ENVIVA PELLETS SAMPSON 2016
P/N 10386
SAMPSON COUNTY

1/7/2016

CENTRAL OFFICE PERMIT TRACKING SLIP

Facility Name: Enviva Pellets Sampson, LLC
Facility/Application ID: 8200152.15A
County/Regional Office: Sampson/FRO
Engineer: Kevin Godwin
Send Regional Office Copy of Application: (•) Yes ( ) No

PART I - ACCEPTANCE CHECKLIST

Acknowledgement Letter: ( ) Already Sent (•) Please Send

Initial Event(s):
- [x] TV-Ack./Complete
- [ ] TV-Ack./Incomplete add info
- [ ] State Ack. Letter due
- [ ] State App. not accepted – add info request

Fee Information:

Amount Due:
- [ ] PSD or NSR/NAA $14,294
- [ ] PSD and NSR/NAA $27,802
- [ ] TV Greenfield $ 9,442
- [x] TV $ 918
- [ ] Ownership Change $60, $50, $25
- [ ] Renewal/Name Change – NA

Initial Amount Received: $918.00
Additional Amount Due: $0.00

Acceptance Check List:

	Yes	No	N/A
Appropriate Number of Apps Submitted (# Received_____, #Needed_____)	☑	☐	☐
Application Fee Submitted	☑	☐	☐
Zoning Addressed	☑	☐	☐
Authorized Signature	☑	☐	☐
PE Seal	☑	☐	☐
Request for Confidentiality	☐	☑	
Application Contains Toxics Modification(s)	☐	☐	☑

PART II - IBEAM UPDATES

Application Type:
- [ ] Additional Permit
- [ ] Administrative Amendment
- [ ] Appeal
- [ ] Greenfield Facility
- [ ] Last GACT/Toxics
- [ ] Last MACT/Toxics
- [x] Modification
- [ ] Name Change
- [ ] New Permit
- [ ] Ownership Change
- [ ] Renewal
- [ ] Renewal w/Modification

Permit Application Schedule:
- [ ] Appeal
- [ ] Expedited State
- [ ] PSD
- [ ] Director Administrative Amendment
- [x] State
- [ ] TV – State Only
- [ ] TV – Expedited
- [ ] TV – Greenfield
- [ ] TV – Reopen for Cause
- [ ] TV – Administrative
- [ ] TV – Ownership Change
- [ ] TV – 502(b)(10)
- [ ] TV – Minor
- [ ] TV – Renewal
- [x] ~~TV – Significant (2Q .0501(e)(2))~~ P.I
- [ ] TV – Significant
- [ ] TV – 1st Time

incorrectly identified in IBEAM. Changed to mod/State 1/28/16 MJC

PART III - COMPLETENESS CHECKLIST

- [ ] Required Application Forms Submitted and Completed
- [ ] Supporting Materials & Calculations Received
- [ ] PE Seal (If 15A NCAC 2Q .0112)
- [ ] Modeling Protocol Acceptance
- [ ] Confirmation of Pollutants Modeled
- [ ] E5 Form (Significant Modifications)

PART IV - GENERAL COMMENTS

No "E" Forms

FORWARD MODELING TO AQAB (11-2-15)

PART V - SUPERVISOR REVIEW CHECKLIST

~~TVEE~~ E3M Updated (by Engineer): KTG ~~12-21-15~~ 1-7-16 TVEE Verified: 1/14/16 Supervisor: JSP 1/26/2016 Chief: 11/27/2016

PART VI - CLOSEOUT INFORMATION

Regulations Applicable to This Application (indicate all new regulations):
- [ ] NESHAPS/MACT
- [ ] NESHAPS/GACT
- [ ] NSPS
- [ ] 2D .1100
- [ ] 2Q .0711
- [ ] 112(j)/112(d)
- [ ] PSD/NSR
- [ ] PSD/NSR Avoidance
- [ ] Existing Source RACT/LAER
- [ ] New Source RACT/LAER
- [ ] RACT Avoidance
- [ ] RACT/LAER Added Fee*
  (Notify Connie Horne)
- [ ] Toxics/Combustion Sources After 7/10/10
- [ ] SIP Regulations (list all new): NA – none new

Permit Class Information

	Before	After
Small	☐	☐
Syn. Minor	☐	☐
Title V	☑	☑
Proh. Small	☐	☐
General	☐	☐

HAP Major Status (after) [x] Major [ ] Minor [ ] Not Determined
PSD or NSR Status (after) [x] Major [ ] Minor

Miscellaneous ~~☐ Multiple Permits at Facility~~ ~~☐ Multi-Site Permit~~ ~~☐ Recycled Oil Condition~~

Permit Dates Issue: 1-27-16 Effective: 1-27-16 Expiration: 10-31-19

IBEAM Closed Out By: MJC 1/28/16 Permit Number: 10386 Revision Number: R02

~~☐ Public Notice Published~~ ~~☐ Public Notice Affidavit (if not noticed via DAQ Website)~~

Document Manager Updated by Engineer: KTG Date: 1-27-16

Tracking Slip V44 - cjh 9/9/15

Air Quality
ENVIRONMENTAL QUALITY

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

SHEILA C. HOLMAN
Director

January 27, 2016

Mr. Maitland Horner
Vice President Construction
Enviva Pellets Sampson, LLC
7200 Wisconsin Avenue, Suite 1000
Bethesda, Maryland 20814

SUBJECT: Air Quality Permit No. 10386R02
Facility ID: 8200152
Enviva Pellets Sampson, LLC
Faison, North Carolina
Sampson County
PSD Status: Major
Fee Class: Title V

Dear Mr. Horner:

In accordance with the request for a significant modification to your permit under 15A NCAC 02Q .0501(c)(2) received October 29, 2015, we are forwarding herewith Air Quality Permit No. 10386R02 to Enviva Pellets Sampson, LLC, 5 Connector Road, Faison, North Carolina, authorizing the construction and operation, of the emission source(s) and associated air pollution control device(s) specified herein. Additionally, any emissions activities determined from your Air Quality Permit Application as being insignificant per 15A North Carolina Administrative Code 2Q .0503(8) have been listed for informational purposes as an "ATTACHMENT."

As the designated responsible official it is your responsibility to review, understand, and abide by all of the terms and conditions of the attached permit. It is also your responsibility to ensure that any person who operates any emission source and associated air pollution control device subject to any term or condition of the attached permit reviews, understands, and abides by the condition(s) of the attached permit that are applicable to that particular emission source.

The Permittee shall file a Title V Air Quality Permit Application pursuant to 15A NCAC 2Q .0504 on or before 12 months after commencing operation.

If any parts, requirements, or limitations contained in this Air Quality Permit are unacceptable to you, you have the right to request a formal adjudicatory hearing within 30 days following receipt of this permit, identifying the specific issues to be contested. This hearing request must be in the form of a written petition, conforming to NCGS (North Carolina General Statutes) 150B-23, and filed with both the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, North Carolina 27699-6714 and the Division of Air Quality, Permitting Section, 1641 Mail Service Center, Raleigh, North Carolina 27699-1641. The form for requesting a formal adjudicatory hearing may be obtained upon request from the Office of Administrative Hearings. Please note that this permit will be stayed in its entirety upon receipt of the request for a hearing.

binding 30 days after issuance.

You may request modification of your Air Quality Permit through informal means pursuant to NCGS 150B-22. This request must be submitted in writing to the Director and must identify the specific provisions or issues for which the modification is sought. Please note that this Air Quality Permit will become final and binding regardless of a request for informal modification unless a request for a hearing is also made under NCGS 150B-23.

The construction of new air pollution emission source(s) and associated air pollution control device(s), or modifications to the emission source(s) and air pollution control device(s) described in this permit must be covered under an Air Quality Permit issued by the Division of Air Quality prior to construction unless the Permittee has fulfilled the requirements of GS 143-215-108A(b) and received written approval from the Director of the Division of Air Quality to commence construction. Failure to receive an Air Quality Permit or written approval prior to commencing construction is a violation of GS 143-215.108A and may subject the Permittee to civil or criminal penalties as described in GS 143-215.114A and 143-215.114B.

For PSD increment tracking purposes in Sampson County, PM-10 emissions are increased by 0.57 pounds per hour, and PM-2.5 emissions are increased by 0.57 pounds per hour.

This Air Quality Permit shall be effective from January 27, 2016 until October 31, 2019, is nontransferable to future owners and operators, and shall be subject to the conditions and limitations as specified therein. Should you have any questions concerning this matter, please contact Kevin Godwin at (919) 707-8480.

Sincerely yours,

William D. Willets, P.E., Chief, Permitting Section
Division of Air Quality, NCDENR

c: Heather Ceron, EPA Region 4
Steven Vozzo, Supervisor, Fayetteville Regional Office
Shannon Vogel, Stationary Source Compliance Branch
Central Files

ATTACHMENT

Insignificant Activities per 15A NCAC 2Q .0503(8)

Emission Source ID No.	Emission Source Description
IES-GWHS	Green wood handling and sizing operations
IES-DWHS	Dried wood handling and sizing operations
IES-TK-1	Diesel fuel storage tank (up to 2,500 gallons capacity)
IES-TK-2	Diesel fuel storage tank (up to 1,000 gallons capacity)
IES-TK-3	Diesel fuel storage tank (up to 2,500 gallons capacity)
IES-GWSP-1 and 2	Green wood storage piles
IES-DEBARK-1	De-barker
IES-GWFB	Green wood fuel bin
IES-EG	536 HP diesel-fired emergency generator - (NSPS, Subpart IIII & NESHAP, Subpart ZZZZ)
IES-FWP	131 HP diesel-fired fire water pump - (NSPS, Subpart IIII & NESHAP, Subpart ZZZZ)

1. Because an activity is insignificant does not mean that the activity is exempted from an applicable requirement or that the owner or operator of the source is exempted from demonstrating compliance with any applicable requirement.
2. When applicable, emissions from stationary source activities identified above shall be included in determining compliance with the permit requirements for toxic air pollutants under 15A NCAC 2D .1100 "Control of Toxic Air Pollutants" or 2Q .0711 "Emission Rates Requiring a Permit".
3. For additional information regarding the applicability of GACT see the DAQ page titled "The Regulatory Guide for Insignificant Activities/Permits Exempt Activities". The link to this site is as follows: http://daq.state.nc.us/permits/insig/

State of North Carolina
Department of Environmental Quality
Division of Air Quality

AIR QUALITY PERMIT

Permit No.	Replaces Permit No.(s)	Effective Date	Expiration Date
10386R02	10386R01	January 27, 2016	October 31, 2019

Until such time as this permit expires or is modified or revoked, the below named Permittee is permitted to construct and operate the emission source(s) and associated air pollution control device(s) specified herein, in accordance with the terms, conditions, and limitations within this permit. This permit is issued under the provisions of Article 21B of Chapter 143, General Statutes of North Carolina as amended, and Title 15A North Carolina Administrative Codes (15A NCAC), Subchapters 2D and 2Q, and other applicable Laws.

Pursuant to Title 15A NCAC, Subchapter 2Q, the Permittee shall not construct, operate, or modify any emission source(s) or air pollution control device(s) without having first submitted a complete Air Quality Permit Application to the permitting authority and received an Air Quality Permit, except as provided in this permit.

Permittee:	**Enviva Pellets Sampson, LLC**
Facility ID:	**8200152**
Facility Site Location: **City, County, State, Zip:**	**5 Connector Road** **Faison, Sampson County, North Carolina, 28341**
Mailing Address: **City, State, Zip:**	**7200 Wisconsin Avenue** **Bethesda, Maryland 20814**
Application Number: **Complete Application Date:**	**8200152.15A** **October 29, 2015**
Primary SIC Code: **Division of Air Quality, Regional Office Address:**	**2499** **Fayetteville Regional Office** **Systel Building** **225 Green Street, Suite 714** **Fayetteville, North Carolina, 28301**

Table Of Contents

SECTION 1- PERMITTED EMISSION SOURCE (S) AND ASSOCIATED AIR POLLUTION CONTROL DEVICE (S) AND APPURTENANCES

The following table contains a summary of all permitted emission sources and associated air pollution control devices and appurtenances:

Emission Source ID No.	**Emission Source Description**	**Control Device ID No.**	**Control Device Description**
ES-CHIP-1 **PSD**	Log chipping	N/A	N/A
ES-GHM-1, ES-GHM-2, ES-GHM-3 **PSD**	Three (3) green wood hammermills	CD-GHM-BF-1, CD-GHM-BF-2, and CD-GHM-BF-3	Three bagfilters (2,577 square feet of filter area each)
ES-BARKHOG **PSD**	Bark hog	N/A	N/A
ES-DRYER **PSD 2D .1112 Case-by-case MACT**	Wood-fired direct heat drying system (250.4 million Btu per hour heat input)	CD-DC1, CD-DC2, CD-DC3, CD-DC4, and CD-WESP	Four simple cyclones (132 inches in diameter each) in series with one wet electrostatic precipitator (29,904 square feet of collector plate area)
ES-HM-1 through ES-HM-8 **PSD 2D .1112 Case-by-case MACT**	Eight (8) hammermills	CD-HM-CYC-1 through CD-HM-CYC-8, and CD-HM-BF1 through CD-HM-BF8	Eight (8) simple cyclones (96 inches in diameter each) in series with eight (8) bagfilters (2,168 square feet of filter area each)
ES-HMA & ES-PFB **PSD 2D .1112 Case-by-case MACT**	Hammermill area and Pellets fines bin	CD-PFB-BV	One bagfilter (1,520 square feet of filter area)
ES-PMFS **PSD**	Pellet mill feed silo	CD-PMFS-BV	One bin vent filter (377 square feet of filter area)

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
ES-CLR-1 through ES-CLR-6 **PSD 2D .1112 Case-by-case MACT**	Six (6) pellet coolers	CD-CLR-1 through CD-CLR-6	Six (6) simple cyclones (54 inches in diameter) installed one each on the coolers
ES-PCR **PSD**	Pellet cooler recirculation	CD-PCR-BV	One bin vent filter (942 square feet of filter area)
ES-PSTB **PSD**	Pellet sampling transfer bin	CD-DC-BV-3	One bin vent filter (377 square feet of filter area)
ES-FPH, ES-PB-1 through ES-PB-4, ES-PL-1 and ES-PL-2 **PSD**	Finished product handling, four (4) pellet load-out bins, and two pellet mill loadouts	CD-FPH-BF	One bagfilter (4,842 square feet of filter area)

SECTION 2 - SPECIFIC LIMITATIONS AND CONDITIONS

2.1- Emission Source(s) and Control Devices(s) Specific Limitations and Conditions

The emission source(s) and associated air pollution control device(s) and appurtenances listed below are subject to the following specific terms, conditions, and limitations, including the testing, monitoring, recordkeeping, and reporting requirements as specified herein:

A. Log Chipping (ID No. ES-CHIP-1), Bark Hog (ID No. ES-BARKHOG), Wood-fired direct heat drying system (ID No. ES-DRYER), Hammermills (ID Nos. ES-GHM-1, GHM-2 and GHM-3, ES-HM-1 through HM-8), Hammermill Area Filter (ID No. ES-HMA), Pellet Mill Feed Silo (ID No. ES-PMFS), Pellet Coolers (ID Nos. ES-CLR-1 through CLR-6), Pellet cooler recirculation (ID No. ES-PCR), Pellets Fines Bin (ID No. ES-PFB), Pellet Sampling Transfer Bin (ID No. ES-PSTB), Finished Product Handling (ID No. ES-FPH), Pellet Load-out Bins (ID Nos. ES-PB-1 through PB-4), and Pellet Mill Load-out (ID No. ES-PL-1 and PL-2)

The following table provides a summary of limits and standards for the emission source(s) described above:

Regulated Pollutant	Limits/Standards	Applicable Regulation
Particulate matter	$E = 4.10 \times P^{0.67}$ for $P < 30$ tph $E = 55 \times P^{0.11} - 40$ for $P \geq 30$ tph where, E = allowable emission rate (lb/hr) P = process weight rate (tph)	15A NCAC 02D .0515

Regulated Pollutant	Limits/Standards	Applicable Regulation
Sulfur dioxide	2.3 pounds per million Btu	15A NCAC 02D .0516
Visible emissions	20 percent opacity when averaged over a 6-minute period	15A NCAC 02D .0521
HAPS	See Section 2.1 A.4.	15A NCAC 02D .1112 [§ 112(g) Case-by-case MACT]
PM/PM-10/PM-2.5, NOx VOC CO GHG	BACT Limits, See Section 2.2 A.2.	15A NCAC 02D .0530

1. 15A NCAC 2D .0515: PARTICULATES FROM MISCELLANEOUS INDUSTRIAL PROCESSES

a. Emissions of particulate matter from these sources shall not exceed an allowable emission rate as calculated by the following equation: [15A NCAC 2D .0515(a)]

$E = 4.10 \times P^{0.67}$ for $P < 30$ tph
$E = 55 \times P^{0.11} - 40$ for $P \geq 30$ tph

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

Liquid and gaseous fuels and combustion air are not considered as part of the process weight.

Testing [15A NCAC 2Q .0308(a)]

b. Under the provisions of NCGS 143-215.108, the Permittee shall test the wet electrostatic precipitator (ID No. CD-WESP) for total suspended particulate (TSP) in accordance with a testing protocol approved by the DAQ. Testing shall be completed and the results submitted within 180 days of commencement of operation unless an alternate date is approved by the DAQ.

