AP-42 emission factor of 5.3 lb/ODT.

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	yes	✓		
PM_{10}	yes	✓		
$PM_{2.5}$	yes	✓		
SO_2	yes			✓
VOC	yes	✓		
NO_x	yes			✓
CO	yes			✓
Individual HAP	yes		✓	
Total HAPs	yes			✓
Total GHGs	yes			✓

3. MACT Standards

The wood dryer is potentially subject to the plywood and composite wood product MACT (40 CFR 63 Subparts A and DDDD). However, this MACT does not have any limits or work practice standards for the wood dryer. The Heat source (HS01) is not subject to the area source boiler MACT (40 CFR 63 Subpart A and 6J) since the dryer is heated directly by the exhaust from the heat source. The heat source is not a boiler or process heater. The dryer is a direct-fired unit. No steam is generated by the heat source.

4. Program Applicability

Program Code	Applicable (y/n)
Program Code 6 - PSD	no
Program Code 8 – Part 61 NESHAP	no
Program Code 9 - NSPS	no
Program Code M – Part 63 NESHAP	no
Program Code V – Title V	yes

Regulatory Analysis

II. Facility Wide Requirements

A. Emission and Operating Caps:

Methanol emission from the facility has potential to exceed 10 tons per year. In order to prevent the facility from being a HAPs major source Methanol emissions are limited to less than 10 tons per year by limiting the wood pellet production to 120,000 tons per year.

B. Applicable Rules and Regulations

Not applicable.

C. Compliance Status

Not applicable.

D. Operational Flexibility

None requested in the permit application.

E. Permit Conditions

New Condition 2.1.1 is the facilitywide synthetic minor emission limit for individual and total HAPs.

III. Regulated Equipment Requirements

A. Brief Process Description

The facility receives wood furnish (a mixture of hardwood and softwood species), normally at a maximum moisture content of 50 percent. The wood furnish will be dried in one large rotary wood dryer with heat source/dryer burner to a 10 percent moisture content. The wood chips are then hammermilled, and put through a pelletizer with a capacity of 20 tons/hour of wood pellets. The wood pellets are then loaded on to rail cars or trucks for sale to customers. The pellets loaded on to cargo ships destined for Europe to be fired in the boilers. A 62.4 MMBtu/hr wood-fired heat source, combusting bark and sawdust, supplies heat for the wood dryer. A PM emission from the dryer exhaust is controlled by high efficiency quad pack cyclones.

The hammermill PM emissions are controlled by bin vent filters and the pellet cooler PM emission exhaust is controlled by a baghouse.

B. Equipment List for the Process

		Specific Limitations/Requirements		Air Pollution Control Devices	
ID No.	**Description**	**Applicable Requirements/Standards**	**Corresponding Permit Conditions**	**ID No.**	**Description**
HS01	62.4 MMBtu/hr Heat Source - GTS Reciprocating Grate Furnace	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(g)	2.1.1, 3.4.1, 3.4.2, 3.4.3, 3.5.2, 4.2.1, 5.2.1, 5.2.2, 5.2.4, 6.1.7, 6.2.1, 6.2.2, 6.2.3, 6.2.4, 6.2.5	FK03	High Efficiency Cyclone – Fisher Klosterman XQ 120 Series
WD02	Rotary Wood Dryer rated at 20 tph	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(n)	2.1.1, 3.4.1, 3.4.2, 3.4.4, 3.4.5, 3.5.2, 4.2.1, 4.2.2, 4.2.3, 5.2.1, 5.2.2, 5.2.4, 6.1.7, 6.2.1, 6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.6	FK03	High Efficiency Cyclone – Fisher Klosterman XQ 120 Series
HM04	Hammermill rated 20 tph	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(n)	2.1.1, 3.2.1, 3.4.1, 3.4.2, 3.4.4, 3.4.5, 3.5.2, 5.2.2, 5.2.5, 6.1.7, 6.2.1, 6.2.3, 6.2.5	BV01	Bin Vent Filter
PM05	Pellet Mill/Cooler 20 tph	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(n)	2.1.1, 3.2.1, 3.2.2, 3.4.1, 3.4.2, 3.4.4, 3.4.5, 3.5.1, 3.5.2, 4.2.2, 4.2.3, 5.2.2, 5.2.3, 5.2.5, 6.1.7, 6.2.1, 6.2.3, 6.2.4, 6.2.5, 6.2.6, 6.2.7	BH01	Baghouse

C. Equipment & Rule Applicability

Emission and Operating Caps –
The facility has a HAP major source avoidance cap of 120,000 tons of pellet production. The facility also has SM limits for individual and total HAPs. The pellet production cap insures that the facility will be a HAPs minor source.

Applicable Rules and Regulations -
Rules and Regulations Assessment: Rules and Regulations Assessment – Georgia Rule 391-3-1-.02(2)(b) – "Visible Emissions," applies to all sources that are subject to at least one other emission limitation and are not subject to any other, more stringent, opacity standard. Georgia Rule (b) limits visible emissions to 40 percent opacity.

Georgia Rule 391-3-1-.02(2)(e) - "Particulate Emission from Manufacturing Processes," where the following equations are used to calculate the allowable rate of emission:

$E = 4.1P^{0.67}$; for process input weight rate up to and including 30 tons per hour

$E = 55P^{0.11} – 40$; for process input weight rate above 30 tons per hour

Where:
E = Emission rate in pounds per hour
P = Process input weight rate in tons per hour.

Georgia Rule (n)
The facility is subject to Georgia Rule (n), which governs fugitive dust emissions. It requires the facility to take the steps necessary to minimize fugitive dust and limit the VE of fugitive dust to 20 percent opacity.

Heat Source (HS01)
The 62.4 MMBtu/hr heat source, which supplies heat directly to the wood dryer, does not meet the definition of "fuel-burning equipment" according to the Georgia Rules for Air Quality Control. Therefore, the emissions from this unit are not subject to Georgia Rule 391-3-1-.02(2)(d) - "Fuel Burning Equipment." Hot gases from the heat source goes to the dryer and exhaust out of the dryer.
The heat source (HS01) is subject to Georgia Rule 391-3-1-.02(2)(g) - "Sulfur Dioxide."

Since the heat source burns wood waste, the sulfur content will always be much less than 2.5 percent with no controls; therefore, no monitoring is needed. The heat source is also subject to the 40 percent opacity limit of GA Rule (b).

Wood Dryer (WD02)

The wood dryer is subject to GA Rules (b) and (e). The application indicates that the process input rate is 18 tons per hour on a dry basis.

$E = 4.1(18)^{0.67} = 28$ lb/hr

Actual emissions from the wood dryer (WD02) are calculated as shown below.

$$PM = \left(\frac{18ODT}{hr}\right)\left(\frac{1.4lb}{ODT}\right) = \frac{25.2lb}{hr}$$

The actual PM emissions are estimated to be 25.2 lb/hr based on the May 2013 source test result, which is less than the allowable limit, so compliance with GA Rules (b) and (e) is expected.

Other Sources

Hammer Mill (HM04)

The hammer mill is subject to GA Rules (b) and (e). The application indicates that the hourly input rate of the hammer mill is 16 tons/hr. The allowable PM emission rate for the hammer mill per Georgia Rule (e) is:

$E = 4.1(16)^{0.67} = 26.3$ lb/hr

Predicted emissions from the bin vent (BV01) are calculated as shown below.

$$9{,}100cfm\left(\frac{0.02gr}{scf}\right)\left(\frac{lb}{7000gr}\right)\left(\frac{60\min}{hr}\right)=\frac{1.56lb}{hr}$$

The actual PM emissions are estimated to be 1.56 lb/hr, which is much less than the allowable. Compliance with GA Rules (b) and (e) is expected.

Pellet Mill (PM05)

PM emissions from the hammer mill bin vent filter and the pellet mill baghouse are calculated as shown, using a factor of 0.005 grains/dscf.

$$PM = 44{,}500cfm\left(\frac{0.02gr}{scf}\right)\left(\frac{lb}{7000gr}\right)\left(\frac{60\min}{hr}\right)\left(\frac{8760hr}{yr}\right)\left(\frac{ton}{2000lb}\right)=32tpy$$

The pellet mill is subject to GA Rules (b) and (e). The pellet mill is controlled by a baghouse so compliance with GA Rules (b) and (e) is expected.

The application indicates that the facility has a 4 MMBtu/hr gas boiler burning propane. Under the exemption list in Georgia Air Quality Rule 391-3-1-.03(6)(b)1, any fuel-burning equipment with a rated input capacity of 10 MMBtu/hr heat input capacity or less, burning LPG is exempt from permitting. Therefore, the gas boiler has not been included in this permit.
However, it will be subject to Rule 391-3-1-.02(2)(d), which limits visible emissions and PM emissions, and Rule (g), which limits sulfur dioxide emissions. Since only propane is fired in the gas boiler, it is expected that the unit will be in compliance with these rules.

D. Compliance Status

The facility is operating out of compliance. The facility has been operating as minor (B) source since 2008.

PM source test in 2008, 2009, 2011, 2013 and 2015 indicate that the facility is a Title V major source for PM and VOC. Source test emission factors for CO and VOC indicate that the facility has potential to be a PSD major source for unlimited operations. Therefore, within a year of becoming a Title V major source, the facility should have applied for a major source Title V permit which it did not. A notice of violation was sent on August 19, 2015 for operating without

a Title V permit. EPD is in the process of determining the unpaid emission fess from 2008. A consent order will be proposed to the facility after determination of the amount of unpaid past emission fees. The facility applied for a Title V permit on October 19, 2015.

In the 2016 source the average emission rate of methanol from the dryer (over three test runs) was 2.59 lb/hr or 11.3 tons/year at a production rate of 18 ODT/hour. This rate amounts to 157,680 tons/year of production (drying). The facility is thus a major source of methanol for uncontrolled operation. For a production rate of 120,000 tons/year the Methanol emission is 8.6 tons/year. The facility is thus a synthetic minor source of HAPs emission.

E. Operational Flexibility

None requested in this permit application.

F. Permit Conditions

Condition 3.2.1 is the PM emission rate limit for the hammer mill bin vent filter (BV01) and the pellet mill baghouse (BH01) expressed in pounds per hour which corresponds to the grain loading limit of 0.005 gr/dscf. This limit is based on the manufacturer guaranteed control efficiency for the cyclones and the baghouse. This is a PSD avoidance limit for PM.

New Condition 3.2.2 is the HAPs major source avoidance permit limit of 120,000 tons of pellet production per year.

Condition 3.4.1 is the allowable PM emission limit for PM emissions from the Heat source/Wood dryer, Hammermill and the pelletmill/pellet cooler per Georgia Rule (e).

Condition 3.4.2 limits the opacity from the Heat source/Wood dryer, Hammermill and the pelletmill/pellet cooler to 40% per Georgia Rule (b).

Condition 3.4.3 limits the fuel sulfur content to 2.5% for the fuel fired in the heat source (HS01) per Georgia Rule (g)2.

Condition 3.4.4 list methods to be adopted by the Permittee to minimize fugitive emissions from the various operations at the pellet mill.

Condition 3.4.5 limits fugitive emissions opacity to 20% per Georgia Rule (n) to 20% opacity.

Condition 3.5.1 and 3.5.2 are standard operation and maintenance condition for sources with cyclones, bin vents and baghouses for PM control.

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

A. General Testing Requirements

The standard general requirements are included in the permit.

B. Specific Testing Requirements

1. Individual Equipment

Condition 4.2.1 requires biennial testing of PM from the Heat source/Wood dryer. During the tests the wood dryer multiclone pressure drops, the hammermill cyclone pressure drop and the pellet cooler pressure drops are required to be monitored. The burner temperatures, wood dryer inlet and exit temperatures.

Condition 4.2.2 requires biennial testing of VOC, Formaldehyde, Methanol and acetaldehyde from the Heat source/Wood dryer, hammermills and the pelletcoller stacks. During the tests the wood dryer multiclone pressure drops, the hammermill cyclone pressure drop and the pellet cooler pressure drops are required to be monitored. The burner temperatures, wood dryer inlet and exit temperatures.

New Condition 4.2.3 requires the Permittee to conduct performance test under normal operating conditions.

2. Equipment Groups (all subject to the same test requirements):

Not applicable.

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

A. General Monitoring Requirements

The standard general requirements are included in the permit.

B. Specific Monitoring Requirements

1. Individual Equipment:

Condition 5.2.1 requires the Permittee to continuously monitor the burner temperatures, dryer inlet and exit temperatures and record hourly and three hourly averages of these parameters.

Condition 5.2.2 requires the Permittee to continuously monitor the pressure drops across the heat source/wood dryer cyclone system (FK03), hammer mill bin vent filter (BV01), and the pellet mill/cooler baghouse (BH01). Representative values are required to be recorded in the operations log book daily.
Condition 5.2.3 requires the Permittee to implement a preventive maintenance program for the pellet cooler baghouse.

Condition 5.2.4 requires the Permittee to conduct weekly checks of the dryer multiclones and the hammermill cyclones and promptly address any adverse conditions discovered during the inspection and record the corrective actions in a log book.

2. Equipment Groups (all subject to the same monitoring requirements):

Not applicable.

VI. Other Record Keeping and Reporting Requirements

A. General Record Keeping and Reporting Requirements

The standard general requirements are included in the permit.

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).

Exceedance of the HAPs major source avoidance limit of pellet production (120,000 tons) needs to be reported to EPD (Condition 6.1.7.b.i.).

Exceedance of HAP emission synthetic minor permit limit of 10 tpy for a single HAP and 25 tpy for total HAPs also needs to be reported.

Condition 6.1.7 requires reporting of the following excursions: Heat Source and dryer inlet and exhaust temperatures, opacities from the dryer and hammermill cyclones and pellet cooler baghouse in excess of 30%.

B. Specific Record Keeping and Reporting Requirements

Condition 6.2.1 requires the Permittee to maintain monthly records of the amount of wood dried in the dryer, hammermill process rates and the pellet production.

Condition 6.2.2 requires the Permittee to calculate monthly emissions of PM/PM_{10}, emissions from the heat Source (HS01)/Wood Dryer (DR02) using production data from these sources and the emission factors established from the most recent source tests.

Condition 6.2.3 requires the Permittee to calculate monthly emissions of VOC and HAPs (formaldehyde, acetaldehyde and methanol) emissions using the production data form the dryer, hammermill and the pellet cooler and the emission factors established from the most recent source tests. This condition requires reporting if total VOC emissions exceed 20.5 tons during any month or 249 tons during any consecutive twelve months.

Condition 6.2.4 requires the Permittee to calculate total HAP emissions using the monthly pellet production and the emission factor for formaldehyde, methanol, acetaldehyde and other HAPs. This condition requires the Permittee to notify EPD if monthly production of any HAP exceeds 0.83 tons or total monthly HAP production exceeds 2.08 tons.

Condition 6.2.5 requires the Permittee to calculate the 12 moth rolling total PM/PM_{10} emissions from the heat Source (HS01)/Wood Dryer (DR02) for each month.

Condition 6.2.6 requires the Permittee to calculate 12 month rolling total of VOC and HAPs emissions from the heat Source (HS01)/Wood Dryer (DR02), hammermill and pellet cooler for each month.

Condition 6.2.7 requires the Permittee to report any monthly pellet production exceeding 10000 tons.

VII. Specific Requirements

A. Operational Flexibility

None applicable.

B. Alternative Requirements

Not applicable.

C. Insignificant Activities

Refer to http://gatv.georgiaair.org/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

None proposed in the permit application.

E. Short-Term Activities

Not applicable.

F. Compliance Schedule/Progress Reports

Not at the current time.

G. Emissions Trading

Not applicable.

H. Acid Rain Requirements

Not applicable.

I. Prevention of Accidental Releases

Not applicable.

J. Stratospheric Ozone Protection Requirements

Not applicable.

K. Pollution Prevention

Not applicable.

L. Specific Conditions

Not 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.

Template Condition Section 8.27 was updated in August 2014 to include more detailed, clear requirements for emergency generator engines currently exempt from SIP permitting and considered insignificant sources in the Title V permit.

Template Condition Section 8.28 was updated in August 2014 to more clearly define the applicability of the Boiler MACT or GACT for major or minor sources of HAP.

Attachment O

Part 70 Operating Permit

Permit Number: **2499-299-0053-V-02-0** **Effective Date:** **December 19, 2013**

Facility Name: **Georgia Biomass, LLC**

Facility Address: 3390 Industrial Boulevard
Waycross, Georgia 31503 (Ware County)

Mailing Address: 3390 Industrial Boulevard
Waycross, Georgia 31503

Parent/Holding Company: **Georgia Biomass, LLC**

Facility AIRS Number: 04-13-299-00053

In accordance with the provisions of the Georgia Air Quality Act, O.C.G.A. Section 12-9-1, et seq and the Georgia Rules for Air Quality Control, Chapter 391-3-1, adopted pursuant to and in effect under the Act, the Permittee described above is issued a Part 70 Permit for:

> The operation of a wood pellets manufacturing facility including operation of two biomass fired 193 MMBtu/hr heat energy system, two direct-fired dryers, two hammermill lines with five hammermills in each line, five pellet mills and five pellet cooler lines, a diesel-fired 300 hp fire water pump engine, a 500 kW diesel-fired emergency generator for the dryer lines, a 250 kW diesel-fired emergency generator for the pellet lines and associated pollution control equipment.

This Permit is conditioned upon compliance with all provisions of The Georgia Air Quality Act, O.C.G.A. Section 12-9-1, et seq, the Rules, Chapter 391-3-1, adopted and in effect under that Act, or any other condition of this Permit. Unless modified or revoked, this Permit expires five years after the effective date indicated above.

This Permit may be subject to revocation, suspension, modification or amendment by the Director for cause including evidence of noncompliance with any of the above, for any misrepresentation made in Title V Application No. TV-21087 signed on March 30, 2012, SIP Permit application No. 21741 dated February 26, 2013 and Consent Order No. EPD-AQC-6566 dated March 4, 2013, any other applications upon which this Permit is based, supporting data entered therein or attached thereto, or any subsequent submittal of supporting data, or for any alterations affecting the emissions from this source.

This Permit is further subject to and conditioned upon the terms, conditions, limitations, standards, or schedules contained in or specified on the attached **44** pages.

[Signed]

Director
Environmental Protection Division

Table of Contents

PART 1.0 FACILITY DESCRIPTION 1
1.1 Site Determination 1
1.2 Previous and/or Other Names 1
1.3 Overall Facility Process Description 1
PART 2.0 REQUIREMENTS PERTAINING TO THE ENTIRE FACILITY 2
2.1 Facility Wide Emission Caps and Operating Limits 2
2.2 Facility Wide Federal Rule Standards 2
2.3 Facility Wide SIP Rule Standards 2
2.4 Facility Wide Standards Not Covered by a Federal or SIP Rule and Not Instituted as an Emission Cap or Operating Limit 2
PART 3.0 REQUIREMENTS FOR EMISSION UNITS 3
3.1 Emission Units 3
3.2 Equipment Emission Caps and Operating Limits 4
3.3 Equipment Federal Rule Standards 5
3.4 Equipment SIP Rule Standards 7
3.5 Equipment Standards Not Covered by a Federal or SIP Rule and Not Instituted as an Emission Cap or Operating Limit 8
PART 4.0 REQUIREMENTS FOR TESTING 9
4.1 General Testing Requirements 9
4.2 Specific Testing Requirements 10
5.1 General Monitoring Requirements 12
5.2 Specific Monitoring Requirements 12
PART 6.0 RECORD KEEPING AND REPORTING REQUIREMENTS 17
6.1 General Record Keeping and Reporting Requirements 17
6.2 Specific Record Keeping and Reporting Requirements 20
PART 7.0 OTHER SPECIFIC REQUIREMENTS 25
7.1 Operational Flexibility 25
7.2 Off-Permit Changes 25
7.3 Alternative Requirements 26
7.4 Insignificant Activities 26
7.5 Temporary Sources 26
7.6 Short-term Activities 26
7.7 Compliance Schedule/Progress Reports 26
7.8 Emissions Trading 26
7.9 Acid Rain Requirements 26
7.10 Prevention of Accidental Releases (Section 112(r) of the 1990 CAAA) 26
7.11 Stratospheric Ozone Protection Requirements (Title VI of the CAAA of 1990) 28
7.12 Revocation of Existing Permits and Amendments 29
7.13 Pollution Prevention 29
7.14 Specific Conditions 29
PART 8.0 GENERAL PROVISIONS 30
8.1 Terms and References 30
8.2 EPA Authorities 30
8.3 Duty to Comply 30
8.4 Fee Assessment and Payment 31
8.5 Permit Renewal and Expiration 31

8.6 Transfer of Ownership or Operation 31
8.7 Property Rights 31
8.8 Submissions 32
8.9 Duty to Provide Information 32
8.10 Modifications 33
8.11 Permit Revision, Revocation, Reopening and Termination 33
8.12 Severability 34
8.13 Excess Emissions Due to an Emergency 34
8.14 Compliance Requirements 35
8.15 Circumvention 37
8.16 Permit Shield 37
8.17 Operational Practices 38
8.18 Visible Emissions 38
8.19 Fuel-burning Equipment 38
8.20 Sulfur Dioxide 39
8.21 Particulate Emissions 39
8.22 Fugitive Dust 39
8.23 Solvent Metal Cleaning 40
8.24 Incinerators 41
8.25 Volatile Organic Liquid Handling and Storage 41
8.26 Use of Any Credible Evidence or Information 42
8.27 Internal Combustion Engines 42
8.28 Boilers and Process Heaters 42
Attachments 44
A. List of Standard Abbreviations and List of Permit Specific Abbreviations
B. Insignificant Activities Checklist, Insignificant Activities Based on Emission Levels and Generic Emission Groups
C. List of References

PART 1.0 FACILITY DESCRIPTION

1.1 Site Determination

There is no site determination issue pertaining to the Georgia Biomass Pelletmill. Georgia Biomass is currently operating a wood pellet production facility in Waycross, Georgia under construction and operating permit No. 2499-299-0053-E-01-0 and four permit amendments. The operations are categorized under Standard Industrial Classification (SIC) code 2499, *Wood Products – Not Elsewhere Classified.* The Waycross facility processes logs into fuel pellets, to produce a source of alternative renewable fuel for utility power boilers in Europe.

1.2 Previous and/or Other Names

The facility has not been known by any other name other than Georgia Biomass, LLC.

1.3 Overall Facility Process Description

Georgia Biomass operates a wood pellet facility located in Waycross, Georgia. The facility includes a wood fiber receiving and storage area, two direct-fired dryers, two hammermill lines with five hammermills in each line, five pelletmills and five pellet coolers and wood pellet loadout area. The Waycross facility processes logs into fuel pellets. Tree length pulpwood logs are received via trucks. The logs are stored to promote air drying. A log loader transfers the logs into a debarker drum. The bark is separated and used as fuel in the heat energy systems providing heat for drying the wood chips in the dryers. The debarked logs are chipped into small chips. Oversized chips are removed using a jet screen located downstream from the chipper and the chips stream is pneumatically conveyed to a cyclone to drop out the chips and control PM emissions from the chipping operation. The chips are fed into two direct-fired rotary dryers where in the moisture level in the chips is reduced from around 50% to 10%. Heat for the chip dryers is obtained from the two 193 MMBtu/hr bark fueled heat energy systems. The dried wood chips pass through 10 total hammermills in two hammermill lines, which further grind the wood chips into wood flakes before they are compressed into pellets on a rotating press roll (pelletizer/pelletmill). The pellets are cooled in five counter-flow pellet coolers before they are loaded into rail cars where they are transported to Savannah for storage prior to shipment via vessels to be used in utility power boilers in Europe.

In February 2013 the facility proposed to control VOC and HAP emissions from the Hammermills, Pellet Coolers and Conveying equipment aspiration systems for the hammermills and pelletmills using two Regenerative Catalytic Oxidizers (RCOs) so that facilitywide VOC emission will be less than PSD major source threshold of 250 tons per year. The two RCOs were required by Consent Order No. EPD-AQC-6566 dated March 4, 2013.

The Waycross facility can produce up to 826,733 tpy of wood pellets.[1] The Waycross facility has the capacity to operate continuously (8,760 hr/yr).

[1] Production capacity design of 750,000 metric tons per year of wood pellets.

PART 2.0 REQUIREMENTS PERTAINING TO THE ENTIRE FACILITY

2.1 Facility Wide Emission Caps and Operating Limits

2.1.1 The Permittee shall not discharge or cause the discharge into the atmosphere from the entire facility, any emissions which contain Nitrogen Oxides (NOx), Carbon Monoxide (CO) or Volatile Organic Compounds (VOC) in excess of 249 tons during any twelve consecutive months.
[Avoidance of 40 CFR 52.21]

2.1.2 The Permittee shall not discharge or cause the discharge into the atmosphere from the entire facility any single hazardous air pollutant which is listed in Section 112 of the Clean Air Act, in an amount equal to or exceeding 10 tons during any twelve consecutive months, or any combination of such listed pollutants in an amount equal to or exceeding 25 tons during any twelve consecutive months.
[Avoidance of Major Source MACT per 40 CFR 63]

2.2 Facility Wide Federal Rule Standards

None applicable.

2.3 Facility Wide SIP Rule Standards

None applicable.

2.4 Facility Wide Standards Not Covered by a Federal or SIP Rule and Not Instituted as an Emission Cap or Operating Limit

None applicable.

PART 3.0 REQUIREMENTS FOR EMISSION UNITS

Note: Except where an applicable requirement specifically states otherwise, the averaging times of any of the Emissions Limitations or Standards included in this permit are tied to or based on the run time(s) specified for the applicable reference test method(s) or procedures required for demonstrating compliance.

3.1 Emission Units

Emission Units		Specific Limitations/Requirements		Air Pollution Control Devices	
ID No.	**Description**	**Applicable Requirements/Standards**	**Corresponding Permit Conditions**	**ID No.**	**Description**
LC01	Wood chip Screen	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	CYC1	Cyclone
HES1	193 MMBtu/hr Heat Energy System 1	391-3-1-.02(2)(d) subsumed 40 CFR 60 Subparts A & Db 40 CFR 63 Subparts A and 6J PSD avoidance	2.1.1, 2.1.2, 3.2.1, 3.2.2, 3.2.3, 3.3.1, 3.3.5, 3.3.11, 3.3.12, 3.3.13, 3.4.1, 3.4.5, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.2.5, 5.2.1, 5.2.2, 5.2.3, 5.2.9 , 5.2.8, 5.2.12, 5.2.13, 6.1.6b, 6.1.6c, 6.2.1, 6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.6, 6.2.7 through 6.2.10	WE01 RTO1	Wet ESP Regenerative Thermal Oxidizer
HES2	193 MMBtu/hr Heat Energy System 2			WE02 RTO2	Wet ESP Regenerative Thermal Oxidizer
DRY1	Rotary Drum Dryer 1	391-3-1-.02(2)(e) PSD avoidance	2.1.1, 2.1.2, 3.2.1, 3.2.2, 3.2.3, 3.3.11, 3.4.2, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 5.2.1, 5.2.2, 5.2.3, 5.2.7, 5.2.8, 6.1.6b, 6.1.6c, 6.2.2, 6.2.3, 6.2.4, 6.2.5.	WE01 RTO1	Wet ESP Regenerative Thermal Oxidizer
DRY2	Rotary Drum Dryer 2			WE02 RTO2	Wet ESP Regenerative Thermal Oxidizer
CE01	Conveying Equipment Aspiration System for Hammermill Lines	391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	2.1.1, 2.1.2, 3.2.4, 3.2.5, 3.4.1, 3.4.2, 3.5.1, 4.2.3, 4.2.4, 4.2.5, 5.2.2, 5.2.4, 5.2.5, 5.2.6, 5.2.11, 6.1.6c.	CBH2 RCO1	Baghouse Regenerative Catalytic Oxidizer (West)
HML1	Hammermill Line 1 (5 Hammermills)	391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	2.1.1, 2.1.2, 3.2.4, 3.2.5, 3.4.1, 3.4.2, 3.5.1, 4.2.6, 4.2.7, 5.2.4, 5.2.5, 5.2.6, 3.5.1, 5.2.2a, 5.2.10, 5.2.11, 6.1.7c, 5.1.3, 6.2.2, 6.2.3	HBH1 HBH2 HBH3 HBH4 HBH8 RCO1	Baghouses Regenerative Catalytic Oxidizer (West)
HML2	Hammermill Line 2 (5 Hammermills)	391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	2.1.1, 3.2.4, 3.2.5, 3.4.1, 3.4.2, 3.5.1, 4.2.5, 5.2.4, 5.2.5, 5.2.6, 3.5.1, 5.2.2a, 5.2.10, 5.2.11, 6.1.7c, 5.1.3, 6.2.2, 6.2.3	HBH5 HBH6 HBH7 HBH9 HBH10 RCO1	Baghouses Regenerative Catalytic Oxidizer (West)
CE02	Conveying Equipment Aspiration System for Pelletmill/Pellet Cooler Lines	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(n)	2.1.1, 3.2.4, 3.2.5, 3.4.1, 3.4.2, 3.4.4, 4.2.5, 5.2.4, 5.2.5, 5.2.6, 3.5.1, 5.2.2a, 5.2.11, 6.1.7c, 5.1.3, 6.2.2, 6.2.3	PBH1-PBH5 RCO2	Five Bag houses Regenerative Catalytic Oxidizer (East)

Emission Units		Specific Limitations/Requirements		Air Pollution Control Devices	
ID No.	**Description**	**Applicable Requirements/Standards**	**Corresponding Permit Conditions**	**ID No.**	**Description**
PML1 thru PML5	Pelletmill (5 Lines)	391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	3.4.1, 3.4.2, 5.2.4, 5.2.5, 5.2.6, 5.2.10, 5.2.11, 6.1.7c, 5.1.3	PAB1 RCO2	Baghouse Regenerative Catalytic Oxidizer (East)
PCL1 PCL2 PCL3 PCL4 PCL5	Pellet Cooler Line 1 Pellet Cooler Line 2 Pellet Cooler Line 3 Pellet Cooler Line 4 Pellet Cooler Line 5	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(n)	2.1.1, 3.2.4, 3.2.5, 3.4.1, 3.4.2, 3.5.1, 4.2.5, 5.2.4, 5.2.5, 5.2.6, 3.5.1, 5.2.2a, 5.2.10, 5.2.11, 6.1.7c, 5.1.3, 6.2.3.	PBH1 - PBH5 RCO2	Five Bag houses Regenerative Catalytic Oxidizer (East)
PA01	Pelletizing Area Vacuum System	391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	3.4.1, 3.4.2, 3.4.4, 5.2.4, 5.2.5, 5.2.6, 6.1.7c, 5.1.3	PAB1	Baghouse
RL01	Railcar Loadout	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	RCF1	Compact Filter
FP01	300 hp Fire Water Pump Engine – diesel fired	391-3-1-.02(2)(b) 40 CFR 60 Subparts A and IIII 40 CFR 63 Subpart ZZZZ	3.3.2, 3.3.3, 3.3.7, 3.3.8, 3.3.9, 3.3.10, 3.4.1, 5.2.14, 6.1.7c, 6.2.11, 6.2.12	N/A	N/A
EG01	500 kW Diesel fired Emergency Generator - Dryers	391-3-1-.02(2)(b) 40 CFR 60 Subparts A and IIII 40 CFR 63 Subpart ZZZZ	3.3.2, 3.3.3, 3.3.6, 3.3.8, 3.3.9, 3.3.10, 3.4.1, 5.2.14, 6.1.7c, 6.2.11, 6.2.12	N/A	N/A
EG02	250 kW Diesel fired Emergency Generator - Pelletizing	391-3-1-.02(2)(b) 40 CFR 60 Subparts A and IIII 40 CFR 63 Subpart ZZZZ	3.3.2, 3.3.3, 3.3.6, 3.3.8, 3.3.9, 3.3.10, 3.4.1, 5.2.14, 6.1.7c, 6.2.11, 6.2.12	N/A	N/A

* 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.

3.2 Equipment Emission Caps and Operating Limits

3.2.1 The Permittee shall not discharge or cause the discharge into the atmosphere from Heat Energy Systems (HES1 and HES2) and Dryers (DRY1 and DRY2), any emissions which contain Total Particulate Matter (TPM) (filterable+condessible) in excess of 0.047 pounds per million Btu heat input from each stack.
[Avoidance of 40 CFR 52.21]

3.2.2 The Permittee shall operate and maintain the WetESP (WE01 and WE02) and the Regenerative Thermal Oxidizers (RTO1 and RTO2) during all periods in which the respective Heat Energy Systems (HES1 and HES2)/Dryers (DRY1 and DRY2) are in operation.
[391-3-1-.03(2)(c)]

3.2.3 The combustion temperature of the Regenerative Thermal Oxidizers (RTO1 and RTO2) shall be at least 1500°F, or the temperature approved by the Division based upon the most recent VOC performance test.
[391-3-1-.03(2)(c)]

3.2.4 The Permittee shall operate and maintain the Regenerative Catalytic Oxidizers (RCO1 and RCO2) during all periods in which the Hammermill lines (HML1 and HML2), the Pelletmills (PML1 – PML5), the Pellet cooler Lines (PCL1 – PCL5) and the conveying equipment aspiration systems (CEO1 and CEO2) are in operation.
[391-3-1-.03(2)(c)]

3.2.5 The combustion temperature of the Regenerative Catalytic Oxidizers (RCO1 and RCO2) shall be at least 800°F, or the temperature approved by the Division based upon the most recent VOC performance test.
[391-3-1-.03(2)(c)]

3.3 Equipment Federal Rule Standards

3.3.1 The Permittee shall comply with all applicable provisions of the New Source Performance Standards (NSPS) as found in 40 CFR 60 Subpart A - "General Provisions" and 40 CFR 60 Subpart Db - "Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units," for operation of the Heat Energy Systems (HES1 and HES2).
[40 CFR 60 Subpart A and Subpart Db]

3.3.2 The Permittee shall comply with all applicable provisions of the New Source Performance Standards (NSPS) as found in 40 CFR 60 Subpart A - "General Provisions" and 40 CFR 60 Subpart IIII - " Standards of Performance for Stationary Compression Ignition Internal Combustion Engines," for operation of the Fire water pump engine (FP01) and the two Emergency Generators (EG01 and EG02).
[40 CFR 60 Subparts A and IIII]

3.3.3 The Permittee shall comply with all applicable provisions of the National Emission Standard for Hazardous Air Pollutants (NESHAPs) 40 CFR 63 Subpart A and ZZZZ " NESHAP for Stationary Reciprocating Internal Combustion Engines (RICE)" for the operation of Fire water pump engine (FP01) and the two Emergency Generator engines (EG01 and EG02).
[40 CFR 63 Subparts A and ZZZZ]

3.3.4 The Permittee shall comply with all applicable provisions of the "National Emission Standards for Hazardous Air Pollutants" as found in 40 CFR 63 Subpart A, "General Provisions" and 40 CFR 63 Subpart JJJJJJ, "National Emission Standards for Hazardous Air Pollutants for Area Sources: Industrial Commercial, and Institutional Boilers" for the operation of Heat Energy Systems (HES1 and HES2), including the following requirements:
[40 CFR 63 Subpart A and Subpart JJJJJJ and 40 CFR 63.11193]

a. Conduct an initial performance tune-up on Heat Energy Systems (HES1 and HES2) as required by 40 CFR 63.11214. The initial performance tune-up shall be completed by March 21, 2014.
[40 CFR 63.11196(a)(1) and 40 CFR 63.11214(b)]

b. Conduct biennial performance tune-ups on Heat Energy Systems (HES1 and HES2) as required by 40 CFR 63.11223. Each biennial tune-up must be conducted no more than 25 months after the previous tune-up for the purpose of demonstrating

continuous compliance with the Boiler MACT requirements. The tune-up must be conducted as specified in Condition 5.2.16.
[40 CFR 63.11196(a)(1), 63.11214(b), 40 CFR 63.11223(a) and 40 CFR 63.11223(b)]

c. Conduct a one-time energy assessment on Heat Energy Systems (HES1 and HES2) as specified in Table 2 to Subpart JJJJJJ by a qualified energy assessor no later than March 21, 2014. An energy assessment completed on or after January 1, 2008, that meets or is amended to meet the energy assessment requirements of this condition, satisfies the energy assessment requirement. The energy assessment must be conducted per Condition 5.2.17.
[40 CFR 63.11196(a)(3), 40 CFR 63.11201(b), and 40 CFR 63.11237]

3.3.5 At all times, the Permittee shall operate and maintain the Heat Energy Systems (HES1 and HES2) and associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions.
[40 CFR 63.11205(a)]

3.3.6 The Permittee shall not discharge or cause the discharge into the atmosphere from the engine of either Emergency Generator engine (EG01 and EG02), any gases which contain emissions in excess of the following:
[40 CFR 60.4205(b)]

a. CO emissions in excess of 3.5 g/kW-hr or 2.6 g/bhp-hr

b. PM emissions in excess of 0.2 g/kW-hr or 0.15 g/bhp-hr

c. NMHC + NOx emissions in excess of 4.0 g/kW-hr or 3.0 g/bhp-hr

3.3.7 The Permittee shall not discharge or cause the discharge into the atmosphere from the Fire Water Pump Engine (FP01), any gases which contain emissions in excess of the following:
[40 CFR 60.4205(c)]

a. PM emissions in excess of 0.2 g/kW-hr or 0.15 g/bhp-hr

b. NMHC + NOx emissions in excess of 4.0 g/kW-hr or 3.0 g/bhp-hr.

3.3.8 The Permittee shall only fire diesel fuel in the Emergency Generator engines (EG01 and EG02) and Fire Water Pump Engine (FP01), which meets the following requirements:
[40 CFR 60.4207(b) and 391-3-1-.02(2)(g) subsumed]

a. Maximum sulfur content of 15 ppm.

b. A minimum cetane index of 40, or

c. A maximum aromatic content of 35 volume percent.

3.3.9 The maintenance check and readiness testing time for the Emergency Generator engines (EG01 and EG02) and Fire Water Pump Engine (FP01) shall not exceed 100 hours during any twelve consecutive months for each unit. Any operation other than emergency operation, maintenance check and readiness testing is prohibited.
[40 CFR 60.4211(e)]

3.3.10 The Permittee shall operate and maintain the Emergency Generator engines (EG01 and EG02) and Fire Water Pump Engine (FP01) according to the engine manufacturer's written instructions, or using procedures developed by the Permittee that are approved by the engine manufacturer.
[40 CFR 60.4206 and 40 CFR 60.4211(a)]

3.3.11 The Permittee shall not cause, let, suffer, permit or allow the emission of filterable Particulate Matter (PM) from the Heat Energy Systems (HES1 and HES2) and Dryers (DRY1 and DRY2) in amounts equal to or exceeding 0.03 pounds per million Btu heat input.
[40 CFR 60.43b(h)(1) and 391-3-1-.02(2)(d) subsumed]

3.3.12 The Permittee shall limit the fuel fired in the Heat Energy Systems (HES1 and HES2) to biomass only, in order to avoid having to calculate the annual capacity factor for the fuel fired in these sources.
[40 CFR 60.49b(d)(2)]

3.3.13 The Permittee shall not discharge, or cause the discharge, into the atmosphere from the Heat Energy Systems (HES1 and HES2), gases which exhibit opacity equal to or greater than 20 percent except for one six-minute period of not more than 27 percent opacity except during periods of startup, shutdown, and malfunction.
[40 CFR 60.43b(g) and 391-3-1-.02(2)(d) (subsumed)]

3.4 Equipment SIP Rule Standards

3.4.1 The Permittee shall not cause, let, suffer, permit or allow emissions from sources in the emission units table in Section 3.1 for which this rule is applicable, the opacity of which is equal to or greater than forty (40) percent except the Heat Energy Systems (HES1 and HES2).
[391-3-1-.02(2)(b)1.]

3.4.2 The Permittee shall not cause, let, permit, suffer, or allow the rate of emissions from each manufacturing process, including the Hammermill Lines (HML1 and HML2), Pelletmill Lines (PML1 to PML5), Pellet Cooler Lines (PCL1 to PCL5), Railcar Loadout (RL01) and other sources in the emission units table in Section 3.1 for which this rule is applicable, particulate matter in total quantities equal to or exceeding the allowable rate, calculated as follows:
[391-3-1-.02(2)(e)]

$E = 4.1P^{0.67}$; for process input weight rate up to and including 30 tons per hour, or
$E = 55P^{0.11} - 40$; for process input weight above 30 tons per hour

Where:

E = emission rate in pounds per hour
P = process input weight rate in tons per hour

3.4.3 The Permittee shall take all reasonable precautions to prevent dust from any operation, process, handling, transportation or storage facility from becoming airborne. Reasonable precautions that could be taken to prevent dust from becoming airborne include, but are not limited to, the following:
[391-3-1-.02(2)(n)]

a. Use, where possible, of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads or the clearing of land;

b. Application of asphalt, water, or suitable chemicals on dirt roads, materials, stockpiles, and other surfaces that can give rise to airborne dusts;

c. Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials;

d. Covering, at all times when in motion, open bodied trucks that are transporting materials likely to give rise to airborne dusts; and

e. The prompt removal of earth or other material from paved streets onto which earth or other material has been deposited.

3.4.4 The opacity from any fugitive dust source shall not equal or exceed 20 percent.
[391-3-1-.02(2)(n)]

3.4.5 The Permittee shall not burn fuel containing more than 3 percent sulfur, by weight, in the Heat Energy Systems (HES1 and HES2).
[391-3-1-.02(2)(g)]

3.5 Equipment Standards Not Covered by a Federal or SIP Rule and Not Instituted as an Emission Cap or Operating Limit

3.5.1 Before March 4, 2014, the Permittee shall install, start up, maintain and operate Regenerative Catalytic Oxidizers (RCO1 and RCO2) to control VOC emissions from the Hammermill Lines (HML1 and HML2), the Pellet Coolers (PCL1 through PCL5) and the Conveying Equipment Aspiration Systems (CE01 and CE02) for the Hammermills and the Pelletmills/Pellet Coolers, which are designed to reduce VOC emissions, such that facilitywide VOC emissions are less than the limits in Condition 2.1.1.
[391-3-1-.02(6)(b)1 and Consent Order No. EPD-AQC-6566 dated March 4, 2013]

PART 4.0 REQUIREMENTS FOR TESTING

4.1 General Testing Requirements

4.1.1 The Permittee shall cause to be conducted a performance test at any specified emission unit when so directed by the Environmental Protection Division ("Division"). The test results shall be submitted to the Division within 60 days of the completion of the testing. Any tests shall be performed and conducted using methods and procedures that have been previously specified or approved by the Division.
[391-3-1-.02(6)(b)1(i)]

4.1.2 The Permittee shall provide the Division thirty (30) days (or sixty (60) days for tests required by 40 CFR Part 63) prior written notice of the date of any performance test(s) to afford the Division the opportunity to witness and/or audit the test, and shall provide with the notification a test plan in accordance with Division guidelines.
[391-3-1-.02(3)(a) and 40 CFR 63.7(b)(1)]

4.1.3 Performance and compliance tests shall be conducted and data reduced in accordance with applicable procedures and methods specified in the Division's Procedures for Testing and Monitoring Sources of Air Pollutants. The methods for the determination of compliance with emission limits listed under Sections 3.2, 3.3, 3.4 and 3.5 are as follows:

a. Method 1 shall be used for the determination of sample point locations.

b. Method 2 shall be used for the determination of stack gas flow rate.

c. Method 3 or 3A shall be used for the determination of stack gas molecular weight.

d. Method 3B shall be used for the determination of emission rate correction factor or excess air, Method 3A may be used as an alternative.

e. Method 4 shall be used for the determination of stack gas moisture.

f. Method 5 for the determination of Particulate Matter emissions to demonstrate compliance with the Particulate Matter emission limit in Condition 3.3.11.

g. Method 5 in conjunction with Method 202 shall be used to demonstrate compliance with the Particulate Matter emission limit in Condition 3.2.8.

h. Method 7E shall be used for the determination of NOx concentrations.

i. Method 9 and the procedures in Section 1.3 of the above referenced document shall be used to determine the opacity.

j. Method 10 shall be used for the determination of CO concentrations.

k. Method 19 shall be used when applicable; to convert particulate matter, carbon monoxide, and nitrogen oxides concentrations (i.e., grains/dscf for PM, ppm for gaseous pollutants), as determined using other methods specified in this section, to mass emission rates (i.e., lb/MM Btu, lb/hr).

l. EPA OTM-26 (Interim VOC Measurement Protocol for the Wood Products Industry – July 2007) or "WPP1 VOC" (Wood Products Protocol 1 VOC) shall be used for the determination of VOC concentrations.

i. Method 25A shall be used for the determination of VOC concentrations.

ii. NCASI 99.02 or Method 308 shall be used for the determination of methanol concentrations.

iii. NCASI 99.02 or Method 316 or NCASI 98.01 or shall be used for the determination of formaldehyde concentrations.

iv. NCASI 99.02 or SW 846 Method 0011 shall be used for the determination of acetaldehyde concentrations.

Minor changes in methodology may be specified or approved by the Director or his designee when necessitated by process variables, changes in facility design, or improvement or corrections that, in his opinion, render those methods or procedures, or portions thereof, more reliable.
[391-3-1-.02(3)(a)]

4.1.4 The Permittee shall submit performance test reports to the US EPA's WebFIRE database in accordance with any applicable NSPS or NESHAP standards (40 CFR 60 or 40 CFR 63) that contain Electronic Data Reporting Requirements. Subsequent to the initial performance test, results of the Method 5 portion of tests specified in Condition 4.2.2 shall also be reported electronically to EPA using the Electronic Reporting Tool (ERT).
[391-3-1-.02)(8)(a) and 391-3-1-.02(9)(a)]

4.2 Specific Testing Requirements

4.2.1 The Permittee shall conduct PM tests to show compliance with the PM limit in Condition 3.2.1 at 12-month intervals. The tests shall be conducted at the maximum anticipated production rate. Should the PM emissions for the Heat Energy Systems be fifty (50) percent or less of the emissions limit contained in Condition 3.2.1, the testing may be conducted at 24 month intervals until such time that an emissions test indicates an emission rate greater than 50 percent of that limit, at which time testing shall revert to 12 month intervals. If the results of the PM test exceed the factor currently being used in Condition 6.2.2, then the Permittee must immediately reestablish the factors using the method described in Condition 6.2.2 (using the new, higher emission factors starting on the test date). During the performance testing, the Permittee shall record the amount of product dried in the dryers. Performance testing shall be conducted with the equipment operating under normal conditions.
[391-3-1-.02(6)(b)1(i)]

4.2.2 The Permittee shall conduct NOx and CO tests on the RTO exit stack, at 12-month intervals. The tests shall be conducted at the maximum anticipated drying rate and pellet production rate. If the results of either the NOx or CO test exceed the factor currently being used in Condition 6.2.2, then the Permittee must immediately reestablish the factors using the method described in Condition 6.2.2 (using the new, higher emission factors starting on the test date). The performance test must be conducted simultaneously each time a test is required for one of these pollutants.
[391-3-1-.02(6)(b)1(i)]

4.2.3 The Permittee shall conduct VOC, formaldehyde, acetaldehyde, and methanol tests on the RTO exit stacks. The Permittee shall conduct VOC tests on RCO exit stacks. The tests shall be conducted at 48 month intervals at the maximum anticipated production rate. The performance test must be conducted simultaneously each time a test is required for one of these pollutants. During the performance tests the Permittee shall continuously measure and record the combustion zone temperatures for the RTOs and RCOs. These measurements shall be used to establish the minimum temperature at which the RTOs and RCOs must operate so that compliance with the VOC emission limit of Condition 2.1.1 can be assured. The Permittee shall submit the temperature measurements recorded during the testing and the temperatures established to the Division for approval.
[391-3-1-.02(6)(b)1(i)]

4.2.4 During the performance tests, the Permittee shall, using the monitoring systems required by Condition 5.2.2, verify the control device is operating within the appropriate operating limits for the following control device parameters:
[391-3-1-.02(6)(b)1(i)]

.

a. the total secondary power of each wet ESP calculated from the secondary voltage and secondary current.

b. the minimum combustion temperature of the RTOs and RCOs.

4.2.5 Within 120 days of initial startup of the RCOs (RCO1 and RCO2), the Permittee shall conduct performance tests for VOC emissions from the Hammermills, Pellet coolers and the conveying equipment aspiration systems. The Permittee shall submit the temperature measurements recorded during the testing and the temperature ranges established if any to the Division for approval. Test notification shall be made per Condition 4.1.2. Test results shall be submitted per Condition 4.1.1. The test results shall be submitted with an analysis demonstrating that facilitywide VOC emissions comply with the limit in Condition 2.1.1. The test methods in Condition 4.1.3 shall be used in the performance tests.
[391-3-1-.02(6)(b)1(i) and Consent Order No. EPD-AQC-6566 dated March 4, 2013]

PART 5.0 REQUIREMENTS FOR MONITORING (Related to Data Collection)

5.1 General Monitoring Requirements

5.1.1 Any continuous monitoring system required by the Division and installed by the Permittee shall be in continuous operation and data recorded during all periods of operation of the affected facility except for continuous monitoring system breakdowns and repairs. Monitoring system response, relating only to calibration checks and zero and span adjustments, shall be measured and recorded during such periods. Maintenance or repair shall be conducted in the most expedient manner to minimize the period during which the system is out of service.
[391-3-1-.02(6)(b)1]

5.1.2 Routine maintenance shall be performed on all air pollution control equipment. Maintenance records shall be in a form suitable for inspection or submittal to the Division and shall be maintained for a period of five (5) years from date of entry.
[391-3-1-.02(6)(b)1]

5.1.3 The Permittee shall maintain an inventory of baghouse filter bags such that an adequate supply of bags is on hand to replace any defective ones.
[391-3-1-.02(6)(b)1]

5.2 Specific Monitoring Requirements

5.2.1 The Permittee shall install, calibrate, maintain, and operate a system to continuously monitor and record the indicated pollutants on the following equipment. Each system shall meet the applicable performance specification(s) of the Division's monitoring requirements.
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

a. A Continuous Opacity Monitoring System (COMS) for the measurement of opacity on each stack of the Heat Energy Systems (HES1 and HES2) and Dryers (DRY1 and DRY2). The span value for each COMS shall be between 60 and 80 percent per 40 CFR 60.48b(e)(1).
[40 CFR 60.48b(a), 40 CFR 60.48b(f), 40 CFR 60.13 and 40 CFR 60.49b(b)]

5.2.2 The Permittee shall install, calibrate, maintain, and operate a system to continuously monitor and record the indicated parameters on the following equipment. Each system shall meet the applicable performance specification(s) of the Division's monitoring requirements.
[391-3-1-.02(6)(b)1, 40 CFR 60.48b(a), and 40 CFR 60.49b(f) for the energy system]

a. The combustion temperature of the RTOs and RCOs. The temperature monitoring device shall have an accuracy of ±2% (°F).

b. The secondary voltage for each field of the Wet ESPs (WE01 and WE02). Such devices shall have a required accuracy of ±2%.

c. The secondary current for each field of the Wet ESPs (WE01 and WE02).

5.2.3 The Permittee shall, using the data required to be recorded by Condition 5.2.2, determine the total power for each hour of operation. Total Wet ESP power shall be calculated using the following equation:
[391-3-1-.02(6)(b)1]

$$P_t = \sum_{i=1}^{n} V_i I_i$$

Where:
P_t = Total Wet ESP power (watts)
V_i = secondary voltage (kV) in wetESP field i
I_i = secondary current (ma) in ESP field i
n = Total number of fields in ESP
i = ith field in ESP (i =1 to n)

5.2.4 The Permittee shall install, calibrate, maintain, and operate pressure drop indicators on each of the Hammermill Line Baghouses (HBH1, HBH2, HBH3, HBF4, HBH5, HBH6, HBH7, HBH8, HBH9, and HBH10), Pellet Cooler Line Baghouses (PBH1, PBH2, PBH3, PBH4, and PBH5), Conveying Equipment Aspiration System Baghouses (CBH1 and CBH2) and Pelletizing Area Vacuum System Baghouse (PAB1). Where such performance specification(s) exist, each system shall meet the applicable performance specification(s) of the Division's monitoring requirements. The Permittee shall read and record the pressure drop at least once per week of operation. A logbook containing these records shall be available for inspection and/or submittal to the Division.
[391-3-1-.02(6)(b)1]

5.2.5 The Permittee shall perform checks of the visible emissions (VE) from the Hammermill Line Baghouses (HBH1, HBH2, HBH3, HBF4, HBH5, HBH6, HBH7, HBH8, HBH9, and HBH10), Pellet Cooler Line Baghouses (PBH1, PBH2, PBH3, PBH4, and PBH5), Conveying Equipment Aspiration System Baghouses (CBH1 and CBH2), and Pelletizing Area Vacuum System Baghouse (PAB1). VE checks shall be made daily, for each day of operation. The Permittee shall retain a record in a VE log, suitable for inspection or submittal.

The checks shall be conducted using the procedure below except when atmospheric conditions or sun positioning prevent any opportunity to perform the daily VE check.
Any operational day when atmospheric conditions or sun position prevent a daily reading shall be reported as monitor downtime in the VE log.
[391-3-1-.02(6)(b)1]

a. The person performing the determination shall stand at a distance of at least 15 feet which is sufficient to provide a clear view of the plume against a contrasting background with the sun in the 140° sector at his/her back. Consistent with this requirement, the determination shall be made from a position such that the line of vision is approximately perpendicular to the plume direction. Only one plume shall be in the line of sight at any time when multiple stacks are in proximity to each other.

b. For each source that exhibits visible emissions, the Permittee shall determine the cause of that visible emission and correct the problem in the most expedient manner possible. The Permittee shall note the cause of the visible emission, the pressure drop, any other pertinent operating parameters, and the corrective action taken in the log described above.

5.2.6 The Permittee shall implement a Preventive Maintenance Program (PMP) for the Hammermill Line Baghouses (HBH1, HBH2, HBH3, HBF4, HBH5, HBH6, HBH7, HBH8, HBH9, and HBH10), Pellet Cooler Line Baghouses (PBH1, PBH2, PBH3, PBH4, and PBH5), Conveying Equipment Aspiration System Baghouses (CBH1 and CBH2) and Pelletizing Area Vacuum System Baghouse (PAB1). At a minimum, the following operation and maintenance checks shall be made on at least a weekly basis, and a record of the findings and corrective actions taken shall be kept in a maintenance log:
[391-3-1-.02(6)(b)1]

a. For baghouses equipped with compressed air cleaning systems, check the system for proper operation. This may include checking for low pressure, leaks, proper lubrication, and proper operation of timer and valves.

b. For baghouses equipped with reverse air cleaning systems, check the system for proper operation. This may include checking damper, bypass, and isolation valves for proper operation.

c. For baghouses equipped with shaker cleaning systems, check the system for proper operation. This may include checking shaker mechanism for loose or worn bearings, drive components, mounting; proper operation of outlet/isolation valves; and proper lubrication.

d. Check dust collector hoppers and conveying systems for proper operation.

5.2.7 The Permittee shall keep operating records to determine the total amount of product dried in each of the Dryers (DRY1 and DRY2) in oven dried tons (ODT), on a monthly basis.
[PSD Avoidance per 40 CFR 52.21]

5.2.8 The Permittee shall ensure that temperatures in the RTO combustion zone are maintained above the levels established during the most recent compliance test and measured using a temperature sensor. Three-hour combustion temperature data shall be calculated from the measured temperature data.

5.2.9 The Permittee shall calculate three-hour average wetESP secondary power using data measured per Condition 5.2.3.
[391-3-1-.02(6)(b)1]

5.2.10 The Permittee shall keep operating records to determine the total amount of product processed in each of the Hammermill Lines (HML1 and HML2), the Pelletmills (PML1 – PML5) and the five Pellet Coolers (PCL1 – PCL5) in (short tons), on a monthly basis.
[PSD Avoidance per 40 CFR 52.21 and 391-3-1-.02(6)(b)1]

5.2.11 The Permittee shall check the activity level of the catalyst in each RCO (RCO1 and RCO2) at least once every 12 months to ensure efficient removal/destruction of VOC. [391-3-1-.02(6)(b)1]

5.2.12 The Permittee shall conduct a performance tune-up on the Heat Energy Systems (HES1 and HES2) biennially, as specified in 40 CFR 63.11223. Each biennial tune-up must be conducted no more than 25 months after the previous tune-up. The initial tune-up shall be conducted by March 21, 2014. The tune-ups shall include the following:
[40 CFR 63.11196(a)(1), 40 CFR 63.11223(a) and (b), and Table 2 of 40 CFR 63 Subpart JJJJJJ]

a. As applicable, inspect the burner, and clean or replace any components of the burner as necessary (you may delay the burner inspection until the next scheduled unit shutdown, not to exceed 36 months from the previous inspection).

b. Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimize the flame pattern. The adjustment should be consistent with the manufacturer's specifications, if available.

c. Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly.

d. Optimize total emissions of carbon monoxide. This optimization should be consistent with the manufacturer's specifications, if available, and with any nitrogen oxide requirement to which the unit is subject.

e. Measure the concentrations in the effluent stream of carbon monoxide in parts per million, by volume, and oxygen in volume percent, before and after the adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). Measurements may be taken using a portable CO analyzer.

f. Maintain onsite and submit, if requested by the Division, a biennial report containing the following information:

i. The concentrations of CO in the effluent stream in parts per million, by volume, and oxygen in volume percent, measured at high fire or typical operating load, before and after the tune-up of the Heat Energy System.

ii. A description of any corrective actions taken as a part of the tune-up of the Heat Energy System.

iii. The type and amount of fuel used over the 12 months prior to the tune-up of the Heat Energy System.

g. If the unit is not operating on the required date for a tune-up, the tune-up must be conducted within 30 days of startup.

5.2.13 The Permittee must have a one-time energy assessment performed on the Heat Energy Systems (HES1 and HES2), by a qualified energy assessor no later than March 21, 2014. An energy assessment completed on or after January 1, 2008, that meets or is amended to meet the energy assessment requirements in Table 2 of Subpart JJJJJJ, satisfies the energy assessment requirement for the Heat Energy System. The energy assessment must include:
[40 CFR 63.11196(a)(3) and Table 2 of 40 CFR 63 Subpart JJJJJJ]

a. A visual inspection of the boiler system,

b. An evaluation of operating characteristics of the affected boiler systems, specifications of energy use systems, operating and maintenance procedures, and unusual operating constraints,

c. An inventory of major energy use systems consuming energy from affected Heat Energy System(s),

d. A review of available architectural and engineering plans, facility operation and maintenance procedures and logs, and fuel usage,

e. A list of major energy conservation measures,

f. A list of the energy savings potential of the energy conservation measures identified,

g. A comprehensive report detailing the ways to improve efficiency, the cost of specific improvements, benefits, and the time frame for recouping those investments.

5.2.14 The Permittee shall install, calibrate, maintain, and operate a non-resettable hour meter to measure and record the engine operating hours for the Emergency Generators (EG01 and EG02) and Fire Water Pump Engine (FP01).
[40 CFR 60.4209(a)]

PART 6.0 RECORD KEEPING AND REPORTING REQUIREMENTS

6.1 General Record Keeping and Reporting Requirements

6.1.1 Unless otherwise specified, all records required to be maintained by this Permit shall be recorded in a permanent form suitable for inspection and submission to the Division and to the EPA. The records shall be retained for at least five (5) years following the date of entry.
[391-3-1-.02(6)(b)1(i) and 40 CFR 70.6(a)(3)]

6.1.2 In addition to any other reporting requirements of this Permit, the Permittee shall report to the Division in writing, within seven (7) days, any deviations from applicable requirements associated with any malfunction or breakdown of process, fuel burning, or emissions control equipment for a period of four hours or more which results in excessive emissions.

The Permittee shall submit a written report that shall contain the probable cause of the deviation(s), duration of the deviation(s), and any corrective actions or preventive measures taken.
[391-3-1-.02(6)(b)1(iv), 391-3-1-.03(10)(d)1(i) and 40 CFR 70.6(a)(3)(iii)(B)]

6.1.3 The Permittee shall submit written reports of any failure to meet an applicable emission limitation or standard contained in this permit and/or any failure to comply with or complete a work practice standard or requirement contained in this permit which is not otherwise reported in accordance with Conditions 6.1.4 or 6.1.2. Such failures shall be determined through observation, data from any monitoring protocol, or by any other monitoring which is required by this permit. The reports shall cover each semiannual period ending June 30 and December 31 of each year, shall be postmarked by August 29 and February 28, respectively following each reporting period, and shall contain the probable cause of the failure(s), duration of the failure(s), and any corrective actions or preventive measures taken.
[391-3-1-.03(10)(d)1.(i) and 40 CFR 70.6(a)(3)(iii)(B)]

6.1.4 The Permittee shall submit a written report containing any excess emissions, exceedances, and/or excursions as described in this permit and any monitor malfunctions for each semi-annual period ending June 30 and December 31 of each year. All reports shall be postmarked by August 29 and February 28, respectively. In the event that there have not been any excess emissions, exceedances, excursions or malfunctions during a reporting period, the report should so state. Otherwise, the contents of each report shall be as specified by the Division's Procedures for Testing and Monitoring Sources of Air Pollutants and shall contain the following:
[391-3-1-.02(6)(b)(1) and 40 CFR 70.6(a)(3)(iii)(A)]

a. A summary report of excess emissions, exceedances and excursions, and monitor downtime, in accordance with Section 1.5(c) and (d) of the above referenced document, including any failure to follow required work practice procedures.

b. Total process operating time during each reporting period.

c. The magnitude of all excess emissions, exceedances and excursions computed in accordance with the applicable definitions as determined by the Director, and any conversion factors used, and the date and time of the commencement and completion of each time period of occurrence.

d. Specific identification of each period of such excess emissions, exceedances, and excursions that occur during startups, shutdowns, or malfunctions of the affected facility. Include the nature and cause of any malfunction (if known), the corrective action taken or preventive measures adopted.

e. The date and time identifying each period during which any required monitoring system or device was inoperative (including periods of malfunction) except for zero and span checks, and the nature of the repairs, adjustments, or replacement. When the monitoring system or device has not been inoperative, repaired, or adjusted, such information shall be stated in the report.

f. Certification by a Responsible Official that, based on information and belief formed after reasonable inquiry, the statements and information in the report are true, accurate, and complete.

6.1.5 Where applicable, the Permittee shall keep the following records:
[391-3-1-.03(10)(d)1(i) and 40 CFR 70.6(a)(3)(ii)(A)]

a. The date, place, and time of sampling or measurement;

b. The date(s) analyses were performed;

c. The company or entity that performed the analyses;

d. The analytical techniques or methods used;

e. The results of such analyses; and

f. The operating conditions as existing at the time of sampling or measurement.