Monitoring/Recordkeeping [15A NCAC 2Q .0308(a)]

c. The Permittee shall maintain production records such that the process rates "P" in tons per hour, as specified by the formulas contained above (or the formulas contained in 15A NCAC 2D .0515) can be derived, and shall make these records available to a DAQ authorized representative upon request.

d. Particulate matter emissions from the wood-fired dryer (ID No. ES-DRYER) shall be controlled by four (4) cyclones (ID Nos. CD-DC-1 through DC-4) in series with one wet electrostatic precipitator (ID No. CD-WESP). Particulate matter emissions from the hammermills (ID Nos. ES-GHM-1 through 3, ES-HM-1 through 8) shall be controlled by bin vent filters, bagfilters and cyclones (ID Nos. CD-GHM-BF-1 through 3, CD-RCHP-BV-1 and 2, CD-HM-CYC-1 through 8, and CD-HM-BF-1 through 8). Particulate matter emissions from the hammermill area (ID No. ES-HMA) and the pellets fines bin (ID No. ES-PFB) shall be controlled by a bin vent filter (ID No. CD-PFB-BV). Particulate matter emissions from the pellet mill feed silo (ID No. ES-PMFS) shall be controlled by a bin vent filter (ID No. CD-PMFS-BV). Particulate matter emissions from the pellet coolers (ID Nos. ES-CLR-1 through 6) shall be controlled by

cyclones (ID Nos. CD-CLR-1 through 6). Particulate matter emissions from pellet cooler recirculation (ID No. ES-PCR) shall be controlled by a bin vent filter (ID No. CD-PCR-BV). Particulate matter emissions from pellet sampling transfer bin (ID No. ES-PSTB) shall be controlled by a bin vent filter (ID No. CD-DC-BV3). Particulate matter emissions from finished product handling (ID No. ES-FPH), pellet mill load-out bins (ID Nos. ES-PB-1 through 4), and pellet mill load-out (ID No. ES-PL-1 and 2) shall be controlled by a bagfilter (ID No. CD-FPH-BF)

For bagfilters, bin vent filters, and cyclones:
To assure compliance, the Permittee shall perform inspections and maintenance as recommended by the manufacturer. In addition to the manufacturer's inspection and maintenance recommendations, or if there is no manufacturer's inspection and maintenance recommendations, as a minimum, the inspection and maintenance requirement shall include the following:

i. a monthly visual inspection of the system ductwork and material collection unit for leaks.
ii. an annual (for each 12 month period following the initial inspection) internal inspection of the bagfilters' structural integrity.

For WESP:
To assure compliance, the Permittee shall perform inspections and maintenance as recommended by the manufacturer. In addition to the manufacturer's inspection and maintenance recommendations, or if there is no manufacturer's inspection and maintenance recommendations, as a minimum, the inspection and maintenance requirement shall include the following:

The Permittee shall establish the minimum primary voltage and minimum current within the first 30 days following the commencement of operation of the dryer. To assure compliance and effective operation of the wet electrostatic precipitator, the Permittee shall monitor and record the primary voltage and minimum current through the precipitator for each day of the calendar year period that the dryer system is operated. The Permittee shall be allowed three (3) days of absent observations per semi-annual period.

e. The results of inspection and maintenance shall be maintained in a log (written or electronic format) on-site and made available to an authorized representative upon request. The log shall record the following:
   i. the date and time of each recorded action;
   ii. the results of each inspection;
   iii. the results of any maintenance performed; and
   iv. any variance from manufacturer's recommendations, if any, and corrections made.

Reporting
f. The Permittee shall submit the results of any maintenance performed on the WESP, cyclones, bagfilters, and bin vent filters within 30 days of a written request by the DAQ.

2. 15A NCAC 2D .0516: SULFUR DIOXIDE EMISSIONS FROM COMBUSTION SOURCES
a. Emissions of sulfur dioxide from these sources shall not exceed 2.3 pounds per million Btu heat input. Sulfur dioxide formed by the combustion of sulfur in fuels, wastes, ores, and other substances shall be included when determining compliance with this standard. [15A NCAC 2D .0516]

Testing [15A NCAC 2Q .0308(a)]
b. If emissions testing is required, the testing shall be performed in accordance with General Condition JJ found in Section 3.

Monitoring/Recordkeeping/Reporting [15A NCAC 2Q .0308(a)]
c. No monitoring/recordkeeping/reporting is required for sulfur dioxide emissions from firing biomass in the

dryer system.

3. **15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS**
   a. Visible emissions from these sources shall not be more than 20 percent opacity when averaged over a six-minute period. However, six-minute averaging periods may exceed 20 percent not more than once in any hour and not more than four times in any 24-hour period. In no event shall the six-minute average exceed 87 percent opacity. [15A NCAC 2D .0521 (d)]

   Testing [15A NCAC 2Q .0308(a)]
   b. If emissions testing is required, the testing shall be performed in accordance with General Condition JJ.

   Monitoring [15A NCAC 2Q .0308(a)]
   c. To assure compliance, once a month the Permittee shall observe the emission points of this source for any visible emissions above normal. The monthly observation must be made for each month of the calendar year period to ensure compliance with this requirement. The Permittee shall establish "normal" for the source in the first 30 days following the effective date of the permit. If visible emissions from this source are observed to be above normal, the Permittee shall either:
      i. take appropriate action to correct the above-normal emissions as soon as practicable and within the monitoring period and record the action taken as provided in the recordkeeping requirements below, or
      ii. demonstrate that the percent opacity from the emission points of the emission source in accordance with 15A NCAC 2D .2610 (Method 9) for 12 minutes is below the limit given in Section 2.1 A.3. a. above.

   Recordkeeping [15A NCAC 2Q .0308(a)]
   d. The results of the monitoring shall be maintained in a log (written or electronic format) on-site and made available to an authorized representative upon request. The log shall record the following:
      i. the date and time of each recorded action;
      ii. the results of each observation and/or test noting those sources with emissions that were observed to be in noncompliance along with any corrective actions taken to reduce visible emissions; and
      iii. the results of any corrective actions performed.

   Reporting [15A NCAC 2Q .0308(a)]
   e. No reporting is required.

4. **15A NCAC 02D .1112 National Emissions Standards for Hazardous Air Pollutants, 112(g) Case-by-Case Maximum Achievable Control Technology** – For the wood pellet mill dryer (ID No. ES-DRYER), the Permittee shall use a low HAP emitting dryer design not requiring add-on control.

   Testing [15A NCAC 2D .0530]
   a. Under the provisions of North Carolina General Statute 143-215.108, the Permittee shall establish emission factors by conducting an intitial performance test on the dryer system for formaldehyde, methanol, acetaldehyde, and propionaldehyde utilizing EPA reference methods, as in effect on the date of permit issuance, contained in 40 CFR 60, Appendix A, or 40 CFR 63 AND in accordance with a testing protocol (using testing protocol submittal form) approved by the Division of Air Quality. The sum of the above HAPs will be multiplied by a correction factor of 1.04 to determine total HAPs for the dryer system.

   Initial testing shall be completed and the results submitted within 180 days of commencement of operation unless an alternate date is approved by the DAQ.

   b. **Monitoring/Recordkeeping/Reporting** [15A NCAC 2Q .0308(a)]
   No monitoring, recordkeeping, or reporting is required.

2.2- Multiple Emission Source(s) Limitations and Conditions

A. Facility-wide Emission Sources

The following table provides a summary of limits and standards for the emission source(s) describe above:

Regulated Pollutant	Limits/Standards	Applicable Regulation
Fugitive dust	Minimize fugitive dust beyond property boundary	15A NCAC 02D .0540
PM/PM-10/PM-2.5, NOx, CO, VOC, and GHG	BACT Limits	15A NCAC 02D .0530

1. **Fugitive Dust Control Requirement** [15A NCAC 2D .0540] - STATE ENFORCEABLE ONLY
As required by 15A NCAC 2D .0540 "Particulates from Fugitive Dust Emission Sources," the Permittee shall not cause or allow fugitive dust emissions to cause or contribute to substantive complaints or excess visible emissions beyond the property boundary. If substantive complaints or excessive fugitive dust emissions from the facility are observed beyond the property boundaries for six minutes in any one hour (using Reference Method 22 in 40 CFR, Appendix A), the owner or operator may be required to submit a fugitive dust plan as described in 2D .0540(f).

   "Fugitive dust emissions" means particulate matter from process operations that does not pass through a process stack or vent and that is generated within plant property boundaries from activities such as: unloading and loading areas, process areas stockpiles, stock pile working, plant parking lots, and plant roads (including access roads and haul roads).

2. **15A NCAC 2D .0530: PREVENTION OF SIGNIFICANT DETERIORATION**
   a. The Permittee shall comply with all applicable provisions, including the notification, testing, reporting, recordkeeping, and monitoring requirements in accordance with 15A NCAC 2D .0530, "Prevention of Significant Deterioration of Air Quality" as promulgated in 40 CFR 51.166. [15A NCAC 2D .0530]

   b. The following emission limits shall not be exceeded except during periods of start-up, shut-down, or malfunction. [15A NCAC 2D .0530]:

Unit	Pollutant	BACT Limit*	Units	Averaging Period	Technology
Dryer system	NOx	0.20	lb/MMBtu	3-hour	Good Combustion Practices/low NOx burners
	PM PM10/2.5	0.105 (filterable only)	lb/ODT	3-hour	Cyclones/WESP
	CO	0.21	lb/MMBtu	3-hour	Process Design
	VOC**	1.07	lb/ODT	3-hour	Process Design
	GHG	230,000	tpy (CO_2e)	Annual	Good Operating Practices
Green Wood Hammermills	PM/PM10/2.5	0.004 (filterable only)	gr/dscf	3-hour	Bin vent filter
	VOC**	0.27	lb/ODT	3-hour	Good operating and maintenance procedures

Unit	Pollutant	BACT Limit*	Units	Averaging Period	Technology
Dry Hammermills	PM/PM10/2.5	0.004/0.004/0.000014 (filterable only)	gr/dscf	3-hour	Cyclones & Bagfilter
	VOC**	0.24	lb/ODT	3-hour	Process Design
Pellet Mill Feed Silo	PM/PM10/2.5	0.004 (filterable only)	gr/dscf	3-hour	Bin vent filter
Hammermill Area and Pellet Mill Fines Bin	PM/PM10/2.5	0.004 (filterable only)	gr/dscf	3-hour	Bin vent filter
Final Product Handling	PM/PM10/2.5	0.004/0.004/0.000014 (filterable only)	gr/dscf	3-hour	Bagfilter
Pellet Coolers	PM/PM10/2.5	0.022/0.0057/0.0007 (filterable only)	gr/dscf	3-hour	Cyclones
	VOC**	0.85	lb/ODT	3-hour	Process Design
Log Bark Hog	VOC	N/A	N/A	N/A	Fugitive
Chipper	VOC	N/A	N/A	N/A	Fugitive
Green Wood Handling	PM/PM10/2.5	N/A	N/A	N/A	Inherent Moisture
Storage Piles	PM/PM10/2.5	N/A	N/A	N/A	Inherent Moisture
	VOC	N/A	N/A	N/A	Fugitive
Road Dust	PM/PM10/2.5	N/A	N/A	N/A	Paving & Water Spray
Storage tanks	VOC	Good Operation Practices	N/A	N/A	Good operating practices

* BACT emission limits shall apply at all times except the following: Emissions resulting from start-up, shutdown or malfunction above those given in Section 2.2 A.4. Table above are permitted provided that optimal operational practices are adhered to and periods of excess emissions are minimized.

** The VOC limit is expressed as alpha pinene basis per the procedures in EPA OTM 26.

Testing [15A NCAC 2D .0530]

c. Under the provisions of North Carolina General Statute 143-215.108, the Permittee shall demonstrate compliance with the BACT emission limits by conducting performance test on the dryer system, the pellet coolers, and the greenwood hammermills as specified below utilizing EPA reference methods, as in effect on the date of permit issuance, contained in 40 CFR 60, Appendix A, 40 CFR 63, and/or OTM 26 AND in accordance with a testing protocol (using testing protocol submittal form) approved by the Division of Air Quality, as follows:

Unit	Pollutant	Testing
Dryer system	NOx	Annually
	PM/PM10/PM2.5	Annually
	VOC	Initial Only
	CO	Initial Only
One Pellet cooler	VOC	Initial Only
One Green wood hammermill	VOC	Initial Only

Initial testing shall be completed and the results submitted within 180 days of commencement of operation

unless an alternate date is approved by the DAQ.

Monitoring/Recordkeeping/Reporting [15ANCAC 02Q .0308(a)]

d. The Permittee shall not process more than 537,625 oven-dried tons (ODT) of pellets per year. The Permittee shall not process more than 75% softwood on a 12-month rolling average basis. The process rate and hardwood/softwood mix shall be recorded in a monthly log kept on site. Calculations and the total amount of NOx, filterable PM, CO, and VOC emissions shall be recorded monthly in a log (written or electronic format) kept on site and made available to DAQ personnel upon request.

e. For the dryer system, GHG (CO_2e) emissions shall be calculated on a monthly basis and compliance demonstrated using the applicable Part 98 emission factors. Compliance shall be documented on a 12 month rolling basis.

f. No reporting is required.

g. REPORTING REQUIREMENT – Within 30 days of beginning commercial operation, the Permittee shall notify, in writing, the Regional Office of the date the facility began commercial operation. Pursuant to 15A NCAC 2Q .0500 the Permittee shall have one year from the date of beginning commercial operation to submit a complete Title V application to the Regional Supervisor.

SECTION 3 - GENERAL CONDITIONS

1. REPORTS, TEST DATA, MONITORING DATA, NOTIFICATIONS, AND REQUESTS FOR RENEWAL shall be submitted to:

   Steven Vozzo
   Regional Air Quality Supervisor
   North Carolina Division of Air Quality
   Fayetteville Regional Office
   Systel Building, 225 Green Street, Suite 714
   Fayetteville, NC 28301
   (910) 433-3300

2. PERMIT RENEWAL REQUIREMENT - The Permittee, at least 90 days prior to the expiration date of this permit, shall request permit renewal by letter in accordance with 15A NCAC 2Q .0304(d) and (f). Pursuant to 15A NCAC 2Q .0203(i), no permit application fee is required for renewal of an existing air permit. The renewal request should be submitted to the Regional Supervisor, DAQ.

3. ANNUAL FEE PAYMENT - Pursuant to 15A NCAC 2Q .0203(a), the Permittee shall pay the annual permit fee within 30 days of being billed by the DAQ. Failure to pay the fee in a timely manner will cause the DAQ to initiate action to revoke the permit.

4. ANNUAL EMISSION INVENTORY REQUIREMENTS – The Permittee shall report by June 30 of each year the actual emissions of each air pollutant listed in 15A NCAC 02Q .0207(a) from each emission source within the facility during the previous calendar year. The report shall be in or on such form as may be established by the Director. The accuracy of the report shall be certified by the responsible official of the facility.

5. EQUIPMENT RELOCATION - A new air permit shall be obtained by the Permittee prior to establishing, building, erecting, using, or operating the emission sources or air cleaning equipment at a site or location not specified in this permit.

6. This permit is subject to revocation or modification by the DAQ upon a determination that information contained in the application or presented in the support thereof is incorrect, conditions under which this permit was granted have changed, or violations of conditions contained in this permit have occurred. The facility shall be properly operated and maintained at all times in a manner that will effect an overall reduction in air pollution. Unless otherwise specified by this permit, no emission source may be operated without the concurrent operation of its associated air cleaning device(s) and appurtenances.

7. REPORTING REQUIREMENT - Any of the following that would result in previously unpermitted, new, or increased emissions must be reported to the Regional Supervisor, DAQ:
   a. changes in the information submitted in the application regarding facility emissions;
   b. changes that modify equipment or processes of existing permitted facilities; or
   c. changes in the quantity or quality of materials processed.

   If appropriate, modifications to the permit may then be made by the DAQ to reflect any necessary changes in the permit conditions. In no case are any new or increased emissions allowed that will cause a violation of the emission limitations specified herein.

8. This permit is nontransferable by the Permittee. Future owners and operators must obtain a new air permit from the DAQ.

9. This issuance of this permit in no way absolves the Permittee of liability for any potential civil penalties which may be assessed for violations of State law which have occurred prior to the effective date of this permit.

10. This permit does not relieve the Permittee of the responsibility of complying with all applicable requirements of any Federal, State, or Local water quality or land quality control authority.

11. Reports on the operation and maintenance of the facility shall be submitted by the Permittee to the Regional Supervisor, DAQ at such intervals and in such form and detail as may be required by the DAQ. Information required in such reports may include, but is not limited to, process weight rates, firing rates, hours of operation, and preventive maintenance schedules.

12. A violation of any term or condition of this permit shall subject the Permittee to enforcement pursuant to G.S. 143-215.114A, 143-215.114B, and 143-215.114C, including assessment of civil and/or criminal penalties.

13. Pursuant to North Carolina General Statute 143-215.3(a)(2), no person shall refuse entry or access to any authorized representative of the DAQ who requests entry or access for purposes of inspection, and who presents appropriate credentials, nor shall any person obstruct, hamper, or interfere with any such 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.

14. The Permittee must comply with any applicable Federal, State, or Local requirements governing the handling, disposal, or incineration of hazardous, solid, or medical wastes, including the Resource Conservation and Recovery Act (RCRA) administered by the Division of Waste Management.

15. PERMIT RETENTION REQUIREMENT - The Permittee shall retain a current copy of the air permit at the site. The Permittee must make available to personnel of the DAQ, upon request, the current copy of the air permit for the site.