6.1.6 The Permittee shall maintain files of all required measurements, including continuous monitoring systems, monitoring devices, and performance testing measurements; all continuous monitoring system or monitoring device calibration checks; and adjustments and maintenance performed on these systems or devices. These files shall be kept in a permanent form suitable for inspection and shall be maintained for a period of at least five (5) years following the date of such measurements, reports, maintenance and records.
[391-3-1-.03(10)(d)1(i) and 40 CFR 70.6 (a)(3)(ii)(B)]

6.1.7 For the purpose of reporting excess emissions, exceedances or excursions in the report required in Condition 6.1.4, the following excess emissions, exceedances, and excursions shall be reported:
[40 CFR 60.49(h)(3), 391-3-1-.02(6)(b)(1) and 40 CFR 70.6(a)(3)(iii)]

a. Excess emissions: (means for the purpose of this Condition and Condition 6.1.4, any condition that is detected by monitoring or record keeping which is specifically defined or stated to be, excess emissions by an applicable requirement)

None to be reported per Condition 6.1.4

b. Exceedances: (means for the purpose of this Condition and Condition 6.1.4, any condition that is detected by monitoring or record keeping that provides data in terms of an emission limitation or standard and that indicates that emissions (or opacity) do not meet the applicable emission limitation or standard consistent with the averaging period specified for averaging the results of the monitoring)

i. Any six-minute period during which the average opacity, measured and recorded in accordance with Condition 3.3.13, exceeds 20 percent, except for one 6-minute period per hour of not more than 27 percent opacity, for the Heat Energy Systems (HES1 and HES2)/Dryers (DRY1 and DRY2).
[40 CFR 60.49b(h)(3)]

ii. Any rolling twelve consecutive month total NOx, CO or VOC emissions from the facility in excess of 249 tons.

iii. Any rolling twelve consecutive month totals for a single HAP or total HAPs in excess of 9.9 tons or 24.9 tons respectively.

iv. Any twelve consecutive month total hours of operation of the Emergency Generator engines (EG01 and EG02) and the Fire Water Pump engine (FP01) which equals or exceeds 100 hours for maintenance checks and readiness testing, in accordance with Condition 3.3.9.

c. Excursions: (means for the purpose of this Condition and Condition 6.1.4, any departure from an indicator range or value established for monitoring consistent with any averaging period specified for averaging the results of the monitoring)

i. Any three-hour average time period during which a Regenerative Thermal Oxidizer (RTO1 and/or RTO2) operates below 1,500°F or the combustion temperature established during the most recent Division-approved performance test.

ii. Any three-hour period during which the average total power for the Wet ESP (WE01 and WE02) is less than 80 percent of the value determined in accordance with Conditions 5.2.2 and 5.2.3.

iii. Any visible emissions from any baghouse, including the Hammermill Line Baghouses (HBH1, HBH2, HBH3, HBF4, HBH5, HBH6, HBH7, HBH8, HBH9, and HBH10), Pellet Cooler Line Baghouses (PBH1, PBH2, PBH3, PBH4, and PBH5), Conveying Equipment Aspiration System Baghouses (CBH1 and CBH2) and Pelletizing Area Vacuum System Baghouse (PAB1), which occurs for two consecutive determinations.

iv. Any three-hour average time period during which a Regenerative Catalytic Oxidizer (RCO1 and/or RCO2) operates below 800°F or the combustion temperature established during the most recent Division-approved performance test.

6.2 Specific Record Keeping and Reporting Requirements

6.2.1 The Permittee shall calculate the monthly NOx and CO emissions from the Heat Energy Systems (HES1 and HES2)/Dryers (DRY1 and DRY2) using the records from Condition 5.2.7 and the following equation:
[PSD Avoidance per 40 CFR 52.21]

$$E = \left(\frac{\text{Emission Factor lb Pollutant}}{\text{ODT}}\right)\left(\text{Monthly Dryer Product ODT}\right)\left(\frac{\text{ton}}{2{,}000\text{lb}}\right)$$

Where: E = tons of NOx/CO pollutant per month
ODT refers to Oven Dried Tons and refers to short tons.

The Permittee can later reestablish both the NOx and CO factors if it wishes. This may be done using the results from the NOx and CO testing required by Conditions 4.2.2 or any other testing, as long as it was done per the permit requirements. The results shall be submitted to the Division. Upon review and approval, the Permittee may then begin using the new factors to calculate CO and NOx emissions. Note that this changes the NOx and CO factors.
[391-3-1-.02(6)(b)1]

6.2.2 The Permittee shall calculate the monthly VOC, Formaldehyde, Acetaldehyde, and Methanol emissions from the Heat Energy Systems (HES1 and HES2)/Dryers (DRY1 and DRY2) and monthly VOC emissions from Hammermills and Pellet coolers using the records from Condition 4.2.3 and the following equation. All emission factors and calculations shall be kept as part of the monthly records, readily available for inspection or submittal. VOC emissions shall be calculated using EPA OTM-26:
[Title III Major Source Avoidance and 391-3-1-.02(6)(b)1]

VOC = [Method 25A VOC $_{\text{as propane}}$ + Methanol + Formaldehyde + Acetaldehyde] – [(0.65) Methanol]

Where the final emission factors are the sum of all results from the Heat Energy Systems and Dryers, Hammermills, Pellet Mills and Pellet Coolers from the Pelletizing Lines for each pollutant.

Then determine the tons of pollutant per month using the following equation.

$$E = \left(\frac{\text{Emission Factor lb Pollutant}}{\text{ODT}}\right)\left(\text{Monthly Dryer Product ODT}\right)\left(\frac{\text{ton}}{2{,}000\text{lb}}\right)$$

Where: E = tons pollutant per month
ODT refers to Oven Dried Tons and refers to short tons.

The Permittee can later reestablish emissions factors if it wishes. This may be done using the results from the testing required by Condition 4.2.3 or any other testing, as long as it was done per the permit requirements. The results shall be submitted to the Division. Upon review and approval, the Permittee may then begin using the new factors to calculate HAP emissions.

Monthly HAPs = (Production in ODT) ($EF_F + EF_M + EF_A + EF_O$)

Where: EF_F = Emission Factor for Formaldehyde (lb/ODT)
EF_M = Emission Factor for Methanol (lb/ODT)
EF_A = Emission Factor for Acetaldehyde (lb/ODT)
EF_O = 0.0205 lb/ODT (Emission Factor for Others)

6.2.3 The Permittee shall use the monthly VOC, NOx, CO, Formaldehyde, Acetaldehyde, Methanol and total HAP emission data required in Conditions 6.2.1 and 6.2.2 to calculate the twelve-month rolling total of each pollutant emissions from the Heat Energy Systems (HES1 and HES2)/Dryers (DRY1 and DRY2), Hammermills, and Pelletmill and Pellet coolers for each calendar month in the reporting period. These records shall be kept available for inspection or submittal.
[391-3-1-.03(2)(c)]

6.2.4 The Permittee shall notify the Division in writing if any individual HAP or total HAP emissions equal or exceed the limit in Condition 2.1.2 during any rolling consecutive twelve-month period. This notification shall be postmarked by the fifteenth day of the following month and shall include an explanation of how the Permittee intends to attain compliance with the emission limit(s) in Condition 2.1.2.
[391-3-1-.03(2)(c)]

6.2.5 The Permittee shall notify the Division in writing if the total NOx, VOC or CO emissions from the facility equal or exceed 249 tons during any rolling consecutive twelve-month period. This notification shall be postmarked by the fifteenth day of the following month and shall include an explanation of how the Permittee intends to attain compliance with the PSD avoidance limits in Conditions 3.2.1 and 2.1.1.
[391-3-1-.03(2)(c)]

6.2.6 The Permittee shall maintain the following records in order to comply with the recordkeeping requirements of 40 CFR 63 Subpart JJJJJJ for the Heat Energy Systems (HES1 and HES2).
[40 CFR 63.11214, 40 CFR 63.11223, 40 CFR 63.11225(c), and 40 CFR Subpart 241]

a. The Permittee must keep a copy of each notification and report that is submitted to comply with Subpart JJJJJJ and all documentation supporting any Initial Notification or Notification of Compliance Status that is submitted.

b. The Permittee must keep records to document conformance with the work practices, emission reduction measures, and management practices required by 40 CFR 63.11214 and 63.11223 as specified:

i. Records must identify each Heat Energy System, the date of tune-up, the procedures followed for tune-up, and the manufacturer's specifications to which the Heat Energy System was tuned.

ii. Records documenting that no secondary materials that are solid waste were combusted in the Heat Energy System in accordance with the definitions and requirements of 40 CFR Part 241.

iii. The Permittee must keep a copy of the energy assessment report.

c. Records of the occurrence and duration of each malfunction of the heat energy system, or of the associated air pollution control and monitoring equipment.

d. Records of actions taken during periods of malfunction to minimize emissions in accordance with the general duty to minimize emissions as required by Condition 3.3.5 in accordance with 40 CFR 63.11205(a), including corrective actions to restore the malfunctioning Heat Energy System, air pollution control, or monitoring equipment to its normal or usual manner of operation.

6.2.7 The Permittee shall submit the following notifications in order to comply with the notification and reporting requirements of 40 CFR 63 Subpart JJJJJJ:
[40 CFR 63.11225(a), 40 CFR 63.9(h)(2)]

a. As specified in 40 CFR 40 CFR 63.11225(a)(2), the Permittee must submit the Initial Notification no later than January 20, 2014.

b. The Permittee must submit the Notification of Compliance Status no later than 120 days after the compliance date of March 21, 2014. In accordance with Subpart JJJJJJ and 40 CFR 63.9(h)(2), the notification must include the following information and certification(s) of compliance, as applicable, and signed by a responsible official:

i. The methods that were used to determine compliance.

ii. The methods that will be used for determining continuing compliance, including a description of monitoring and reporting requirements and test methods.

iii. A statement by the owner or operator as to whether the source has complied with the relevant standard or other requirements.

iv. “This facility complies with the requirements in 40 CFR 63.11214 to conduct an initial tune-up of the Heat Energy System.”

v. “This facility has had an energy assessment performed according to 40 CFR 63.11214(c).”

vi. “No secondary materials that are solid waste were combusted in the Heat Energy System.”

6.2.8 The Permittee shall prepare and submit to the Division a biennial compliance report to comply with the requirements of 40 CFR 63 Subpart JJJJJJ, which shall include the following information:
[40 CFR 63.11225(b)]

a. Company name and address.

b. Statement by a responsible official, with the official's name, title, phone number, email address, and signature, certifying the truth, accuracy and completeness of the notification and a statement of whether the source has complied with all the relevant standards and other requirements of Subpart JJJJJJ. The notification must include the following certification(s) of compliance, as applicable, signed by a responsible official:

i. "This facility complies with the requirements in 40 CFR 63.11223 to conduct a biennial tune-up of each Heat Energy System."

ii. "No secondary materials that are solid waste were combusted in the Heat Energy System."

c. A description of any deviations, the time periods during which the deviations occurred, and the corrective actions taken.

6.2.9 The Permittee shall submit a signed certification in the Notification of Compliance Status report by July 19, 2014 that an energy assessment of the Heat Energy System and its energy use systems was completed according to Condition 5.2.13 of this permit and is an accurate depiction of your facility.
[40 CFR 63.11214]

6.2.10 The Permittee shall maintain a record of all actions taken in accordance with Section 8.22 in the current permit to suppress fugitive dust from any process(s) or any other source of fugitive dust. Such records shall include the date and time of occurrence and a description of the actions taken.
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

6.2.11 The Permittee shall use the hour meters required by Condition 5.2.14 to determine and record the following:
[391-3-1-.02(6)(b)1. and 40 CFR 52.21]

a. The total operating hours for each of the Emergency Generator engines (EG01 and EG02) and the Fire Water Pump engine (FP01) during every calendar month.

b. The total operating hours for each of the Emergency Generator engines (EG01 and EG02) and the Fire Water Pump engine (FP01) for the twelve consecutive month period ending with each calendar month.

6.2.12 The Permittee shall maintain records to demonstrate that each shipment of diesel fuel received for combustion in the Emergency Generator engines (EG01 and EG02) and the Fire Water Pump engine (FP01) complies with the requirements of Condition 3.3.8. Verification shall consist of either of the following:
[40 CFR 60.4207(b) and 391-3-1-.02(2)(g)2.(subsumed)]

a. Fuel oil receipts obtained from the fuel supplier certifying that the oil is diesel fuel and complies with the standards; or

b. Analysis of the diesel fuel conducted by methods of sampling and analysis which have been specified or approved by the Division which demonstrates that the diesel fuel complies with the standards.

PART 7.0 OTHER SPECIFIC REQUIREMENTS

7.1 Operational Flexibility

7.1.1 The Permittee may make Section 502(b)(10) changes as defined in 40 CFR 70.2 without requiring a Permit revision, if the changes are not modifications under any provisions of Title I of the Federal Act and the changes do not exceed the emissions allowable under the Permit (whether expressed therein as a rate of emissions or in terms of total emissions). For each such change, the Permittee shall provide the Division and the EPA with written notification as required below in advance of the proposed changes and shall obtain any Permits required under Rules 391-3-1-.03(1) and (2). The Permittee and the Division shall attach each such notice to their copy of this Permit.
[391-3-1-.03(10)(b)5 and 40 CFR 70.4(b)(12)(i)]

a. For each such change, the Permittee's written notification and application for a construction Permit shall be submitted well in advance of any critical date (typically at least 3 months in advance of any commencement of construction, Permit issuance date, etc.) involved in the change, but no less than seven (7) days in advance of such change and shall include a brief description of the change within the Permitted facility, the date on which the change is proposed to occur, any change in emissions, and any Permit term or condition that is no longer applicable as a result of the change.

b. The Permit shield described in Condition 8.16.1 shall not apply to any change made pursuant to this condition.

7.2 Off-Permit Changes

7.2.1 The Permittee may make changes that are not addressed or prohibited by this Permit, other than those described in Condition 7.2.2 below, without a Permit revision, provided the following requirements are met:
[391-3-1-.03(10)(b)6 and 40 CFR 70.4(b)(14)]

a. Each such change shall meet all applicable requirements and shall not violate any existing Permit term or condition.

b. The Permittee must provide contemporaneous written notice to the Division and to the EPA of each such change, except for changes that qualify as insignificant under Rule 391-3-1-.03(10)(g). Such written notice shall describe each such change, including the date, any change in emissions, pollutants emitted, and any applicable requirement that would apply as a result of the change.

c. The change shall not qualify for the Permit shield in Condition 8.16.1.

d. The Permittee shall keep a record describing changes made at the source that result in emissions of a regulated air pollutant subject to an applicable requirement, but not otherwise regulated under the Permit, and the emissions resulting from those changes.

7.2.2 The Permittee shall not make, without a Permit revision, any changes that are not addressed or prohibited by this Permit, if such changes are subject to any requirements under Title IV of the Federal Act or are modifications under any provision of Title I of the Federal Act. [Rule 391-3-1-.03(10)(b)7 and 40 CFR 70.4(b)(15)]

7.3 Alternative Requirements
[White Paper #2]

Not Applicable.

7.4 Insignificant Activities
(see Attachment B for the list of Insignificant Activities in existence at the facility at the time of permit issuance)

7.5 Temporary Sources
[391-3-1-.03(10)(d)5 and 40 CFR 70.6(e)]

Not Applicable.

7.6 Short-term Activities
(see Form D5 "Short Term Activities" of the Permit application and White Paper #1)

Not Applicable.

7.7 Compliance Schedule/Progress Reports
[391-3-1-.03(10)(d)3 and 40 CFR 70.6(c)(4)]

None applicable.

7.8 Emissions Trading
[391-3-1-.03(10)(d)1(ii) and 40 CFR 70.6(a)(10)]

Not Applicable.

7.9 Acid Rain Requirements

Not Applicable.

7.10 Prevention of Accidental Releases (Section 112(r) of the 1990 CAAA)
[391-3-1-.02(10)]

7.10.1 When and if the requirements of 40 CFR Part 68 becomes applicable, the Permittee shall comply with all applicable requirements of 40 CFR Part 68, including the following.

a. The Permittee shall submit a Risk Management Plan (RMP) as provided in 40 CFR 68.150 through 68.185. The RMP shall include a registration that reflects all covered processes.

b. For processes eligible for Program 1, as provided in 40 CFR 68.10, the Permittee shall comply with 7.10.1.a. and the following additional requirements:

i. Analyze the worst-case release scenario for the process(es), as provided in 40 CFR 68.25; document that the nearest public receptor is beyond the distance to a toxic or flammable endpoint defined in 40 CFR 68.22(a); and submit in the RMP the worst-case release scenario as provided in 40 CFR 68.165.
ii. Complete the five-year accident history for the process as provided in 40 CFR 68.42 and submit in the RMP as provided in 40 CFR 68.168
iii. Ensure that response actions have been coordinated with local emergency planning and response agencies
iv. Include a certification in the RMP as specified in 40 CFR 68.12(b)(4)

c. For processes subject to Program 2, as provided in 40 CFR 68.10, the Permittee shall comply with 7.10.1.a, 7.10.1.b and the following additional requirements:

i. Develop and implement a management system as provided in 40 CFR 68.15
ii. Conduct a hazard assessment as provided in 40 CFR 68.20 through 68.42
iii. Implement the Program 2 prevention steps provided in 40 CFR 68.48 through 68.60 or implement the Program 3 prevention steps provided in 40 CFR 68.65 through 68.87
iv. Develop and implement an emergency response program as provided in 40 CFR 68.90 through 68.95
v. Submit as part of the RMP the data on prevention program elements for Program 2 processes as provided in 40 CFR 68.170

d. For processes subject to Program 3, as provided in 40 CFR 68.10, the Permittee shall comply with 7.10.1.a, 7.10.1.b and the following additional requirements:

i. Develop and implement a management system as provided in 40 CFR 68.15
ii. Conduct a hazard assessment as provided in 40 CFR 68.20 through 68.42
iii. Implement the prevention requirements of 40 CFR 68.65 through 68.87
iv. Develop and implement an emergency response program as provided in 40 CFR 68.90 through 68.95
v. Submit as part of the RMP the data on prevention program elements for Program 3 as provided in 40 CFR 68.175

e. All reports and notification required by 40 CFR Part 68 must be submitted electronically using RMP*eSubmit (information for establishing an account can be found at www.epa.gov/emergencies/content/rmp/rmp_esubmit.htm). Electronic Signature Agreements should be mailed to:

MAIL

Risk Management Program (RMP) Reporting Center
P.O. Box 10162
Fairfax, VA 22038

COURIER & FEDEX

Risk Management Program (RMP) Reporting Center
CGI Federal
12601 Fair Lakes Circle
Fairfax, VA 22033

Compliance with all requirements of this condition, including the registration and submission of the RMP, shall be included as part of the compliance certification submitted in accordance with Condition 8.14.1.

7.11 Stratospheric Ozone Protection Requirements (Title VI of the CAAA of 1990)

7.11.1 If the Permittee performs any of the activities described below or as otherwise defined in 40 CFR Part 82, the Permittee shall comply with the standards for recycling and emissions reduction pursuant to 40 CFR Part 82, Subpart F, except as provided for motor vehicle air conditioners (MVACs) in Subpart B:

a. Persons opening appliances for maintenance, service, repair, or disposal must comply with the required practices pursuant to 40 CFR 82.156.

b. Equipment used during the maintenance, service, repair, or disposal of appliance must comply with the standards for recycling and recovery equipment pursuant to 40 CFR 82.158.

c. Persons performing maintenance, service, repair, or disposal of appliances must be certified by an approved technician certification program pursuant to 40 CFR 82.161.

d. Persons disposing of small appliances, MVACs, and MVAC-like appliances must comply with record keeping requirements pursuant to 40 CFR 82.166.
[Note: “MVAC-like appliance” is defined in 40 CFR 82.152.]

e. Persons owning commercial or industrial process refrigeration equipment must comply with the leak repair requirements pursuant to 40 CFR 82.156.

f. Owners/operators of appliances normally containing 50 or more pounds of refrigerant must keep records of refrigerant purchased and added to such appliances pursuant to 40 CFR 82.166.

7.11.2 If the Permittee performs a service on motor (fleet) vehicles and if this service involves an ozone-depleting substance (refrigerant) in the MVAC, the Permittee is subject to all the applicable requirements as specified in 40 CFR Part 82, Subpart B, and Servicing of Motor Vehicle Air Conditioners.

The term “motor vehicle” as used in Subpart B does not include a vehicle in which final assembly of the vehicle has not been completed. The term “MVAC” as used in Subpart B does not include air-tight sealed refrigeration systems used for refrigerated cargo, or air conditioning systems on passenger buses using HCFC-22 refrigerant.

7.12 Revocation of Existing Permits and Amendments

The following Air Quality Permits, Amendments, and 502(b) 10 are subsumed by this permit and are hereby revoked:

Air Quality Permit and Amendment Number(s)	Dates of Original Permit or Amendment Issuance
2499-299-0053-E-01-0	March 26, 2010
2499-299-0053-E-01-1	December 3, 2010
2499-299-0053-E-01-2	November 1, 2011
2499-299-0053-E-01-3	October 22, 2012
2499-299-0053-E-01-4	May 15, 2013

7.13 Pollution Prevention

None applicable.

7.14 Specific Conditions

None applicable.

PART 8.0 GENERAL PROVISIONS

8.1 Terms and References

8.1.1 Terms not otherwise defined in the Permit shall have the meaning assigned to such terms in the referenced regulation.

8.1.2 Where more than one condition in this Permit applies to an emission unit and/or the entire facility, each condition shall apply and the most stringent condition shall take precedence.
[391-3-1-.02(2)(a)2]

8.2 EPA Authorities

8.2.1 Except as identified as "State-only enforceable" requirements in this Permit, all terms and conditions contained herein shall be enforceable by the EPA and citizens under the Clean Air Act, as amended, 42 U.S.C. 7401, et seq.
[40 CFR 70.6(b)(1)]

8.2.2 Nothing in this Permit shall alter or affect the authority of the EPA to obtain information pursuant to 42 U.S.C. 7414, "Inspections, Monitoring, and Entry."
[40 CFR 70.6(f)(3)(iv)]

8.2.3 Nothing in this Permit shall alter or affect the authority of the EPA to impose emergency orders pursuant to 42 U.S.C. 7603, "Emergency Powers."
[40 CFR 70.6(f)(3)(i)]

8.3 Duty to Comply

8.3.1 The Permittee shall comply with all conditions of this operating Permit. Any Permit noncompliance constitutes a violation of the Federal Clean Air Act and the Georgia Air Quality Act and/or State rules and is grounds for enforcement action; for Permit termination, revocation and reissuance, or modification; or for denial of a Permit renewal application. Any noncompliance with a Permit condition specifically designated as enforceable only by the State constitutes a violation of the Georgia Air Quality Act and/or State rules only and is grounds for enforcement action; for Permit termination, revocation and reissuance, or modification; or for denial of a Permit renewal application.
[391-3-1-.03(10)(d)1(i) and 40 CFR 70.6(a)(6)(i)]

8.3.2 The Permittee shall not use as a defense in an enforcement action the contention that it would have been necessary to halt or reduce the Permitted activity in order to maintain compliance with the conditions of this Permit.
[391-3-1-.03(10)(d)1(i) and 40 CFR 70.6(a)(6)(ii)]

8.3.3 Nothing in this Permit shall alter or affect the liability of the Permittee for any violation of applicable requirements prior to or at the time of Permit issuance.
[391-3-1-.03(10)(d)1(i) and 40 CFR 70.6(f)(3)(ii)]

8.3.4 Issuance of this Permit does not relieve the Permittee from the responsibility of obtaining any other permits, licenses, or approvals required by the Director or any other federal, state, or local agency.
[391-3-1-.03(10)(e)1(iv) and 40 CFR 70.7(a)(6)]

8.4 Fee Assessment and Payment

8.4.1 The Permittee shall calculate and pay an annual Permit fee to the Division. The amount of fee shall be determined each year in accordance with the "Procedures for Calculating Air Permit Fees."
[391-3-1-.03(9)]

8.5 Permit Renewal and Expiration

8.5.1 This Permit shall remain in effect for five (5) years from the effective date. The Permit shall become null and void after the expiration date unless a timely and complete renewal application has been submitted to the Division at least six (6) months, but no more than eighteen (18) months prior to the expiration date of the Permit.
[391-3-1-.03(10)(d)1(i), (e)2, and (e)3(ii) and 40 CFR 70.5(a)(1)(iii)]

8.5.2 Permits being renewed are subject to the same procedural requirements, including those for public participation and affected State and EPA review that apply to initial Permit issuance.
[391-3-1-.03(10)(e)3(i)]

8.5.3 Notwithstanding the provisions in 8.5.1 above, if the Division has received a timely and complete application for renewal, deemed it administratively complete, and failed to reissue the Permit for reasons other than cause, authorization to operate shall continue beyond the expiration date to the point of Permit modification, reissuance, or revocation.
[391-3-1-.03(10)(e)3(iii)]

8.6 Transfer of Ownership or Operation

8.6.1 This Permit is not transferable by the Permittee. Future owners and operators shall obtain a new Permit from the Director. The new Permit may be processed as an administrative amendment if no other change in this Permit is necessary, and provided that a written agreement containing a specific date for transfer of Permit responsibility coverage and liability between the current and new Permittee has been submitted to the Division at least thirty (30) days in advance of the transfer.
[391-3-1-.03(4)]

8.7 Property Rights

8.7.1 This Permit shall not convey property rights of any sort, or any exclusive privileges.
[391-3-1-.03(10)(d)1(i) and 40 CFR 70.6(a)(6)(iv)]

8.8 Submissions

8.8.1 Reports, test data, monitoring data, notifications, annual certifications, and requests for revision and renewal shall be submitted to:

Georgia Department of Natural Resources
Environmental Protection Division
Air Protection Branch
Atlanta Tradeport, Suite 120
4244 International Parkway
Atlanta, Georgia 30354-3908

8.8.2 Any records, compliance certifications, and monitoring data required by the provisions in this Permit to be submitted to the EPA shall be sent to:

Air and EPCRA Enforcement Branch – U. S. EPA Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303-3104

8.8.3 Any application form, report, or compliance certification submitted pursuant to this Permit shall contain a certification by a responsible official of its truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.
[391-3-1-.03(10)(c)2, 40 CFR 70.5(d) and 40 CFR 70.6(c)(1)]

8.8.4 Unless otherwise specified, all submissions under this permit shall be submitted to the Division only.

8.9 Duty to Provide Information

8.9.1 The Permittee, upon becoming aware that any relevant facts were omitted or incorrect information was submitted in the Permit application, shall promptly submit such supplementary facts or corrected information to the Division.
[391-3-1-.03(10)(c)5]

8.9.2 The Permittee shall furnish to the Division, in writing, information that the Division may request to determine whether cause exists for modifying, revoking and reissuing, or terminating the Permit, or to determine compliance with the Permit. Upon request, the Permittee shall also furnish to the Division copies of records that the Permittee is required to keep by this Permit or, for information claimed to be confidential, the Permittee may furnish such records directly to the EPA, if necessary, along with a claim of confidentiality.
[391-3-1-.03(10)(d)1(i) and 40 CFR 70.6(a)(6)(v)]

8.10 Modifications

8.10.1 Prior to any source commencing a modification as defined in 391-3-1-.01(pp) that may result in air pollution and not exempted by 391-3-1-.03(6), the Permittee shall submit a Permit application to the Division. The application shall be submitted sufficiently in advance of any critical date involved to allow adequate time for review, discussion, or revision of plans, if necessary. Such application shall include, but not be limited to, information describing the precise nature of the change, modifications to any emission control system, production capacity of the plant before and after the change, and the anticipated completion date of the change. The application shall be in the form of a Georgia air quality Permit application to construct or modify (otherwise known as a SIP application) and shall be submitted on forms supplied by the Division, unless otherwise notified by the Division.
[391-3-1-.03(1) through (8)]

8.11 Permit Revision, Revocation, Reopening and Termination

8.11.1 This Permit may be revised, revoked, reopened and reissued, or terminated for cause by the Director. The Permit will be reopened for cause and revised accordingly under the following circumstances:
[391-3-1-.03(10)(d)1(i)]

a. If additional applicable requirements become applicable to the source and the remaining Permit term is three (3) or more years. In this case, the reopening shall be completed no later than eighteen (18) months after promulgation of the applicable requirement. A reopening shall not be required if the effective date of the requirement is later than the date on which the Permit is due to expire, unless the original permit or any of its terms and conditions has been extended under Condition 8.5.3;
[391-3-1-.03(10)(e)6(i)(I)]

b. If any additional applicable requirements of the Acid Rain Program become applicable to the source;
[391-3-1-.03(10)(e)6(i)(II)] (Acid Rain sources only)

c. The Director determines that the Permit contains a material mistake or inaccurate statements were made in establishing the emissions standards or other terms or conditions of the Permit; or
[391-3-1-.03(10)(e)6(i)(III) and 40 CFR 70.7(f)(1)(iii)]

d. The Director determines that the Permit must be revised or revoked to assure compliance with the applicable requirements.
[391-3-1-.03(10)(e)6(i)(IV) and 40 CFR 70.7(f)(1)(iv)]

8.11.2 Proceedings to reopen and reissue a Permit shall follow the same procedures as applicable to initial Permit issuance and shall affect only those parts of the Permit for which cause to reopen exists. Reopenings shall be made as expeditiously as practicable.
[391-3-1-.03(10)(e)6(ii)]

8.11.3 Reopenings shall not be initiated before a notice of intent to reopen is provided to the source by the Director at least thirty (30) days in advance of the date the Permit is to be reopened, except that the Director may provide a shorter time period in the case of an emergency.
[391-3-1-.03(10)(e)6(iii)]

8.11.4 All Permit conditions remain in effect until such time as the Director takes final action. The filing of a request by the Permittee for any Permit revision, revocation, reissuance, or termination, or of a notification of planned changes or anticipated noncompliance, shall not stay any Permit condition.
[391-3-1-.03(10)(d)1(i) and 40 CFR 70.6(a)(6)(iii)]

8.11.5 A Permit revision shall not be required for changes that are explicitly authorized by the conditions of this Permit.

8.11.6 A Permit revision shall not be required for changes that are part of an approved economic incentive, marketable Permit, emission trading, or other similar program or process for change which is specifically provided for in this Permit.
[391-3-1-.03(10)(d)1(i) and 40 CFR 70.6(a)(8)]

8.12 Severability

8.12.1 Any condition or portion of this Permit which is challenged, becomes suspended or is ruled invalid as a result of any legal or other action shall not invalidate any other portion or condition of this Permit.
[391-3-1-.03(10)(d)1(i) and 40 CFR 70.6(a)(5)]

8.13 Excess Emissions Due to an Emergency

8.13.1 An "emergency" means any situation arising from sudden and reasonably unforeseeable events beyond the control of the source, including acts of God, which situation requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission limitation under the Permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.
[391-3-1-.03(10)(d)7 and 40 CFR 70.6(g)(1)]

8.13.2 An emergency shall constitute an affirmative defense to an action brought for noncompliance with the technology-based emission limitations if the Permittee demonstrates, through properly signed contemporaneous operating logs or other relevant evidence, that:
[391-3-1-.03(10)(d)7 and 40 CFR 70.6(g)(2) and (3)]

a. An emergency occurred and the Permittee can identify the cause(s) of the emergency;

b. The Permitted facility was at the time of the emergency being properly operated;

c. During the period of the emergency, the Permittee took all reasonable steps to minimize levels of emissions that exceeded the emissions standards, or other requirements in the Permit; and

d. The Permittee promptly notified the Division and submitted written notice of the emergency to the Division within two (2) working days of the time when emission limitations were exceeded due to the emergency. This notice must contain a description of the emergency, any steps taken to mitigate emissions, and corrective actions taken.

8.13.3 In an enforcement proceeding, the Permittee seeking to establish the occurrence of an emergency shall have the burden of proof.
[391-3-1-.03(10)(d)7 and 40 CFR 70.6(g)(4)]

8.13.4 The emergency conditions listed above are in addition to any emergency or upset provisions contained in any applicable requirement.
[391-3-1-.03(10)(d)7 and 40 CFR 70.6(g)(5)]

8.14 Compliance Requirements

8.14.1 Compliance Certification

The Permittee shall provide written certification to the Division and to the EPA, at least annually, of compliance with the conditions of this Permit. The annual written certification shall be postmarked no later than February 28 of each year and shall be submitted to the Division and to the EPA. The certification shall include, but not be limited to, the following elements:
[391-3-1-.03(10)(d)3 and 40 CFR 70.6(c)(5)]

a. The identification of each term or condition of the Permit that is the basis of the certification;

b. The status of compliance with the terms and conditions of the permit for the period covered by the certification, including whether compliance during the period was continuous or intermittent, based on the method or means designated in paragraph c below. The certification shall identify each deviation and take it into account in the compliance certification. The certification shall also identify as possible exceptions to compliance any periods during which compliance is required and in which an excursion or exceedance as defined under 40 CFR Part 64 occurred;

c. The identification of the method(s) or other means used by the owner or operator for determining the compliance status with each term and condition during the certification period;

d. Any other information that must be included to comply with section 113(c)(2) of the Act, which prohibits knowingly making a false certification or omitting material information; and

e. Any additional requirements specified by the Division.

8.14.2 Inspection and Entry

a. Upon presentation of credentials and other documents as may be required by law, the Permittee shall allow authorized representatives of the Division to perform the following:
[391-3-1-.03(10)(d)3 and 40 CFR 70.6(c)(2)]

i. Enter upon the Permittee's premises where a Part 70 source is located or an emissions-related activity is conducted, or where records must be kept under the conditions of this Permit;
ii. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Permit;
iii. Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this Permit; and
iv. Sample or monitor any substances or parameters at any location during operating hours for the purpose of assuring Permit compliance or compliance with applicable requirements as authorized by the Georgia Air Quality Act.

b. No person shall obstruct, hamper, or interfere with any such authorized representative while in the process of carrying out his official duties. Refusal of entry or access may constitute grounds for Permit revocation and assessment of civil penalties.
[391-3-1-.07 and 40 CFR 70.11(a)(3)(i)]

8.14.3 Schedule of Compliance

a. For applicable requirements with which the Permittee is in compliance, the Permittee shall continue to comply with those requirements.
[391-3-1-.03(10)(c)2 and 40 CFR 70.5(c)(8)(iii)(A)]

b. For applicable requirements that become effective during the Permit term, the Permittee shall meet such requirements on a timely basis unless a more detailed schedule is expressly required by the applicable requirement.
[391-3-1-.03(10)(c)2 and 40 CFR 70.5(c)(8)(iii)(B)]

c. Any schedule of compliance for applicable requirements with which the source is not in compliance at the time of Permit issuance shall be supplemental to, and shall not sanction noncompliance with, the applicable requirements on which it is based.
[391-3-1-.03(10)(c)2 and 40 CFR 70.5(c)(8)(iii)(C)]

8.14.4 Excess Emissions

a. Excess emissions resulting from startup, shutdown, or malfunction of any source which occur though ordinary diligence is employed shall be allowed provided that:
[391-3-1-.02(2)(a)7(i)]

i. The best operational practices to minimize emissions are adhered to;

ii. All associated air pollution control equipment is operated in a manner consistent with good air pollution control practice for minimizing emissions; and

iii. The duration of excess emissions is minimized.

b. Excess emissions which are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented during startup, shutdown or malfunction are prohibited and are violations of Chapter 391-3-1 of the Georgia Rules for Air Quality Control.
[391-3-1-.02(2)(a)7(ii)]

c. The provisions of this condition and Georgia Rule 391-3-1-.02(2)(a)7 shall apply only to those sources which are not subject to any requirement under Georgia Rule 391-3-1-.02(8) – New Source Performance Standards or any requirement of 40 CFR, Part 60, as amended concerning New Source Performance Standards.
[391-3-1-.02(2)(a)7(iii)]

8.15 Circumvention

State Only Enforceable Condition

8.15.1 The Permittee shall not build, erect, install, or use any article, machine, equipment or process the use of which conceals an emission, which would otherwise constitute a violation of an applicable emission standard. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with an opacity standard or with a standard, which is based on the concentration of the pollutants in the gases discharged into the atmosphere.
[391-3-1-.03(2)(c)]

8.16 Permit Shield

8.16.1 Compliance with the terms of this Permit shall be deemed compliance with all applicable requirements as of the date of Permit issuance provided that all applicable requirements are included and specifically identified in the Permit.
[391-3-1-.03(10)(d)6]

8.16.2 Any Permit condition identified as “State only enforceable” does not have a Permit shield.

8.17 Operational Practices

8.17.1 At all times, including periods of startup, shutdown, and malfunction, the Permittee shall maintain and operate the source, including associated air pollution control equipment, in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on any information available to the Division that may include, but is not limited to, monitoring results, observations of the opacity or other characteristics of emissions, review of operating and maintenance procedures or records, and inspection or surveillance of the source.
[391-3-1-.02(2)(a)10]

State Only Enforceable Condition

8.17.2 No person owning, leasing, or controlling, the operation of any air contaminant sources shall willfully, negligently or through failure to provide necessary equipment or facilities or to take necessary precautions, cause, permit, or allow the emission from said air contamination source or sources, of such quantities of air contaminants as will cause, or tend to cause, by themselves, or in conjunction with other air contaminants, a condition of air pollution in quantities or characteristics or of a duration which is injurious or which unreasonably interferes with the enjoyment of life or use of property in such area of the State as is affected thereby. Complying with Georgia's Rules for Air Quality Control Chapter 391-3-1 and Conditions in this Permit, shall in no way exempt a person from this provision.
[391-3-1-.02(2)(a)1]

8.18 Visible Emissions

8.18.1 Except as may be provided in other provisions of this Permit, the Permittee shall not cause, let, suffer, permit or allow emissions from any air contaminant source the opacity of which is equal to or greater than forty (40) percent.
[391-3-1-.02(2)(b)1]

8.19 Fuel-burning Equipment

8.19.1 The Permittee shall not cause, let, suffer, permit, or allow the emission of fly ash and/or other particulate matter from any fuel-burning equipment with rated heat input capacity of less than 10 million Btu per hour, in operation or under construction on or before January 1, 1972 in amounts equal to or exceeding 0.7 pounds per million BTU heat input.
[391-3-1-.02(2)(d)]

8.19.2 The Permittee shall not cause, let, suffer, permit, or allow the emission of fly ash and/or other particulate matter from any fuel-burning equipment with rated heat input capacity of less than 10 million Btu per hour, constructed after January 1, 1972 in amounts equal to or exceeding 0.5 pounds per million BTU heat input.
[391-3-1-.02(2)(d)]

8.19.3 The Permittee shall not cause, let, suffer, permit, or allow the emission from any fuel-burning equipment constructed or extensively modified after January 1, 1972, visible emissions the opacity of which is equal to or greater than twenty (20) percent except for one six minute period per hour of not more than twenty-seven (27) percent opacity.
[391-3-1-.02(2)(d)]

8.20 Sulfur Dioxide

8.20.1 Except as may be specified in other provisions of this Permit, the Permittee shall not burn fuel containing more than 2.5 percent sulfur, by weight, in any fuel burning source that has a heat input capacity below 100 million Btu's per hour.
[391-3-1-.02(2)(g)]

8.21 Particulate Emissions

8.21.1 Except as may be specified in other provisions of this Permit, the Permittee shall not cause, let, permit, suffer, or allow the rate of emission from any source, particulate matter in total quantities equal to or exceeding the allowable rates shown below. Equipment in operation, or under construction contract, on or before July 2, 1968, shall be considered existing equipment. All other equipment put in operation or extensively altered after said date is to be considered new equipment.
[391-3-1-.02(2)(e)]

a. The following equations shall be used to calculate the allowable rates of emission from new equipment:

$E = 4.1P^{0.67}$; for process input weight rate up to and including 30 tons per hour.
$E = 55P^{0.11} - 40$; for process input weight rate above 30 tons per hour.

b. The following equation shall be used to calculate the allowable rates of emission from existing equipment:

$E = 4.1P^{0.67}$

In the above equations, E = emission rate in pounds per hour, and
P = process input weight rate in tons per hour.

8.22 Fugitive Dust
[391-3-1-.02(2)(n)]

8.22.1 Except as may be specified in other provisions of this Permit, the Permittee shall take all reasonable precautions to prevent dust from any operation, process, handling, transportation or storage facility from becoming airborne. Reasonable precautions that could be taken to prevent dust from becoming airborne include, but are not limited to, the following:

a. Use, where possible, of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads or the clearing of land;

b. Application of asphalt, water, or suitable chemicals on dirt roads, materials, stockpiles, and other surfaces that can give rise to airborne dusts;

c. Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials. Adequate containment methods can be employed during sandblasting or other similar operations;

d. Covering, at all times when in motion, open bodied trucks transporting materials likely to give rise to airborne dusts; and

e. The prompt removal of earth or other material from paved streets onto which earth or other material has been deposited.

8.22.2 The opacity from any fugitive dust source shall not equal or exceed 20 percent.

8.23 Solvent Metal Cleaning

8.23.1 Except as may be specified in other provisions of this Permit, the Permittee shall not cause, suffer, allow, or permit the operation of a cold cleaner degreaser unless the following requirements for control of emissions of the volatile organic compounds are satisfied: [391-3-1-.02(2)(ff)1]

a. The degreaser shall be equipped with a cover to prevent escape of VOC during periods of non-use,

b. The degreaser shall be equipped with a device to drain cleaned parts before removal from the unit,

c. If the solvent volatility is 0.60 psi or greater measured at 100 ºF, or if the solvent is heated above 120 ºF, then one of the following control devices must be used:

i. The degreaser shall be equipped with a freeboard that gives a freeboard ratio of 0.7 or greater, or

ii. The degreaser shall be equipped with a water cover (solvent must be insoluble in and heavier than water), or

iii. The degreaser shall be equipped with a system of equivalent control, including but not limited to, a refrigerated chiller or carbon adsorption system.

d. Any solvent spray utilized by the degreaser must be in the form of a solid, fluid stream (not a fine, atomized or shower type spray) and at a pressure which will not cause excessive splashing, and

e. All waste solvent from the degreaser shall be stored in covered containers and shall not be disposed of by such a method as to allow excessive evaporation into the atmosphere.

8.24 Incinerators

8.24.1 Except as specified in the section dealing with conical burners, no person shall cause, let, suffer, permit, or allow the emissions of fly ash and/or other particulate matter from any incinerator, in amounts equal to or exceeding the following:
[391-3-1-.02(2)(c)1-4]

a. Units with charging rates of 500 pounds per hour or less of combustible waste, including water, shall not emit fly ash and/or particulate matter in quantities exceeding 1.0 pound per hour.

b. Units with charging rates in excess of 500 pounds per hour of combustible waste, including water, shall not emit fly ash and/or particulate matter in excess of 0.20 pounds per 100 pounds of charge.

8.24.2 No person shall cause, let, suffer, permit, or allow from any incinerator, visible emissions the opacity of which is equal to or greater than twenty (20) percent except for one six minute period per hour of not more than twenty-seven (27) percent opacity.

8.24.3 No person shall cause or allow particles to be emitted from an incinerator which are individually large enough to be visible to the unaided eye.

8.24.4 No person shall operate an existing incinerator unless:

a. It is a multiple chamber incinerator;

b. It is equipped with an auxiliary burner in the primary chamber for the purpose of creating a pre-ignition temperature of 800°F; and

c. It has a secondary burner to control smoke and/or odors and maintain a temperature of at least 1500°F in the secondary chamber.

8.25 Volatile Organic Liquid Handling and Storage

8.25.1 The Permittee shall ensure that each storage tank subject to the requirements of Rule 391-3-1-.02(2)(vv) “Volatile Organic Liquid Handling and Storage” is equipped with submerged fill pipes. For the purposes of this condition and the permit, a submerged fill pipe is defined as any fill pipe with a discharge opening which is within six inches of the tank bottom.
[391-3-1-.02(2)(vv)(1)]

8.26 Use of Any Credible Evidence or Information

8.26.1 Notwithstanding any other provisions of any applicable rule or regulation or requirement of this permit, for the purpose of submission of compliance certifications or establishing whether or not a person has violated or is in violation of any emissions limitation or standard, nothing in this permit or any Emission Limitation or Standard to which it pertains, shall preclude the use, including the exclusive use, of any credible evidence or information, relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test or procedure had been performed.
[391-3-1-.02(3)(a)]

8.27 Internal Combustion Engines

8.27.1 The Permittee shall comply with all applicable provisions of New Source Performance Standards (NSPS) as found in 40 CFR 60 Subpart A - "General Provisions" and 40 CFR 60 Subpart IIII-"Standard of Performance for Stationary Compression Ignition Internal Combustion Engines," for diesel-fired internal combustion engine(s) manufactured after April 1, 2006 or modified/reconstructed after July 11, 2005. Such requirements include but are not limited to:
[40 CFR 60.4200, 391-3-1-.02(8)(b)77]

a. Equip all emergency generator engines with non-resettable hour meters.

b. Purchase only diesel fuel with a maximum sulfur content of 15 ppm unless otherwise specified by the Division.

8.27.2 The Permittee shall comply with all applicable provisions of New Source Performance Standards (NSPS) as found in 40 CFR 60 Subpart A - "General Provisions" and 40 CFR 60 Subpart JJJJ-"Standard of Performance for Stationary Spark Ignition Internal Combustion Engines," for spark ignition internal combustion engines(s) (gasoline, natural gas, liquefied petroleum gas or propane-fired) manufactured after July 1, 2007 or modified/reconstructed after June 12, 2006.
[40 CFR 60.4230, 391-3-1-.02(8)(b)79]

8.27.3 The Permittee shall comply with all applicable provisions of National Emission Standards for Hazardous Air Pollutants (NESHAP) as found in 40 CFR 63 Subpart A - "General Provisions" and 40 CFR 63 Subpart ZZZZ-"National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines."
[40 CFR 63.6580, 391-3-1-.02(9)(b)118]

8.28 Boilers and Process Heaters

8.28.1 The Permittee shall comply with all applicable provisions of National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 CFR Part 63 Subpart A-"General Provisions" and 40 CFR 63 Subpart JJJJJJ-" National Emission Standards for Hazardous Air Pollutants for Area Sources: Industrial, Commercial, and Institutional Boilers."
[40 CFR 63.11193]

8.28.2 The Permittee shall comply with all applicable provisions of National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 CFR Part 63 Subpart A-"General Provisions" and 40 CFR 63 Subpart DDDDD-“ National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters.”
[40 CFR 63.7480]

Attachments

A. List of Standard Abbreviations and List of Permit Specific Abbreviations
B. Insignificant Activities Checklist, Insignificant Activities Based on Emission Levels and Generic Emission Groups
C. List of References

ATTACHMENT A

List Of Standard Abbreviations

AIRS	Aerometric Information Retrieval System
APCD	Air Pollution Control Device
ASTM	American Society for Testing and Materials
BACT	Best Available Control Technology
BTU	British Thermal Unit
CAAA	Clean Air Act Amendments
CEMS	Continuous Emission Monitoring System
CERMS	Continuous Emission Rate Monitoring System
CFR	Code of Federal Regulations
CMS	Continuous Monitoring System(s)
CO	Carbon Monoxide
COMS	Continuous Opacity Monitoring System
dscf/dscm	Dry Standard Cubic Foot / Dry Standard Cubic Meter
EPA	United States Environmental Protection Agency
EPCRA	Emergency Planning and Community Right to Know Act
gr	Grain(s)
GPM (gpm)	Gallons per minute
H_2O (H2O)	Water
HAP	Hazardous Air Pollutant
HCFC	Hydro-chloro-fluorocarbon
MACT	Maximum Achievable Control Technology
MMBtu	Million British Thermal Units
MMBtu/hr	Million British Thermal Units per hour
MVAC	Motor Vehicle Air Conditioner
MW	Megawatt
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_x (NOx)	Nitrogen Oxides
NSPS	New Source Performance Standards
OCGA	Official Code of Georgia Annotated

PM	Particulate Matter
PM_{10} (PM10)	Particulate Matter less than 10 micrometers in diameter
PPM (ppm)	Parts per Million
PSD	Prevention of Significant Deterioration
RACT	Reasonably Available Control Technology
RMP	Risk Management Plan
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SO_2 (SO2)	Sulfur Dioxide
USC	United States Code
VE	Visible Emissions
VOC	Volatile Organic Compound

List of Permit Specific Abbreviations

ATTACHMENT B

NOTE: Attachment B contains information regarding insignificant emission units/activities and groups of generic emission units/activities in existence at the facility at the time of Permit issuance. Future modifications or additions of insignificant emission units/activities and equipment that are part of generic emissions groups may not necessarily cause this attachment to be updated.

INSIGNIFICANT ACTIVITIES CHECKLIST

Category	Description of Insignificant Activity/Unit	Quantity
Mobile Sources	1. Cleaning and sweeping of streets and paved surfaces	
Combustion Equipment	1. Fire fighting and similar safety equipment used to train fire fighters or other emergency personnel.	
	2. Small incinerators that are not subject to any standard, limitation or other requirement under Section 111 or 112 (excluding 112(r)) of the Federal Act and are not considered a "designated facility" as specified in 40 CFR 60.32e of the Federal emissions guidelines for Hospital/Medical/Infectious Waste Incinerators, that are operating as follows: i) Less than 8 million BTU/hr heat input, firing types 0, 1, 2, and/or 3 waste.	
	ii) Less than 8 million BTU/hr heat input with no more than 10% pathological (type 4) waste by weight combined with types 0, 1, 2, and/or 3 waste.	
	iii) Less than 4 million BTU/hr heat input firing type 4 waste. (Refer to 391-3-1-.03(10)(g)2.(ii) for descriptions of waste types)	
	3. Open burning in compliance with Georgia Rule 391-3-1-.02 (5).	
	4. Stationary engines burning: i) Natural gas, LPG, gasoline, dual fuel, or diesel fuel which are used exclusively as emergency generators shall not exceed 500 hours per year or 200 hours per year if subject to Georgia Rule 391-3-1-.02(2)(mmm).7	2
	ii) Natural gas, LPG, and/or diesel fueled generators used for emergency, peaking, and/or standby power generation, where the combined peaking and standby power generation do not exceed 200 hours per year.	
	iii) Natural gas, LPG, and/or diesel fuel used for other purposes, provided that the output of each engine does not exceed 400 horsepower and that no individual engine operates for more than 2,000 hours per year.	1
	iv) Gasoline used for other purposes, provided that the output of each engine does not exceed 100 horsepower and that no individual engine operates for more than 500 hours per year.	
Trade Operations	1. Brazing, soldering, and welding equipment, and cutting torches related to manufacturing and construction activities whose emissions of hazardous air pollutants (HAPs) fall below 1,000 pounds per year.	
Maintenance, Cleaning, and Housekeeping	1. Blast-cleaning equipment using a suspension of abrasive in water and any exhaust system (or collector) serving them exclusively.	
	2. Portable blast-cleaning equipment.	
	3. Non-Perchloroethylene Dry-cleaning equipment with a capacity of 100 pounds per hour or less of clothes.	
	4. Cold cleaners having an air/vapor interface of not more than 10 square feet and that do not use a halogenated solvent.	
	5. Non-routine clean out of tanks and equipment for the purposes of worker entry or in preparation for maintenance or decommissioning.	
	6. Devices used exclusively for cleaning metal parts or surfaces by burning off residual amounts of paint, varnish, or other foreign material, provided that such devices are equipped with afterburners.	
	7. Cleaning operations: Alkaline phosphate cleaners and associated cleaners and burners.	

INSIGNIFICANT ACTIVITIES CHECKLIST

Category	Description of Insignificant Activity/Unit	Quantity
Laboratories and Testing	1. Laboratory fume hoods and vents associated with bench-scale laboratory equipment used for physical or chemical analysis.	
	2. Research and development facilities, quality control testing facilities and/or small pilot projects, where combined daily emissions from all operations are not individually major or are support facilities not making significant contributions to the product of a collocated major manufacturing facility.	
Pollution Control	1. Sanitary waste water collection and treatment systems, except incineration equipment or equipment subject to any standard, limitation or other requirement under Section 111 or 112 (excluding 112(r)) of the Federal Act.	
	2. On site soil or groundwater decontamination units that are not subject to any standard, limitation or other requirement under Section 111 or 112 (excluding 112(r)) of the Federal Act.	
	3. Bioremediation operations units that are not subject to any standard, limitation or other requirement under Section 111 or 112 (excluding 112(r)) of the Federal Act.	
	4. Landfills that are not subject to any standard, limitation or other requirement under Section 111 or 112 (excluding 112(r)) of the Federal Act.	
Industrial Operations	1. Concrete block and brick plants, concrete products plants, and ready mix concrete plants producing less than 125,000 tons per year.	
	2. Any of the following processes or process equipment which are electrically heated or which fire natural gas, LPG or distillate fuel oil at a maximum total heat input rate of not more than 5 million BTU's per hour: i) Furnaces for heat treating glass or metals, the use of which do not involve molten materials or oil-coated parts.	
	ii) Porcelain enameling furnaces or porcelain enameling drying ovens.	
	iii) Kilns for firing ceramic ware.	
	iv) Crucible furnaces, pot furnaces, or induction melting and holding furnaces with a capacity of 1,000 pounds or less each, in which sweating or distilling is not conducted and in which fluxing is not conducted utilizing free chlorine, chloride or fluoride derivatives, or ammonium compounds.	
	v) Bakery ovens and confection cookers.	
	vi) Feed mill ovens.	
	vii) Surface coating drying ovens	
	3. Carving, cutting, routing, turning, drilling, machining, sawing, surface grinding, sanding, planing, buffing, shot blasting, shot peening, or polishing; ceramics, glass, leather, metals, plastics, rubber, concrete, paper stock or wood, also including roll grinding and ground wood pulping stone sharpening, provided that: i) Activity is performed indoors; & ii) No significant fugitive particulate emissions enter the environment; & iii) No visible emissions enter the outdoor atmosphere.	
	4. Photographic process equipment by which an image is reproduced upon material sensitized to radiant energy (e.g., blueprint activity, photographic developing and microfiche).	
	5. Grain, food, or mineral extrusion processes	
	6. Equipment used exclusively for sintering of glass or metals, but not including equipment used for sintering metal-bearing ores, metal scale, clay, fly ash, or metal compounds.	
	7. Equipment for the mining and screening of uncrushed native sand and gravel.	
	8. Ozonization process or process equipment.	
	9. Electrostatic powder coating booths with an appropriately designed and operated particulate control system.	
	10. Activities involving the application of hot melt adhesives where VOC emissions are less than 5 tons per year and HAP emissions are less than 1,000 pounds per year.	
	11. Equipment used exclusively for the mixing and blending water-based adhesives and coatings at ambient temperatures.	
	12. Equipment used for compression, molding and injection of plastics where VOC emissions are less than 5 tons per year and HAP emissions are less than 1,000 pounds per year.	
	13. Ultraviolet curing processes where VOC emissions are less than 5 tons per year and HAP emissions are less than 1,000 pounds per year.	

INSIGNIFICANT ACTIVITIES CHECKLIST

Category	Description of Insignificant Activity/Unit	Quantity
Storage Tanks and Equipment	1. All petroleum liquid storage tanks storing a liquid with a true vapor pressure of equal to or less than 0.50 psia as stored.	
	2. All petroleum liquid storage tanks with a capacity of less than 40,000 gallons storing a liquid with a true vapor pressure of equal to or less than 2.0 psia as stored that are not subject to any standard, limitation or other requirement under Section 111 or 112 (excluding 112(r)) of the Federal Act.	1
	3. All petroleum liquid storage tanks with a capacity of less than 10,000 gallons storing a petroleum liquid.	1
	4. All pressurized vessels designed to operate in excess of 30 psig storing petroleum fuels that are not subject to any standard, limitation or other requirement under Section 111 or 112 (excluding 112(r)) of the Federal Act.	
	5. Gasoline storage and handling equipment at loading facilities handling less than 20,000 gallons per day or at vehicle dispensing facilities that are not subject to any standard, limitation or other requirement under Section 111 or 112 (excluding 112(r)) of the Federal Act.	
	6. Portable drums, barrels, and totes provided that the volume of each container does not exceed 550 gallons.	
	7. All chemical storage tanks used to store a chemical with a true vapor pressure of less than or equal to 10 millimeters of mercury (0.19 psia).	

INSIGNIFICANT ACTIVITIES BASED ON EMISSION LEVELS

Description of Emission Units / Activities	Quantity
Emergency abort stack for each dryer line	2
Emergency abort stack for each Heat Energy System	2
Process Building Vacuum System	1

ATTACHMENT B (continued)

GENERIC EMISSION GROUPS

Emission units/activities appearing in the following table are subject only to one or more of Georgia Rules 391-3-1-.02 (2) (b), (e) &/or (n). Potential emissions of particulate matter, from these sources based on TSP, are less than 25 tons per year per process line or unit in each group. Any emissions unit subject to a NESHAP, NSPS, or any specific Air Quality Permit Condition(s) are not included in this table.

Description of Emissions Units / Activities	Number of Units (if appropriate)	Applicable Rules		
		Opacity Rule (b)	PM from Mfg Process Rule (e)	Fugitive Dust Rule (n)

The following table includes groups of fuel burning equipment subject only to Georgia Rules 391-3-1-.02 (2) (b) & (d).Any emissions unit subject to a NESHAP, NSPS, or any specific Air Quality Permit Condition(s) are not included in this table.

Description of Fuel Burning Equipment	Number of Units
Fuel burning equipment with a rated heat input capacity of less than 10 million BTU/hr burning only natural gas and/or LPG.	4
Fuel burning equipment with a rated heat input capacity of less than 5 million BTU/hr, burning only distillate fuel oil, natural gas and/or LPG.	0
Any fuel burning equipment with a rated heat input capacity of 1 million BTU/hr or less.	0

ATTACHMENT C

LIST OF REFERENCES

1. The Georgia Rules for Air Quality Control Chapter 391-3-1. All Rules cited herein which begin with 391-3-1 are State Air Quality Rules.

2. Title 40 of the Code of Federal Regulations; specifically 40 CFR Parts 50, 51, 52, 60, 61, 63, 64, 68, 70, 72, 73, 75, 76 and 82. All rules cited with these parts are Federal Air Quality Rules.

3. ***Georgia Department of Natural Resources, Environmental Protection Division, Air Protection Branch, Procedures for Testing and Monitoring Sources of Air Pollutants.***

4. ***Georgia Department of Natural Resources, Environmental Protection Division, Air Protection Branch, Procedures for Calculating Air Permit Fees***.

5. Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources. This information may be obtained from EPA's TTN web site at *www.epa.gov/ttn/chief/ap42/index.html*.

6. The latest properly functioning version of EPA's **TANKS** emission estimation software. The software may be obtained from EPA's TTN web site at *www.epa.gov/ttn/chief/software/tanks/index.html*.

7. The Clean Air Act (42 U.S.C. 7401 et seq).

8. White Paper for Streamlined Development of Part 70 Permit Applications, July 10, 1995 (White Paper #1).

9. White Paper Number 2 for Improved Implementation of the Part 70 Operating Permits Program, March 5, 1996 (White Paper #2).

Attachment P

Facility Name: **Hazlehurst Wood Pellets, LLC**
City: Hazlehurst
County: Jeff Davis
AIRS #: 04-13-161-00023

Application #: TV-40062
Date Application Received: January 26, 2015
Date Application Deemed Administratively Complete: March 26, 2015
Date of Draft Permit: June 5, 2015
Permit No: 2499-161-0023-V-02-0

Program	Review Engineers	Review Managers
SSPP	S. Ganapathy	Manny Patel
ISMP	Jeff Babb	Ross Winne
SSCP	Fred Francis	Farhana Yasmin
Toxics	n/a	n/a
Permitting Program Manager		Eric Cornwell

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 **Hazlehurst Wood Pellets, 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: Hazlehurst Wood Pellets, LLC

2. Parent/Holding Company Name

Hazlehurst Wood Pellets, LLC

3. Previous and/or Other Name(s)

None. The facility has always been known as Hazlehurst Wood Pellets, LLC.

4. Facility Location

430 Hulett Wooten Farms Road, Hazlehurst, GA 31539 (Jeff Davis County)

5. Attainment or Non-attainment Area Location

The facility is located in an attainment area for all pollutants.

B. Site Determination

There are no other facilities which could possibly be contiguous or adjacent and under common control to the Hazlehurst Wood Pellets.

C. Existing Permits

Table 1 below lists all current permits (including Part 71 permits), as amended, issued to the facility. Based on a comparative review of Item 19 in Section 1.10 of the Title V application and the "Permit" file(s) on the facility found in the Air Branch office, comments are listed in Table 2 below."

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
2499-161-0023-E-01-0	May 30, 2013	✓	

Table 2: Comments on Specific Permits

Permit Number	Comments
2499-161-0023-E-01-0	First Permit (transition permit) issued to the pellet mill.

D. Process Description

1. SIC Codes(s)

2499 – Wood product Not Elsewhere Classified

The SIC Code(s) identified above were assigned by EPD's Air Protection Branch for purposes pursuant to the Georgia Air Quality Act and related administrative purposes only and are not intended to be used for any other purpose. Assignment of SIC Codes by EPD's Air Protection Branch for these purposes does not prohibit the facility from using these or different SIC Codes for other regulatory and non-regulatory purposes.

Should the reference(s) to SIC Code(s) in any narratives or narrative addendum previously issued for the Title V permit for this facility conflict with the revised language herein, the language herein shall control; provided, however, language in previously issued narratives that does not expressly reference SIC Code(s) shall not be affected.

2. Description of Product(s)

The facility makes wood pellets from woodchips (slash and Loblolly Pine).

3. Overall Facility Process Description

The facility is a wood pellet mill and consists of three pellet furnish dryer lines and three pellet lines. Each drying line consist of a 65 MMBtu/hr wood-residue fired burner, indirect heated rotary pre-dryer and a primary tube dryer controlled by a baghouse. Each pellet line consists of two hammermills downstream of the pellet furnish dryers and controlled by a product recovery cyclone and the wood-residue burner, four pellet presses and a pellet cooler. Exhaust from the hammermills is sent to the wood dust burner for control of VOC and HAPs. PM emissions from the pellet press are controlled by four baghouses. VOC and HAPs emissions from the pellet presses will be controlled by the wood dust burners. The wood dust burners will supply indirect heat to the pre-dryer and the primary tube dryer for chip drying and will be fired with sawdust.

Hazlehurst Pellet Plant will be designed to produce up to 525,600 Oven dry ton/year of wood pellets. The facility has a feedstock receiving and storage area, a packaging and storage area for the produced pellets and associated air pollution control equipment such as cyclones, baghouses and wood dust burners. Finished pellets are either trucked out or loaded on to rail car for shipment to the port of Savannah.

The pelletmill receives wood chips (slash and loblolly pine), normally at a maximum moisture content of 50 percent. The wood chips are dried in an indirect fired pre dryer and an indirectly-fired primary dryer to a 10 percent moisture content, then hammermilled to provide dried pellet furnish.

The pellet furnish is put through pelletizers to produce wood pellets that are exported to markets in the European Union for powering utility boilers.

Three 65 MMBtu/hr wood dust burners will supply heat for the three indirect-fired pre dryers and three indirect-fired primary dryer. Each Pellet line has a production capacity of 22 tons/hour of wood pellets with 10% moisture content. The facility also has Emergency generators and fire pumps.