16. CLEAN AIR ACT SECTION 112(r) REQUIREMENTS - Pursuant to 40 CFR Part 68 "Accidental Release Prevention Requirements: Risk Management Programs Under the Clean Air Act, Section 112(r)," if the Permittee is required to develop and register a risk management plan pursuant to Section 112(r) of the

Federal Clean Air Act, then the Permittee is required to register this plan in accordance with 40 CFR Part 68.

17. PREVENTION OF ACCIDENTAL RELEASES - GENERAL DUTY - Pursuant to Title I Part A Section 112(r)(1) of the Clean Air Act "Hazardous Air Pollutants - Prevention of Accidental Releases - Purpose and General Duty," although a risk management plan may not be required, if the Permittee produces, processes, handles, or stores any amount of a listed hazardous substance, the Permittee has a general duty to take such steps as are necessary to prevent the accidental release of such substance and to minimize the consequences of any release. This condition is federally-enforceable only.

Permit issued this the 27th day of January, 2016.

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

William D. Willets, P.E., Chief, Permitting Section
Division of Air Quality, NCDENR
By Authority of the Environmental Management Commission

NORTH CAROLINA DIVISION OF AIR QUALITY

Air Permit Review

Permit Issue Date: January 27, 2016

Region: Fayetteville Regional Office
County: Sampson
NC Facility ID: 8200152
Inspector's Name:
Date of Last Inspection:
Compliance Code:

Facility Data

Applicant (Facility's Name): Enviva Pellets Sampson, LLC

Facility Address:
Enviva Pellets Sampson, LLC
5 Connector Road
Faison, NC 28341

SIC: 2499 / Wood Products, Nec
NAICS: 321999 / All Other Miscellaneous Wood Product Manufacturing

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP: 15A NCAC 02D .0515, .0516, .0521
NSPS: Subpart IIII
NESHAP: Subpart ZZZZ
PSD: N/A
PSD Avoidance: N/A
NC Toxics: N/A
112(r): N/A
Other: N/A

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Joe Harrell Corporate EHS Manager (252) 209-6032 142 NC Route 561 East Ahoskie, NC 27910	Maitland Horner Vice President (301) 657-5560 7200 Wisconsin Avenue, Suite 1000 Bethesda, MD 20814	Joe Harrell Corporate EHS Manager (252) 209-6032 142 NC Route 561 East Ahoskie, NC 27910

Application Data

Application Number: 8200152.15A
Date Received: 10/29/2015
Application Type: Modification
Application Schedule: TV-Sign-501(c)(2) Part I

Existing Permit Data
Existing Permit Number: 10386/R01
Existing Permit Issue Date: 01/06/2015
Existing Permit Expiration Date: 10/31/2019

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2014	---	---	---	---	---	---	.00E+00 [Arsenic & Compounds (total mas]

Review Engineer: Kevin Godwin

Review Engineer's Signature: **Date:** 1-27-16

Kevin T. Godwin

Comments / Recommendations:
Issue 10386/R02
Permit Issue Date: 01/27/2016
Permit Expiration Date: 10/31/2019

I. Introduction and Purpose of Application

A. Enviva is constructing a wood pellets manufacturing plant in Sampson County. The permitted plant is designed to produce up to 537,625 oven dried tons (ODT) per year of wood pellets using up to 75% softwood on a 12-month rolling total basis.

B. This permit action is for modifications to the existing Prevention of Significant Deterioration (PSD) construction permit issued on January 6, 2015. The modifications are as follows:

1. Add a third green wood hammermill (ID No. ES-GHM-3) controlled by a bagfilter (2,577 square feet of filter area, ID No. CD-GHM-BF-3),

2. Add a pellet sampling transfer bin (ID No. ES-PSTB) controlled by a bin vent filter (377 square feet of filter area, ID No. CD-DC-BV-3),
3. Add pellet cooler recirculation (ID No. ES-PCR) controlled by a bin vent filter (942 square feet of filter area),
4. Modify the emergency engine and fire water pump engine to 536 horsepower and 131 horsepower, respectively,
5. Increase throughput through the green wood hammermills, and
6. Update prior air dispersion modeling analysis to reflect the updated design of the facility.

II. Changes to Existing Permit

The following table provides a summary of changes to existing Permit No. 10386R01.

Page No.	Section	Description of Change
N/A	Cover Page	Addressed cover letter to Mr. Maitland Horner, Vice President, as the responsible official. Also, updated PSD increment tracking statement for PM-10 and PM-2.5 increases.
N/A	Insignificant Activities List	Included emergency engine (ID No. IES-EG) and fire water pump engine (ID No. IES-FWP) as insignificant activities.
3	Table of Emission Sources	Included new sources (ID Nos. ES-GHM-3, ES-PSTB, and ES-PCR) and associated control devices.
4	2.1 A.	Included new sources (ID Nos. ES-GHM-3, ES-PSTB, and ES-PCR).

III. Statement of Compliance

As the facility is under construction, there is no compliance history. The Fayetteville Regional Office (FRO) will be responsible for compliance inspections.

IV. Description of Changes

A. Green Wood Hammermills (ID Nos. ES-GHM-1, 2, and 3) – According to the application, a pre-screener will not be installed, rather a third hammermill will be installed allowing throughput to increase from 376,338 oven dried tons per year (ODT/yr) to the plant rated capacity of 537,625 ODT/yr. As in the previously approved PSD application, total VOC/HAP emission estimates for the hammermills are based on Enviva Wiggins stack test emission factors (0.27 lb/ODT). Potential VOC emissions increase from 50.53 tons per year (tpy) to 72.18 tpy. Potential HAP emissions increase from 2.83 tpy to 4.05 tpy.

Particulate matter (PM) emissions are controlled by bagfilters. PM emissions are calculated based on air flow rate (15,000 cfm) and a manufacturer's guaranteed outlet grain loading factor of 0.004 gr/ft^3. Potential PM emissions from the new hammermill are reported to be 0.51 lb/hr or 2.25 tpy.

B. Pellet Sampling Transfer Bin (ID No. ES-PSTB) – According to the application, pelletized wood is transferred from the pellet coolers to the truck loadout operations via conveyor. The pellet sampling transfer bin vent filter controls emissions from the conveyor. PM emissions are calculated using manufacturer's guaranteed outlet grain loading factor of 0.004 gr/ft^3 and the maximum flow rate (1,000 cfm). Potential PM emissions are reported to be 0.03 lb/hr or 0.15 tpy.

C. Pellet Cooler Recirculation (ID No. ES-PCR) – According to the application, formed pellets are discharged into one of six pellet coolers. Cooling air is passed through the pellets. A small amount of wood fines are swept out with the cooling air and controlled by six cyclones operating in parallel. Enviva is proposing to add a bin vent to the recirculation exhaust that will collect fines from the cyclones to be transferred and reused in the process. VOC, HAP, and TAP emissions are calculated using stack test data.

PM emissions are calculated using a guaranteed outlet grain loading factor of 0.004 gr/ft^3 and the maximum flow rate (1,000 cfm). Potential PM emissions are reported to be 0.03 lb/hr or 0.15 tpy.

D. Air Quality Analysis – As a result of the changes, the applicant updated the previously approved air dispersion modeling analysis to demonstrate that the facility will not cause or contribute to any violation of the NAAQS, PSD increments, or SAAQS. The revised modeling analysis was reviewed by Mr. Tom Anderson, Supervisor, Air Quality Analysis Branch (AQAB). According to Mr. Anderson's memo dated December 29, 2015, an initial modeling analysis was conducted and approved by AQAB in June 2014, followed by a revised analysis in September 2014. The latest revision received on October 29, 2015 indicates that the facility will not cause or contribute to any violation of the Class II NAAQS, PSD increments, Class I increments, or any FLM AQRVs. Since the changes were relatively minor and emissions increased only slightly, a full PSD analysis was not required.

V. Regulatory Summary - Specific Emission Source Limitations and Conditions

A. 15A NCAC 02D .0515 "Particulates from Miscellaneous Industrial Processes" – This regulation establishes an allowable emission rate for particulate matter from any stack, vent, or outlet resulting from any industrial process for which no other emission control standards are applicable. This regulation applies to Total Suspended Particulate (TSP) or PM less than 100 micrometers (μm). The allowable emission rate is calculated using the following equation:

$E = 4.10 \times P^{0.67}$ for $P < 30$ tph
$E = 55 \times P^{0.11} - 40$ for $P \geq 30$ tph

where, E = allowable emission rate (lb/hr)
P = process weight rate (tph)

According to the application, the most significant source of PM emissions is the dryer system operating at 71.71 ODT/hr. The allowable emission rate is calculated to be 48 lb/hr. The maximum PM emission rate estimate is provided by the dryer vendor. The maximum hourly emission rate is 12 lb/hr. Therefore, compliance is indicated.

The proposed third green hammermill, pellet sampling transfer bin, and pellet cooler recirculation will all be controlled by bagfilters and bin vent filters. The increase in PM emissions is 0.57 lb/hr.

B. 15A NCAC 02D .0516 "Sulfur Dioxide Emissions from Combustion Sources" – Under this regulation, sulfur dioxide emissions from combustion sources cannot exceed 2.3 lb/million Btu heat input. Wood is fired in the dryer and low sulfur diesel is combusted in the two emergency engines. Diesel is the worst case fuel. Firing diesel fuel (0.5% sulfur b.w.) will not cause this limit to be exceeded. Therefore, compliance is indicated.

C. 15A NCAC 02D .0521 "Control of Visible Emissions" – This regulation establishes a visible emission standard for sources based on the manufacture date. For sources manufactured after July 1, 1971, the standard is 20% opacity when averaged over a 6-minute period. The Permittee will be required to establish 'normal' visible emissions from these sources within the first 30-days of the permit effective date. In order to demonstrate compliance, the Permittee will be required to observe actual visible emissions on a monthly basis for comparison to 'normal'. If emissions are observed outside of 'normal', the Permittee shall take corrective action. Recordkeeping and reporting are required. Because all emission sources are designed to be well controlled, compliance with this standard is expected.

D. 15A NCAC 02Q .0700 "Toxic Air Pollutant Procedures" – This regulation requires that certain new and modified sources of state-only toxic air pollutants (TAP) with emissions exceeding toxic permit exemption rates (TPER) receive a permit to emit TAP. Previously approved facility-wide TAP modeling demonstrated that the sources will not present an unacceptable health risk. According to the application, the proposed changes result in a slight increase in emissions of formaldehyde (2%) and benzo-a-pyrene (0.03%). Due to the small increase, no further TAP modeling is required.

VI. Regulatory Summary - Multiple Emission Source Limitations and Conditions

A. 15A NCAC 02D .0530 "Prevention of Significant Deterioration" – The facility is a major source of VOC emissions. For the initial project, PSD review was triggered for VOC, CO, NOx, TSP, PM-10, PM-2.5, and CO2e. Enforceable limits for these pollutants were placed in the permit based on a Best Available Control Technology (BACT) review. The facility will not trigger PSD review for the proposed modification because emissions do not exceed significant emission rates (SER).

The following table taken from the application provides a facility-wide criteria pollutant emissions summary after this modification.

Source Description	**ID No.**	**CO** (tpy)	**NOx** (tpy)	**TSP** (tpy)	**PM-10** (tpy)	**PM-2.5** (tpy)	**SO2** (tpy)	**VOC** (tpy)	**CO2e** (tpy)
Dryer	ES-DRYER	230.45	219.35	51.55	51.55	51.55	27.42	288.25	229,828
E. Engine	ES-EG	0.77	0.88	0.04	0.04	0.04	0.0005	0.88	143
FWP	ES-FWP	0.27	0.22	0.02	0.02	0.02	0.0001	0.22	35
Hammermills	ES-HM-1-8	-	-	18.02	18.02	0.31	-	-	-
Pellet Mill Feed Silo	ES-PMFS	-	-	0.37	0.37	0.37	-	-	-
Pellet Mill Fins Bin	ES-PFBHMA	-	-	0.47	0.47	0.47	-	-	-
Pellet Presses and Coolers	ES-CLR1-6	-	-	74.33	19.36	2.37	-	227.64	-
Log Bark Hog		-	-	-	-	-	-	0.37	-
Log Chipper		-	-	-	-	-	-	1.25	-
Green Hammermills	ES-GHM-1-3	-	-	6.76	6.76	6.76	-	72.18	-
Finished Product		-	-	1.28	1.16	0.02	-	-	-
Paved Roads		-	-	2.42	0.48	0.12	-	-	-
Dried Wood	ES-DWH	-	-	0.30	0.30	0.30	-	-	-
Pellet Sampling	ES-PSTB	-	-	0.15	0.15	0.15	-	-	-
Cooler Recirculation	ES-PCR	-	-	0.15	0.15	0.15	-	-	-
Green Wood Handling	IES-GWH	-	-	0.016	0.008	0.001	-	-	-
Green Wood Storage Piles	IES-GWSP	-	-	4.01	2.00	0.30	-	-	-
Diesel Storage	TK1-3	-	-	-	-	-	-	4.00E-03	-
Total Emissions		231.49	220.45	159.87	100.84	62.92	27.42	628	230,006

B. 15A NCAC 02D .0524 "New Source Performance Standards (NSPS), Subpart IIII" – This regulation applies to owners or operators of compression ignition (CI) reciprocating internal combustion engines (RICE) manufactured after April 1, 2006 that are not fire pump engines, and fire pump engines manufactured after July 1, 2006. Both the 536 hp emergency engine and the 131 hp fire pump engine are subject to the requirements of this regulation.

Under NSPS Subpart IIII, owners or operators of emergency engines manufactured in 2007 or later with a maximum engine power greater than or equal to 50 hp are required to comply with the emission limits referenced in 40 CFR §60.4205(b). These limits are as follows: 0.20 g/kW for PM; 3.5 g/kW for CO; and 4 g/kW for NOx + nonmethane hydrocarbons (NMHC).

Under NSPS Subpart IIII, owners or operators of fire pump engines manufactured after July 1, 2006 must comply with the emission limits in Table 4 of the subpart. The limits are as follows: 0.30 g/kW for PM; 5.0 g/kW for CO; and 4 g/kW for NOx + NMHC.

As stated in the application, Enviva will comply with these limits by operating the engines as instructed in the manufacturer's operating manual in accordance with 40 CFR 60.4211(a), and purchasing an engine certified to meet the referenced emission limits in accordance with 40 CFR 60.4211(b). The engines will be equipped with a non-resettable hour meter in accordance with 40 CFR 60.4209(a). Emergency and readiness testing will be limited to 100 hours per year.

In addition, both engines are required to comply with fuel requirements in 40 CFR 60.4207, which limit sulfur content to a maximum of 15 ppm and a cetane index of at least 40.

B. 15A NCAC 02D .1111 "Maximum Achievable Control Technology, Subpart ZZZZ" – 40 CFR Part 63 applies to RICE located at a major or area source of hazardous air pollutants (HAP). Pursuant to 40 CFR §63.6590(c) (amended January 30, 2013), a new stationary RICE located at a major source must meet the requirements of this part by meeting the requirements of 40 CFR Part 60 Subpart IIII for compression ignition engines. No further requirements apply to such engines under this part.

Note: The two new engines (536 and 131 HP) are being added as a non-PSD modification. Since these two engines are not subject to PSD, they qualify as insignificant activities under 15A NCAC 02Q .0503(8).

VII. Other Applicable Regulatory Requirements

- An application fee of $918.00 is required and was received by DAQ.
- The appropriate number of application copies was received on October 29, 2015.
- The application included the Reduction and Recycling Form (A4).
- Public notice is not required for this 1st Step significant modification under 15A NCAC 02Q .0501(c)(2).
- A Professional Engineer's Seal was included in the application (ref. M. Dale Overcash, P.E. Seal No. 12627).
- Receipt of the request for a zoning consistency determination was acknowledged by Mary M. Rose, Clinton-Sampson Planning Department on October 28, 2015.
- IBEAM Emission Source Module (ESM) update was verified on January 7, 2016.
- According to the application, the facility does not handle any of the substances subject to 112(r).
- The application was signed by Mr. Maitland Horner, Vice President Construction on October 19, 2015.

VIII. Recommendations

This permit application has been reviewed by DAQ to determine compliance with all procedures and requirements. DAQ has determined that this facility is expected to achieve compliance as specified in the permit with all applicable requirements. A draft permit and review were provided to the applicant and FRO on December 31, 2015. The applicant responded on January 6, 2016 with corrections to the draft. All of the suggested corrections were made. FRO responded with no comments. DAQ recommends issuance of Permit No. 10386R02.