4. Overall Process Flow Diagram (optional)

The facility submitted a process flow diagram with it initial permit application (Application No. 21738). There is no change to this process flow diagram.

E. Regulatory Status

1. PSD/NSR

The facility is synthetic minor under PSD/NSR regulations for CO, NOx and VOC. Emissions of CO, VOC and NOx are limited to 249 tons/year in order to avoid going through a New Source Review under the PSD rules:

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	yes			✓
PM_{10}	yes			✓
$PM_{2.5}$	yes			✓
SO_2	yes			✓
VOC	yes	✓		
NO_x	yes			✓
CO	yes			✓
TRS	no			
H_2S	no			
Individual HAP	yes			✓
Total HAPs	yes			✓
Total GHGs	yes			✓

3. MACT Standards

MACT standards do not apply to this pelletmill since the facility is a minor source of HAPs. Area source boiler MACT (40 CFR 63 Subpart 6J) does not apply to the wood-fired burners since the burners are defined as process heaters in the area source boiler MACT. Process heaters are exempt from the area source boiler MACT.

4. Program Applicability

Indicate if the following programs are applicable to the facility (with a "yes" or "no").

Program Code	Applicable (y/n)
Program Code 6 - PSD	no
Program Code 8 – Part 61 NESHAP	no
Program Code 9 - NSPS	yes
Program Code M – Part 63 NESHAP	no
Program Code V – Title V	yes

Regulatory Analysis

II. Facility Wide Requirements

A. Emission and Operating Caps:

Facilitywide NOx, CO and VOC emissions are capped at 249 tons for the purpose of avoiding new source review under the PSD Rules.

Individual and Total HAP emissions are limited to less than the major source emission limit of 10 tpy for single HAP and 25 tpy for total HAPs for MACT avoidance.

B. Applicable Rules and Regulations

Rules and Regulations Assessment – PSD does not apply since the facility has PSD avoidance limits for NOx, CO and VOC and is considered a conditional minor source with respect to PSD. MACT does not apply since the facility is a minor source of HAPs.

Emission and Operating Standards – Not applicable.

C. Compliance Status

The facility appears to operate in compliance with all applicable rules and regulations.

D. Operational Flexibility

None requested in the Title V Permit application.

E. Permit Conditions

Condition 2.1.1 is a new source review avoidance condition under the PSD rules for NOx, CO and VOC since facilitywide potential emissions for these pollutants is capped at 249 tons per year. The 249 tpy limit is also known as PSD avoidance limits.

Condition 2.1.2 is a MACT avoidance condition and limit HAP emission to less than the major source threshold for single and Total HAPs.

III. Regulated Equipment Requirements

A. Brief Process Description

The facility is a wood pellet mill and consists of three pellet furnish dryer lines and three pellet lines. Each drying line consist of a 65 MMBtu/hr wood-residue fired burner, indirect heated rotary pre-dryer and a primary tube dryer which is controlled by a baghouse. Each pellet line consists of two Hammermills downstream of the pellet furnish dryers and controlled by a product recovery cyclone and the wood-residue burner, four pellet presses and a pellet cooler. Exhaust from the hammermills is sent to the wood dust burner for control of VOC and HAPs. PM emissions from the pellet press are controlled by four baghouses. VOC and HAPs emissions from the pellet presses will be controlled by the wood dust burners. The wood dust burners will supply indirect heat to the pre-dryer and the primary dryer for chip drying and will be fired with sawdust.

Hazlehurst Pellet Plant is designed to produce up to 525,600 Oven dry ton/year of wood pellets. The facility has a feedstock receiving and storage area, a packaging and storage area for the produced pellets and associated air pollution control equipment such as cyclones, baghouses and wood dust burners. Finished pellets are either trucked out or loaded on to rail car for shipment to the port of Savannah.

The pelletmill receives wood chips (slash and loblolly pine), normally at a maximum moisture content of 50 percent. The wood chips are dried in an indirect fired pre dryer and an indirectly-fired primary dryer to a 10 percent moisture content, then hammermilled to provide pellet furnish. The pellet furnish is put through pelletizers to produce wood pellets that are exported to markets in the European Union for powering utility boilers. Three 65 MMBtu/hr wood dust burners will supply heat for the three indirect-fired pre dryers and three indirect-fired primary dryer. Each Pellet line has a production capacity of 22 tons/hour of wood pellets with 10% moisture content. The facility also has emergency generators and fire pumps.

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**
E1A1	Wood Residue Fired Burner 65 MMBtu/hr	40 CFR 60 Subparts A and Dc 391-3-1-.02(2)(g) 391-3-1-.02(2)(d)	2.1.1, 2.1.2, 3.3.1, 3.4.3, 3.4.4, 3.4.5, 3.5.2, 4.2.2, 4.2.4, 4.2.6, 5.2.1, 5.2.2, 5.2.3, 6.1.7, 6.2.2, 6.2.4, 6.2.6, 6.2.7, 6.2.8	C1A	Filter Media (Baghouse)
E1A2, E1A3	Line 1 Rotary Pre Dryer and Primary Tube Dryer 20 tons/hr (indirect heated)	391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	2.1.1, 2.1.2, 3.4.1, 3.4.2, 3.5.2, 3.5.3, 5.2.4, 6.1.7, 6.2.1, 6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.6, 6.2.7, 6.2.8	C1A E1A1	Filter Media (Baghouse) Wood-fired Burner
E2A1	Wood Residue Fired Burner 65 MMBtu/hr	40 CFR 60 Subparts A and Dc 391-3-1-.02(2)(g) 391-3-1-.02(2)(d)	2.1.1, 2.1.2, 3.3.1, 3.4.3, 3.4.4, 3.4.5, 3.5.2, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.2.5, 4.2.6, 4.2.7, 5.2.1, 5.2.2, 5.2.3, 6.1.7, 6.2.2, 6.2.4, 6.2.6, 6.2.7, 6.2.8	C2A	Filter Media (Baghouse)

Emission Units		Specific Limitations/Requirements		Air Pollution Control Devices	
ID No.	Description	Applicable Requirements/Standards	Corresponding Permit Conditions	ID No.	Description
E2A2, E2A3	Line 2 Rotary Pre Dryer and Primary Tube Dryer 20 tons/hr (indirect heated)	391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	2.1.1, 2.1.2, 3.4.1, 3.4.2, 3.5.2, 3.5.3, 5.2.4, 6.1.7, 6.2.1, 6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.6, 6.2.7, 6.2.8	C2A E2A1	Filter Media (Baghouse) Wood-fired Burner
E3A1	Wood Residue Fired Burner 65 MMBtu/hr	40 CFR 60 Subparts A and Dc 391-3-1-.02(2)(g) 391-3-1-.02(2)(d)	2.1.1, 2.1.2, 3.3.1, 3.4.3, 3.4.4, 3.4.5, 3.5.2, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.2.5, 4.2.6, 4.2.7, 5.2.1, 5.2.2, 5.2.3, 6.1.7, 6.2.2, 6.2.4, 6.2.6, 6.2.7, 6.2.8	C3A	Filter Media (Baghouse)
E3A2, E3A3	Line 3 Rotary Pre Dryer and Primary Tube Dryer 20 tons/hr (indirect heated)	391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	2.1.1, 2.1.2, 3.4.1, 3.4.2, 3.5.2, 3.5.3, 5.2.4, 6.1.7, 6.2.1, 6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.6, 6.2.7, 6.2.8	C3A E3A1	Filter Media (Baghouse) Wood-fired Burner
E1A4	Line 1 Hammermills (two) 20 tons/hr total	391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	2.1.1, 2.1.2, 3.4.1, 3.5.3, 4.2.2, 6.1.7, 6.2.1, 6.2.3, 6.2.5	C1B E1A1	Filter Media (Cyclone) Wood-fired Burner
E1A5	Line 1 Pellet Presses (four) 20 tons/hr total	391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	2.1.1, 2.1.2, 3.4.1, 3.5.2, 3.5.3, 4.2.2, 6.1.7, 6.2.1, 6.2.3, 6.2.5	C1B E1A1	Baghouses (four) Wood-fired Burner
E1A6	Line 1 Pellet Cooler	391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	2.1.1, 2.1.2, 3.4.1, 3.4.2, 3.5.2, 4.2.2, 4.2.4, 6.1.7, 6.2.1, 6.2.3, 6.25	C1B	Baghouse
E2A4	Line 2 Hammermills (two) 20 tons/hr total	391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	2.1.1, 2.1.2, 3.4.1, 3.5.3, 4.2.2, 6.1.7, 6.2.1, 6.2.3, 6.2.5	C2B E2A1	Filter Media (Cyclone) Wood-fired Burner
E2A5	Line 2 Pellet Presses (four) 20 tons/hr total	391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	2.1.1, 2.1.2, 3.4.1, 3.5.2, 3.5.3, 4.2.2, 6.1.7, 6.2.1, 6.2.3, 6.2.5	C2B E2A1	Baghouses (four) Wood-Fired Burner
E2A6	Line 2 Pellet Cooler	391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	2.1.1, 2.1.2, 3.4.1, 3.4.2, 3.5.2, 4.2.2, 4.2.3, 4.2.4, 4.2.5, 6.1.7, 6.2.1, 6.2.3, 6.2.5	C2B	Baghouse
E3A4	Line 3 Hammermills (two) 20 tons/hr total	391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	2.1.1, 2.1.2, 3.4.1, 3.5.2, 3.5.3, 4.2.2, 6.1.7, 6.2.1, 6.2.3, 6.2.5	C3B	Filter Media (Cyclone) Wood-fired Burner
E3A5	Line 3 Pellet Presses (four) 20 tons/hr total	391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	2.1.1, 2.1.2, 3.4.1, 3.5.2, 3.5.3, 4.2.2, 6.1.7, 6.2.1, 6.2.3, 6.2.5	C3B E3A1	Baghouses (four) Wood-fired Burner
E3A6	Line 3 Pellet Cooler	391-3-1-.02(2)(b) 391-3-1-.02(2)(e)	2.1.1, 2.1.2, 3.4.1, 3.4.2, 3.5.2, 4.2.2, 4.2.3, 4.2.4, 4.2.5, 6.1.7, 6.2.1, 6.2.3, 6.2.5	C3B	Baghouse

C. Equipment & Rule Applicability

Applicable Rules and Regulations –

All three wood-fired burners in the three drying lines are subject to NSPS Subpart Dc. The opacity of visible emissions from the dryers, hammermills, pellet presses and pellet coolers are limited to 40% by Georgia Rule (b). The opacity from the three wood-fired burners is limited to 20% by Georgia Rule (d). PM emissions from the hammermill, pellet presses and pellet coolers will be subject to Georgia Rule (e). PM emissions from the wood-fired burners will be subject to NSPS Subpart Dc limits which subsume PM emission limits under Georgia Rule (d)2.

The sulfur content of fuel oil fired in the dryer burners is limited to 0.5% by weight by Georgia Rule (g)2 and NSPS Subpart Dc. Fugitive emissions from the Hammermills, Pellet presses and Pellet coolers are limited to 20% by Georgia Rule (n)2.

D. Compliance Status

The pelletmill appears to operate in compliance with all applicable rules and regulations.

E. Operational Flexibility

Not requested in the permit application.

F. Permit Conditions

Condition 3.3.1 states that the wood-fired burners are subject to the federal New Source Performance Standards NSPS Subpart Dc and A.

Condition 3.4.1 limits opacity of visible emissions from the pellet cooler baghouse to 40% per Georgia Rule (b). Baghouse opacities are close to zero when they are operating properly. There should be no problem complying with this opacity limit.

Condition 3.4.2 limits PM emissions from the Pre-dryer baghouse stacks (S1A, S2A or S3A) or the Pellet cooler baghouse stacks (S1B, S2B or S3B) to allowable limits per Georgia Rule (e). Once again the baghouses are more than 99.9% efficient in removing particulate matter. With a proper functioning baghouse compliance with the Rule (e) PM limit should not be a problem.

Condition 3.4.3 limits opacity of visible emissions from the wood dust burners (Source ID: E1A1, E1A2 and E1A3) measured at the baghouse stacks (S1A, S2A or S3A) to 20% per NSPS Subpart Dc and Georgia Rule (d)2. With a baghouse control this 20% opacity limit should be easily met.

Condition 3.4.4 limits PM emissions from the wood dust burners (Source ID: E1A1, E1A2 and E1A3), measured at the baghouse stacks (S1A, S2A or S3A) to 0.1 lb/MMBtu heat input per NSPS Subpart Dc. This limit subsumes PM emission limit for the burners per Georgia Rule (d)2.

Condition 3.4.5 limits sulfur content of any fuel oil fired in the wood dust burners to less than 0.5% by weight per NSPS Subpart Dc which subsumes the sulfur content limit of Georgia Rule (g)2. The sulfur content of wood is small and there should be no problem in complying with this sulfur content limit.

Condition 3.4.6 list the measures the Permittee must adopt to minimize the fugitive emissions from the pelletmill operations. This is a standard fugitive dust condition in all Title V permits.

Condition 3.4.7 limits opacity of fugitive emissions from the production operations to 20% per Georgia Rule (n)2.

Condition 3.5.3 requires the Permittee to exhaust all the gases from the pre-dryer, primary dryer, hammermills and the pellet presses to the wood dust burners at all times these equipment operate in order to control VOC, CO and HAPs emissions. This condition helps achieve compliance with the PSD avoidance limit for VOC, CO and the MACT avoidance limit for HAPs.

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

A. General Testing Requirements

The standard general requirements are included in the permit.

B. Specific Testing Requirements

Condition 4.2.1 requires the Permittee to conduct NOx and CO performance tests on the wood dust burners and pre-dryer at the baghouse stack (S1A, S2A and S3A) at 48 month intervals. The pre dryer baghouse (S1A) exhaust was tested for NOx on August 27, 2014. The average NOx emission rate from three runs during this test was 5.23 lb/hr (22.9 tons/year) which is 9.2% of the PSD avoidance rate of 249 tons/year. Carbon monoxide (CO) was also tested concurrently during this source test. The average CO emission rate during the three runs was 6 lb/hour (26.28 tons/year) which is 10.6% of PSD avoidance limit of 250 tons/year. The next NOx and CO test will have to be conducted in August 2018.

Condition 4.2.2 requires the Permittee to conduct periodic VOC, formaldehyde, acetaldehyde and methanol tests on the pellet cooler emissions at the baghouse stacks (S1A, S2A, S3A, S1B, S2B and S3B) at 48-month intervals. On August 27, 2014 formaldehyde emissions were tested from the pre-dryer baghouse S1A exhaust and the pellet cooler baghouse S1B exhaust. The total formaldehyde emission rate was 0.02 lb/hr (0.09 tons/year) which is 0.9% of the allowable emission. VOC emissions from the pre-dryer baghouse S1A exhaust and the pellet cooler baghouse S1B exhaust was tested concurrently. The total VOC emission rate was 8.8 lb/hr (38.5 tons/year) which is 15% of the allowable VOC emissions. The methanol emission rate at these emission point was 0.1 lb/hr (0.44 tons/year) which is 4% of the allowable emissions. Total acetaldehyde emission rate at these two emission point was 0.08 lb/hr (0.35 tons/year) which is 3.5% of the allowable emissions. The next source tests for the VOC and HAP emissions is in August 2018.

Condition 4.2.3 requires the Permittee to perform periodic performance tests for HCl emissions from the wood dust burners and pre-dryer baghouse exhaust stacks (S1A, S2A and S3A) at 48 month intervals. HCl emissions from the pre-dryer baghouse exhaust was tested on August 27, 2014 at a rate of 0.01 lb/hr (0.04 tons/year) which is 0.4% of the allowable emissions. The next HCl source test is scheduled in August 2018.

Condition 4.2.4 requires that Permittee not use monitors or test equipment during performance tests that are not used in daily operations of the facility and to adjust/fine tune burners prior to testing. This condition also requires submission of all pretest and posttest data conducted a day or two before and following the source test to EPD along with the source test data.

2. Equipment Groups (all subject to the same test requirements):

Not applicable.

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

A. General Monitoring Requirements

The standard general requirements are included in the permit.

B. Specific Monitoring Requirements

1. Individual Equipment:

The opacity of visible emissions from wood dust burners (Source ID: E1A1, E2A1 and E3A1) via the baghouse stacks (S1A, S2A and S3A) are monitored using a continuous opacity monitoring systems (COMS) as per NSPS Subpart Dc requirements.
Instead of COMS the opacity of the visible emissions from the wood dust burners can be monitored using a bag leak detection system in the baghouses (C1A, C2A and C3A) per NSPS Subpart Dc.

The Permittee is required to continuously monitor the temperature at the exit of the wood-fired burners. Hourly and three-hour averages of the burner exit temperature are calculated using this data.

The Permittee is required to monitor the natural gas and fuel oil consumption in the wood-fired burners by NSPS Subpart Dc (Condition 5.2.3).

The fuel consumption can be monitored using a fuel consumption meter or the Permittee may propose an alternative protocol for monitoring fuel usage or monitor the fuel delivered to the facility each month.

Condition 5.2.4 requires the Permittee to implement a preventive maintenance program (PMP) for the pre-dryer and pellet cooler baghouses (C1A, C2A and C3A, C1B, C2B and C3B). This PMP shall include weekly operation and maintenance checks.

Condition 5.2.5 requires the Permittee to continuously monitor and record the pressure drop in the recycle duct from the hammermills, pellet press and pellet coolers.

Condition 5.2.6 requires the Permittee to establish a pressure drop range from the monitored pressured drops in Condition 5.2.5.

2. Equipment Groups (all subject to the same monitoring requirements):

Not applicable.

VI. Other Record Keeping and Reporting Requirements

A. General Record Keeping and Reporting Requirements

The standard general requirements are included in the permit that requires all maintenance, operational, testing and monitoring data to be maintained for five years.

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 requires the Permittee to keep records of the total amount of product dried in each of the pre-dryer, primary dryer in oven dry tons (ODT), hammermill, pellet press and the pellet cooler in metric tons (short tons), on a monthly basis to demonstrate compliance with the PSD avoidance permit limits for NOx, CO and VOC emissions and using the source tested emission factors for NOx, CO and VOC.

Condition 6.2.2 requires the Permittee to calculate monthly emissions of PM/PM_{10}, NOx, CO and HCl emissions from the wood dust burners, pre-dryer, primary dryer, hammermill and pellet press using the records from Condition 6.2.1 and emission factors for these pollutants.

Condition 6.2.3 requires the Permittee to calculate monthly emissions of VOC, formaldehyde, acetaldehyde and methanol from the wood dust burners, pre-dryer, primary dryer, hammermill, the pellet press at the baghouse stacks (S1A, S2A and S3A) and the pellet cooler emissions at the baghouse stacks (S1B, S2B and S3B), using the hammermill, pellet press and pellet cooler production records and the source test derived emission factors.

Condition 6.2.4 requires the Permittee to calculate the 12-month rolling total NOx, CO, PM and HCl emissions from the monthly emissions data in Condition 6.2.2.

Condition 6.2.5 requires the Permittee to calculate the 12-month rolling total of VOC, formaldehyde, acetaldehyde and methanol emissions from the wood dust burners, pre-dryer, primary dryer, hammermill, the pellet press and the pellet coolers stacks using the monthly emissions data in Condition 6.2.3.

Conditions 6.2.6, 6.2.7 and 6.2.8 are the NSPS Subpart Dc recordkeeping requirements for the fuel oil and natural gas consumed in the wood-fired burners.

VII. Specific Requirements

A. Operational Flexibility

None requested in the permit application.

B. Alternative Requirements

Not applicable.

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

Not applicable.

E. Short-Term Activities

Not applicable.

F. Compliance Schedule/Progress Reports

Not applicable.

G. Emissions Trading

Not applicable.

H. Acid Rain Requirements

Not applicable.

I. Prevention of Accidental Releases

Not applicable.

J. Stratospheric Ozone Protection Requirements

Not applicable.

K. Pollution Prevention

Not applicable.

L. Specific Conditions

Not 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.

Template Condition Section 8.27 was updated in August 2014 to include more detailed, clear requirements for emergency generator engines currently exempt from SIP permitting and considered insignificant sources in the Title V permit.

Template Condition Section 8.28 was updated in August 2014 to more clearly define the applicability of the Boiler MACT or GACT for major or minor sources of HAP.

Addendum to Narrative

The 30-day public review started on July 1, 2015 and ended on July 31, 2015. Comments were not received by the Division. No change was made to the draft permit.

Attachment Q

From: Lucas, Jill M <Jill.Lucas@ncdenr.gov>
Sent: Thursday, September 28, 2017 12:51 PM
To: Patrick Anderson
Subject: RE: Incomplete Public Records Request - Wood Pellet Manufacturing

Patrick,
We can have the Northampton documents available tomorrow. The SELC representative visits with a scanner so you should be set.

Please note that DEQ's Office of General Counsel says that our agency has interpreted G.S. 132-6 to mean we are obligated to make public records available for inspection and examination at reasonable times, but that we are not obligated to make the copies for the requestor.

Let me know how you'd like to proceed.
Jill

From: Patrick Anderson [mailto:panderson@powellenvironmentallaw.com]
Sent: Thursday, September 28, 2017 9:13 AM
To: Lucas, Jill M <Jill.Lucas@ncdenr.gov>
Cc: Kritzer, Jamie <jamie.kritzer@ncdenr.gov>; Myra Blake <mblake@selcnc.org>; Kym Hunter <khunter@selcnc.org>
Subject: Incomplete Public Records Request - Wood Pellet Manufacturing

Jill:
I have been able to arrange for an intern from the Southern Environmental Law Center to visit and scan the Enviva Northampton documents on Friday, September 29. Because the intern was already planning to visit DEQ offices on SELC's behalf for other matters, she will not have time to scan the totality of my original Public Records Request, but only the Enviva Northampton files.

I have been able to obtain most of the stack testing I had requested through other channels, so the bulk of the documents I'm after are application materials. I would, however, like to know if any stack testing has occurred at Enviva Northampton since their modifications authorized by Permit No. 10203R04 (issued October 12, 2015)?

In particular, then, these are the documents I'm hoping to have available for inspection and scanning:

1. Enviva Northampton's initial PSD construction permit application (submitted August 26, 2011) and an addendum requesting a non-PSD state construction permit (submitted on January 6, 2012).
2. Enviva Northampton's initial Title V permit application (submitted April 22, 2014), as well as an amended Title V application (submitted August 9, 2016).
3. Enviva Northampton's application for Permit No. 10203R04 (submitted June 2, 2015.)
4. Any stack testing conducted at Enviva Northampton subsequent to October 12, 2015.

Finally, I would like to renew my request that DEQ furnish copies of the other documents I requested in my May 25 Public Records Request, as the DEQ is legally obligated to do. (see copied e-mail below). Having SELC's intern pick up these documents may save DEQ time and resources. If any fees are accrued, please invoice me at:

Patrick Anderson
Powell Environmental Law
315 W. Ponce de Leon Ave, Suite 842
Decatur, GA 30030

Thank you for your assistance, and as always feel free to reach out with questions, I will be available all day tomorrow and Friday by phone : 1-719-963-4072.

Patrick

Patrick Anderson
719-963-4072
Law Clerk
Powell Environmental Law
315 W. Ponce de Leon Ave, Suite 842
Decatur, GA 30030

From: Patrick Anderson
Sent: Tuesday, September 26, 2017 5:11 PM
To: Lucas, Jill M <Jill.Lucas@ncdenr.gov>
Cc: Kritzer, Jamie <jamie.kritzer@ncdenr.gov>
Subject: RE: Incomplete Public Records Request - Wood Pellet Manufacturing

Jill,
N.C. Gen. Stat. § 132-6 provides that "Every custodian of public records shall permit any record in the custodian's custody to be inspected and examined at reasonable times and under reasonable supervision by any person, and shall, as promptly as possible, **furnish copies** thereof upon payment of any fees as may be prescribed by law." (emphasis added). Further, North Carolina Department of Environmental Quality's Public Records Request Policy states that "Persons requesting copies of public records may elect to obtain them in any and all media in which the public agency keeps them." (See (I)(1)(h), document available at: https://deq.nc.gov/about/divisions/public-affairs/public-records-policy).

Although I understand some of the requested documents may be large and are not in electronic form, North Carolina's Public Records statute also provide for the assessment of reasonable fees to compensate for costs and time spent on requests. See § 132-6.2. *Provisions for copies of public records; fees*; see also the Public Records Request Policy at II.

While we are not local, we work in conjunction with North Carolina citizens and organizations who are concerned about air pollution from these facilities, which are not located in close proximity to the Raleigh office. We plan to file comments on the Enviva Northampton permit on their behalf, as well as other facilities included in our request. In order to adequately represent these citizens, we filed our Public Records Request several months in advance of the current permit's public notice period so that we would have sufficient leeway to receive the requested documents.

At no point since our May 25 request were we made aware of a policy or statutory provision requiring us to visit the DEQ office in Raleigh to collect the documents we requested. Further, we were never notified that the requested documents had been assembled and were available at the Raleigh office.

Ideally we can facilitate a way to pick up these documents this week. If that is the case, will the entire records request be available, or only the Enviva Northampton documents? If we are not able to send a representative, we would then request that DEQ promptly provide the documents in a format convenient to agency, or alternatively to identify the legal authority that DEQ believes allows them not to furnish copies upon the payment of reasonable fees, as stated in N.C. Gen. Stat. § 132-6.

Thank you,
Patrick

From: Lucas, Jill M [mailto:Jill.Lucas@ncdenr.gov]
Sent: Tuesday, September 26, 2017 3:49 PM
To: Patrick Anderson <panderson@powellenvironmentallaw.com>
Cc: Kritzer, Jamie <jamie.kritzer@ncdenr.gov>
Subject: RE: Incomplete Public Records Request - Wood Pellet Manufacturing

Patrick,

I'm sorry if you feel there has been a miscommunication. The permit applications and stack test records for Enviva are available for your review at our central office in Raleigh or our Raleigh Regional Office. If you wish to schedule an appointment, we will be glad to pull the documents for your review.

Most of these records are hard copy. We do not have the resources to copy or scan all of these documents for you but we will gladly make them available to you or a representative. Do I take it from your note below that you will not have a representative here this week? There are a number of contract services that manage similar matters for other requestors. Please let us know if you need help connecting with a resource.

The public comment notice was posted last week in accordance with our standard procedures. From our website, here is information about how you can request email notification of DAQ public comment notices:

> The North Carolina Division of Air Quality Permitting Section maintains an email list for dissemination of permitting information to interested parties. These emails include public notices with draft permits and application reviews. Final permits will be distributed through this email list as well. Please note that only permitting actions that are processed through the public notice procedures will be distributed. To have your email address added to the list of recipients, please send a request to kathy.hash@ncdenr.gov.

Please let me know how you'd like to proceed.
Best regards,
Jill

From: Patrick Anderson [mailto:panderson@powellenvironmentallaw.com]
Sent: Tuesday, September 26, 2017 3:02 PM
To: Lucas, Jill M <Jill.Lucas@ncdenr.gov>
Cc: Kritzer, Jamie <jamie.kritzer@ncdenr.gov>
Subject: Incomplete Public Records Request - Wood Pellet Manufacturing

Jill,
I received a package today with a CD and a letter stating that "this document fulfills your pubic records request dated May 25, 2017." The only file on the CD contained e-mail correspondence from the Division of Air Quality. While these e-mails are relevant to my original request, I still have not received any of the air permit applications or the air pollution stack testing that I requested in May.

Most concerningly, one of the facilities I have requested records for, Enviva Northampton, has a Title V Operating Permit out for 30-day public comment, which expires October 20. In addition to the Enviva Northampton records, all of the other files I requested are relevant to the Enviva Northampton public comment process because these documents contain information on air emissions from wood pellet facilities. Access to public records such as stack testing and permit applications is crucial to ensuring a facility receives an adequate public review process.

While I continue to work with yourself and Yuki Puram to hopefully have someone visit the DAQ office to review the Enviva Northampton file, that process should not be seen as a substitute for my original public records request from May, which pertained to other facilities and documents which may not be in the Enviva Northampton file. Additionally, although we are doing our best, we simply may not be able to have anyone visit the Raleigh office in a timely manner.

Please let me know how I can get these additional documents as quickly as possible.

Patrick

Patrick Anderson
719-963-4072
Law Clerk
Powell Environmental Law

315 W. Ponce de Leon Ave, Suite 842
Decatur, GA 30030

Attachment R

http://www.hannapub.com/ouachitacitizen/news/local_state_headlines/homeowners-seek-epa-s-help-with-pollutior complaints/article_5d11a19e-650b-11e4-8331-001a4bcf6878.html

Homeowners seek EPA's help with pollution complaints

By Zach Parker The Citizen Nov 5, 2014

Citizen photo by Zach Parker

HOMEOWNERS IN in the Cheniere Drew community in West Monroe are reaching out to the EPA for help over the emission of sawd Bayou Wood Pellets on Hwy 15 (above) over their homes and properties. The group of homeowners claim the sawdust falls so regula washed vehicles accumulate thick layers of dust over several hours.

A group of homeowners in the Cheniere Drew community in West Monroe asked the Environmental Protection Agency to investigate sawdust emissions from a wood pellets factory near their homes.

Representatives of the Drew Community of Concerned Citizens group sent a letter to the EPA's Region 6 headquarters in Dallas, Texas, last month, asking the agency to investigate Bayou Wood Pellet LLC's plant off Highway 15. The group is made up of homeowners who live near the plant, which manufactures wood pellets.

The plant has "been polluting our community for many months with wood dust and noise," the group

letter said. "Many people have recently moved from this area because of the pollution and noise."

The group claims its complaints and pleas to the state Department of Environmental Quality (DEQ) have not yielded a reduction in the pollution. The group decided to reach out to the EPA since DEQ inspections of Bayou Wood did not halt sawdust emissions.

"They (DEQ) have not helped us in any manner," the letter said.

In its letter, the group describes the area as a "nice community," made up of churches, businesses, many homes, Glenwood Family Medical Practice and Drew Elementary School. Some 800 students attend Drew Elementary, which is located across the highway from Bayou Wood's plant.

"The sawdust falling on us is a fine powdered dust and it goes everywhere," said Johnny Holyfield, a spokesman for the group. Holyfield and his family live in the neighborhood around Bayou Wood's plant. He also is a minister at Faith Christian Church, located next door to the wood pellet factory.

Holyfield said Bayou Wood's plant sprays dust continually over the area's homes and vehicles. The dust covering their properties was not simply the result of seasonal pollen or of dust kicked up in yards or on blacktop roadways, Holyfield said.

On several occasions, members of the group showed The Ouachita Citizen sawdust falling from the sky onto their properties as well as thick layers of sawdust on area foliage.

"When the leaves fall during autumn, the dust gets twice as bad," said Jerry Walker, a group membe whose home is located west of Bayou Wood's plant.

According to group members, the sawdust sprayed over their community has made enjoying the outdoors difficult. The sawdust, the group's members claim, falls into their swimming pools like sand infiltrates automobile engines, slips into attic spaces and has become a breathing hazard for human as well as for pets and Drew Elementary students at recess.

"We've lived here 17 years, built this deck so we could sit outside but we can't because of the dust," said Walker's wife, Kaila Walker. "I have asthma, and have to take breathing treatments sometimes when it's so heavy. Sometimes, the smell of fresh sawdust gets overpowering. It's terrible."

In its letter, the group said it approached Steve Tippen, president at Bayou Wood, on numerous

occasions.

"He has flatly refused to help," the letter said. "Mr. Tippen has at night, on many occasions, turned o the lights and run machinery at maximum effort, possibly without filters and polluting our wildlife and domestic animals."