Comprehensive Application Report for 8200152.15A

01/28/2016

Enviva Pellets Sampson, LLC - Faison (8200152)

Sampson County

General Information: Permit/Latest Revision: 10386/ R02

Permit code:	State
Application type:	Modification
Engineer/Rev. location:	Kevin Godwin/RCO
Regional Contact:	Gregory Reeves
Facility location:	Fayetteville Regional Office
Facility classification:	Title V
Clock is ON	Application is COMPLETE
Status is :	Issued

Application Dates

Received	Completeness Due	Clock Start	Calculated Issue Due
10/29/2015	12/13/2015	10/29/2015	02/03/2016

Fee Information

Initial amount:	Date received:	Amount Due:	Add. Amt Rcv'd:	Date Rcv'd:
$918.00	10/29/2015	0.00		

Fund type:	Deposit Slip #:	Location rec'd:	Location deposited:
2333			

Contact Information

Type	Name	Address	City State ZIP	Telephone
Authorized	Maitland J. W. Horner, Vice President	7200 Wisconsin Avenue, Suite	Bethesda, MD 20814	(301) 657-5560
Technical/Permit	Joe Harrell, Corporate EHS Manager	142 NC Route 561 East	Ahoskie, NC 27910	(252) 209-6032

Acceptance Criteria

Received?	Acceptance Criteria Description
Yes	Application fee
Yes	Appropriate number of apps submitted
Yes	Zoning Addressed
Yes	Authorized signature
Yes	PE Seal
N/A	Application contains toxic modification(s)

Completeness Criteria

Received?	Complete Item Description

Application Events

Event	Start	Due	Complete	Comments	Staff
Acknowledgment letter due	10/29/2015	11/08/2015	10/30/2015		mjcuilla
Internal assistance - modeling input	11/02/2015		12/29/2015		mjcuilla
Regional technical review received in RCO	11/23/2015		11/23/2015		mjcuilla
Draft permit to region	12/31/2015	01/07/2016	01/07/2016		mjcuilla
Draft permit to applicant	12/31/2015	01/07/2016	01/06/2016		mjcuilla
Draft to coordinator/supervisor for review	01/07/2016		01/26/2016		mjcuilla
Permit to coordinator/supervisor for signature	01/27/2016		01/27/2016		mjcuilla
Permit issued	01/27/2016		01/27/2016		mjcuilla

Comprehensive Application Report for 8200152.15A

01/28/2016

Enviva Pellets Sampson, LLC - Faison (8200152)

Sampson County

Outcome Information

Class before: Title V Class after: Title V

2Q .0711: No 2D .1100: No

NSPS: No NESHAPS/MACT: No PSD/NSR: No

PSD/NSR Avoid: No Prohibitory Small: No

PSD/NSR Status After: Major General permit: No

Multi-site permit: No Multi. permits at facility: No

Quarry permit: No HAP Major (10/25 tpy): Major

2Q .0705 Last MACT/Toxics: NO NESHAPS/GACT: NO

New Source RACT/LAER: NO Existing Source RACT: NO

RACT/LAER Added Fee: NO RACT Avoidance: NO

2Q .0702 (a)(18) - Toxics/Combustion Source(s) After 07/10/10: NO

Permit/Revision: 10386/R02

Revision Issue Date: 01/27/2016

Accumulated process days (includes public notice periods): 83

Public notice/hearing/add info after 80 days: No

Manager's discretion: Appealed? No

Current Permit Information:

Issue	Effective	Expiration	Revision #
01/27/2016	01/27/2016	10/31/2019	R02

Regulations Pertaining to this Permit

Reference Rule		Regulation Description
2D	.0515	Particulates Miscellaneous Industrial Processes
2D	.0516	Sulfur Dioxide Emissions Combustion Sources
2D	.0521	Control of Visible Emissions

Audit Information Pertaining to this Application

Column Name	Date Changed	Old Value	New Value	Editor
perm_Code	01/28/2016	501C2 (TV-Sign-501(c)(2) Part I)	300 (State)	Mark Cuilla

Kevin

1 Copley Parkway | Suite 310 | Morrisville, NC 27560 | P (919) 462-9693 | F (919) 462-9694
trinityconsultants.com

Trinity Consultants

October 28, 2015

Mr. William Willets, P.E.
Chief, Air Permits Section
North Carolina Division of Air Quality
217 West Jones Street
Raleigh, NC 27603

Received
OCT 29 2015
Air Permits Section

Re: Pre-Construction Permit Application
Minor Modification under the PSD Regulations
Enviva Pellets Sampson, LLC
Faison, NC

Dear William:

On behalf of Enviva Pellets Sampson, LLC (Enviva), please find attached three copies of a pre-construction permit application for the pellet manufacturing facility that is currently under construction near Faison, NC. This application has updated emission sources, emissions estimates, dispersion modeling, and facility data. The proposed changes will not re-trigger PSD review. The DAQ has previously a PSD permit for the site. The current Air Permit No. is 10386R01.

The enclosed application was developed in accordance with the current DAQ pre-construction regulations and other DAQ pre-construction application guidance. The permit application fee and the consistency determination are included in the application package.

If you have any questions regarding this application, please feel free to contact me at (919) 462-9693.

Sincerely,

Dale Overcash, P.E.
Principal Consultant

Cc: Mr. Michael Doniger, Enviva
Mr. Joe Harrell, Enviva
Mr. Alan McConnell, Kilpatrick Townsend

DIVISION OF AIR QUALITY
December 29, 2015

MEMORANDUM

TO: Kevin Godwin, Environmental Engineer, Permitting Section
Permit Coordinator, FRO

FROM: Tom Anderson, Supervisor, Air Quality Analysis Branch (AQAB)

SUBJECT: Review of Revised Dispersion Modeling Analysis – Enviva Pellets Sampson, LLC
Faison, NC Sampson County

Attached is a discussion of the revised modeling analysis for Enviva Pellets Sampson, LLC that was conducted in support of the construction and operation of a new facility near Faison, NC. An initial modeling analysis was conducted and approved by the AQAB in June 2014, followed by a revised analysis in September 2014 due to expected increases in the heat input value for the burner on the proposed WESP triggering review of carbon monoxide (CO). Emission rates for other pollutants increased marginally and some stack parameters also changed.

The latest revision, summarized in this report, addresses several changes that comprise an updated design of the proposed facility. Since the changes were relatively minor and emissions increased only marginally, a full PSD analysis was not required.

c: Nancy Jones
Tom Anderson

ENVIVA PELLETS SAMPSON LLC, PREVENTION OF SIGNIFICANT DETERIORATION (PSD) AIR DISPERSION MODELING ANALYSIS

Introduction

The PSD modeling analysis described in this section was conducted in accordance with current PSD directives and modeling guidance. A detailed description of the modeling and modeling methodology is described below.

Project Description / Significant Emission Rate (SER) Analysis

Enviva Pellets Sampson, LLC (Enviva) plans to construct and operate a wood pellet manufacturing plant in Sampson County near Faison, NC. Operations are expected to occur 24 hours per day, 7 days per week and 52 weeks per year. A facility-wide pollutant netting analysis was accomplished and documented in Table 3-1 of the initial (October 2013) Enviva permit application. The emission rate increases due to the latest revision does not result in any pollutants exceeding their respective PSD Significant Emission Rates (SERs) which would typically require a PSD analysis; however a revised analysis was requested by NCDAQ. Details of the emissions increases and proposed new sources are provided in Table B-1 of the application report.

Preliminary Impact Air Quality Modeling Analysis

An air quality preliminary impact analysis was conducted for the pollutants exceeding their corresponding SER's from the previous analyses. The modeling results were then compared to applicable Significant Impact Levels (SILs) as defined in the NSR Workshop Manual to determine if a full impact air quality analysis would be required for that pollutant.

The Enviva facility will be located near Faison, NC, in Sampson County. The facility area is in the southeastern coastal plain with terrain being predominantly flat and is generally agricultural, industrial, and forest land. For modeling purposes, the area, including and surrounding the site, is classified rural, based on the land use type scheme established by Auer 1978.

Enviva evaluated the pollutants' significant emissions using the EPA AERMOD model and five years (2008-2012) of National Weather Service (NWS) surface (Fayetteville) and upper air (Greensboro) meteorological data. Full terrain elevations were included, as were normal regulatory defaults. Sufficient receptors were placed in ambient air beginning at the fenceline to establish maximum impacts. Emission rates for this specific project were used and the maximum impacts were then compared to the SIL. Since the results showed impacts above the SILs for PM_{10}, $PM_{2.5}$, and NO_2, further modeling was required for those pollutants. The SIL results are shown in Table 1.

Table 1 - Class II Significant Impact Results (ug/m^3)

Pollutant	Averaging Period	Facility maximum Impact	Class II Significant Impact Level	Significant Impact Distance (km)
CO	1-hour	136.37	2,000	N/A
	8-hour	44.30	500	
PM_{10}	annual	**3.96**	1	2.5
	24-hour	**28.98**	5	
$PM_{2.5}$	annual	**1.25**	.3	2.5
	24-hour	**7.60**	1.2	
NO_2	annual	**2.48**	1	3.5
	1-hour	**88.19**	10	

Class II Area Full Impact Air Quality Modeling Analysis

A Class II Area NAAQS and PSD increment analysis was performed for PM_{10}, $PM_{2.5}$, and NO_2 to include offsite source emissions and background concentrations (NAAQS). Enviva used AERMOD with the modeling methodology as described above. Off-site source inventories for both increment and NAAQS modeling were obtained from NCDAQ and then refined by Enviva using the NCDAQ approved "Q/D=20" guideline. For the NO_2 NAAQS analysis, 6 offsite sources (all from the same facility) were used; the same sources were also used for the increment analysis. These sources, along with their emission rates, are provided in the attachments. For the PM_{10} and $PM_{2.5}$ NAAQS and increment analyses, no offsite sources were included since Enviva is the first facility to trigger review for those pollutants since their respective established baseline dates.

Enviva used an appropriate array of receptors beginning at the declared fenceline and extending outward to 5 kilometers. PM_{10} background concentrations were obtained from the Cumberland County PM_{10} monitoring station. The Duplin County monitor was used for $PM_{2.5}$ background concentrations. NO_2 background concentrations were obtained from a monitor located in Paulding County, GA since it was judged to be most representative of the rural NO_2 background concentrations for the Sampson County region. The modeling results are shown in Table 2 and indicate compliance with the NAAQS for PM_{10}, $PM_{2.5}$, and NO_2.

Table 2 - Class II Area NAAQS Modeling Results

Pollutant	Averaging Period	Maximum Onsite & Offsite Source Impacts (ug/m^3)	Background Concentration (ug/m3)	Total Impact (ug/m3)	NAAQS (ug/m3)	% NAAQS
PM_{10}	24-hour	27.02	25.00	52.09	150	35
$PM_{2.5}$	24-hour	5.65	19.00	24.65	35	70
	annual	1.25	7.76	9.01	12	75
NO_2	1-hour	63.50	32.10	95.60	188	51
	annual	2.55	5.30	7.85	100	8

In the CLASS II increment analysis, Enviva used the same onsite sources, fenceline, and receptors as in the NAAQS analysis. The emission rates modeled are provided in the attachments. The Class II Area increment modeling results are shown in Table 3 and indicate compliance with the Class II Area increments.

Table 3 - Class II Area PSD Increment Modeling Results

Pollutant	Averaging Period	Maximum Onsite & Offsite Source Impacts (ug/m^3)	PSD Increment (ug/m3)	% Increment
PM_{10}	24-hour	27.09	30	90
	annual	3.96	17	23
$PM_{2.5}$	24-hour	8.31	9	92
	annual	1.47	4	37
NO_2	annual	2.55	25	10

Non Regulated Pollutant Impact Analysis (North Carolina Toxics)

Enviva also modeled TSP (total suspended particulate) as required by N.C. regulations using AERMOD with the same receptor array and meteorology as used in the NAAQS analysis. A list of the facility sources and emission rates used are attached to this document. The maximum concentrations as shown in Table 4 occurred along the fenceline.

Table 4 – Non-Regulated Pollutants Modeling Results

Pollutant	Averaging Period	Max Facility Impact (µg/m3)	AAL (µg/m3)	Percent of AAL
TSP	annual	8.0	75	11
	24-hr	64.7	150	43

Additional Impacts Analysis

The previously reviewed and approved analyses addressed additional impacts such those on growth, soils and vegetation, and visibility impairment in both Class 1 and Class II areas. Since the proposed modifications and resulting changes in emission rates are minimal and are expected to have trivial, if any, impact on the aforementioned subjects, nor does the project require full PSD review, revisions to those portions of the analysis were not conducted.

PSD Air Quality Modeling Result Summary

Based on the PSD air quality ambient impact analysis performed the proposed Enviva Pellets Sampson, LLC facility will not cause or contribute to any violation of the Class 1I NAAQS, PSD increments, Class 1 Increments, or any FLM AQRVs.

Note: Tables follow below.

TABLE 4-1. MODELED SOURCE LOCATIONS

Model ID	Description	UTM-E (m)	UTM-N (m)	Elevation (m)
EP1	Dryer WESP Stack	756748.6	3890256.1	51.91
EP2	Hammermill Filter #1 and #2	756693.7	3890154.7	52.06
EP3	Hammermill Filter #3 and #4	756687.1	3890148.8	52.02
EP4	Hammermill Filter #5 and #6	756680.6	3890142.9	52.01
EP5	Hammermill Filter #7 and #8	756677.3	3890140.0	52.01
EP6	Pellet Silo Bin Vent	756648.3	3890136.1	52.09
EP7	Pellet Cooler #1 Cyclone	756642.1	3890119.9	52.10
EP8	Pellet Cooler #2 Cyclone	756637.4	3890115.8	52.05
EP9	Pellet Cooler #3 Cyclone	756633.1	3890111.9	52.01
EP10	Pellet Cooler #4 Cyclone	756628.5	3890107.7	51.98
EP11	Pellet Cooler #5 Cyclone	756624.2	3890103.9	51.97
EP12	Pellet Cooler #6 Cyclone	756619.5	3890099.7	51.96
EP13	Emergency Generator	756675.2	3890243.0	52.30
EP14	Firewater Pump	756542.7	3889988.5	51.97
EP15	Pellet Cooler HP Fines Filter Stack	756660.1	3890141.9	52.04
EP16	Finished Goods Dust Collection Stack	756490.7	3889998.7	51.89
EP17	Greenwood Hammermill #1 Stack	756742.3	3890280.5	51.87
EP18	Greenwood Hammermill #2 Stack	756737.2	3890275.9	51.89
EP19	Dryer Out Conv. #1 Bin Vent	756699.4	3890197.1	52.25
EP20	Dryer Out Conv. #2 Bin Vent	756697.0	3890195.3	52.27
EP21	Loadout Conveyor Bin Vent	756594.1	3890089.0	52.01
EP22	Greenwood Hammermill #3 Stack	756732.1	3890271.3	51.92
EP23	Pellet Cooler LP Fines Filter Stack	756620.5	3890092.6	51.97

TABLE 4-2. MODELED STACK PARAMETERS

Model ID	Stack Height (m)	Stack Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
EP1	28.65	350.93	10.59	3.05
EP2	19.81	310.93	17.46	1.02
EP3	19.81	310.93	17.46	1.02
EP4	19.81	310.93	17.46	1.02
EP5	19.81	310.93	17.46	1.02
EP6	23.77	305.37	0.01	0.40
EP7	27.43	316.48	17.82	0.71
EP8	27.43	316.48	17.82	0.71
EP9	27.43	316.48	17.82	0.71
EP10	27.43	316.48	17.82	0.71
EP11	27.43	316.48	17.82	0.71
EP12	27.43	316.48	17.82	0.71
EP13	4.57	760.87	78.30	0.15
EP14	4.57	954.00	109.18	0.06
EP15	20.42	293.00	15.92	0.36
EP16	7.62	310.93	16.36	0.56
EP17	15.24	293.00	17.82	0.71
EP18	15.24	293.00	17.82	0.71
EP19	4.57	293.00	0.01	0.40
EP20	15.85	293.00	0.01	0.40
EP21	4.57	293.00	0.01	0.40
EP22	15.24	293.00	17.82	0.71
EP23	14.02	293.00	25.87	0.15

TABLE 4-3. MODELED EMISSION RATES

Model ID	Modeled Emission Rates (g/s) TSP	PM_{10}	$PM_{2.5}$	CO	NO_x
EP1	1.483E+00	1.483E+00	1.483E+00	6.629E+00	6.310E+00
EP2	1.296E-01	1.296E-01	2.203E-03	-	-
EP3	1.296E-01	1.296E-01	2.203E-03	-	-
EP4	1.296E-01	1.296E-01	2.203E-03	-	-
EP5	1.296E-01	1.296E-01	2.203E-03	-	-
EP6	1.056E-02	1.056E-02	1.056E-02	-	-
EP7	3.564E-01	9.284E-02	1.138E-02	-	-
EP8	3.564E-01	9.284E-02	1.138E-02	-	-
EP9	3.564E-01	9.284E-02	1.138E-02	-	-
EP10	3.564E-01	9.284E-02	1.138E-02	-	-
EP11	3.564E-01	9.284E-02	1.138E-02	-	-
EP12	3.564E-01	9.284E-02	1.138E-02	-	-
EP13	9.244E-04	9.244E-04	9.244E-04	1.941E-01	2.219E-01
EP14	3.389E-04	3.389E-04	3.389E-04	6.778E-02	5.422E-02
EP15	1.340E-02	1.340E-02	1.340E-02	-	-
EP16	3.672E-02	3.342E-02	6.242E-04	-	-
EP17	6.480E-02	6.480E-02	6.480E-02	-	-
EP18	6.480E-02	6.480E-02	6.480E-02	-	-
EP19	4.320E-03	4.320E-03	4.320E-03	-	-
EP20	4.320E-03	4.320E-03	4.320E-03	-	-
EP21	4.320E-03	4.320E-03	4.320E-03	-	-
EP22	6.480E-02	6.480E-02	6.480E-02	-	-
EP23	4.320E-03	4.320E-03	4.320E-03	-	-
PAVEDRDS*	9.869E-07	1.974E-07	4.845E-08	-	-

* Area source emission rates expressed per unit area ($g/s/m^2$)

Table G-1. Modeled NO_x Inventory Sources

Model ID	Description	UTM-E (m)	UTM-N (m)	Elevation (m)	Emission Rate (g/s)	Stack Height (m)	Exit Temp. (k)	Exit Velocity (m/s)	Stack Diameter (m)
HFLEE1	IC Turbine 10/11	764,564.0	3,918,961.0	24.97	3.76E-01	30.48	878.71	48.77	5.39
HFLEE2	LEE IC Turbine 12/13	764,564.0	3,918,961.0	24.97	6.38E-01	30.48	878.71	48.77	5.39
HFLEE3	IC Turbine 2/3/4 Stack	764,564.0	3,918,961.0	24.97	2.27E-02	10.36	758.71	31.88	3.44
HFLEE4	Units 1&2 Stack	764,564.0	3,918,961.0	24.97	2.41E+01	91.44	410.93	27.43	6.11
HFLEE5	Unit 3 Boiler Stack	764,564.0	3,918,961.0	24.97	4.99E+01	91.44	421.48	40.60	5.79
HFLEE6	Unit 14	764,564.0	3,918,961.0	24.97	3.64E-01	30.48	878.71	48.77	5.39

NORTH CAROLINA DIVISION OF AIR QUALITY

Regional Office P&O Review

P&O Review Date: 11/10/2015

Region: Fayetteville Regional Office
County: Sampson
NC Facility ID: 8200152
Inspector's Name:
Date of Last Inspection:
Compliance Code:

Facility Data

Applicant (Facility's Name): Enviva Pellets Sampson, LLC

Facility Address:
Enviva Pellets Sampson, LLC
5 Connector Road
Faison, NC 28341

SIC: 2499 / Wood Products, Nec
NAICS: 321999 / All Other Miscellaneous Wood Product Manufacturing

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP:
NSPS:
NESHAP:
PSD:
PSD Avoidance:
NC Toxics:
112(r):
Other:

P&O REVIEW MODIFICATION

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Joe Harrell Corporate EHS Manager (252) 209-6032 142 NC Route 561 East Ahoskie, NC 27910	Maitland Horner Vice President (301) 657-5560 7200 Wisconsin Avenue, Suite 1000 Bethesda, MD 20814	Joe Harrell Corporate EHS Manager (252) 209-6032 142 NC Route 561 East Ahoskie, NC 27910

Application Data

Application Number: 8200152.15A
Date Received: 10/29/2015
Application Type: Modification
Application Schedule: TV-Sign-501(c)(2) Part I

Existing Permit Data
Existing Permit Number: 10386/R01
Existing Permit Issue Date: 01/06/2015
Existing Permit Expiration Date: 10/31/2019

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2014	---	---	---	---	---	---	.00E+00 [Arsenic & Compounds (total mas]

Review Engineer: Kevin Godwin
Regional Office Review Engineer: Gregory Reeves

Regional Review Engineer's Signature: **Date:**

Comments / Recommendations:

P&O Review Date: 11/10/2015

1. Purpose of Application

Enviva Pellets Sampson, LLC is constructing a new wood pellet production facility in Faison, Sampson County. The facility will be a PSD Major source of NOx and VOC, and will be classified as Title V. The facility will also be a Title III Major source for HAP, with projected actual emissions of formaldehyde and methanol greater than 10 tons/yr each. In addition, the facility may also be a PSD Major source of Greenhouse Gas (GHG) emissions if the EPA deferral of greenhouse gas emissions from biogenic fuels expires.

The facility originally submitted a PSD application for this facility on 09/11/13 and submitted an updated application on 05/05/14. PSD permit 10386R00 was issued to the facility on 11/17/14. A revised permit 10386R01 was issued on 01/06/15. A complete Title V permit application is required to be submitted within 12 months after commencement of operations.

This application requests the following changes to the permit:

- Add a third green wood hammermill (ID No. ES-GHM-3), controlled by a bin vent filter (ID No. CD-GHM-BV3).
- Add a pellet sampling transfer bin (ID No. ES-PTSB), controlled by a bin vent filter (ID No. CD-DC-BV3).
- Add a pellet cooler recirculation system (ID No. ES-PCR), controlled by a bin vent filter (ID No. CD-PCR-BV).
- Modify the horsepower of the emergency generator (ID No. ES-GN) to be 536 HP.
- Modify the horsepower of the fire pump (ID No. ES-FWP) to be 131 HP.

These modifications will result in some slight increases in emissions of CO, NOx, PM, PM_{10}, $PM_{2.5}$, SO_2, and CO_2e. None of these increases appear to exceed the PSD significant emission rates, and therefore a PSD review does not appear to be required.

The proposed modifications will also result in some slight increases in toxics emissions. None of these increases appear to indicate any exceedances of the AALs, and thus do not appear to present an unacceptable risk to human health.

remove.

The permit application did not contain any confidential information.

The facility contact for this application is Joe Harrell, EHS Manager (252-209-6032).

The new Authorized contact for the facility is Maitland Horner, Vice President Construction. This information has been updated in the IBEAM Facilities module.

The company utilized a consultant to assist in the permitting process. The contact at the consultant, Trinity Consultants, Inc in Morrisville, NC, is Dale Overcash (919-462-9693).

2. Application Chronology:

10/29/15 RCO received the permit application, including a check in the amount of $918 for the applicable processing fees. The application appeared to be complete for processing.

11/04/15 RCO forwarded a copy of the permit application to FRO.

3. Facility Description:

The company plans for the facility to produce approximately 537,625 tons of wood pellets for use as a fuel source for the generation of electricity and for industrial customers. The facility will utilize up to 75% softwood on a 12-month rolling basis.

The process will utilize green wood, either in the form of whole logs or pre-chipped wood. The whole logs are received, debarked, chipped, and run through a green wood hammer mill. Green wood chips are dried in a direct-fired rotary dryer, fueled by a portion of the chipped green wood and bark. The dried wood is reduced in size in hammer mills, then pelletized in screw presses. The pellets are then cooled, screened to remove fines, and loaded out in bulk for shipment.

The facility equipment will consist of the following:

- Green wood handling and sizing operations
- Green wood storage bin
- Log debarker
- Log bark hog
- Log chipper
- Three (3) green wood hammer mills controlled by bin vent filters
- 250.4 mmBtu/hr green wood-fired rotary dryer system controlled by fur (4) simple cyclones in parallel, all in series with wet electrostatic precipitator (WESP)
- Eight (8) dry wood hammer mills, each controlled by a simple cyclone in series with a fabric filter.
- Hammermill area emissions will be controlled by the pellet fines bin vent filter.
- Pellet mill feed silo controlled by a bin vent fabric filter
- Twelve (12) pellet presses and six (6) pellet coolers, each system controlled by one simple cyclone.
- Pellet sampling transfer bin controlled by a bin vent filter.
- Pellet cooler recirculation controlled by a bin vent filter.
- Finished product storage and loadout, controlled by a fabric filter.
- Pellet fines bin, controlled by a bin vent fabric filter.
- Dried wood handling operations (conveying, screening) controlled by fabric filter.

- Auxiliary Operations
  - ✓ Three (3) diesel fuel storage tanks
  - ✓ 536 HP diesel-fired emergency electrical generator
  - ✓ 131 HP diesel-fired fire pump

4. Compliance History:

The facility has not yet commenced operation, and thus has no compliance history. Required reports have been submitted as required.

5. Conclusions, Comments, and Recommendations:

If Enviva Pellets Sampson, LLC submits any revisions to this application, including any significant response to additional information requests, FRO requests a contemporaneous copy for additional review.

FRO requests the opportunity to review the draft permit and permit review prior to issuance of the permit. Additionally, as part of this review process, FRO requests copies of all correspondence regarding this application, including e-mails and meeting notes.

Respond. Did we to require send this

Review Engineer: _____ Date: _____

Permit Coordinator: _____ Date: _____

DAQ Supervisor: _____ Date: _____

\GWR
cc: FRO Files

Did we need this in review?

Received
OCT 2 9 2015
Air Permits Section

ENVIVA PELLETS SAMPSON, LLC • SAMPSON COUNTY, NORTH CAROLINA

GREEN HAMMERMILL CONSTRUCTION PERMIT APPLICATION AND OTHER MISCELLANEOUS MODIFICATIONS

Prepared By:

TRINITY CONSULTANTS
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Received
OCT 2 9 2015
Air Permits Section

October 2015

Project 153401.0106

Trinity Consultants

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TABLE OF CONTENTS

1. INTRODUCTION

Enviva Pellets Sampson, LLC (Enviva) is constructing a wood pellets manufacturing plant (the "Facility") in Richmond County, NC under the authorization of PSD Permit No 10386R01 issued by the NC DENR, Division of Air Quality (now the NC Department of Environmental Quality, Division of Air Quality or "DAQ") on January 6, 2015. The permitted wood pellets plant is designed to produce up to 537,625 oven-dried tons (ODT) per year of wood pellets utilizing up to 75% softwood on a 12-month rolling total basis. The permitted plant consists of a log chipper, green wood hammermills, bark hog, 250.4 MMBtu/hr dryer, hammermills, pellet presses and coolers, production loading operations and other ancillary activities.

The purpose of this application is to: (1) add a third green wood hammermill (ES-GHM-3) to the Facility with a bin vent filter, (2) add a pellet sampling transfer bin (ES-PSTB) with bin vent filter, (3) add a pellet cooler recirculation (ES-PCR) bin vent filter, (4) modify the emergency generator and fire pump sizes from the 250 hp (each), that were originally permitted, to 536 horsepower and 131 horsepower, (5) increase the throughput through the green wood hammermills to reflect updated operations, and (6) update the prior modeling analysis to reflect the updated design of the Facility.

Enviva manufactures wood pellets for use as a renewable fuel for energy generation and industrial customers. Enviva's customers use wood pellets in place of coal, significantly reducing emissions of pollutants such as carbon dioxide, mercury, arsenic and lead. The company is dedicated to improving the environmental profile of energy generation while promoting sustainable forestry in the southeastern United States. Enviva holds certifications from the Forest Stewardship Council (FSC), Sustainable Forestry Initiative (SFI) and the Programme for the Endorsement of Forest Certifications (PEFC). Enviva requires that all suppliers adhere to state-developed "Best Management Practices" (BMPs) in their activities to protect water quality and sensitive ecosystems. In addition, Enviva is implementing an industry leading "track and trace" system to further ensure that all fiber resources come from responsible harvests. Enviva pays particular attention to: land use change, use and effectiveness of BMPs, wetlands, biodiversity and certification status. All of this combined ensures that Enviva's forestry activities contribute to healthy forests both today and in the future.

1.1. REGULATORY APPLICABILITY

This document comprises an air quality construction permit application for proposed modifications to the Sampson plant. An initial application for the project was submitted to DAQ in October 2013, and a revision in August 2014. The initial PSD permit was issued November, 17, 2014. The original project triggered PSD review as a result of the construction of a new major source of volatile organic compounds (VOCs), with potential emissions from the project exceeding the PSD Significant Emission Rates (SERs) for carbon monoxide (CO), nitrogen oxides (NO_x), and particulate matter (PM, also called total suspended particulate [TSP]), and particulate matter less than 10 and 2.5 microns in aerodynamic diameter (PM_{10} and $PM_{2.5}$). PSD review was also triggered for Green House Gases (GHGs) since the emissions for the initial project exceeded 75,000 tons per year of CO_2e.

The modifications presented in this construction application do not result in emission increases above the PSD-significant emission rates. Therefore, BACT is not addressed in this application. However, these modifications do impact the air quality modeling analyses that were previously performed for criteria pollutants subject to PSD review, as well as for certain toxic air pollutants (TAPs) in accordance with NC DAQ regulations. This application conforms to all permitting requirements and contains updated modeling analyses that demonstrate that the Facility as modified will operate in accordance with those

requirements. Further, the Facility modifications will not cause or contribute to violations of the National and State Ambient Air Quality Standards (NAAQS and SAAQS) and PSD Increments. In addition to the major regulatory requirements highlighted above, this permitting action will trigger several other state requirements addressed in this application.

1.2. AIR QUALITY ANALYSIS

An updated air dispersion modeling analysis that conforms to the PSD requirements is provided in Section 4 of this report. The modeling demonstrates that the Facility as modified will not cause or contribute to an exceedance of any National Ambient Air Quality Standards (NAAQS) or Class II PSD Increment requirements. The Sampson Facility is exempt from air toxics requirements; however the PSD application included TAP modeling to demonstrate that there was no unacceptable risk associated with the proposed operations. This application includes the addition of a green wood hammermill, along with modified engine sizes for the emergency generator and firewater pump, which are sources of TAP emissions. However, the increase in TAP emissions from the changes is less than 1% of the Facility-wide total. The maximum modeled impact in relation to the TAP Acceptable Ambient Level (AAL) was 13%. Therefore, the trivial increase in emissions will not result in any unacceptable risk and. as such, no additional TAP modeling was performed for this application.

1.3. APPLICATION ORGANIZATION

Three copies of the application have been provided to DAQ as well as the required check for $918. This application is comprised of the following:

- Section 1 provides an executive summary,
- Section 2 provides a project description and discusses air emissions,
- Section 3 discusses regulatory applicability,
- Section 4 summarizes the air dispersion modeling analysis,
- Appendix A contains air permit application forms,
- Appendix B presents air emissions calculations,
- Appendix C contains the required local zoning consistency determination,
- Appendix D contains modeling plots, and
- Appendix E contains the electronic modeling files

2. PROCESS DESCRIPTION AND AIR EMISSIONS

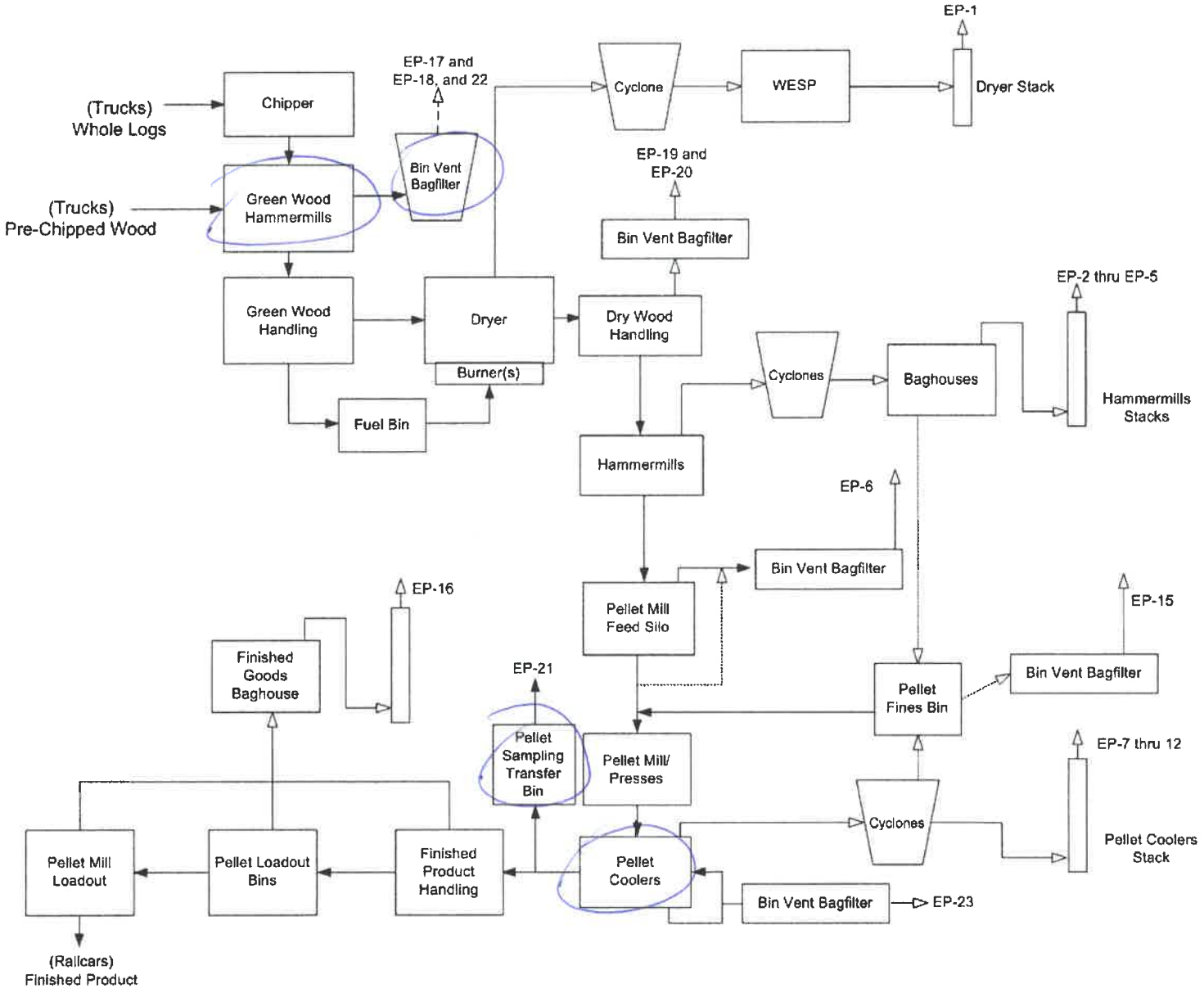
The permitted Facility is designed to produce up to 537,625 oven-dried tons (ODT) per year of wood pellets utilizing up to 75% softwood on a 12-month rolling total basis. As a part of this application, Enviva will be adding a third green wood hammermill (ES-GHM-3) to the Facility with a bin vent filter, increasing total throughput through the green wood hammermills, adding a pellet sampling transfer bin (ES-PSTB) with bin vent filter, and a pellet cooler recirculation (ES-PCR) with bin vent filter. In addition, Enviva would like to modify the emergency generator and fire pump sizes from the 250 hp (each) that was originally proposed, to 536 horsepower and 131 horsepower.