Tippen was unavailable for comment.

"They (Bayou Wood) seem to be running the most at night, and they used to have lights on at night so you could easily see all the dust but they don't turn those lights on at night anymore," Holyfield said.

Since the beginning of the year, the group contends the plant runs machinery 24 hours a day, seven days a week, often becoming much louder at night than during the day and resulting in a heavier spread of sawdust over their community.

"They're (Bayou Wood) not supposed to have the trucks going at night but that happens all the time, Kaila Walker said. "Late at night, those trucks keep going and the front loader as well and it all soun like a train coming through my bedroom wall."

The group's members agreed the sawdust emissions and factory noise did not become a problem until about a year ago.

"More than a year ago, Mr. Tippen would only run it during daylight hours," Kaila Walker said. "I don' understand. We didn't have this problem back then."

According to published reports, Bayou Wood was bought in August 2013 by Gulf Coast Renewable Energy LLC. At the time of the purchase, Bayou Wood's plant had the capacity to produce 54,000 metric tons of wood pellets per year. Gulf Coast Renewable Energy announced last year it would expand production capacity to 120,000 metric tons per year with the expansion set to be completed by the end of January 2014.

In January and February, DEQ observed wood particle emissions released at the facility's unloading and loading bay areas during two separate inspections. The emissions detailed during the two inspections were in violation of state law and department regulations since the facility was not permitted to emit wood particles from those areas.

"The trucks going in and out of the plant create dust going everywhere," Holyfield said. "They're supposed to have curtains, an enclosed space, everything to keep these trucks from creating dust, too."

According to reports filed with DEQ, the department issued a warning letter to Bayou Wood Product (Pellets) in February concerning the facility's compliance with the Louisiana Environmental Quality Act and Air Quality Regulations. Bayou Wood responded to DEQ after a third inspection on May 1 with details of measures taken to ensure compliance with environmental regulations.

At the end of May, DEQ inspector Blake Watson conducted an inspection at the facility and surrounding area. The reports and citizen complaints prompting the inspection indicated "the facility was releasing sawdust into the air covering the community," according to Watson's field interview form.

"At the time of arrival (on May 27), emissions were observed at the loading and unloading area," Watson said in his field interview form.

When Watson contacted Jerry Coleman, general manager at Bayou Wood, about the emissions during his inspection, Coleman said the wood pellet company was still in the process of installing a damper in the plant's exhaust stack to reduce emissions.

Following Watson's inspection, DEQ issued a compliance order to Bayou Wood on June 11 for violations of environmental regulations. The compliance order required Bayou Wood to become compliant by Aug. 15 in light of the unlawful emissions observed throughout the year.

On June 30, PPM Consultants Inc., submitted a response to DEQ on behalf of Bayou Wood, claimin

the wood pellet company "immediately addressed wood particulate emissions that were documente in the January inspection. Bayou Wood, according to PPM's letter, also installed control measures and began building other facilities to help contain emissions in response to DEQ's compliance order.

PPM Consultants is an environmental consulting firm headquartered in Monroe.

According to Greg Langley, a spokesman for DEQ Secretary Peggy Hatch, Bayou Wood had met all requirements in the compliance order by the deadline.

"They are under compliance according to the compliance order for their earlier violations," Langley said.

Langley said DEQ had received additional citizen complaints after the compliance order's deadline and that the issue was still under investigation.

Though Bayou Wood said it would add a damper to the plant's exhaust stack, members of the homeowner's group claim the damper is only used on some occasions.

"The Sunday after they first had the crane up putting the filter in the exhaust stack, a fire truck responded," Holyfield said. "There was a fire inside, smoke, but still a fire. After that, the stack began blowing like usual again."

The group's members contend the factory does not use the damper most of the time because it impedes the plant's production.

Attachment S

Residents are having concerns with saw dust particles in the air coming from Bayou Wood Pellet Plant

By Janelle Brandom | Posted: Wed 9:15 PM, Jan 21, 2015 | Updated: Wed 9:16 PM, Jan 21, 2015

WEST MONROE, La. (KNOE 8 News) - Members of the Drew Community Concerned Citizen Committee say saw dust coming from the Bayou Wood Pellet Plant in West Monroe is causing problems to their homes and businesses.

A group of residents in the area say they've been having issues with dust particles in the air for about a year.

They've made complaints to the Department of Environmental Quality and the plant but haven't seen any changes.

Kaila Walker is a secretary of the committee and lives less than a mile from the plant.

"I've been here seventeen years and I'm having to move. It's not fair because you'll won't make them come into compliance and he goes out there at night and turns them lights off and flogs us. I'd like you to come spend a week at my house and let you experience what we experience," says Walker.

Walker says she can barely go outside anymore.

"My deck gets covered with dust, I can't even stand to be on the deck. I have to go in when I've been in the yard an extended time and take a breathing treatment because my allergies are so flared up and several of our community members can't go out in their yards like they used to," says Walker.

She says the plant contacted her wanting to know why they were trying to shut them down.

"I explained to him that no were weren't trying to put them out of business we just want to try and enjoy our homes again and want them back in compliance," says Walker.

A representative from DEQ met with members of the committee today to discuss the problems. KNOE spoke with the press secretary for DEQ Greg Langley today over the phone. He says after inspections they found the plant had some violations.

"There was some dust issues and some equipment questions and they were issued orders to be repaired or to update equipment and I'm not sure if they complied," says Langley.

DEQ says the plant then asked for a hearing.

"We agreed to enter a dispute resolution with Bayou Wood Pellet. We're hoping that by meeting with them we can find some solutions to these violations and they can enact some actions," says Langley.

Langley says the agreement for the dispute was signed last week and now the plant and DEQ will meet and hopefully reduce or eliminate the problem. This is a story we will continue to follow and update you as we get more information.

This Clouded Leopard Cub Is One Of A Kind

US Government Won't Look Into Gas and Oil Company Methane Emissions

Comments are posted from viewers like you and do not always reflect the views of this station.

Attachment T

Ministry of Environment

FACTSHEET
AIR EMISSIONS

July 2011

Wood Pellet Manufacturing Facilities

Under the *Environmental Management Act* (EMA), all high-risk, and some medium-risk, industrial operations in British Columbia are required to have government authorization[1] prior to discharging emissions or waste to the environment. These authorizations are legally enforceable and are subject to pollution preventing conditions and criteria. Authorizations for new, or significantly modified, wood pellet manufacturing facilities are developed based on the Ministry's Guideline for Emissions from Wood Pellet Manufacturing Facilities.

The purpose of this document is to summarize key emissions information contained in the Ministry's Guideline for Emissions from Wood Pellet Manufacturing Facilities.

What are guidelines used for?

Guidelines provide assistance to directors, appointed under EMA, when preparing and issuing authorizations for industrial facilities.

What are wood pellets?

Wood pellets are a type of wood fuel, usually produced as a by-product of sawmilling and other wood transformation activities. The pellets are generally made from compacted sawdust and shavings. The sawdust and shavings may be blended with smaller amounts of processed bark, hog fuel, processed standing dead timber and processed landing debris.

Wood pellets are usually 6 to 8mm in diameter and 2cm in length. However, they can be manufactured in other configurations, such as pucks or logs.

[1] Authorizations may include permits, approvals, operational certificates or regulations. For more information on waste discharge authorizations, see: http://www.env.gov.bc.ca/epd/waste_discharge_auth/index.htm

How are wood pellets produced?

Wood pellets are normally produced by compressing dry wood materials to a desired size. First, raw wood materials are passed through a hammer mill and dryer to achieve consistent moisture content. Then, the dry wood particles are fed to a press. In the press they are squeezed through a die having holes of the required size.

The high pressure causes the temperature of the wood to increase greatly, causing the lignin to plasticize slightly and form a natural 'glue' that holds the pellet together.

How are air emissions produced during the wood pellet manufacturing process?

Air emissions may be produced during the wood pellet manufacturing process from sources such as dryers, coolers, pelletizers, hammermills, and conveyors. Fugitive emissions are also released during the handling, storage and transportation of the materials.

What are the emission limits?

The Guideline for Emissions from Wood Pellet Manufacturing Facilities outlines emission limits for total particulate matter (TPM) and fugitive emissions.

The guideline is based on best achievable technology and describes requirements for both new and significantly modified existing facilities.

New Facilities

The guideline stipulates that all new facilities should install control technologies that will at minimum, achieve the emission limits listed in Tables 1 and 2.

Existing Facilities

The guideline specifies that existing facilities that have undergone significant modifications are expected to meet the applicable monitoring and control requirements listed in Tables 1 and 2. Existing wood pellet manufacturing facilities that have not been significantly modified may continue to operate in accordance with the limits of their current permit.

When has a facility been "significantly modified"?

A facility has been significantly modified if it has undergone a physical or operational change resulting in an increase of 10% or more in the volume of discharge or the total amount of any contaminant released to the environment, based on authorized values.

What is Total Particulate Matter (TPM)?

Particulate matter refers to tiny solid or liquid particles that float in the air. TPM consists of filterable and condensable particulate matter. Filterable particulate matter includes all PM_{10} and $PM_{2.5}$ emissions, where PM_{10} and $PM_{2.5}$ are comprised of particulate matter with aerodynamic diameters less than 10 and 2.5 micrometers respectively. Condensable particulate matter is any material that is not particulate matter at stack conditions, but condenses and/or reacts to form particulate matter immediately after discharge from the stack.

Why are TPM emissions limited?

TPM emissions are limited because they can have negative impacts on local air quality and human health. $PM_{2.5}$ is known to cause aggravation of respiratory and cardiovascular disease, reduced lung function, increased respiratory symptoms and premature death. TPM also impairs visibility, affects climate and can damage and/or discolour structures and property.[2]

TPM emission limits

The TPM emission limits and monitoring frequency for wood pellet manufacturing facilities outlined in the Ministry's guideline are summarized in Table 1.

In addition to emission limits listed below, facilities should strive to maintain opacity below 10%. Opacity can be thought of as the amount of light blocked by TPM.

How frequently should TPM emissions be monitored?

The monitoring frequency listed in Table 1 should be followed except in the case of the implementation of new process units. For new units, an operator should undertake baseline monitoring (stack testing) within six months of start up. Thereafter, the operator should continue monitoring at the prescribed monitoring frequency stated in Table 1.

What are fugitive emissions?

Fugitive emissions are unintentional or incidental releases. The significance of fugitive emissions at wood pellet manufacturing facilities may vary depending on the type of raw material, method of transportation and specific process used in the production of the wood pellets. Major sources of these emissions include raw material handling, raw material storage piles, conveyor transfer points, yard dust, haul road dust and engine exhaust.

Fugitive emission limits

Table 2 provides a summary of the limits and monitoring and control strategies detailed in the guideline to mitigate fugitive emissions.

What are the effluent handling requirements?

If the applied emission control technology uses a solution, such as water, any resulting effluent should be delivered to an approved facility for treatment or disposed of in a manner approved by a director.

[2] More information on how air quality affects human health can be found in the State of the Air Report 2010 at: http://www.bc.lung.ca/airquality/documents/StateOfTheAir2010webrevised.pdf

Are there other considerations?

The information contained in the Ministry's guideline documents are just one of the main pieces of information taken into consideration by the director when approving an authorization. Additional sources of information considered by the director may include environmental impact assessments, local air shed plans, other guidelines and stakeholder input. The director also has the authority to impose emission standards other than those that are recommended in these types of guidelines.

For more information, contact the Environmental Standards Branch at envprotdiv@victoria1.gov.bc.ca

Or, consult our website at http://www.env.gov.bc.ca/epd/industrial/pulp_paper_lumber/pdf/moe-pellet-industry-051410.pdf.

Table 1: Total Particulate Matter Emissions Limits for Wood Pellet Manufacturing Facilities.

Source	Limit[(a)] (mg/m^3)	Monitoring[(b)]
Dryer Exhaust	60[(c)]	Quarterly
Pellet Cooler Exhaust	115[(e)]	Annual
Other Plant Processes[(d)]	20[(e)]	Annual

(a) Concentration limits measured at standard conditions of 20°C, 101.3kPa, dry gas.
(b) All monitoring for this guideline must be carried out in accordance with the latest version of the: *British Columbia Field Sampling Manual – For Continuous Monitoring and the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment and Biological Samples.*
(c) The dryer exhaust limit includes filterable and condensable particulate matter. It is an interim two year limit. This limit may be adjusted as more data becomes available.
(d) Other plant processes may include pelletizers, hammermills, storage, screening and conveyors.
(e) Includes filterable particulate matter only.

Table 2. Fugitive Emissions from Raw Material Storage Piles and Road Dust

Source	Limit	Monitoring and Control
Sawdust and Wet Material	No Visible downwind carry over	Visual monitoring with controls as required including: limiting pile heights and limiting exposed pile faces to high winds (e.g. wind breaks; vegetative or screens). Include meteorological controls and planning.
Planer Shavings and Dry Material		As above, plus three sided and covered containment. Prevent vehicle traffic from grinding material finer.
Onsite Haul Roads		Dust suppression in dry season or paving.

Attachment U

ENVIRONMENTAL
Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • www.des.nh.gov

ARD-42 2014

Fugitive Dust

Fugitive dust is particulate matter (particle pollution) that becomes airborne from activities such as construction, commercial mining, demolition, and soil and wind erosion. Fugitive dust is an open, or nonpoint, source of air pollution since it does not originate from a specific source such as a stack, chimney or vent. Under certain conditions, fugitive dust can be a public nuisance and may be harmful to human health. It is, therefore, a regulated pollutant that must be minimized.

Health and Environmental Effects

The potential health effects of particle pollution are related to the makeup and size of the particles. The smallest particles pose the greatest health problems because they can be inhaled deeply into the lungs. People most at risk from breathing particle pollution are children, the elderly, and people with existing heart and respiratory disease. Healthy individuals can be affected as well, especially those who work and recreate outdoors. The health effects of inhaling particle pollution include:

- Irritation to the eyes, nose and throat.
- Respiratory distress, including coughing, difficulty in breathing and chest tightness.
- Increased severity of bronchitis, asthma and emphysema.
- Heart attacks and aggravated heart disease.
- Premature death in individuals with serious lung or heart disease.

Fugitive dust can also reduce visibility (i.e., cause hazy conditions) which can result in driving or work-site accidents.

How is Fugitive Dust Regulated in New Hampshire?

The Department of Environmental Services (NHDES) Air Resources Division regulates fugitive dust. Fugitive dust is defined in New Hampshire Code of Administrative Rule Env-A 101.88 as

"particulate matter that is uncontaminated by pollutants resulting from industrial activity, including but not limited to emissions from haul roads, wind erosion of exposed surfaces and storage piles, and other removal, storage, transportation, or redistribution activities."

The New Hampshire Code of Administrative Rule Env-A 1002 establishes requirements for controlling fugitive dust. Env-A 1002 regulates fugitive dust from activities such as commercial mining, constructing or renovating buildings, road building or pavement maintenance, demolition of structures, and material storage activities. Anyone engaged in an activity that emits fugitive dust within the state is required to take precautions throughout the duration of the activity to prevent, abate and control dust emissions. Measures can include but are not limited to enclosing or covering, wetting, and vacuuming.

In addition, NHDES has rules for specific activities that create fugitive dust. For example, Env-A 2705 requires hot mix asphalt plant operators to control fugitive dust from chutes and conveyors. Env-A 2805 requires sand and gravel operators to control dust from roadways and stockpiles at their facilities.

Best Management Practices Plan

To control and minimize fugitive dust, NHDES strongly suggests that any commercial or business activity subject to Env-A 1002, or that has the potential to generate dust, initiate best management practices for controlling dust, to include a written protocol.

At a minimum, best management practices should address the following elements:

- Wetting surfaces prior to and during demolition activities.
- Watering, treating, sweeping, sealing or paving roadways.
- Maintaining stockpiles to include watering, reducing drop distance between discharge point and top of stockpile, covering, or enclosing.
- Constructing windbreaks, vegetative control, embankment construction or topographic controls.
- Enclosing crushers, screens or other material transfer points, wetting and dust collection equipment.
- Controlling the loading and movement of vehicles throughout the site under unfavorable conditions.

More Information

For more information about fugitive dust in New Hampshire, contact the NHDES Air Resources Division at (603) 271-1370.

Attachment V

DANISH TECHNOLOGICAL INSTITUTE

Guideline: Storage and Handling of Wood Pellets

Resultat Kontrakt (RK) Report

Wolfgang Stelte

December 2012

Energy & Climate
Centre for Renewable Energy and Transport
Section for Biomass

DANISH
TECHNOLOGICAL
INSTITUTE

Gregersensvej 2C
DK-2630 Taastrup

Tel: +45 7220 2000
Fax: +45 7220 2019

info@teknologisk.dk
www.teknologisk.dk

Contents

1 INTRODUCTION 3
2 SCOPE 4
3 TERMINOLOGY AND DEFINITIONS 4
4 SOLID BIOFUELS 4
5 GENERAL RISK EVALUATION OF BIOMASS HANDLING AND STORAGE 4
5.1 Self-heating and self-ignition 5
5.2 Off-gas formation and oxygen depletion 5
5.3 Dust formation 6
5.4 Biological hazards 7
6 HANDLING OF WOOD PELLETS 7
6.1 Loading and transport (in closed vessel) 8
6.2 Unloading and internal handling 8
6.3 Conveying 8
7 STORAGE OF SOLID BIOFUELS 8
7.1 Storage types 9
7.1.1 Silo 9
7.1.2 Flat storage 9
7.2 Self-heating and ignition risk 9
7.3 Monitoring of temperature, off-gasses and moisture 10
7.4 Safety measures for handling personnel 10
REFERENCES 11

1 INTRODUCTION

The use of solid biofuels i.e. wood pellets and briquettes has increased significantly during the last 15 years. Biomass briquettes are mainly used by small scale consumer's i.e. private households while biomass pellets are used both within the private sector and for commercial heat and power production in large scale, industrial plants. During the past 10 years wood pellets have become an important energy carrier to substitute coal in the Danish energy sector. Today most pellets used in Denmark are produced abroad and shipped to Denmark in large container vessels where they are used as fuel in combined heat and power plants (CHP-plants), for district heating and small scale pellet boilers. The pellet consumption in Denmark is expected to increase strongly within the next 10 years and it is therefore necessary to provide a guideline for secure handling of solid biofuels. Recently different guidelines have been published by the Association of German Engineers [1], German pellets institute [2] or the Nordic Innovation Centre [3] dealing with safe handling and storage of solid biofuels. Safety considerations of biomass handling have been picked up in several journal articles and books dealing with solid biofuels [4-11].
A number of serious incidents have been reported across Europe in connection with false handling of wood pellets. Some of them have resulted in injury or even death of the handling personnel and some resulted in great damage and financial loss for the companies handling the pellets. Table 1 provides examples of accidents in relation with handling and storage of solid biofuels during the last 10 years. Most people consider wood materials as harmless, natural products and underestimate the risk potential, especially when storing it in closed compartments i.e. silo, storage room or transport vessels.

Table 1: Examples of accidents related to the storage and transportation of solid biofuels [4]

Year	Place	Accident
2002	Rotterdam	A ship loader on board of the "Weaver Arrow" loaded with wood pellets went down in the storage compartment and suffocated
2005	Gruvön	A seaman suffocated on board of the wood freighter "Eken" when he went down the stairs to the cargo room that was filled with pulpwood.
2006	Helsingborg	A seaman on board of the "Saga Spray" suffocated when he went down the stairs to the storage compartment filled with wood pellets. A ship loader and a rescue team rushing for assistance got severely injured
2006	Skelleftehamn	A seaman on board of the "Noren" died when he entered a storage compartment filled with wood chips
2007	Timrå	The captain and one seamen of the wood freighter "Fembria" died when they walked in the storage compartment filled with timber wood.
2007	Finland	A person died when walking into a small (10 t) wood pellets silo.
2008	Finland	Another person died when walking into a small (10 t) wood pellets silo.
2009	Bornholm	Two seaman on board of the "Amirante" died when they entered the cargo room filled with wood pellets. The pellets were loaded one day before.
2010	Germany	A person suffocated in a pellet storage (150 t)
2010	Ireland	A person suffocated in a pellet storage (7 t)
2011	Switzerland	A person suffocated in a pellet storage (100 t)

2 SCOPE

The intention of this guideline is to provide recommendations for the handling of solid biofuels in a responsible and safe way, minimizing risks for health and safety. The guideline is addressing both large and small scale producers, transporters and end users of solid biofuels. Focus is set on wood pellets and wood chips since they are by far the most common type of solid biofuels in Denmark.

3 TERMINOLOGY AND DEFINITIONS

Terms and terminology of this guideline apply as given in EN 14588. Specifications of different types of solid biofuels are defined according to EN 14961-1

4 SOLID BIOFUELS

Solid biofuels cover a wide range of sizes and shapes from wood pellets to straw bales. Solid biofuels and their typical dimensions and preparation method are specified in the European standard EN 14961 as shown in Table 2.

Table 2. Major trade form of solid biofuels according to EN 14961-1 [1]

Name	Typical particle size	Preparation
Whole tree	> 500 mm	No preparation or delimbing
Wood chips	5 to 100 mm	Cutting with sharp tools
Hog fuel	undefined	Crushing with blunt tools
Log wood/firewood	100 to 1000 mm	Cutting with sharp tools
Bark	undefined	Debarking residues from trees, can be crushed, shredded or unshredded
Bundle	undefined	Lengthwise oriented & bound
Fuel powder	< 1 mm	Milling
Sawdust	1 to 5 mm	Cutting with sharp tools
Shavings	1 to 30 mm	Planning with sharp tools
Briquettes	Diameter > 25 mm	Mechanical compression
Pellets	Diameter < 25 mm	Mechanical compression
Small square bales	0.1 m^3	Compressed and bound to cubes
Big square bales	3.7 m^3	Compressed and bound to cubes
Round bales	2.1 m^3	Compressed and bound to cylinders
Chopped straw or energy grass	10 to 200 mm	Chopped during harvesting or before combustion
Grain or seed	undefined	No preparation or drying except for process operations necessary for storage
Shells and fruit stones	5 to 15 mm	No preparation or pressing and extraction by chemicals
Fiber cake	undefined	Prepared from fibrous waste by dewatering

5 GENERAL RISK EVALUATION OF BIOMASS HANDLING AND STORAGE

Major problems that can arise when handling large amounts of biomass are connected to dust formation, off gassing, self-heating and biological hazards. The quality of biomass is subject of large variation and depending on biomass origin, size, shape, composition and moisture content different problems can occur during handling and storage. The most common problems are summarized in the following section:

5.1 Self-heating and self-ignition

Self-heating of biomass can occur either by chemical oxidation reactions and/or microbiological decay. The more fresh the biomass and the higher the moisture content the greater is the risk for self-heating and potential self-ignition. Self-heating of biomass is a serious problem and has been cause of several incidents.
Oxidation reactions require oxygen and the oxidation rate of the biomass seems to depend on the age of the biomass and generally decreases with storage time. The reactions go along with oxygen depletion which is a potential risk for pellet handling personal. The mechanism behind the oxidation reactions are not completely understood but it is likely connected to the biomass extractives. Heat development due to microbiological decay is to large extent depending on the moisture content and the surface area [5].

There are some general recommendations to avoid self-heating and self-ignition of biomass. According to Obernberger and Thek they can be summarized as follows [5]:

- Avoid storage and transport of large volumes if the fuel's tendency for self-heating is unknown
- Be conscious of the risk of self-heating and spontaneous ignition in large storage volumes
- Avoid mixing of different types of biomass fuels in one storage
- Avoid mixing of biomass fuels with different moisture content
- Avoid large parts of fines in the fuel bulk
- Measure and monitor the distribution temperature and gas composition within the stored material
- Prepare (large) silos for gas injection at the bottom of the silo in case a fir should occur
- Pellet storage units must be equipped with size dependent, appropriate means of ventilation control to remove carbon monoxide and carbon dioxide

In case a fire occurs it has to be noted that fire fighting procedures are difficult since water cannot be used in many cases, especially when pellets are stored in a silo. Pellets absorb moisture quickly and swell to about 3 to 4 times of their size, forming a cake like structure that can become very hard and is difficult to remove from the silo. The pellet expansion can in worst case result in a burst and collapse of the pellet silo. Self-heating occurs usually deep inside the bulk and the fire source is therefore difficult to reach.
Gases such as nitrogen and carbon dioxide and foams are usually the methods of choice to extinguish fires in pellet silos. Fire fighting operations, especially in large silos can be very complex and expensive operations. The technical research institute of Sweden (SP Sveriges Tekniska Forskningsinstitut) has published methods for extinguishing fires in wood pellet silos [17,18].

5.2 Off-gas formation and oxygen depletion

Biomass releases CO and CO_2 and oxygen is consumed in chemical oxidation processes and microbiological processes. CO and CO_2 are odourless toxins and can be lethal at low concentrations. Low oxygen concentrations can lead to suffocation of the handling personal when entering closed biomass storage without proper ventilation. Several death cases have been reported in connection with wood pellet storages during the last years both in large silos and container vessels but also in relatively small pellet storage in private homes. A closed biomass storage i.e. pellet storage room should never be entered before it has been ventilated with fresh air. CO and CO_2 are heavier then air and will accumulate at higher

concentrations at the bottom of the storage. Furthermore does biomass contains various different volatile organic compounds (VOCs) i.e. terpenes and terpenoids, esters, ethers and aldehydes. A lot of these VOCs can evaporate from the wood and in some cases they might accumulate in concentrations that may cause a health and safety hazard.

5.3 Dust formation

Handling of biomass can liberate significant amounts of dust. Especially dry biomass particles have often a low density and a high drag coefficient and can easily be dispersed in the air. Airborne dust particles pose a great risk to anyone coming into contact with them, mainly through inhalation. Dust can have different impacts on health, but the main effects of biomass dust are on the lungs and the respiratory system. The inhalation of an excessive amount of dust particles can result in irritation of the lungs, nasal and respiratory system. It can give raise to allergic reactions and severe illness such as cancer when exposed repeatedly over a longer period of time. Apart from that dust can irritate the eyes, causing sourness and conjunctivitis. There are clear limitations for dust exposure of working personal on national and international level. For Denmark the Danish Working Environment Authority (Arbejdstilsynet) can be contacted for further information.

The second great risk connected to biomass dust is the risk for dust explosion. Dust has a very large surface area compared to its mass. Ignition of biomass can only occur at the interphase between biomass and air and this causes dust to be much more flammable then bulk material. Depending on biomass type, size and shape of the particles, explosive suspensions can be formed at different mass to oxygen ratios. Those explosive mixtures can be ignited by electrostatic discharges, friction or hot surfaces and can result in fatal damage. There are strict regulations in place to prevent dust explosion accidents. In some cases it might be necessary to classify biomass handling processes according to the ATEX directive. For Denmark the Danish Technological Institute (Teknologisk Institut) can be contacted for further information and help regarding risk evaluation and safety procedures. Table 3 shows an example of the ignition/explosion properties of dust from wood pellets (white dust), bark pellets, coal and a fungi and the used testing standard [5]. The pellet handbook from Obernberger and Thek [5] should be consulted for further reading.

Table 3. Ignition and explosion properties of dust from wood pellets (white dust), bark pellets, coal and a fungi. Data taken from Obernberger and Thek [5].

Test mode	Test parameter (dust < 63 µm)	Unit	White dust	Bark dust	Coal dust	Lycopodium spores	Testing standards
Dust cloud	Auto-ignition Temp (T_C) (Godbert-Greenwald)	°C	450	450	585	430	ASTM E1491
	Min Ignition Energy (MIE)	mJ	17	17	110	17	ASTM E2019
	Max Explosion Pressure (P_{max})	bar	8.1	8.4	7.3	7.4	ASTM E1226
	Min Explosion Pressure Rate (dP/dt_{max})	bar/s	537	595	426	511	ASTM E1226
	Deflagration Index (K_{St})	bar.m/s	146	162	124	139	ASTM E1226
	Min Explosible Concentration (MEC)	g/m³	70	70	65	30	ASTM E1515
	Limiting Oxygen Concentration (LOC)	%	10.5	10.5	12.5	14.0	ASTM E1515 mod
Dust layer	Hot Surface Ignition Temp (5 mm) (T_s)	°C	300	310			ASTM E2021
	Hot Surface Ignition Temp (19 mm) (T_s)	°C	260	260			ASTM E2021
	Auto-ignition Temp (T_L)	°C	[illegible]	[illegible]			[illegible]
	Dust Class (> 10 to 200 bar m/s)		St 1	St 1	St 1	St 1	ASTM E [illegible]
	Dust Class (Explosion Severity [ES] = 0,8)		Class II	Class II			OSHA [illegible]

5.4 Biological hazards

Biomass is a natural product and as such a potential feedstock for different types of microorganisms i.e. fungi and bacteria. The risk of microbiological decay of the biomass depends on the biomass properties i.e. size and composition, moisture content and temperature. The major source of decay is caused by fungal infections. Fungi can digest the biomass and form large colonies commonly known as mould. Fungi produce toxins when growing on biomass i.e. mycotoxines and they can be released as dust into the air. Airborne fungal spores and toxins can cause irritations and allergic reactions along the respiratory system. Inhalation and direct contact should be avoided.

6 HANDLING OF WOOD PELLETS

Large amounts of wood pellets are transported by land and sea way, and the intercontinental trade of wood pellets is likely to increase by factor 10 within the next decade. It is therefore important to look on the overall risks involved in handling wood pellets. Mechanical forces during transportation of pellets cause fractures and breakage of the pellets, resulting in fines and dust. Although there are high quality standards (i.e. EN 14961-1) ensuring that pellet producers produce pellets with a high strength and abrasion resistance this problem cannot be eliminated completely. Especially pellets used in large scale applications such as heat and power plants are usually not following those standards. In those cases the quality standards are often agreed directly between the pellet producer and the large scale consumer. The mechanical durability of wood pellets is usually determined in a tumbler, simulating the impact forces that pellets experience during transportation. A standardized method exists to measure pellet durability, and this can be consulted for further reading (EN 15210-1).

To prevent the formation of fines and dust, handling should be as gentle as possible. The more handling steps the more degradation of the pellet. Important factors for handling are the drop height, elasticity of the impact surface and the number of times the pellets are dropped. Pellet degradation is a function of number of impacts and impact force (i.e. drop height) and they should be limited to a minimum to prevent dust and fines formation. There are many different ways of transporting pellets. The most common ways to move pellets from/to storage and transportation vessels are conveying and vacuum pumping. Especially large scale bulk handling of pellets exposes high mechanical load onto the pellets. This can be the case when loading pellets into an ocean vessel or into a large pellet silo at the producer/consumer site. Drop height are usually high (up to 25 m and more). It also has to be considered that pellets drop on each other and that a high weight load is exposed to the pellets lying in the bottom of the vessel/silo.

Pellet abrasion and dust formation takes place along the whole supply chain of the wood pellets from the pellet mill to the customer. Fines and dust formation during handling can occur during all of the steps during the supply chain. The most prominent ones are listed below:

- Conveying the pellets from the pellet plant to storage
- Packing of pellets i.e. big bags
- Conveying to transport vehicle
- Filling transport vehicle
- Discharge transport vehicle
- Conveying to another transport vehicle or to storage
- Filling into storage

Pellets are usually conveyed or transported by pneumatic pumps. The latter one might do severe damage to the pellets when the pressure (velocity of the pellets) is too high and if there are sharp turns in the transport pipe or potential impact sites for the pellets.

Pellet transport can take place either in trucks, trains or ships depending on the transport distance. Trucks are usually used to bridge short distances while trains are used for longer distance. Ship are used to transport large amounts of pellets either directly to the end customer or to a harbor were the pellets are unloaded and distributed to smaller transport vessels. A lot of large scale users are located close to the water so they can receive pellets by ship.