This section discusses the Sampson Plant's pelletizing process and associated air emissions for the proposed plant after modification, which consists of the following:

- Green wood handling and sizing operations;
- Green wood fuel storage bin;
- Log debarker;
- Log bark hog;
- Log chipper;
- Three (3) green wood hammermills controlled by three (3) bin vent filters;
- Eight (8) dry wood hammermills controlled by eight cyclones and eight fabric filtration systems;
- Hammermill area emissions controlled by the pellet fines bin vent filter;
- A pellet mill feed silo controlled by a bin vent filter;
- Twelve (12) wood pellet presses and six (6) pellet coolers controlled by cyclones;
- One 250.4 MMBtu/hr green wood direct-fired dryer system with pollution control equipment consisting of four (4) cyclones and a wet electrostatic precipitator (WESP) for particulate matter abatement;
- Pellet sampling transfer bin with bin vent filter;
- Pellet cooler recirculation with bin vent filter;
- Finished product storage and loading controlled by a fabric filter;
- Pellet fines bin controlled via a bin vent filter;
- Dried wood handling operations;
- Three (3) diesel storage tanks;
- Emergency electric generator; and
- Fire water pump.

Detailed air emissions calculations are presented for each source discussed in this section in Appendix B. A process flow diagram is presented in Figure 2-1.

Figure 2-1. Process Flow Diagram



2.1. GREEN WOOD HANDLING AND SIZING, FUEL STORAGE BIN, AND STORAGE PILES

"Green" (i.e., wet) wood will be delivered to the Facility via trucks as either pre-chipped wood or unchipped low grade wood fiber, tops, limbs, and logs from commercial thinning for on-site chipping. Pre-chipped wood will be screened and oversized chips will undergo additional chipping. Unchipped wood will be debarked and chipped to specification for drying in the on-site electric-powered debarker (IES-DEBARK-1), chipper (ES-CHIP-1), and three green wood hammermills (ES-GHM-1, ES-GHM-2, and ES-GHM-3) as required. Chipped wood for drying is conveyed to a chipped wood storage pile while bark is conveyed to a bark fuel storage pile (IES-GWFB).

Green wood and bark contain a high moisture content approaching 50 percent by weight. Therefore, green wood handling and sizing, the fuel storage bin, and storage piles have negligible emissions and are included on the insignificant activities list. Representative drop point emission calculations using AP-42 Section 13.2.3 for Aggregate Handling are attached in Appendix B for green wood handling and sizing to demonstrate that these emissions are negligible.

Fugitive particulate emissions from chipped wood storage piles are quantified in Appendix B. Emission factors were developed based on the surface area of the piles in accordance with U.S. EPA guidance for active storage pile fugitive emissions.[1] These factors provide estimates of PM emissions due to wind erosion at the surface of each storage pile based on the annual frequency of high wind speeds (> 12 mph).

In addition to particulate matter emissions, volatile organic compounds are also emitted from the storage pile. Emission factors were obtained from a National Council for Air and Stream Improvement (NCASI) document for the calculation of fugitive VOC emissions from woody biomass storage piles. Emission factors range from 1.6 to 3.6 lb VOC as carbon/acre-day. Enviva chose to employ the maximum emission factor to be conservative. Emission factors are provided in pounds of carbon per surface area of the pile. Detailed calculations are included in Appendix B.

2.2. DEBARKING, CHIPPING, GREEN WOOD HAMMERMILLING, AND BARK HOG

Bark is removed from unchipped wood prior to chipping in rotary drum debarkers. There are no current AP-42 emission factors or other emission factors available for debarkers, and visual observations of these units in operation at other Enviva plants indicate that emissions are negligible due to the high moisture content of bark and containment of emissions provided by the drums.

Emission estimates for the chipper and bark hog are based on limited emission factors available for wood chipping. As shown in the attached emissions calculations (Appendix B), VOC emissions from these sources are calculated using emission factors from AP-42 Section 10.6.3 emission factors for hardwood chipping emissions. Methanol emissions are also calculated using factors from AP-42 Sections 10.6.3 and 10.6.4. Particulate matter (PM) emissions will be negligible from the chipper (ES-CHP) because the exhaust is directed downward towards the ground.

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[1] U.S. EPA *Control of Open Fugitive Dust Sources*, Research Triangle Park, North Carolina, EPA-450/3-88-008. September 1988.

VOC emission estimates for the green wood hammermills (ES-GHM-1, 2, and 3) are derived from Enviva Wiggins, MS stack test emission factors and the green wood hammermill throughput. As a part of this application the throughput was revised, since a pre-screener will no longer be installed. PM emissions from the green wood hammermills will be controlled via bin vent filters. Particulate emissions from the green wood hammermills are based on air flow rate and a bin vent outlet particulate matter grain loading factor of 0.022 gr/ft3. As such, since the PM emissions are based on a grain loading, there is an increase in emissions shown in the calculations. ***[Note: Emission source (ES-GHM-3) is being added as a part of this application.]***

2.3. WOOD DRYER (ES-DRYER)

Green wood is conveyed to a single rotary dryer system. Direct contact heat is provided to the system via a 250.4 MMBtu/hr total heat input burner system using bark and wood chips as fuel. Air emissions are controlled by four identical cyclones to capture bulk particulate matter. Emissions from each of the cyclones are combined into a common duct and are routed to the wet electrostatic precipitator (WESP) for additional particulate, metallic HAP, and hydrogen chloride removal.

Criteria pollutant emissions are calculated using a combination of AP-42 emission factors and existing stack testing results from Enviva's Ahoskie, NC and Wiggins facilities. The reader should refer to footnotes in Appendix B for details of the origin of each factor.

HAP and TAP emissions are calculated from combustion of wood in the dryer using AP-42 Section 1.6 and control of metallic HAP emissions via the WESP. In addition to HAP and TAP emissions from combustion of wood in the dryer, HAPs and TAPs are also released during the drying of wood. Emission factors for green, direct wood-fired softwood are obtained from Enviva stack test data. Refer to Appendix B for a detailed description of the emission factors.

2.4. DRIED AND SIZED WOOD HANDLING (ES-DWH)

Dried materials are transferred from the dryer via conveyors to screening operations that remove smaller size wood particles prior to transfer into hammermills for further size reduction prior to pelletization. Smaller particles passing through the screens are diverted to the hammermill discharge conveyor, while oversized wood is diverted to the hammermills. Dust generated from transfer operations around the screening operation is diverted to the hammermill area filtration system, which is described in the following subsection. There are several other transfer points comprising emission source ES-DWH" that are located between the dryer and hammermills. These sources are completely enclosed with only two emission points that are controlled by individual bin vents. The bin vent particulate matter emissions are calculated using a manufacturer-guaranteed grain loading factor for the wood particulates and the maximum nominal flow rate.

2.5. HAMMERMILLS (ES-HM-1 THROUGH 8)

Prior to pelletization, dried wood is reduced to the appropriate size needed using eight hammermills operating in parallel. A conveyor system receives the ground wood from the hammermills and sends it to the pellet mill feed silo.

Particulate emissions from each of the eight hammermills are controlled using eight individual cyclones, which are subsequently controlled by eight individual fabric filters. Appendix B summarizes the emissions from each hammermill bagfilter system. Particulate matter emissions from each bagfilter are

calculated using a manufacturer-guaranteed grain loading factor for the wood particulates and the maximum nominal stack flow rate.

VOC, HAP, and TAP emissions are calculated using Enviva stack testing information as shown in Appendix B.

2.6. HAMMERMILL AREA EMISSIONS (ES-HMA)

An induced draft fan is used to transfer dust generated from a number of enclosed transfer/handling sources around the hammermill to the pellet fines bin (CD-PFB-BV). Sources controlled by the bagfilter on the pellet fines bin include, but are not limited to, the following:

- Hammermills infeed and distribution transfer;
- Hammermills cyclone and bagfilter drop out;
- Pellet cooler transfer (particulate emissions from pellet cooler cyclones large enough to drop out of entrainment) & pellet screening;
- Hammermill pre-screen feeder emissions;
- Pellet screen fines cyclone; and
- Pellet fines bin emissions.

Emissions from this bagfilter are calculated assuming a manufacturer guaranteed grain loading factor for the wood particulates and the maximum nominal stack flow rate.

2.7. PELLET MILL FEED SILO (ES-PMFS) AND PELLET MILL FINES BIN (ES-PFB)

Sized wood from the hammermills is transported on a set of conveyors to the pellet mill feed silo prior to pelletization. Particulate emissions from the pellet mill feed silo bin vent filter are calculated assuming a manufacturer-guaranteed grain loading factor and the maximum nominal stack flow rate.

As described in Section 2.6, fine pellet material from the hammermill pollution control system and screening operation is collected in the pellet fines bin which is controlled by a bin vent filter. Particulate emissions from the filter are calculated assuming a manufacturer-guaranteed grain loading factor and the maximum nominal stack flow rate.

2.8. PELLET PRESS SYSTEM PELLET COOLERS (ES-CLR-1 THROUGH 6)

Dried ground wood is mechanically compacted in the presence of water in several screw presses in the Pellet Press System. Exhaust from the Pellet Press System and Pellet Presses conveyors are vented through the cooler aspiration cyclones and then to the atmosphere, as shown in Appendix B. No chemical binding agents are needed for pelletization.

Formed pellets are discharged into one of six pellet coolers. Cooling air is passed through the pellets. At this point, the pellets contain a small amount of wood fines, which are swept out with the cooling air and are controlled utilizing six cyclones operating in parallel prior to discharge to the atmosphere. In addition to the cyclones, Enviva is proposing to add a bin vent to the recirculation exhaust on the pellet coolers (ES-PCR) that will collect the fines from the cyclones so it can be transferred to be reused in the process. ***[Note: This emission source (ES-PCR) is being added as a part of this application.]***

Particulate matter emissions from each cyclone and the recirculation bin vent are calculated assuming a maximum grain loading factor for the wood particulates and the maximum nominal stack flow rate. VOC, HAP, and TAP emissions are calculated using stack testing data. Please see Appendix B for a detailed discussion.

2.9. PELLET SAMPLING TRANSFER BIN (ES-PSTB)

[Note: This emission source is being added as a part of this application.]

Pelletized wood is transferred from the pellet coolers to the truck loadout operations via conveyor. The pellet sampling transfer bin vent filter controls emissions from that conveyor. Particulate emissions from the pellet sampling transfer bin vent filter are calculated assuming a manufacturer guaranteed grain loading factor and the maximum nominal flow rate.

2.10. FINISHED PRODUCT HANDLING AND LOADOUT

Final product is conveyed to truck loadout pellet bins (ES-PB) that feed truck loadout operations (ES-PL) or trucks if needed. Emissions from the Pellet Loadout Bins are controlled by a bagfilter. Pellet Loadout is accomplished by gravity feed of the pellets through a covered chute to reduce emissions. Emissions to the atmosphere from conveyance from the Pellet Loadout Bins are minimal because dried wood fines have been removed in the pellet screener, and a slight negative pressure is maintained in the loadout building as a fire prevention measure to prevent any buildup of dust on surfaces within the building. Slight negative pressure is produced via an induced draft fan that exhausts to the same bagfilter (CD-FPH) that controls minor dust emissions from loading of the Pellet Loadout Bins.

Particulate emissions from finished product handling and loadout are calculated assuming a manufacturer-guaranteed grain loading factor and the maximum nominal stack flow rate for the bagfilter.

2.11. EMERGENCY GENERATOR AND FIRE WATER PUMP FUEL OIL STORAGE TANKS

The plant will utilize a 536 brake horsepower emergency generator for emergency operations and a 131 brake horsepower fire water pump engine. All engines will combust diesel fuel. Aside from maintenance and readiness testing, the generator and fire water pump engines will only be utilized for emergency operations. ***[Note: Both engines are being modified as part of this application from the original 250 hp rating as specified in the PSD application.]***

Diesel for the emergency generator will be stored in a storage tank of up to 2,500 gallons capacity and diesel for the fire water pump will be stored in a storage tank of up to 1,000 gallons capacity. Emissions from all fuel oil storage tanks are estimated to be 1.6 pounds per year and are listed as insignificant sources in the permit.

3. REGULATORY APPLICABILITY ANALYSIS

This section summarizes the applicability and requirements of key federal and state regulations for the emission sources at the Facility.

3.1. FEDERAL REGULATIONS

3.1.1. Prevention of Significant Deterioration (PSD), 40 CFR Part 51.166

North Carolina implements the federal PSD requirements of 40 CFR 51.166 under North Carolina Regulation 15A NCAC 2D .0530. Under the PSD regulations, a major stationary source for PSD is defined as any source in one of the 28 named source categories with the potential to emit 100 tpy or more of any regulated pollutant, or any source not in one of the 28 named source categories with the potential to emit 250 tpy or more of any regulated pollutant other than GHGs.[2] Neither wood pellet production nor operation of associated combustion sources requires inclusion of the Facility in one of the 28 listed source categories.

Federal PSD requirements for GHGs have been implemented in North Carolina under 15A NCAC 2D .0544, which essentially adopts the U.S. EPA's "GHG Tailoring Rule." As a result of the US Supreme Court Action on June 23, 2014 and EPA guidance issued on July 24, 2014, EPA and the state continue to evaluate large increases of GHGs at facilities that trigger PSD for other pollutants. The level for evaluating PSD review was suggested to be 75,000 tpy of CO_{2e}.

As shown in Appendix B, Table B-2 the Facility is a major stationary source of VOC. PSD was triggered as part of the initial project for VOCs, CO, NOx, TSP, PM10, PM2.5 and CO2e.

The Facility will not trigger PSD review for the proposed modifications presented in this application since emissions from the modifications do not exceed the significant emission rates (SERs) as shown in B-1. Therefore, BACT and other PSD analyses (other than dispersion modeling) are not addressed in this application.

3.1.2. Title V Operating Permit Program, 40 CFR Part 70

40 CFR Part 70 establishes the federal Title V operating permit program. North Carolina has incorporated the provisions of this federal program in its Title V operating permit program under 15A NCAC 2Q .0500. The Facility is a major Title V source for criteria and hazardous air pollutants. Enviva requests that the procedures of 15A NCAC 2Q .0504 be applied to this project allowing issuance of a construction and operating permit under 15A NCAC 2D .0300. Enviva will thereafter submit a permit application for a Title V permit within one year after commencement of operation.

3.1.3. New Source Performance Standards, 40 CFR Part 60 (15A NCAC 2D .0524 New Source Performance Standards)

New Source Performance Standards (NSPS), located in 40 CFR Part 60 and implemented in North Carolina Regulation 15A NCAC 2D .0524, require certain categories of new, modified, or reconstructed

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[2] 40 CFR §57. 166(b)(1)(i)

sources to control emissions to specified levels. Applicable NSPS are addressed below. Any source subject to an NSPS is also subject to the general provisions of NSPS Subpart A, unless specifically excluded.

3.1.3.1. NSPS Subpart IIII

NSPS Subpart IIII applies to owners or operators of compression ignition (CI) internal combustion engines (ICE) manufactured after April 1, 2006 that are not fire pump engines, and fire pump engines manufactured after July 1, 2006. As noted in Section 2, the plant is proposing to modify the size of the originally permitted 250 hp emergency generator and fire pump to 536 hp for the generator and 131 for the fire pump. The emergency generator and fire pump are subject to the provisions of NSPS Subpart IIII.

Under NSPS Subpart IIII, owners and operators of emergency generators manufactured in CY 2007 or later with a maximum engine power greater than or equal to 50 hp are required to comply with the emission limits referenced in 40 CFR §60.4205(b). These limits are as follow for a 536 hp engine: 0.20 g/kW for PM, 3.5 g/kW for CO, and 4 g/kW for NO_x + nonmethane hydrocarbons (NMHC).

Enviva will comply with applicable emission limits by operating the emergency generator as instructed in the manufacturer's operating manual in accordance with 40 CFR §60.4211(a), and purchasing an engine certified to meet the referenced emission limits in accordance with 40 CFR §60.4211(c). The engine will be equipped with a non-resettable hour meter in accordance with 40 CFR §60.4209(a). Emergency and readiness testing of the unit will be limited to 100 hours per year.

In accordance with NSPS Subpart IIII, owners and operators of fire pump engines manufactured after July 1, 2006 must comply with the emission limits in Table 4 of NSPS Subpart IIII, which are organized based on the size of the unit. These limits are as follow: 0.30 g/kW for PM, 5.0 g/kW for CO, and 4 g/kW for NO_x + nonmethane hydrocarbons (NMHC).

Enviva will comply with these emission limits by operating the fire pump as instructed in the manufacturer's operating manual in accordance with 40 CFR §60.4211(a), and purchasing an engine certified to meet the referenced emission limits in accordance with 40 CFR §60.4211(b). The engine will be equipped with a non-resettable hour meter in accordance with 40 CFR §60.4209(a). Emergency and readiness testing of the unit will be limited to 100 hours per year.

The emergency generator and fire pump will be required to comply with the fuel requirements in 40 CFR §60.4175.3, which limit sulfur to a maximum of 15 ppmw and a cetane index of at least 40.

3.1.4. National Emission Standards for Hazardous Air Pollutants for Regulated Source Categories, 40 CFR Part 63 (15A NCAC 2D .1111 Maximum Achievable Control Technology)

National Emission Standards for Hazardous Air Pollutants (NESHAP) are listed in 40 CFR Part 63 and implemented via North Carolina regulation 15A NCAC 2D .1111. One applicable NESHAP is addressed below.

3.1.4.1. 40 CFR Part 63 Subpart ZZZZ

40 CFR 63 Subpart ZZZZ applies to reciprocating internal combustion engines (RICE) located at a major or area source of HAP emissions. Emergency power and limited use units are subject to requirements

under 40 CFR 63.6590(b)(i) and 40 CFR 63.6590(b)(ii). Emergency stationary RICE are defined in 40 CFR 63.6675 as any stationary RICE that operates in an emergency situation. These situations include engines used for power generation when power from the local utility is interrupted, or when engines are used to pump water in the case of fire or flood.

The proposed emergency generator and the emergency fire pump at the site will be classified as emergency stationary RICE under the NESHAP and will comply with the requirements listed under this subpart by complying with NSPS IIII.

3.1.5. National Emissions Standards for Hazardous Air Pollutants, Case-by-Case MACT for New and Reconstructed Major Stationary Sources, 40 CFR Part 63 Subpart B (15A NCAC 2D .1112 112(g) Case-by-Case Maximum Achievable Control Technology)

The new green wood hammermill with bin vent control will be a minor source of HAP emissions. Emissions are slightly increasing compared to the original project, and the emissions will now be dispersed between three hammermills instead of two. As referenced in the August 2014 permit application in Section 3.1.5.7, there are currently no pellet mills that are utilizing organic HAP pollution control technologies on these types of sources. Trace PM-matrixed HAP will be controlled by the bin vent filter. In addition to the use of PM control technologies, Enviva proposes to minimize organic HAP emissions by maintaining the equipment in accordance with manufacturer's specifications and/or standard industry practices.

3.2. NORTH CAROLINA REGULATIONS

For the sources that are included for review in this application package, the North Carolina State Implementation Plan (SIP) rules and regulations have been evaluated for applicability. Applicable rules are identified below.

3.2.1. 15A NCAC 02D .0515 Particulates from Miscellaneous Industrial Processes

Particulate emissions from all emissions sources subject to permitting are regulated under 15A NCAC 2D .0515. This regulation limits the particulate emissions based on process throughput using the equation $E = 4.10 \times P^{0.67}$, for process rates (P) less than 30 tons per hour (ton/hr) and $E=55 \times P^{0.11}-40$ for process rates greater than 30 tons per hour.

All emissions from particulate matter sources at the Facility are either negligible or well-controlled. The proposed third green hammermill, pellet sampling transfer bin, and pellet cooler recirculation will all be controlled by bin vent filters.

3.2.2. 15A NCAC 02D .0516 Sulfur Dioxide Emissions from Combustion Sources

Under this regulation, emissions of sulfur dioxide from combustion sources cannot exceed 2.3 pounds of sulfur dioxide per million Btu input. Low sulfur diesel will be combusted in the modified emergency generator and fire pump, resulting in operation well below regulatory limits.

3.2.3. 15A NCAC 02D .0521 Control of Visible Emissions

Under this regulation, for sources manufactured after July 1, 1971, visible emissions cannot exceed 20 percent opacity when averaged over a six-minute period except under the following conditions:

- No six-minute period exceeds 87 percent opacity,
- No more than one six-minute period exceeds 20 percent opacity in any hour, and
- No more than four six-minute periods exceed 20 percent opacity in any 24-hour period.

This rule applies to all processes that may have a visible emission, including proposed particulate matter emissions sources controlled by bin vent filters and the diesel-fired engines.

3.2.4. 15A NCAC 2D .1100 - Control of Toxic Air Pollutant Emissions

A toxic air pollutant (TAP) permit application shall include an evaluation of the TAP emissions from Facility sources, excluding exempt sources listed under 15A NCAC 2Q .0702(a)(18). This regulation outlines the procedures that must be followed if modeling is required under 15A NCAC 2Q .0700. The additional green wood hammermill will result in throughput being directed to 3 stacks rather than two. The total system will have a throughput increase, since the final design has removed the pre-screener which previously allowed 30% of the chips to pass directly through to the dryer system. As such, there will be roughly a 2% increase in formaldehyde emissions facility-wide. The final design also includes engine size changes to the emergency generator (increase) and firewater pump (decrease) that result in a slight net increase of toxic emissions (less than 0.1%). Because these sources are subject to a MACT (ZZZZ) they are exempt under 15A NCAC 2Q .0702(a)(18). Furthermore, as discussed above, the emissions increase is less than 2% of the Facility-wide total. Previous modeling at the Facility demonstrated that the sources will not present an unacceptable risk. Given the trivial emission increases resulting from the proposed source changes, no further TAP modeling is warranted for this application.

3.2.5. 15A NCAC 02Q .0700 Toxic Air Pollutant Procedures

This regulation requires that certain new and modified sources of toxic air pollutants with emissions exceeding specified de minimis values apply for an air toxics permit. Previous modeling at the Facility demonstrated that the sources will not present an unacceptable risk. The proposed changes in this application result in a slight increase in emissions of formaldehyde and benzo-a-pyrene (2% and 0.03%, respectively. Given the trivial emission increases from project changes, no further TAP modeling is warranted for this application.

3.2.6. Air Toxics Exemption

15A NCAC 2Q .0702 exempts Part 63 NESHAP-affected sources from NC air toxics requirements. Since Enviva is subject to NESHAP Subpart B, 112(g) 63.40-63.44 for the Facility, and the emergency engine and fire pump are subject to Subpart ZZZZ, NESHAP for Stationary Reciprocating Internal Combustion Engines, all these sources are exempt from air toxics review. For DAQ's information, Enviva previously evaluated the Facility for compliance with NC air toxics limits and determined through dispersion modeling that all AALs as listed in 2D .1100 are easily met. As such, Enviva has proven that there is no unacceptable risk. The trivial emissions increases associated with the project changes will not alter the previous conclusion and as such, no TAP modeling is included with this application.

4. REVISED AIR DISPERSION MODELING

The remainder of this application addresses the dispersion modeling analyses that were performed for the modified site design to demonstrate that the as-built Facility will not cause or contribute to any violations of the NAAQS, PSD Increments or SAAQS.

Following NCDAQ policy, Trinity Consultants (Trinity), on behalf of Enviva, submitted a dispersion modeling protocol describing the proposed methodologies and data resources for the project.[3] The protocol included a description of the proposed Facility, an overview of the required PSD and State-only modeling analyses, and a description of the methodology proposed to be used in those modeling analyses. The analyses discussed included evaluations of National Ambient Air Quality Standards (NAAQS), PSD Increment, additional impacts analyses for visibility and non-air quality impacts, as well as the ambient impact assessment of toxic air pollutant (TAP) emissions. The protocol was approved by NCDAQ, with limited comments, on January 6, 2014.[4]

The revised modeling analyses described in this section generally follow the methodology described in the approved protocol and documented in the previously-submitted PSD application. The only exceptions are with regard to the AERMOD model version and meteorological data which have been updated since the time of the original submittal. Those updates are described in detail later in this section. The results demonstrate that the modified Facility will continue to comply with the NAAQS, PSD Increments and SAAQS.

The dispersion modeling analyses were conducted in accordance with the following guidance documents:

- U.S. EPA's *Guideline on Air Quality Models* 40 CFR 51, Appendix W (Revised, November 9, 2005), herein referred to as the *Guideline*;
- U.S. EPA's *AERMOD Implementation Guide* (Revised March 19, 2009);
- U.S. EPA's *New Source Review Workshop Manual* (Draft, October, 1990);
- U.S. EPA, Office of Air Quality Planning and Standards, Memorandum from Mr. Tyler Fox to Regional Air Division Directors. *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO2 National Ambient Air Quality Standard* (March 1, 2011);
- U.S. EPA, Office of Air Quality Planning and Standards, *Guidance for $PM_{2.5}$ Permit Modeling* (May 20, 2014), herein referred to as *$PM_{2.5}$ Guidance*;
- North Carolina's *PSD Modeling Guidance* (January 6, 2012); and

4.1. PROJECT LOCATION AND CLASSIFICATION

Figure D-1 provides a map of the area surrounding the Sampson property. The approximate central Universal Transverse Mercator (UTM) coordinates of the Facility are 756.7 kilometers (km) east and 3,890.2 km north in Zone 17 (NAD 83). A detailed site layout showing the locations of the Facility fence line as well as all modeled sources and structures is included in Figure D-2.

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[3] Letter from Jonathan Hill (Trinity) to Mark Cuilla (NCDAQ) dated December 17, 2013.
[4] Letter from Tom Anderson (NCDAQ) to Jonathan Hill (Trinity) dated January 6, 2014.

For modeling purposes, the appropriate urban/rural land use classification for the area was determined using the Auer technique, which is recommended in the *Guideline.* In accordance with this technique, the area within a 3-km radius of the Facility was identified on US Geological Survey (USGS) topographic maps (and was delineated by land use type). More than 50 percent of the surrounding land use can be classified as undeveloped rural (i.e., Auer's A4 classification), therefore the area is classified as rural.

4.2. MODEL SELECTION

The latest version (15181) of the AERMOD modeling system was used to estimate maximum ground-level concentrations in all Class II Area analyses conducted for this application. AERMOD is a refined, steady-state, multiple source, Gaussian dispersion model and was promulgated in December 2005 as the preferred model for use by industrial sources in this type of air quality analysis.[5] The AERMOD model has the Plume Rise Modeling Enhancements (PRIME) incorporated in the regulatory version, so the direction-specific building downwash dimensions used as inputs are determined by the Building Profile Input Program, PRIME version (BPIP PRIME), version 04274.[6] BPIP PRIME is designed to incorporate the concepts and procedures expressed in the GEP Technical Support document, the Building Downwash Guidance document, and other related documents, while incorporating the PRIME enhancements to improve prediction of ambient impacts in building cavities and wake regions.[7]

The AERMOD modeling system is composed of three modular components: AERMAP, the terrain preprocessor; AERMET, the meteorological preprocessor; and AERMOD, the control module and modeling processor. AERMAP is the terrain pre-processor that is used to import terrain elevations for selected model objects and to generate the receptor hill height scale data that are used by AERMOD to drive advanced terrain processing algorithms. National Elevation Dataset (NED) data available from the United States Geological Survey (USGS) were utilized to interpolate surveyed elevations onto user specified receptor grids and buildings and sources in the absence of more accurate site-specific (i.e., site surveys, GPS analyses, etc.) elevation data.

AERMET generates a separate surface file and vertical profile file to pass meteorological observations and turbulence parameters to AERMOD. AERMET meteorological data are refined for a particular analysis based on the choice of micrometeorological parameters that are linked to the land use and land cover (LULC) around the meteorological site shown to be representative of the application site.

The most recent versions of AERMOD and AERMAP (version 11103) were used to estimate ambient impacts from the modeled sources in the Class II area. Per NCDAQ guidelines, AERMOD was run using all regulatory default options.

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[5] 40 CFR Part 51, Appendix W–*Guideline on Air Quality Models*, Appendix A.1– AMS/EPA Regulatory Model (AERMOD).

[6] Earth Tech, Inc., *Addendum to the ISC3 User's Guide, The PRIME Plume Rise and Building Downwash Model,* Concord, MA.

[7] U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *Guidelines for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations) (Revised),* Research Triangle Park, North Carolina, EPA 450/4-80-023R, June 1985.

4.3. METEOROLOGICAL DATA

The AERMOD modeling results were based on sequential hourly surface observations from Fayetteville, NC and upper air data from Greensboro, NC. These stations are recommended by NCDAQ for modeling facilities located in Sampson County and the 2010-2014 files were downloaded from the NCDAQ website.[8] Per NCDAQ guidance, the base elevation (PROFBASE) for the Fayetteville surface station was set to 58 m.[9]

4.4. REPRESENTATION OF EMISSION SOURCES

4.4.1. Source Types and Parameters

The AERMOD dispersion model allows for emission units to be represented as point, area, or volume sources. All of the point sources planned for the Facility have clearly discernable emission points with vertical orientations and no rain caps. As such those sources were characterized as point sources and were modeled with actual stack parameters (i.e., height, diameter, exhaust gas temperature, and gas exit velocity). A list of modeled point sources and locations is presented in Table 4-1 and the modeled stack parameters are shown in Table 4-2. In addition to the modeled point sources, an area source was included in the model to represent ground-level emissions from the roadway areas (PAVEDRDS) at the site, which will all be paved. The area source was polygon-shaped with an area of 70,491 m^2. The release height and initial vertical dimensions for the roadways (based on an average truck height of 12 feet) were set to 3.5 m and 3.26 m, respectively. Those parameters were calculated using the methodology in the NC Quarry Modeling Guidance document.[10]

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[8] http://www.ncair.org/permits/mets/metdata.shtml
[9] http://www.ncair.org/permits/mets/ProfileBaseElevations.pdf
[10] http://www.ncair.org/permits/mets/quarry1.pdf

TABLE 4-1. MODELED SOURCE LOCATIONS

Model ID	Description	UTM-E (m)	UTM-N (m)	Elevation (m)
EP1	Dryer WESP Stack	756748.6	3890256.1	51.91
EP2	Hammermill Filter #1 and #2	756693.7	3890154.7	52.06
EP3	Hammermill Filter #3 and #4	756687.1	3890148.8	52.02
EP4	Hammermill Filter #5 and #6	756680.6	3890142.9	52.01
EP5	Hammermill Filter #7 and #8	756677.3	3890140.0	52.01
EP6	Pellet Silo Bin Vent	756648.3	3890136.1	52.09
EP7	Pellet Cooler #1 Cyclone	756642.1	3890119.9	52.10
EP8	Pellet Cooler #2 Cyclone	756637.4	3890115.8	52.05
EP9	Pellet Cooler #3 Cyclone	756633.1	3890111.9	52.01
EP10	Pellet Cooler #4 Cyclone	756628.5	3890107.7	51.98
EP11	Pellet Cooler #5 Cyclone	756624.2	3890103.9	51.97
EP12	Pellet Cooler #6 Cyclone	756619.5	3890099.7	51.96
EP13	Emergency Generator	756675.2	3890243.0	52.30
EP14	Firewater Pump	756542.7	3889988.5	51.97
EP15	Pellet Cooler HP Fines Filter Stack	756660.1	3890141.9	52.04
EP16	Finished Goods Dust Collection Stack	756490.7	3889998.7	51.89
EP17	Greenwood Hammermill #1 Stack	756742.3	3890280.5	51.87
EP18	Greenwood Hammermill #2 Stack	756737.2	3890275.9	51.89
EP19	Dryer Out Conv. #1 Bin Vent	756699.4	3890197.1	52.25
EP20	Dryer Out Conv. #2 Bin Vent	756697.0	3890195.3	52.27
EP21	Loadout Conveyor Bin Vent	756594.1	3890089.0	52.01
EP22	Greenwood Hammermill #3 Stack	756732.1	3890271.3	51.92
EP23	Pellet Cooler LP Fines Filter Stack	756620.5	3890092.6	51.97

TABLE 4-2. MODELED STACK PARAMETERS

Model ID	Stack Height (m)	Stack Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
EP1	28.65	350.93	10.59	3.05
EP2	19.81	310.93	17.46	1.02
EP3	19.81	310.93	17.46	1.02
EP4	19.81	310.93	17.46	1.02
EP5	19.81	310.93	17.46	1.02
EP6	23.77	305.37	0.01	0.40
EP7	27.43	316.48	17.82	0.71
EP8	27.43	316.48	17.82	0.71
EP9	27.43	316.48	17.82	0.71
EP10	27.43	316.48	17.82	0.71
EP11	27.43	316.48	17.82	0.71
EP12	27.43	316.48	17.82	0.71
EP13	4.57	760.87	78.30	0.15
EP14	4.57	954.00	109.18	0.06
EP15	20.42	293.00	15.92	0.36
EP16	7.62	310.93	16.36	0.56
EP17	15.24	293.00	17.82	0.71
EP18	15.24	293.00	17.82	0.71
EP19	4.57	293.00	0.01	0.40
EP20	15.85	293.00	0.01	0.40
EP21	4.57	293.00	0.01	0.40
EP22	15.24	293.00	17.82	0.71
EP23	14.02	293.00	25.87	0.15

Table 4-3 presents the modeled emission rates for each of the modeled sources.

TABLE 4-3. MODELED EMISSION RATES

Model ID	Modeled Emission Rates (g/s)				
	TSP	PM_{10}	$PM_{2.5}$	CO	NO_x
EP1	1.483E+00	1.483E+00	1.483E+00	6.629E+00	6.310E+00
EP2	1.296E-01	1.296E-01	2.203E-03	-	-
EP3	1.296E-01	1.296E-01	2.203E-03	-	-
EP4	1.296E-01	1.296E-01	2.203E-03	-	-
EP5	1.296E-01	1.296E-01	2.203E-03	-	-
EP6	1.056E-02	1.056E-02	1.056E-02	-	-
EP7	3.564E-01	9.284E-02	1.138E-02	-	-
EP8	3.564E-01	9.284E-02	1.138E-02	-	-
EP9	3.564E-01	9.284E-02	1.138E-02	-	-
EP10	3.564E-01	9.284E-02	1.138E-02	-	-
EP11	3.564E-01	9.284E-02	1.138E-02	-	-
EP12	3.564E-01	9.284E-02	1.138E-02	-	-
EP13	9.244E-04	9.244E-04	9.244E-04	1.941E-01	2.219E-01
EP14	3.389E-04	3.389E-04	3.389E-04	6.778E-02	5.422E-02
EP15	1.340E-02	1.340E-02	1.340E-02	-	-
EP16	3.672E-02	3.342E-02	6.242E-04	-	-
EP17	6.480E-02	6.480E-02	6.480E-02	-	-
EP18	6.480E-02	6.480E-02	6.480E-02	-	-
EP19	4.320E-03	4.320E-03	4.320E-03	-	-
EP20	4.320E-03	4.320E-03	4.320E-03	-	-
EP21	4.320E-03	4.320E-03	4.320E-03	-	-
EP22	6.480E-02	6.480E-02	6.480E-02	-	-
EP23	4.320E-03	4.320E-03	4.320E-03	-	-
PAVEDRDS*	9.869E-07	1.974E-07	4.845E-08	-	-

* Area source emission rates expressed per unit area ($g/s/m^2$)

4.5. STATE-ONLY MODELING REQUIREMENTS

In addition to the federal NAAQS and PSD increment standards that are required to be analyzed under PSD review, North Carolina has two additional, state-only modeling requirements that pertain to this project.