6.1 Loading and transport (in closed vessel)

Large volumes of pellets from oversea are transported in ocean vessels. Especially on the trans-Atlantic route from Northern America to Europe bulk carriers are used. The size varies and is usually ranging from 1.500 to 50.000 deadweight tons (dwt) [5]. During shipping the pellets are kept dry under hatch covers with tight seals. To avoid the penetration of moisture into the storage compartment, ventilation is usually turned off. The storage of large amounts of pellets in a closed compartment on a ship is similar to the risk in a pellet silo and the same safety measures should be taken (see chapter 7).Trucks are a used to transport small amount of pellets (up to 40 tons) to small scale customers. Pellets are loaded either as bulk or in bags. Bulk trucks are sometimes equipped with vacuum pump systems that allow pumping of the pellets and thus a comfortable way to transfer the pellets to a storage compartment. Rail cars and containers are also used for transport if available

6.2 Unloading and internal handling

During receiving and internal operations, the risk of dust generation, ignition and explosion should be minimized. Special precautions should be taken to avoid increase of fines and wear during unloading and receiving pellets. The precautions generally should focus on avoiding over-heated or burning loads, spark detecting and fire extinction systems.

6.3 Conveying

Conveying shall be conducted with a minimum of wear and damage to the solid biofuel. Fuel pellets, in particular, are very sensitive to physical wear and shall be handled with care. Precautions shall be taken to avoid moisture uptake in pellets. Minimal length of belt conveyor line should be applied and many crossings and high drops should be avoided, which raise the content of fines in a batch of pellets.

7 STORAGE OF SOLID BIOFUELS

Due to seasonal fluctuations with periods of high demand (winter) and periods with moderate or low demand (summer months) pellet producers and intermediate traders need large storage space. Also consumers i.e. heat and power producers have a high demand for securing their energy supply and thus keep storage big enough to be able to deal with unforeseen bottlenecks and shortages of supply. Wood pellets are sensitive to moisture uptake and when exposed to rain they swell and lose their pellet structure. High moisture content also promotes microbiological decay and this can result in dangerous conditions such as self-heating and self-ignition. Wood pellets are therefore always stored indoors, either in flat

storages i.e. frames, storage halls or in silos. Indoor storage of biomass is a challenge with respect to self-heating of the biomass, dust formation and off-gassing of the biomass. A range of safety measures have to be taken to grant safety. Recent accidents have shown that improper handling of biomass can result in severe damages and risk for life and health of handling personnel.

7.1 Storage types

7.1.1 Silo

Silo storage is the most common way of storing pellets at power plants, pellet producers and harbors. Silos are consuming less space as storage halls and can be filled and emptied easily using screw conveyors. The size of the silo depends on its function. Large silos with several thousand cubic meter volumes are common as intermediate storage at harbors or at large scale pellet consumers. From there pellets are distributed to transport vessels, or feeding bins.

Large scale silos can be different in size and shape depending on the function and construction year. Typically older silos that have previously been used for agricultural products are high and have a small diameter. Newer silos that have been designed and built from wood pellets storage usually have a larger diameter compared to their height. In general there are two different types of pellet silos, silos with a tapered bottom and silos with a flat bottom.
Vertical silos with a tapered bottom can be emptied by gravity using a discharge tunnel and a conveyor. These type of silos are widely used to store agricultural products i.e. grains and are to some extend also used for pellet storage. Agricultural silos usually range from 50 to 10.000 m^3. Dark colors and corrugated metal should be avoided since they increase heat absorption and lower heat transfer. Vertical silos with a flat bottom are emptied using a circulating auger for center feed to a discharge tunnel. They require less space due to their flat bottom and are therefore cheaper to build. However do they require more maintenance and take longer time to empty.

7.1.2 Flat storage

Flat storage building i.e. A-frames, are used for bulk storage of pellets and are used for large storage of pellets in a range from 15.000 to 100.000 m^3. They are used at the pellet producer's site, for intermediate storage at harbors and at the end users i.e. power plant site. Pellets are conveyed into the building and dropped down onto the floor forming a pile and/or moved by front loaders onto a pile. Emptying of this kind of storage is made by front loaders either into a feed system for a boiler (power plant site) or onto trucks, vessels or rail cars for further transportation. Especially moving pellets with a front loader bears the risk for fines and dust formation and as such a risk for health and dust explosion.

7.2 Self-heating and ignition risk

Fires in wood pellet silos due to self-heating are not uncommon and several incidents have been reported during the last years. Also dust explosion incidents have been reported from several plants and facilities handling wood pellets. Fires and explosions can occur along the whole supply chain of wood pellet production and delivery and can take place in the production plant, transport vessel, transfer facilities and at the consumer site. However fires and explosions are not known to be a problem in the bagged pellets marked [5].

The sources of ignition can either be externally from sparks generated by metal pieces or stones coming in contact with the biomass or by overheating of motors, conveyer belts, bearings due to high friction. An accumulation of dust and fines due to improper maintenance and cleaning can increase the risk of fires and dust explosions. Measure to reduce these risk are control measures to

remove impurities i.e. stones and metal from the biomass, spark and heat detectors along the transport conveyors, extinguishing systems and fixed control schemes for checking the state of the conveyor belts and bearings to prevent overheating and removal of dust and other debris. The utilization of antistatic and fire resistant material as well as proper grounding of the transport conveyors can reduce the risk of external ignition too.

Pellets in a closed storage environment can heat up due to microbiological and/or chemical reactions. The bulk mass act as insulation and therefore heat is usually built up deep inside the bulk. Microbiological decay requires moisture and it is therefore usually a problem occurring when the moisture content of the biomass is too high or in case of water (rain) coming in contact with the biomass. Microbial decay results in a temperature increase in the stored fuel and peak temperatures of microbial self-heating can be up to 80 °C depending on the type of microorganism [19]. Chemical degradation usually starts to have influence at about 40 °C and at temperatures above 50 °C chemical degradation reactions will exceed the biological ones [19]. Due to poor heat transfer within the bulk mass and the insulating properties of biomass, heat is accumulated inside the bulks that can result in self ignition. The main factors affecting the temperature in a pellet silo are the ambient temperature, moisture content, moisture gradients, size of the bulk and density.

7.3 Monitoring of temperature, off-gasses and moisture

Temperature in a pellet silo should be monitored continuously by sensors embedded in the stored product. An alternative and/or addition to direct temperature measurement can be equipment sensing carbon monoxide, hydrocarbons, radiated heat and smoke as precursors for overheating [5]. Even at low temperatures low temperature oxidation of pellets will result I the formation of carbon dioxide, carbon monoxide, aldehydes and methane and these gasses will deplete the oxygen in the silo. One option to cool and ventilate a pellet silo at the same time is to ventilate a storage silo whenever the ambient outside temperature is lower than the temperature inside the storage. In case of too high temperatures (> 80 °C) emergency procedures should be in place. This could be emergency discharge of the pellets by relocating them into a different storage or outside and thus breaking up the hotspots and cool the pellet bulk. In general the temperature in a pellet silo should be kept below 45 °C.

7.4 Safety measures for handling personnel

Gasses formed in a close pellet silo are a threat for the life of handling personnel and therefore measures should be taken to avoid contact with handling personnel. This can be done by ventilation systems, gas monitoring, warning signs and strict working procedures when opening and entering a pellet silo.

REFERENCES

[1] VDI (2012) Emissionsminderung - Lagerung von Holzpellets beim Verbraucher - Anforderungen an das Lager unter Sicherheitsaspekten. VDI Guideline 3464. Verein Deutscher Ingenieure e.V., Düsseldorf, Germany, 22p.

[2] DEPV (2011) Empfehlung zur Lagerung von Holzpellets. Deutscher Energieholz- und Pellets-Verband e.V., Berlin, Germany, 31p.

[3] Nordtest (2008) Guidelines for storing and handling of solid biofuels. NT ENVIR 010. Nordic Innovation Centre, Oslo, Norway, 16p.

[4] Svedberg U, Knutsson A. (2011) Faror och hälsorisker vid förvaring och transport av träpellets, träflis och timmer i slutna utrymmen. Kunskapsöversikt-Rapport 2011:2. Arbetsmiljöverket, Stockholm, Sweden, 46p.

[5] Obernberger I, Thek G (2010) The pellet handbook – The production and thermal utilization of biomass pellets. Earthscan Ltd, London, UK, 549p.

[6] Larsson SH, Lestander TA, Crompton D, Melin S, Sokhansanj S. (2012) Temperature patterns in large scale wood pellet silo storage. Applied Energy, 92:322-327.

[7] Kuang X, Shankar TJ, Bi XT, Sokhansanj S, Jim Lim C, Melin S (2008) Characterization and kinetics study of off-gas emissions from stored wood pellets. Annals of Occupational Hygiene, 52(8):675-683.

[8] Svedberg U, Samuelsson J, Melin S (2008) Hazardous off-gassing of carbon monoxide and oxygen depletion during ocean transportation of wood pellets. Annals of Occupational Hygiene, 52(4):259-266.

[9] Svedberg URA, Högberg HE, Högberg J, Galle B (2004) Emission of hexanal and carbon monoxide from storage of wood pellets, a potential occupational and domestic health hazard. Annals of Occupational Hygiene, 48(4):339-349.

[10] Smith MA, Glasser D (2005) Spontaneous combustion of carbonaceous stockpiles. Part II. Factors affecting the rate of the low-temperature oxidation reaction. Fuel 84(9):1161-1170.

[11] Pauner MA, Bygbjerg H (2007) Spontaneous ignition in storage and production lines: investigation on wood pellets and protein powders. Fire and Materials 31(8):477-494.

[12] Jian F, Jayas DS, White NDG (2009) Temperature fluctuations and moisture migration in wheat stored for 15 months in a metal silo in Canada. Journal of Stored Products Research 45(2):82-90.

[13] Gauthier S, Grass H, Lory M, Krämer T, Thali M, Bartsch, C (2012) Lethal carbon monoxide poisoning in wood pellet storerooms-two cases and a review of the literature. Annals of Occupational Hygiene, 56(7):755-763.

[14] He X, Lau AK, Sokhansanj S, Jim Lim, C, Bi XT, Melin S (2012) Dry matter losses in combination with gaseous emissions during the storage of forest residues. Fuel 95:662-664.

[15] Pa A, Bi XT (2010) Modeling of off-gas emissions from wood pellets during marine transportation. Annals of Occupational Hygiene 54(7):833-841.

[16] Kuang X, Shankar TJ, Sokhansanj S, Lim CJ, Bi XT, Melin S. (2009) Effects of headspace and oxygen level on off-gas emissions from wood pellets in storage. Annals of Occupational Hygiene 53(8):807-813.

[17] Persson H, Blomquist P (2004) Släckning af silobränder, SP Sveriges Tekniska Forskningsinstitut, 2004:16, Borås, Sweden

[18] Persson H, Blomquist P (2009) Silo fires and silo fire fighting. In: Proceedings of bioenergy 2009, pp. 693-702, Jyväskyla, Finland

[19] Kubler H (1987) Heat generating processes as cause of spontaneous ignition in forest product. Forest Products Abstracts 10(11):299-327.

Attachment W

More

Combustible Dust an Explosive Issue

As the pellet-making industry grows, more emphasis is being placed on mitigating and managing the potential for dust-generated fires and explosions.

By Katie Fletcher | December 25, 2014

Dust that accumulates at wood pellet plants during the production process can end up being a fuel source itself, fueling unwanted fires or explosions. This potential hazard makes effective dust management an integral part of wood pellet manufacturing. “Essentially we are taking a woody product, reducing its particle size and drying it into its most combustible form, and then densifying it afterward,” says Shawn Bells, general manager with Pacific BioEnergy. “So with regard to what we do, we’re probably doing the exact opposite of what you are supposed to be doing—we are creating a fuel—so then we have to deal with it.”

Primary Protection: Combustible dust can be found in every step of the pellet-making process. These are the primary filters for the pelletizing line at Drax's Morehouse BioEnergy site in Bastrop, Louisiana.
Photo: Bruce Livesay, Western Pneumatics Inc.

Producers recognize the nature of their operation can produce hazards. “We started really getting serious about dust about 10 years ago,” says Stephen Faehner, president and CEO of American Wood Fibers. “Then OSHA became focused on dust control and management. That’s, I think, when it heightened everyone’s awareness.”

It is the combustible nature of dust at pellet plants that makes it a hazard. Combustible dusts (CD) are defined by OSHA as fine particles that present an explosion hazard when suspended in air in certain conditions. Organizations like OSHA help the industry manage and enforce safety, and some organizations that cater to the pellet industry are beginning to step up compliance standards and standardize protocol. The International Standards Organization has launched an effort, under the direction of Working Group 4 of ISO/TC238, to develop global standards for numerous components of commercial, industrial and small-scale pellet production. Topics to be addressed include not only prevention, detection, suppression and management of fires and explosions, but also safe handling and storage, analysis of spontaneous heat generation and analysis of off-gassing products. Another example of the effort is WorkSafeBC’s new dust policies in British Columbia, Canada. Separate explosions in early 2012 that destroyed two sawmills and resulted in four deaths and 42 injured workers at Burns Lake and Prince George, British Columbia, spurred the organization to prepare a review and action plan that outlines plans for an agency restructuring and reviews mitigation of safety hazards from dust at sawmills and wood manufacturing facilities. “We crafted a policy that speaks to the responsibilities of employers, workers and supervisors with respect to the management and control of combustible dust,” says Al Johnson, vice president of prevention services with WorkSafeBC.

As part of the policy for employers, WorkSafeBC expects them to undertake a risk assessment to account for all of the potential risks and unique aspects at their particular mill. After the risk assessment, employers need to create a dust management and control program based on the assessment’s results. “That program then needs to be implemented and all of the workforce needs to be trained in that program,” Johnson says. “So that when we come knocking on their door doing an inspection, and we ask for their program, they can demonstrate that they have a written program.”

Additionally, the Wood Pellet Association of Canada and all of its British Columbia member mills have agreed to work with the BC Forest Safety Council to create a combustible dust audit tool customized for pellet mill operations. “This has basically helped mature the rest of the pellet industry by relying on the strengths of the larger producers to share the standards, the protocols, give them this inspection that they can use to ensure that their systems are safe and up to the standard of the rest of the industry,” Bells says.

The pellet industry is evolving, and so are dust management practices and the regulations and standards that accompany them. Equipment vendors are also onboard. “It is apparent that there is more focus on the dust collection and safety systems and devices within the pellet manufacturing facilities,” says Andy Clarke, vice president of sales at Clarke’s Sheet Metal Inc. “The basic concepts have remained the same, however, there have been advancements with regard to energy efficiency and advancements aimed at reducing downtime and increasing safety.”

Elements of Explosions

There are many important factors when considering the explosivity of CD including size, shape, moisture and environment. The industry refers to the dust explosion pentagon when illustrating the mix of components that need to be present to cause explosions or fires. The five elements of the pentagon include fuel, ignition source, dispersion, confinement and oxygen. Removing any one of these elements can prevent an explosion, but not necessarily a fire.

Dust is present with other elements of explosions in every stage of the pellet-making process in both internal systems and external environments. Although producers can't see what happens in the pipes and machines of the internal system, "what we do know is those internal systems have four elements of that explosion pentagon present," says Scott Bax, senior vice president of operations with Pinnacle Renewable Energy Inc. "Really, the only thing you are missing at any given time is an ignition source. As a result, there is a tremendous amount of energy from all pellet producers to have very good systems."

The external environment comes down to whether dust is present and can be dispersed. Few systems at plants are perfectly sealed, so dust can accumulate on places like ducts, shafts, cable trays or other places where a small amount of dust is leaking. "What is required is a management system; it should measure the rate of dust accumulation and link that to a rigorous clean-up schedule and program to minimize the presence of dust," Bax says.

The National Fire Protection Association creates standards and guidelines for the pellet industry to follow. "As pellet producers, and, in general, the entire wood industry, we have a better understanding of the issue of combustible dust and that is paying off," Bax says.

The NFPA provides the guideline of one-eighth of an inch over 5 percent of the area accumulating dust to meet the minimum explosible concentration. They define the size of deflagrable wood dust as .5 mm or less with a moisture content of less than 25 percent. "Mill practices on equipment operation and safety is continually influenced by the NFPA and OSHA, and we are continually working to comply with these changing standards," says Bruce Livesay, vice president of marketing and owner of Western Pneumatics Inc. "Knowledge of continued process and safety regulations make it our responsibility to pass this knowledge to our customers."

Managing the Mess

Information shared at a joint WPAC and WorkSafeBC combustible dust workshop held over the summer of 2014 discussed components of how to manage CD at pellet plants. Areas to improve a dust management program include a risk assessment process, implementation of controls, regularly scheduled inspections, thorough investigation of all incidents so as to prevent recurrence, education, training and supervision, program audit and review, a corrective action process and records and statistics to identify trends.

WorkSafeBC works with five companies operating 10 wood pellet mills to improve dust management programs, Pacific BioEnergy and Pinnacle are two. "WorkSafeBC's done a very good job helping us with the education piece," Bax says.

Employee training is regarded as essential moving forward. "A big one, probably our biggest one, is continuing to empower employees to understand combustible dust and report on any dust-related issues anywhere they believe there is a concentration of dust," Bax says.

Equipment manufactures and vendors also take part in educating. "We train our customers how our equipment operates and how it should be maintained," Livesay says. "Documentation is created to substantiate initial operating performance and periodic checks confirm the proper operation of our systems. We also perform inspections and critiques of systems which have been in operation for years and require upgrading."

Designing for Dust

Building design and engineering controls are also impactful factors in dust management. Some pellet producers say this is the sustainable management practice. "The long-term solution to keeping your plant clean is not cleanup," Bells says. "It's meant to be an interim step until you have all the engineering, design, all of the steps necessary to keep the dust contained and keep it from spilling out of the process."

Various equipment features can help fugitive dust from accumulating. Having round metal ducting, and monitoring overhead beams, ducting, electrical cable trays, lighting fixtures and more is important, as these are prime locations for fugitive dust to linger. Sonic air fans can help prevent dust from accumulating in elevated areas that can be difficult to reach, Bax says. Other equipment Pinnacle has for dust mitigation includes NFPA compliant vacuums that are antistatic, as well as wireless temperature sensors in pelletizers, among other equipment.

Western Pneumatics works with 12 large pellet plants, including dryer and pollution abatement systems for Green Circle, Georgia Biomass, German Pellets and Sega Biofuels, to name a few installations. "We developed new lines of dust collection filters and they have been received well for hammermill air-assist, cooler aspiration, dry fiber and pellet silo aspiration and truck and rail load-out aspiration," Livesay says. "We also provide the high pressure pneumatic systems to move fines and dust from one end of the plant to the other."

Dryers use wet precipitators and rapid thermal oxidizers to handle and clean large volumes of air before it is discharged into the atmosphere, according to Livesay.

Abort gates are one piece of equipment that exhaust hazardous air flow from the ducting. The gates are activated from spark detection system sensors. A spark detection system itself is primarily used as a fire

prevention method in dust collectors by detecting and extinguishing sparks and embers. Sparks can be caused by various things such as a dull tool, damaged fan bearings or an overheated motor.

There is equipment to manage the fuel and ignition elements of the dust explosion pentagon, but elements like oxygen and confinement are inevitable. “So you try to focus on eliminating the fuel and minimizing ignition sources,” Bax says. “Those are the two items you have the most control over.”

The Combustible Challenge

“There’s a dust focus,” Faehner says. “The challenge is trying to change a lot of the culture in the wood products industry.”

He adds that almost everyone in the business is focused on manufacturing, and they’re certainly focused on safety, but at the end of the day they have to produce the goods. “With that in mind you have situations where people are driven to produce, produce, produce and they’re reluctant to either stop and fix a dust source—the dust is coming from somewhere—or to be mindful that you must have good housekeeping.”

Although the industry is taking dust seriously, organizations like WorkSafeBC, with a health and safety focus, hope it can become embedded into the overall day-to-day management of the facility. “We’re trying to integrate the safe management of wood dust into their overall operation culturally, if you will, so they just naturally see it as something they need to manage on a day-in-day-out basis,” Johnson says.

Johnson went on to say, stepping up the focus on health and safety is part and parcel of WorkSafeBC’s goal for pellet mill owners to maintain sustainable compliance in dust control management.

The standards take work to maintain for producers. “We have heightened our awareness and increased our focus to go from a very, very tidy facility to a spotless facility, and that’s a challenge because we are still at the stage where we’re still implementing more engineering to deal with some of the point source spillage issues,” Bells says.

Equipment design and system design is more technical than ever as dust control systems now involve many more safeguards, according to Livesay. “Existing mills will be challenged to improve dust control and once the dust is collected to install, equipment which will keep personnel safe and minimize the chance for fires or explosions,” he says.

Producers agree that one of the best paths forward is collaboration among industries dealing with CD issues. “The next evolution is a better understanding of where other organizations have been able to effectively manage dust and develop best practices, so focusing on improving collaboration within the pellet industry, within the forest products industry, and then even broader with payoff,” Bax says.

The work being done with CD standards in BC is just one example of how the industry is working to mitigate the fine particle byproduct of pellet production from becoming a source of fuel itself. “As the regulator, we’re working closely with the pellet mills in the province and they’re working closely with us,” Johnson says. “A lot of work has been done, we see that, to effectively strengthen their programs around managing combustible dust in the pellet mill facilities. I think a little more work can be done, but the indications are positive that they’re moving in that direction.”

Author: Katie Fletcher
Staff Writer, Biomass Magazine
701-738-4920
kfletcher@bbiinternational.com

Related Articles

Business Briefs

The RFS in 2017: A Brave New World

Comment periods on 2 EPA RFS proposals to close in mid-February

Swinerton breaks ground on C2e biogas facility in North Carolina

Evolution Markets brokers residential wood pellet futures trade

Ameresco, city of Phoenix break ground on RNG project

Attachment X

Determination of Explosibility of Dust Layers in Pellet Manufacturing Plants

Staffan Melin
Research Director
August 30, 2012

Executive Summary
Dust explosions and fires has become a major issue in the pellets industry as well as in other woodworking industries with devastating consequences in many cases. The industry is struggling with ever increasing insurance premiums and has been looking for cost effective means of mitigating the risks. Part of the problem is the limited understanding of the complex behavior of dust explosions among plant operating personnel as well as corporate management. This document is intended to increase the understanding from a practical standpoint and to provide references to the important regulatory system for control of dust explosions and fires. A dust management scheme is outlined which if implemented would eliminate much of the risk at a minimal cost. The scheme is built upon a sharing of responsibility between management, operations and maintenance personnel and at the same time providing a robust safety record as the basis for safety inspections and audits. The allowable dust level is determined by a model and inexpensive instrumentation which can be used by plant operating personnel and based on characterization of the dust by scientific means.

1. Introduction

Housekeeping in wood manufacturing facilities such as pellet manufacturing plants traditionally has not had the priority it deserves for a number or reasons. The issue of cleaning has a connotation of lesser significance than keeping a plant operating and producing revenue generating products. Cleaning of floors is a nuisance since the generation of dust never stops but it is as important as regular maintenance of machinery. This document describes a methodology for evaluating how much dust on floors, girders and beams is acceptable in order to stay within reasonable margins of safety. Several guidelines are published on this subject but are not necessarily accessible without substantial effort. Also, these guidelines are not always adapted to the characteristics of the type of dust encountered in pellet plants. Based on lab testing of a couple of fundamental parametric values related to the specific characteristics of the

dust the method described will allow the operator of a pellet plant to evaluate the necessary safety precautions which needs to be taken as it relates to housekeeping.

2. Anatomy of dust explosions

Dust explosions typically have two phases, a primary explosion cased by ignition from a mechanical spark or electrostatic discharge, overheated rotating device (ball bearing, idler, guide roller etc.) or bead from hot work or similar, followed by a secondary explosion. The secondary explosion is a result of dust lodged on the floor, beams, girders, railings etc becoming airborne as result of the pressure wave from the primary explosion and begin to deflagrate (propagation of burning material at high speed). In a dusty environment there is usually also very fine dust suspended in the air for a long period of time[1] which also contributes to propagation of a deflagration throughout a building. The conversion of dust from a layer to a dust cloud changes the dynamics radically since the dust becomes oxygenated and fluid. If there is a secondary explosion it is often far more damaging since it extends the explosion to much larger spaces where people may be working. Precautions to take for limiting primary explosions are well documented and consist of a combination of prudent design of facilities and machinery and proper maintenance, including cleaning of specific equipment. Precautions to take for limitation of secondary explosions are recommended by NFPA[2] and OSHA[3] in North America and consists primarily of maximum thickness of dust layers. Table 4.0[1] summarizes the explosibility characteristics of dust from pellets produced in British Columbia (white dust), Nova Scotia (bark dust) and SE USA (southern yellow pine - SYP).

Table 4.0 Results from testing dust from white pellets and bark pellets

Test Mode	Test Parameter (dust <63 µm)		Measure	White Dust	Bark Dust	SYP Dust	Coal Dust	Testing Standards
Dust cloud	Auto-ignition Temp (Godbert-Greenwald)	T_c	°C	450	450	455	585	ASTM E1491
	Min Ignition Energy	MIE	mJoule	17	17	20	110	ASTM E2019
	Max Explosion Pressure	P_{max}	bar	8.1	8.4	7.7	7.3	ASTM E1226
	Max Explosion Pressure Rate	dP/dt_{max}	bar/sec	537	595	360	426	ASTM E1226
	Deflagration Index	K_{St}	bar.m/sec	146	162	98	124	ASTM E1226
	Min Explosible Concentration	MEC	g/m^3	70	70	25	65	ASTM E1515
	Limiting Oxygen Concentration	LOC	%	10.5	10.5	13.5	12.5	ASTM E1515 mod
Dust Layer	Hot Surface Ignition Temp (5 mm)	T_s	°C	300	310	320		ASTM E2021
	Hot Surface Ignition Temp (19 mm)	T_s	°C	260	250	270		ASTM E2021
	Auto-ignition Temp	T_L	°C	225	215	220		USBM (Bureau of Mines) RI 5624
	Dust Class (>0 to 200 bar.m/sec)			St 1	St 1	St 1	St 1	ASTM E1226
	Dust Class (Explosion Severity (ES > 0.5)			Class II	Class II	Class II		OSHA CPL 03-00-06

[1] Testing of Explosibilty and Flammability of Airborne Dust from Wood Pellets, S. Melin, Wood Pellets Association of Canada, November 2, 2008.
[2] National Fire Protection Association.
[3] Occupational Safety and Health Administration.

3. Calculation of Maximum Recommended Dust Layer Thickness

NFPA[4] 664 focuses on dust in the wood working industry, Chapter 11 and Annex A, paragraph 6.4.2.2 or NFPA 499[5], Chapter 5 are stipulating a dust layer thickness of more than 1/8" (3.2 mm) is considered unsafe if the dust is covering a certain percentage of floor or other flat surfaces in a facility. The bulk density of wood dust is around 250 - 550 kg/m^3. A procedure for estimation of dust concentration in a space volume as a result of a secondary explosion is illustrated below. The result is evaluated in view of the Minimum Explosible Concentration (MEC) in Table 4.0 above based on some assumptions regarding the space volume in a building.

Example

Area selected = 15 m * 25 m = 375 m^2
Dust layer thickness = 1/8" = 3.2 mm
Bulk density = 500 kg/m^3 @ moisture content 5%
Floor area covered with dust = 5%
Total amount of dust in the selected area = 375 * 0.0032 * 500 *5/100 = 30 kg
Height of the selected area = 4 m
Total space volume in the selected area = 375 * 4 = 1500 m^3
Concentration of dust in the space volume = 30/1500 = 0.020 kg/ m^3 = 20 gram/m^3

The 20 gram/m^3 compared to 70 gram/m^3 (as per Table 4.0) provides a good safety margin of 71%. If the area covered with dust is 30% the calculation looks as follows;

Dust in the layer = 375 * 0.0032 * 500 * 30/100 = 180 kg
Concentration = 180/1500 = 0.120 kg/m^3 = 120 gram/m^3

The 120 gram/m^3 is unsafe and would easily sustain a deflagration if a primary explosion were to happen.

Due to the violent turbulation of the dust when dislodged by a pressure wave the concentration of the dust in most cases can be assumed to be spread evenly within a space volume. The larger the area is covered by a layer of dust the more critical the condition becomes. A spreadsheet model[6] has been developed which can be used for evaluating safety margin for explosions based on the following parameters;

- Estimated average thickness of a dust layer within selected floor area
- Bulk density of the dust **(from lab test)**
- Minimum Explosible Concentration (MEC) of the dust **(from lab test)**
- Floor area

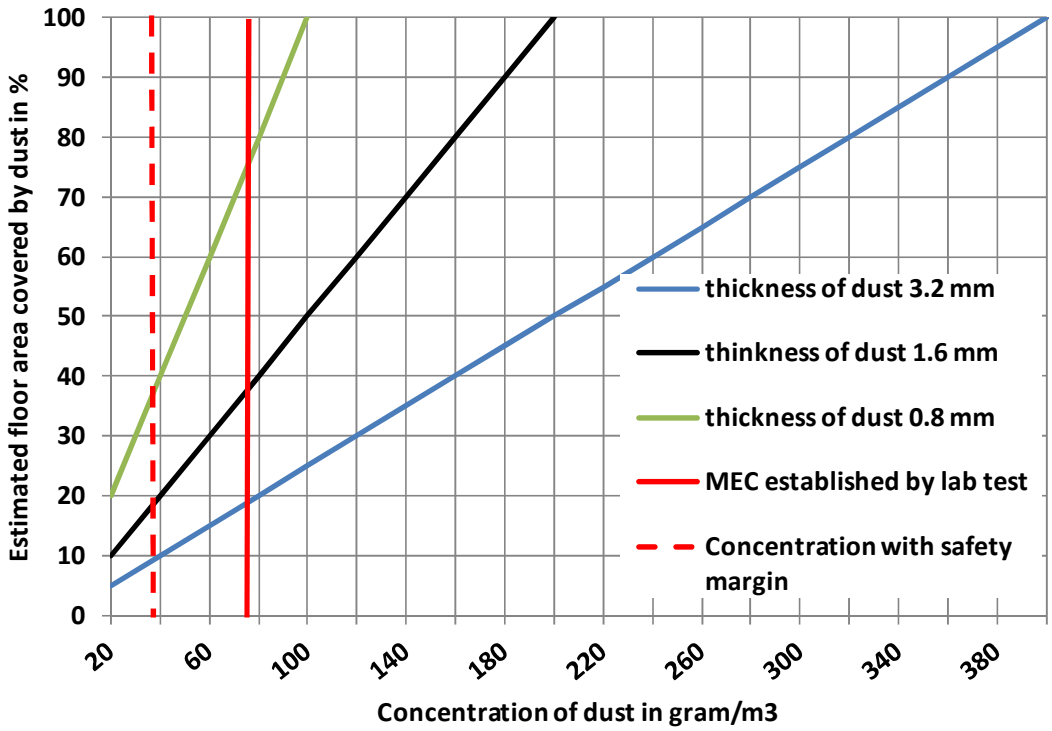
[4] NFPA 664, Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities, 2007 edition.
[5] NFPA 499, Recommended Practice fir the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas, 2004 edition.
[6] Delta Research Corporation drc@dccnet.com

- Ceiling height
- Horizontal surface area within the space volume of beams, girders, railings etc.
- Estimated percentage of selected floor area covered by dust
- Estimated amount of lofted dust in space volume
- Average dust concentration suspended in the air in space volume
- Selected safety margin in relation to measured MEC

The model is iterative and lends itself for estimation of the risk level in selected areas. The model allows for sectionalizing the footprint area during inspection to simplify determination of the estimated average thickness of the dust layer for the total floor space area.

Example of the output from this model is illustrated in Graphs 1. This particular graph is valid for dust with MEC 70 gram/m^3 and a bulk density of 500 kg/m^3.

Graph 1. Calculated Concentration of dust in gram/m3



The concentration of dust C_d is inversely proportional to the space volume V. This means that a space volume twice as large would produce the same dust concentration

$$C_d = (d_{th} * 1000 * A * (A_d/100) * d_b) / V$$

where

C_d = concentration of dust in space volume gram/m^3

d_{th} = dust layer thickness mm

A = total floor area	m^2
d_b = dust bulk density	kg/m^3
A_d = floor area covered by dust	%
V = Space volume	m^3

From Graph 1 it can be concluded that a dust layer with thickness of 3.2 mm (1/8th inch) covering 20% of the selected floor area the concentration of dust is estimated to 75 gram/m^3. With an MEC of 70 gram/m^3 for dust generated in BC pellet plants deflagration could be propagated throughout a building as a result of a primary explosion. A safety margin of 50% to the MEC (50% of 70 gram/m^3 = 35 gram/m^3 from Table 4.0) as established by lab test is recommended. If 10% of the floor area is covered by a 3.2 mm layer of dust the estimated dust concentration is 40 gram/m^3 which is less than the MEC for the dust on Table 4.0 and provides a safety margin of 43%. This safety margin may be sufficient although 50% safety margin should be the target. A housekeeping guideline stipulating a maximum thickness of a dust layer of 1.6 mm would provide a safety margin of 50% or better even if the dust layer is covering approximately 20% of the floor area. Alternatively, a thickness of the dust layer of 3.2 mm covering less than 5% of the floor would also be within the 50% safety margin. This illustrates the importance of keeping as large areas as possible clean.

The MEC is a measure related to the characteristics of the dust such as chemical composition of the material, moisture content, Limiting Oxygen Concentration (LOC), particle size distribution and shape of the dust particles (see foot note 1 for more details). The NFPA 499 and NFPA 664 are not necessarily accounting for the explosibility characteristics as measured by lab test for a particular dust in question.

4. Considerations for Determination of Safety Margin

With MEC established at 70 gram/m^3 for the material as per Table 4.0 and a safety margin of 50% the maximum allowed dust concentration should be less than 35 gram/m^3 keeping in mind that the MEC is tested as per Standard starting at room temperature and the reactivity of most materials increase with temperature. The shop floor temperature in an operating pellets plant may in certain areas be considerably higher causing a more reactive initial state which would justify the 50% safety margin to be on the safe side. The MEC as well as the bulk density of the dust are essential parameters when determining guidelines for housekeeping to keep a manufacturing plant safe. Without those values the guidelines becomes a gamble and the housekeeping may not achieve what it is supposed to achieve – as safe working environment as possible.

The speed of a deflagration is subsonic which means the burning dust is propagating at up to 343 m/sec at a temperature of +20°C and even higher at higher temperatures. The burnout time for many particles would be several seconds. This means that particles in a deflagration wave penetrating objects in its way in a contained building will continue to burn at temperatures above +250°C for several seconds which is sufficient to initiate

fires in combustible materials and cause severe burn injuries if a person is exposed to the ignited dust storm. Spaces inside buildings may have constrictions such as hall ways which may magnify the propagation of the deflagration speed. The average distribution of dust as calculated in a model does not tell the entire story since the dust is unevenly spread due to eddies behind walls etc. With a high speed deflagration wave sweeping through a building a deflagration may propagate between clusters of high concentrations of dust. In an environment where dust layers are forming on floor and flat surfaces there is always dust aloft in the air. The airborne concentration is very much depending on the distance to the source of the dust, air movement and the particle size of the dust. The following diagram illustrates the sedimentation time as a function of particle size (for more details foot note 1) for particles in still air.

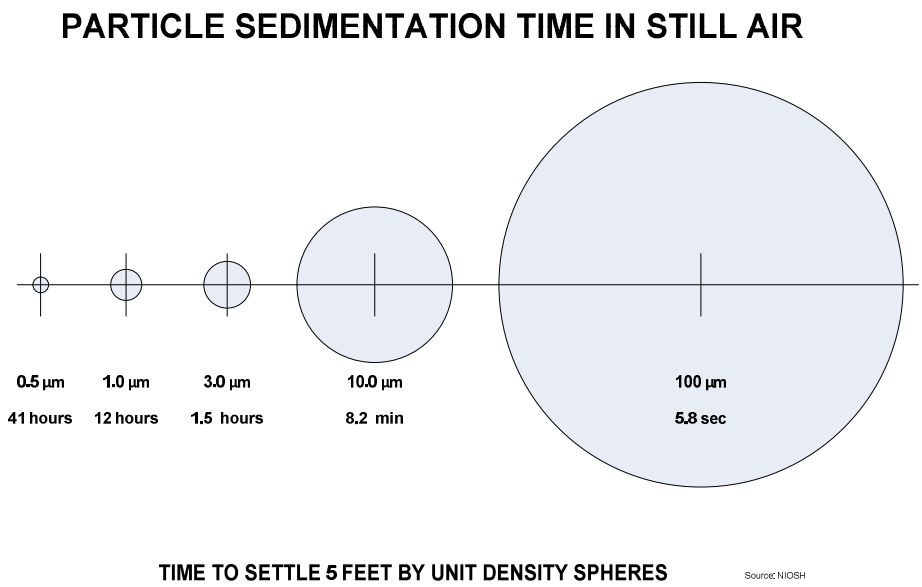


Figure 1.

A substantial portion of the airborne dust in a pellet plant is smaller than 10 micron which means that those particles add to the airborne concentration caused by a secondary explosion. Normal condition in an industrial environment is that the air is in constant turbulence which means that particle sizes less than 100 micron remain lofted.

Dust particles settling further away from the source are smaller and tend to have a flatter surface area and are therefore more sensitive to ignition. Location of dust sampling is therefore an important consideration since it will affect the explosibility characteristics.

For establishing an average dust explosibility characterization the dust collected in a baghouse is a good source since the dust collected usually comes from a space with high

turbulation which means a mix of larger and smaller particles. For establishing the extreme dust explosibility characterization the dust should be collected in an area with dust as far as possible from the source.

5. Research Regarding Dust Layers

Since the MEC is dependent upon particle shape and the sedimentation speed as well as spatial distribution in an area it is important to know where to take samples for testing. Research is needed to develop guidelines for sampling of explosible dust. This issue is under review by ISO Technical Committee 238 for Solid Biofuels and will require extensive research for a variety of dust, impact of air turbidity on settling characteristics of dust and other operating conditions. Unfortunately there is no guideline or standard for how to sample dust. Research[7] is under way to determine the best procedure for sampling dust. The generally accepted technical testing standards explosibility do not prescribe any method for sampling and do not even acknowledge the importance of sampling and how it may affect the explosibility characteristics. The ASTM Standards for example stipulate that the moisture content of the sample shall be below 5% but allows "manufacturing" of the dust using a hammer mill which does not produce a representative dust. The CEN Standard on the other hand stipulates a test sample as received with no restriction on the moisture content which has a major impact on the explosibility characteristics. These differences allow only a limited direct comparison of results from the two standards. ISO/TC238 is currently working on resolving this issue by harmonizing[8] the sample preparation requirement.

Determination of thickness of dust layers is currently done by visual observation and therefore becomes an arbitrary process. A simple methodology needs to be developed for quick measurement in the working environment in support of inspectors and auditors. Small tripod mounted meters using a laser beam with an resolution of ±0.15 mm are available for reasonable price (CAD 350) and can be calibrated to a clean floor and could be one approach. The picture illustrates a prototype measurement setup on a tripod with the laser spot clearly visible as it focuses on a sample of wood dust. The wood dust is surprisingly reflective for a laser beam. A spot measurement procedure takes only a few seconds and the data can be transferred to a computer for further statistical processing and reporting. Research[7] is under way to determine the efficiency, precision and safety of such method. Since dust tend to accumulate in uneven layers, for this method to be

[7] Delta Research Corporation drc@dccnet.com
[8] ISO/TC238 Working Group #4

useful there has to be spots selected in an industrial plant which are representative of dust generation and where fairly even dust layers are formed.

6. Recommendations and Guidelines

The guidelines documented by NFPA are considered the industry standard. Most spaces in a pellet plant should be classified as Class II Division 1 (see NFPA 499, Chapter 4.1). The wood dust itself is classified as Group G (see NFPA 70[9], Chapter 500.6). Each area of a manufacturing plant shall be classified in accordance with the Hazardous Zone definitions in NFPA 70, Chapter 506. Most of the production areas of a pellet plant would fall in to Zone 20.

The discussion in this document focuses on the dust issue in pellets manufacturing plants. Much of the issues as well as potential solutions are probably applicable also to other wood working operations such as sawmills, planer mills and board plants.

Preventive Measures

Buildings were explosions can be expected due to release of dust and difficulty with proper housekeeping shall be designed for explosion protection by deflagration venting as recommended in NFPA 68[10] and 69[11]. Equipment in such areas requires equipment compatible with Temperature Class (T code) in accordance with NFPA 70, Chapter 500.8 depending on the Hot Surface Ignition Temp (19 mm) as established by ASTM[12] E2021. NFPA 664, Annex A paragraph 6.4.2.2 provide some general guidance regarding dust layer thickness, floor size and bulk density of dust but is not necessarily applicable to the environment in a pellets mill with dust of different bulk density.

It is recommended that a site evaluation is done for any specific area to make sure the guideline for robust maximum dust layer thickness is established. Such evaluation should be done in areas where dust is systematically accumulating and where housekeeping is difficult to maintain.

Dust Characterization

Each pellet mill should have the MEC established by a certified lab in accordance with testing standards given in Table 4.0. Equally important is to establish the bulk density of the dust generated in the plant to make sure the fundamentals are met for establishing a safe limit for dust layer thickness as well as housekeeping guidelines to keep the floor areas sufficiently clean and the dust level below the allowable limit. Both of these parameters are unique for each pellet plant since it relates to the feedstock used as well as the comminuting technology used for processing the feedstock.

---

[9] NFPA 70 National Electrical Code, 2008 edition.
[10] NFPA 68 Standard on Explosion Protection by Deflagration Venting, 2007 edition.
[11] NFPA 69 Standard on Explosion Prevention Systems, 2002 edition.
[12] ASTM E2021-06, Standard Test Method for Hot-Surface Ignition Temperature of Dust Layers, American Society for Testing and Materials.

Without knowing the MEC and dust bulk density the safety rules for a production plant and safety management becomes a guessing game. A safety margin policy of 50% or better should be established for any pellet manufacturing plant.

Proposed Dust Management

A successful scheme to control dust explosions must include, besides actual characterization of the dust, a split responsibility between management, operations and maintenance and has to be based on robust and measurable data. Whoever is assigned the responsible of controlling the dust level in a manufacturing plant should be equipped with methodology to record thickness of dust accumulation in layers and spaces where dust is continuously suspended in the air. Inspections and recordings needs to be done at preset intervals. This should be done every time just before vacuuming takes place. The record should be made available to all levels of personnel by posting to cultivate awareness of the importance to control the dust level;

- Frequent accumulation of explosive dust is an indication that a preventive measure likely needs to be taken in terms of redesign of a piece of machinery or change of operating procedures. The responsibility falls on plant or corporate management to act upon in this respect.
- Awareness of recorded data of dust layers promotes more frequent and diligent housekeeping routine. This responsibility falls on the housekeeping or maintenance crew to act upon in this respect.
- The record shall be available to inspection and safety audit bodies for determination if the safety certification for the plant can be upheld. The dust certification becomes part of the safety approval process which affects WorkSafe as well as insurance rates.

One approach might be to use a thickness measurement instrument since it is an "independent" factor providing neutrality for verification of safety compliance. A well calibrated thickness meter and well kept record of measurements could eliminate much uncertainty and disputes regarding safe operating procedures and eliminate poorly designed operating equipment and procedures. It should be noted however that locations with dust layers for determination of dust layer thickness needs to be selected with care in order to be truly representative. A flat surface where dust regularly is accumulating in a well defined layer is the best. The meter data record promotes collaboration between management, plant operations and maintenance. A well kept record would also serve as a valuable forensic tool if the accident is still there.

The ISO/TC 238 will come out with sampling and sample preparation recommendations as a result of the on-going research. The target date for release of recommendations is sometime during 2013.

The generation of dust never gives up and can only be fought with diligence.

Attachment Y

Biomass Handling

All you wanted to know about biomass handling but were afraid to ask.

BIOMASS DUST FIRE AND EXPLOSION CONTROL

April 24, 2013

Introduction

Fires have always been a problem in wood processing plants, particularly in those that handle dry material, including wood finishing plants, panelboard plants and wood pellet facilities; less so in sawmills. Historically, most sawmills in BC were accustomed to processing `green' wood with moisture contents of 40 – 55%, wet basis. While not unknown, fires were not a common experience with such wet wood, and explosions were unheard of. So, the fires and explosions in northern BC in 2011 and 2012, which resulted in the total destruction of two large sawmills, multiple deaths and injuries, is great cause for concern. Everyone is asking, "What happened?" The relevant safety authorities are currently investigating both incidents and at this point in time, firm causes have yet to be identified.

There has been speculation that dust accumulations resulting from the processing of dry (<25%), Mountain Pine Beetle (MPB) killed wood were contributors to the two explosions. The Mountain Pine Beetle has always been present, but nature has kept them in check through long periods of very cold weather. Over the last two decades the amount of timber being killed by the MPB has grown and has reached astronomical proportions in BC, with more than 60% of the pine resource being killed, which has resulted in hundreds of thousands of hectares of forest being decimated. After dying, the pine trees dry out to the ambient humidity level. The longest-dead trees that are still standing are quite dry with moisture contents <25%.

As the MPB plague spread through a region there was a rush to mill the most recently killed trees before their value diminished too drastically. In affected regions after 20 years, sawmills are now processing pine that has been dead for a few years and is quite dry. So, the amount of MPB killed wood being processed is increasing at the same time as the dryness of the wood is decreasing. The dry MPB killed wood is very brittle and tends to shatter and generates large quantities of dust, which can overwhelm dust collection systems.

As are most BC interior mills, both destroyed mills were processing large quantities of MPB wood and were reported to have been very dusty. Since these two serious accidents, it has been learned that in recent years there have been at least five other less calamitous explosions in sawmills processing MPB killed wood. In these incidents, there were varying amounts of property damage but no injuries.

Used to processing benign `green' wood, the sawmilling industry has been caught somewhat `flat-footed' by the potential for disastrous consequences from the handling of dry MPB killed wood. However, since the calamitous fires and explosions, government and industry has responded remarkably and has taken steps to avoid their reoccurrence.

One effect of these two tragedies has been to put a focus on wood dust generation and accumulations in sawmills. As a consequence, the provincial government has ordered all mills to conduct dust safety surveys and WorkSafe BC and industry have compiled a document describing the best industry standards for dust, fire and explosion control. (See the reference at the end of this article)

Panelboard plants and wood finishing plants are very familiar with the fire and explosion risks associated with handling dry wood products. There is probably no dust so explosive as dry sander dust, which is common in panelboard plants. Consequently, most panelboard plants and wood finishing plants have long mastered the safe handling of explosive dusts. Still, not many years ago, one particleboard plant in Quebec was destroyed by dust explosions.

Historically, wood pellet production was a small industry with more than its share of fires and explosions. However with the emphasis on green energy, wood pellet production has skyrocketed and very large plants are being constructed. There have been several recent major fires and explosions in wood pellet manufacturing, shipping, receiving, storage and power plant facilities. These new facilities are learning that they have to employ safe handling practices for dry wood materials.

The purpose of this article is to describe to the newcomer to the industry some of the safety issues associated with handling dry woody biomass and provide general guidelines for dust control, spark, fire and explosion detection and suppression. Relevant codes, regulations and useful resources are listed at the end of the article.

Fire / Explosion Risks

It is well known that when dry, wood will readily burn. Additionally, due to microbial / bacteriological action and oxidation in certain storage conditions, wood can heat up to the point where it will self-combust. The nature of the material being stored, moisture content, particle size, air flow through the pile, compaction, size of storage pile, and contaminants can all contribute to spontaneous combustion. To read how these factors interact, see the article titled “Biomass Storage Pile Basics” on my website www.advancedbiomass.com.

Wet biomass will also burn. Some of the fastest moving fires have involved green sawdust soaked with hydraulic oil; all it takes is a spark or flame to get the fire started. And, smouldering fires in large, wet hog fuel piles are common even during very cold winters.

The causes of biomass fires are numerous. All you need is fuel, oxygen and a source of ignition. For a dust explosion / deflagration to occur, two additional factors are required: mixing the explosive dust with air in the necessary concentration and confining the mixture in a container or structure.

Some milling processes generate sparks. High speed hogs, grinders and chippers are used to process biomass and while doing so, can generate a lot of dust if the wood is dry. If a piece of metal or even a stone falls into the equipment, sparks can be produced, which can ignite the airborne dust. So, it is important to contain and collect the dust, decrease the metal and rock contamination at source and utilize metal removing equipment before the milling process at the plant.

If not controlled, dust will build-up around belts, pulleys, bearings, etc. Friction can result in enough heat build-up to start fires.

No wood handling process is dust-free. With even the best designed, constructed, operated and maintained system, fugitive dusting will occur. Very fine, airborne dust can escape and float in the air for a long time before settling out. And, whether it takes a day, a week or a month, dust will build-up. Accumulations of fine dust are easily disturbed and can become airborne, creating an explosive atmosphere. So, proactive clean-up procedures are required to minimize dust accumulations.

Accumulations of fine dust are easily ignited, particularly by `hot work' maintenance practices, so it is essential to wet areas down before starting `hot work' and have a fire watch posted during and after the hot work.

Even clean-up operations can result in fires and explosions. An inexperienced worker utilizing compressed air or an air blower to `blow-down' an area can stir up the fine dust and re-entrain it in the air stream; and if it drifts to an area where `hot work' is underway, the results can be explosive.

Should a small fire occur, it is common practice for workers to use a fire hose to put the fire out, but the stream of water can cause very dry dust accumulations to become airborne and which can be ignited by the fire resulting in a local primary explosion / deflagration.

A local primary explosion can shake a building causing more very fine dust accumulations to fall off roof beams or wall girts, which if ignited can result in a chain reaction of explosions propagating from one area to another. These secondary explosions can destroy the entire building.

Electrostatic electricity can build-up in equipment and sudden discharges are enough to ignite a dust cloud, so grounding / bonding equipment is important.

Fire and explosions resulting from handling dry wood are a real risk, consequently, it is necessary to assess the risks and utilize appropriate asset protection measures.

Asset Protection

Asset protection includes:

- Risk Assessment
- Prevention
- Dust Control with spark detection and suppression
- Fire detection and suppression
- Explosion detection and suppression
- Gas detection / Monitoring

Risk Assessment

Asset protection is a complex topic and one could write a lengthy manual to cover it completely. There are specialists available to help you with assessing the risks and making recommendations; so when first planning a project, engage an engineering company specializing in risk assessment and asset protection early in your project definition. What you don't want to do is to underestimate the types and amounts of asset protection systems required.

Plant areas fall into various area classifications, from those with low risk of fire or explosions to those with a high risk. The asset protection specialist will be able to assist you in determining the classification that is appropriate for each area in your plant. Each classification has certain requirements for equipment with respect to bonding / grounding, and electrical classification.

Most areas in a wood pellet plant are in the highest risk classification, Class II, Div. 1, Group G. For these areas, all electrical equipment (lighting fixtures, switches, sensors, etc.) must be designed and rated for the area and must be in CSA approved explosion proof enclosures or connected to Intrinsically Safe (IS) Barriers located in non-classified areas. All motors must be TEXP NEMA Premium efficiency motors, CSA approved for Class II, Div. 1, Group G. Armoured cables, rated for hazardous locations, are used for power, control and instrumentation wiring

Prevention

The processes involved in a dust explosion are extremely complex and hard to predict. However, explosions can be prevented by eliminating the fuel or ignition sources, by controlling dust concentrations or by limiting the oxygen necessary to sustain combustion / deflagration. Additionally, the potential effects of an explosion can be controlled by the design of the enclosure. The best countermeasure against fire or explosions is to prevent them from happening. Following are a few general recommendations.

1. Reduce the generation of dust by keeping speeds low and designing chutes to minimize impacts and product degradation.
2. Reduce the likelihood of fires by daily vacuuming up spills and accumulated dust, particularly away from heat generators such as lights, heaters, motors, etc.
3. Provide deflectors (>60°) over hard to reach places such as purlins, roof beams and girts to prevent the build-up of dust on hard to clean, horizontal surfaces.
4. Reduce the explosive environment inside enclosed structures by:
   - Maintaining a good airflow through structures / enclosures to reduce airborne dust concentrations below dangerous levels.
   - Contain the dust inside equipment and evacuate airborne dust from the equipment; collect the dust and dispose of it.
   - Note: Do <u>not</u> use air blowers or compressed air to `blow down' or clean equipment, as that will create an airborne dust cloud that in the correct concentration can be explosive.
5. Reduce potential ignition sources by:
   - Utilizing static conducting materials for belting, liners, grease, etc.
   - Ground and bond all equipment and conveyors to drain away static electricity.
   - Remove tramp metal from the product flow.
   - Line chutes with non-sparking materials.

- Maintain equipment to reduce areas of friction.

6. Don't mix wet and dry biomass within the same storage pile, as that can promote biological action and self-heating.
7. Measure the temperature of stored material and monitor temperature trends. A sudden increase can be indicative of `runaway' heating which can quickly lead to self-ignition.
8. Aeration can be used to keep the temperature level of stored biomass from reaching dangerous levels; however, once temperatures reach the `runaway' level, aeration systems need to be turned off as they will provide O_2 to feed the fire.
9. Monitor the gas levels inside biomass enclosures for CO, CO_2, and O_2, as changes in these can be indicative of fire.

Dust Control

The design parameters for dust control systems should include:

1. Totally enclosing the equipment to contain the product and to give heavier dust particles time to settle out.
2. Keep the equipment under a negative pressure so that there is a net inflow of air into the equipment, thereby reducing fugitive dusting.
3. Remove dust laden air permanently from the system and collect the dust in containers for removal from the site.
4. Do not reintroduce the dust back into the conveyor system where it would only be re-entrained at the next transfer point.

Dust control systems generally include the following:

- A dust collector with sprinklers, explosion vents, rotary airlock and fan, preferably located outdoors.
- Ductwork has pick-up hoods, clean-outs, test ports, visual airflow indicators and blast gates to balance the airflows.
- An airflow transmitter is mounted on the duct between the dust collector and fan.
- IR spark / flame detectors and a quenching water spray and fast-acting (milliseconds) abort gate are located in the main duct before the collector. Dry chemical suppressors are utilized where water cannot be used.
- A disposal bin is provided below the collector rotary airlock.

Fire Detection and Suppression

Fire detection and suppression systems should comprise the following measures:

1. Conveyors with heat sensing wires and sprinkler systems.
2. Infra-red (IR) heat sensors in particularly sensitive areas.
3. Storage silos and bins with temperature and gas monitoring systems and aeration systems, as well as inert gas injection nozzles for fire suppression.
4. All structures and galleries must have sprinkler systems, and fire hose stations located near the entrances to structures.
5. In warm climates, wet sprinkler systems can be used, but in cold climates, dry systems will be required.
6. Fire alarm systems interlocked to shutdown process and HVAC equipment.

7. Fire hydrants should be located outside the structures.

Deflagration / Explosion Detection and Suppression

1. Wherever possible, equipment such as dust collectors that are susceptible to dust explosions, should be physically isolated from other equipment or structures. In order to prevent deflagrations / explosions from propagating to upstream or downstream equipment, the following isolating devices can be used:
   - Rotary airlocks
   - Isolation hoppers and gates
   - Fast-acting isolation gates
   - Material plugs
   - Chemical isolation
   - Blast walls around susceptible equipment
2. Explosion flame-front detectors or pressure detectors trigger fast-acting (milliseconds), dry chemical suppressors to reduce the effects of and extinguish deflagrations. Whenever explosion detectors are activated, the associated process equipment is immediately stopped.
3. Chemical explosion suppression is provided to reduce the effects of explosions occurring inside equipment, and chemical explosion isolation is provided to prevent the propagation of explosions into upstream and downstream equipment.
4. Deflagration venting reduces the explosion pressures inside structures by providing a pathway for the pressure to escape from affected structures or equipment.

Gas Detection / Monitoring

1. CO and CO_2 gas levels can be indicative of smouldering biomass, so measure and trend these gas levels.
2. Methane (CH_4) is a product of biomass degradation, so measure and trend CH_4.
3. Ventilate enclosed spaces to evacuate harmful gasses. Where there is the possibility of CO, CO_2 and CH_4 generation, it is necessary to measure these and O_2 levels in adjacent enclosed areas for personnel protection.

Reference Codes and Regulations

The requirements for asset protection are highly regulated falling under many jurisdictions in Canada, including but not limited to:

- National Building Code (NBC)
- National Fire Code (NFC)
- Local building codes
- Canadian Electrical Code
- National Fire Protection Association (NFPA), particularly the following codes:
  - NFPA 68, Standard on Explosion Protection by Venting
  - NFPA 69, Standard on Explosion Prevention Systems
  - NFPA 70, National Electrical Code, (particularly the sections on area classifications)

- NFPA 77, Standard on Static Electricity
- NFPA 499, Recommended Practice for the Classification of Combustible Dusts and of Hazardous Locations for Electrical Installations
- NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing and Handling of Combustible Particulate Solids
- NFPA 664, Standard for the Prevention of Fire and Explosions in Wood Processing and Woodworking Facilities

It is highly recommended that an asset protection specialist be retained not only to provide help with the design of asset protection systems, but also to provide assistance navigating the `regulatory waters'.

Other Helpful Resources

Plant insurers such as FM Global have their own requirements. For technical guidance on some of the issues, see the following FM Global Property Loss Prevention Data Sheets:

- FM 7-10, Wood Processing and Woodworking Facilities
- FM 7-11, Belt Conveyors
- FM 7-17, Explosion Protection Systems
- FM 7-73, Dust Collectors and Collection Systems
- FM 7-76, Prevention and Mitigation of Combustible Dust Explosions and Fire
- FM 8-27, Storage of Wood Chips

The Industrial Accident Prevention Association (IAPA) has an excellent paper titled “Static Electricity” published in 2008.

After the two sawmill tragedies mentioned above, WorkSafe BC and industry compiled a document titled “Wood Dust in Sawmills, Compilation of Industry Best Practices”, published May 4,2012, which describes industry best practices with regards to “wood dust clean-up, control and associated fire prevention and protection measures”. This lengthy document has a very good list of excellent references,

The BC Forest Safety Council has a Basic Audit and Safety Evaluation (BASE) program for all wood handling operations and in 2011 extended the program to include guidelines for the assessment and safety evaluation of wood pellet mills. “Base Audit, Draft Guidelines Version 2.1, Pellet Industry Addendum”.

The Wood Pellet Association of Canada (WPAC) has written a report titled “Determination of Explosibility of Dust Layers in Pellet Manufacturing Plants”, which provides guidelines for assessing the risk posed by dust accumulations. While targeted at pellet plants, many of the observations and recommendations are applicable to other wood processing facilities.

Published by admin, in Biomass Basics.

---

4 replies on “BIOMASS DUST FIRE AND EXPLOSION CONTROL”

Ben says:
July 2, 2014 at 4:34 pm

Burnley Baffles is an effective way of reducing dust at unloading facilities.

https://www.youtube.com/watch?v=gumGK6A3AqI

See you soon

admin says:
July 3, 2014 at 9:01 pm

Thanks Ben, Burnley Baffles look like they work well with free-flowing material of a fairly uniform size.

Darren Bemrose says:
August 30, 2014 at 12:56 am

Do you have any references to Mobile Plant & Machinery? Most of the standards / guidance are relevant to installations rather than mobile equipment.
Kind regards
Darren

admin says:
August 30, 2014 at 5:28 pm

Hello Darren,
Further to your earlier email, I have many technical specifications for mobile equipment and machinery. However, every installation is unique and the equipment requirements vary from plant to plant. It is my experience that technical specifications need to be customized to meet the client’s requirements. Please tell me more about your company and your specific requirements.
Contact me at pjanze@telus.net
I look forward to hearing from you.
Paul Janze
Advanced Biomass Consulting Inc.
Langley, BC Canada

Attachment Z

The Florida Times-Union
jacksonville.com

(/)

Posted July 13, 2011 12:00 am | Updated July 13, 2011 01:42 am

By Teresa Stepzinski (/authors/teresa-stepzinski-0)

Overheated assembly caused Georgia Biomass explosion

Wood pellet production scheduled to resume at factory near Waycross.

Comments 3 Share

Wood pellet production should resume today at Georgia Biomass, which was crippled by a dust explosion last month. The plant is near Waycross.

"We're ramping up now ... starting the equipment and getting it all ready to go," plant manager Ken Ciarletta said about noon Tuesday.

See Also

Renovation of Brunswick federal building near an end (http://api.cxense.com/public/widget/click/!
GfwH7wzeB156ltcy5UU1g1yhMCKxI1C2gG5
9EA9JSGE6mbX4raTC8Yo2TONpeDZUR9u6Jx
cx_navSource=instory&cx_tag=contextual&

Man "obsessed" with girlfriend, gets 7 years on traffic charges after victim doesn't show at trial (/node/702028)

(http://api.cxense.com/public/widget/click/l
FkOC2d29Z0m0f3Le2TemX6tXsy5BBD1qGfk
H0wV4sMCsszTOfiTeRSvQSNHrDskGwNlyTv
AJjQqlWJ_4E3pWF4msZ37BKkvpHmg2FMtl3t
AT8t19B9Sf4WFgyEKMVUxVeAiwui-
Y5flke7JBmyWeaqDZatkNweq8drY_BJI3eMG
tJlQ6yaAWeqy06GdfdHcUITmkk8IlLg6qVy48
RekgfnaammLiZj069DDrh2muQE-
Qav23u0u9UIqBr-
sPSO7Ut_BT6aOoRuQ1flyBNS0QAOUeZB5pv
cx_navSource=instory&cx_tag=contextual&c

No one was injured in the early morning explosion June 20, which damaged some of the processing equipment at the plant that employs about 80 people.

An investigation revealed that an overheated roller/bearing assembly in a pelletizer sparked the blast at the factory, Ciarletta said.

No employees were laid off while production was shut down at the plant, he said.

As equipment was repaired and modifications made to prevent a recurrence, employees went through training and worked in other areas of the plant, he said.

He wouldn't reveal the cost of the damage, saying it was proprietary information. Ciarletta did say "the capital damage was comparatively low and has been repaired."

Georgia Biomass is a subsidiary of RWE Innogy of Germany, one of the top five electricity and gas companies in Europe. An estimated $175 million investment, the plant is in the Waycross-Ware County Industrial Park about five miles west of Waycross off U.S. 82 and U.S. 1.

The plant began operating May 12. Using yellow pine timber from throughout Southeast Georgia, its goal is to produce about 750,000 tons of wood pellets annually. Wood pellets are used as fuel - a cleaner-burning substitute for coal - primarily in Europe.

teresa.stepzinski@jacksonville.com, (912) 264-0405

READ/POST COMMENTS

Overheated assembly caused Georgia Biomass explosion - By **Teresa Stepzinski (/authors/teresa-stepzinski-0)**
(/node/702023)