4.5.1. Toxic Air Pollutant Modeling

As discussed above, the previously submitted application included a TAP modeling analysis demonstrating that the Facility presents no unacceptable risk. The additional green wood hammermill will result in throughput being directed to 3 stacks rather than two. The total system will have a throughput increase, since the final design has removed the pre-screener which previously allowed 30% of the chips to pass directly through to the dryer system. As such, there will be roughly a 2% increase in formaldehyde emissions facility-wide. The final design also includes engine size changes to the emergency generator (increase) and firewater pump (decrease) that result in a slight net increase of toxic emissions (less than 0.1%). Given the trivial emission increases resulting from the proposed source changes, and the previous demonstration of no unacceptable risk, no further TAP modeling is warranted for this application.

4.5.2. Total Suspended Particulate Modeling

15A NCAC 2D .0403 establishes ambient air quality standards for total suspended particulate matter (TSP). The standards are as follow:

(1) 75 micrograms per cubic meter annual geometric mean,
(2) 150 micrograms per cubic meter maximum 24-hour concentration not to be exceeded more than once per year.

Trinity performed an analysis to demonstrating compliance with this standard.

5. UPDATED DISPERSION MODELING RESULTS

The following sections summarize the results of the updated PSD Class II dispersion modeling analyses which demonstrate that the Facility as modified will neither cause nor contribute to an exceedance of the NAAQS or PSD Increment. Results are presented for all previously triggered PSD pollutants and will include all steps of the PSD modeling process for completeness, since the Facility differs from the original submittal. Electronic copies of all modeling input and output files are included on the CD-ROM in Appendix E.

5.1. SIGNIFICANCE ANALYSIS

The results of the Significance Analysis for each pollutant are provided in Table 5-1. The results were reviewed to determine that the resulting SIA did not impact the previously modeled inventory sources.

TABLE 5-1. CLASS II SIGNIFICANCE MODEL RESULTS

Pollutant	Averaging Period	Concentration Basis	UTM-E (m)	UTM-N (m)	Date/Time	Modeled Concentration ($\mu g/m^3$)	SIL ($\mu g/m^3$)	SIA (km)
CO	1-Hour	H1H in any year	756,421.4	3,889,794.0	12022102	136.37	2,000	N/A
	8-Hour	H1H in any year	756,903.9	3,890,801.3	12111008	44.30	500	
NO_2	1-Hour	5-Year Avg. H1H	756,400.2	3,889,807.1	2010-2014	88.19	10	3.5
	Annual	H1H in any year	756,442.7	3,889,780.8	2014	2.48	1	
PM_{10}	24-Hour	H1H in any year	756,572.6	3,889,691.3	11122424	28.98	5	2.5
	Annual	H1H in any year	756,496.7	3,889,732.0	2014	3.96	1	
$PM_{2.5}$	24-Hour	5-Year Avg. H1H	756,421.4	3,889,794.0	2010-2014	7.60	1.2	2.5
	Annual	5-Year Avg. H1H	756,462.2	3,889,765.4	2010-2014	1.25	0.3	

As shown in the results table, NO_2, PM_{10}, and $PM_{2.5}$ exceed the Class II SILs, requiring further analysis to demonstrate compliance with NAAQS and Class II Increment (where established).

5.2. NAAQS ANALYSIS

The NAAQS Analyses for NO_2, PM_{10}, and $PM_{2.5}$ were conducted using emissions and stack parameter data shown in Tables 4-1 through and 4-3 for the emissions sources.

Table 5-2 presents the results for the NAAQS modeling analyses. The concentrations shown represent the maximum modeled concentrations required by each standard at which the Facility is significant. The results demonstrate that the Facility will neither cause nor contribute to a violation of the NAAQS.

TABLE 5-2. NAAQS MODELING RESULTS

Pollutant	Averaging Period	UTM-E (m)	UTM-N (m)	Date/Time	Modeled Concentration ($\mu g/m^3$)	Background Concentration[1] ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Exceeds NAAQS? (Yes/No)
NO_2	1-Hour	756,496.7	3,890,654.5	2010-2014	63.50	32.10	95.60	188	No
	Annual	756,442.7	3,889,780.8	2014	2.55	5.30	7.85	100	No
PM_{10}	24-Hour	756,595.4	3,889,701.6	11122424	27.09	25.00	52.09	150	No
$PM_{2.5}$	24-Hour	756,496.7	3,889,732.0	2010-2014	5.65	19.00	24.65	35	No
	Annual	756,462.2	3,889,765.4	2010-2014	1.25	7.76	9.01	12	No

[1] Background Concentrations provided in letter from Tom Anderson (NCDAQ) to Jon Hill (Trinity) on August 13, 2013.

5.3. PSD INCREMENT ANALYSIS

The PSD Increment Analysis for NO_2, PM_{10}, and $PM_{2.5}$ was conducted using the emissions and stack parameter data shown in Tables 4-1 through and 4-3 for the emissions sources.
The modeling results presented in Table 5-3 demonstrate that the Facility will neither cause nor contribute to an exceedance of the PSD Increment for NO_2, PM_{10}, or $PM_{2.5}$.

TABLE 5-3. CLASS II PSD INCREMENT RESULTS

Pollutant	Averaging Period	UTM-E (m)	UTM-N (m)	Date/Time	Modeled Concentration ($\mu g/m^3$)	Increment ($\mu g/m^3$)	Exceeds Increment? (Yes/No)
NO_2	Annual	756,442.7	3,889,780.8	2014	2.55	25	No
PM_{10}	24-Hour	756,595.4	3,889,701.6	11122424	27.09	30	No
	Annual	756,496.7	3,889,732.0	2014	3.96	17	No
$PM_{2.5}$	24-Hour	756,595.4	3,889,701.6	11110724	8.31	9	No
	Annual	756,462.2	3,889,765.4	2014	1.47	4	No

5.4. STATE-ONLY MODELING RESULTS

5.4.1. Total Suspended Particulate Modeling

Table 5-4 presents the results for the TSP modeling analysis that was performed for the Facility. As shown, the project will not cause any violation of the TSP SAAQS.

TABLE 5-4. TSP MODELING RESULTS

Pollutant	Averaging Period	UTM-E (m)	UTM-N (m)	Date/Time	Modeled Concentration ($\mu g/m^3$)	SAAQS ($\mu g/m^3$)	Exceeds SAAQS? (Yes/No)
TSP	24-Hour	756,572.6	3,889,691.3	11122424	64.7	150	No
	Annual	756,496.7	3,889,732.0	2014	8.0	75	No

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Air Permits Section

FORM A1

FACILITY (General Information)

REVISED 11/01/02 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — A1

NOTE- APPLICATION WILL NOT BE PROCESSED WITHOUT THE FOLLOWING:

☑ Local Zoning Consistency Determination (if required) ☑ Facility Reduction & Recycling Survey Form (Form A4) ☑ Application Fee
☑ Responsible Official/Authorized Contact Signature ☑ Appropriate Number of Copies of Application ☑ P.E. Seal (if required)

GENERAL INFORMATION

Legal Corporate/Owner Name:	Enviva Pellets Sampson, LLC
Site Name:	Enviva Pellets Sampson, LLC
Site Address (911 Address) Line 1:	5 Connector Road
Site Address Line 2:	
City: Falson	State: North Carolina
Zip Code: 28341	County: Sampson

CONTACT INFORMATION

Permit/Technical Contact:	*Facility/Inspection Contact:*
Name/Title: Joe Harrell	Name/Title: Joe Harrell
Mailing Address Line 1: 142 N.C. Route 561 East	Mailing Address Line 1: 142 N.C. Route 561 East
Mailing Address Line 2:	Mailing Address Line 2:
City: Ahoskie State: NC Zip Code: 27910	City: Ahoskie State: NC Zip Code: 27910
Phone No. (area code) (252) 209-6032 Fax No. (area code)	Phone No. (area code) (252) 209-6032 Fax No. (area code)
Email Addres: Joe.Harrell@envivabiomass.com	Email Addres: Joe.Harrell@envivabiomass.com
Responsible Official/Authorized Contact:	*Invoice Contact:*
Name/Title: Maitland Horner	Name/Title: Same as permit/technical contact
Mailing Address Line 1: 7200 Wisconsin Avenue	Mailing Address Line 1:
Mailing Address Line 2: Suite 1000	Mailing Address Line 2:
City: Bethesda State: MD Zip Code: 20814	City: State: Zip Code:
Phone No. (area code) (240) 482-3766 Fax No. (area code)	Phone No. (area code) Fax No. (area code)
Email Address: maitland.horner@envivabiomass.com	Email Address:

APPLICATION IS BEING MADE FOR

☐ New Non-permitted Facility/Greenfield ☑ Modification of Facility (permitted) ☐ Renewal with Modification
☐ Renewal (TV Only)

FACILITY CLASSIFICATION AFTER APPLICATION (Check Only One)

☐ General ☐ Small ☐ Prohibitory Small ☐ Synthetic Minor ☑ Title V

FACILITY (Plant Site) INFORMATION

Describe nature of (plant site) operation(s): Facility ID No. : 8200152
Wood pellet manufacturing facility

Primary SIC/NAICS Code: 2499 (Wood Products, Not Elsewhere Classified)	Current/Previous Air Permit No. 10386R01 Expiration Date 10/31/2019
Facility Coordinates: Latitude: 35 degrees, 7 minutes, 19.8 seconds	Longitude: 78 degrees, 10 minutes, 59.7 seconds
Does this application contain confidential data? ☐ YES	☑ NO

PERSON OR FIRM THAT PREPARED APPLICATION

Person Name: Dale Overcash	Firm Name: Trinity Consultants, Inc.
Mailing Address Line 1: One Copley Parkway	Mailing Address Line 2: Suite 310
City: Morrisville State: North Carolina	Zip Code: 27560 County: Wake
Phone No. (919) 462-9693 Fax No. (919) 462-9694	Email Address: dovercash@trinityconsultants.com

SIGNATURE OF RESPONSIBLE OFFICIAL/AUTHORIZED CONTACT

Name (typed): Maitland Horner — Title: Vice President Construction
X Signature(Blue Ink): — Date: 10/19/15

Attach Additional Sheets As Necessary

FORMs A2, A3

EMISSION SOURCE LISTING FOR THIS APPLICATION - A2

112r APPLICABILITY INFORMATION - A3

REVISED 04/10/07 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **A2**

EMISSION SOURCE LISTING: New, Modified, Previously Unpermitted, Replaced, Deleted

EMISSION SOURCE ID NO.	EMISSION SOURCE DESCRIPTION	CONTROL DEVICE ID NO.	CONTROL DEVICE DESCRIPTION
Equipment To Be ADDED By This Application (New, Previously Unpermitted, or Replacement)			
ES-GHM-3	Green Wood Hammermills	CD-GHM-BV3	Bin Vent Baghouse - CS-22
ES-PSTB	Pellet Sampling Transfer Bin	CD-DC-BV3	Bin Vent Baghouse CS-23
ES-PCR	Pellet Cooler Recirculation	CD-PCR-BV	Bin Vent Baghouse CS-24
Existing Permitted Equipment To Be MODIFIED By This Application			
ES-GN	Emergency Generator	N/A	N/A
ES-FWP	Fire Water Pump	N/A	N/A
Equipment To Be DELETED By This Application			

112(r) APPLICABILITY INFORMATION — **A 3**

Is your facility subject to 40 CFR Part 68 "Prevention of Accidental Releases" - Section 112(r) of the Federal Clean Air Act? Yes (No)

If No, please specify in detail how your facility avoided applicability: _____

If your facility is Subject to 112(r), please complete the following:

A. Have you already submitted a Risk Management Plan (RMP) to EPA Pursuant to 40 CFR Part 68.10 or Part 68.150?

Yes ☐ No ☐ Specify required RMP submittal date: _____ If submitted, RMP submittal date: _____

B. Are you using administrative controls to subject your facility to a lesser 112(r) program standard?

Yes ☐ No ☐ If yes, please specify: _____

Attach Additional Sheets As Necessary

FORM A4

SURVEY OF AIR EMISSIONS AND FACILITY - WIDE REDUCTION & RECYCLING ACTIVITIES

DATE:

Does facility have an environmental mangement system in place? ( ) YES (X) NO If so, is facility ISO 14000 Certified? ( ) YES (X) NO

Facility Name:	Enviva Pellets Sampson, LLC		Permit Number:	N/A	
Facility ID:	8200152	County: Sampson	Environmental Contact:	Joe Harrell	
Mailing Address Line 1:	US Highway 117		Phone No. ( )	(252) 209-6032	Fax No. ( )
Mailing Address Line 2:			Zip Code:	28341	County: Sampson
City:	Faison	State: North Carolina	Email Address:	Joe.Harrell@envivabiomass.com	

AIR EMISSIONS SOURCE REDUCTIONS

Any Air Emissions Source Reductions in the past year? ( ) YES (X) NO

Source Description and ID	Air Pollutant	Enter Code for Emission Reduction Option (See Codes)	Date Reduction Option Implemented (mo/yr)	Quantity Emitted from prior annual report to DAQ (lb/yr)	Quantity Emitted from current annual report to DAQ (lb/yr)	Has reduction activity been discontinued? If so, when was it discontinued? (mo/yr)	Addition detail about source
N/A							

Comments:

FACILITY - WIDE REDUCTIONS & RECYCLING ACTIVITIES

Any Reductions or Recycling Activities in the past year? ( ) YES (X) NO

Source Description or Activity	Pollutant or Recycled or Reduced Materials	Enter Code for Emission Reduction Option (See Codes)	Date Reduction Option Implemented (mo/yr)	Quantity Emitted from prior annual report	Quantity Emitted from current annual report	Has reduction activity been discontinued? If so, when was it discontinued? (mo/yr)	Addition detail about source
N/A							

Comments:

The requested information above shall be used for fulfilling the requirements of North Carolina General Statute 143-215.108(g). The permit holder shall submit to the Department a written description of current and projected plans to reduce the emissions of air pollutants by source reduction or recycling. The written description shall accompany any application for a new permit, modification of an existing permit and for each annual air quality permit fee payment. Source reduction is defined as reducing the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment, or disposal. If no activity has taken place since the previous report, simply indicate so by checking the no box in that section. Once completed, this form should be submitted along with your fee payment. Examples are listed on the first line of each section of the form for your benefit.

N.C. Division of Pollution Prevention and Environmental Assistance

POLLUTION PREVENTION PAYS

REVISED 1/07

Attach Additional Sheets As Necessary

FORM D1

FACILITY-WIDE EMISSIONS SUMMARY

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — D1

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)
AIR POLLUTANT EMITTED	tons/yr	tons/yr	tons/yr
PARTICULATE MATTER (PM)	See Emission Calculations in Appendix B		
PARTICULATE MATTER < 10 MICRONS (PM_{10})			
PARTICULATE MATTER < 2.5 MICRONS ($PM_{2.5}$)			
SULFUR DIOXIDE (SO2)			
NITROGEN OXIDES (NOx)			
CARBON MONOXIDE (CO)			
VOLATILE ORGANIC COMPOUNDS (VOC)			
LEAD			
OTHER			

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

		EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)
HAZARDOUS AIR POLLUTANT EMITTED	CAS NO.	tons/yr	tons/yr	tons/yr
		See Emission Calculations in Appendix B		

TOXIC AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

INDICATE REQUESTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS. EMISSIONS ABOVE THE TOXIC PERMIT EMISSION RATE (TPER) IN 15A NCAC 2Q .0711 MAY REQUIRE AIR DISPERSION MODELING. USE NETTING FORM D2 IF NECESSARY.

					Modeling Required ?		
TOXIC AIR POLLUTANT EMITTED	CAS NO.	lb/hr	lb/day	lb/year	Yes	No	
		See Emission Calculations in Appendix B					

COMMENTS:

Attach Additional Sheets As Necessary

Received
OCT 29 2015
Air Permits Section

FORM D

TECHNICAL ANALYSIS TO SUPPORT PERMIT APPLICATION

REVISED: 12/01/01 | NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate | D5

PROVIDE DETAILED TECHNICAL CALCULATIONS TO SUPPORT ALL EMISSION, CONTROL, AND REGULATORY DEMONSTRATIONS MADE IN THIS APPLICATION. INCLUDE A COMPREHENSIVE PROCESS FLOW DIAGRAM AS NECESSARY TO SUPPORT AND CLARIFY CALCULATIONS AND ASSUMPTIONS. ADDRESS THE FOLLOWING SPECIFIC ISSUES ON SEPARATE PAGES:

A	**SPECIFIC EMISSIONS SOURCE (EMISSION INFORMATION) (FORM B)** - SHOW CALCULATIONS USED, INCLUDING EMISSION FACTORS, MATERIAL BALANCES, AND/OR OTHER METHODS FROM WHICH THE POLLUTANT EMISSION RATES IN THIS APPLICATION WERE DERIVED. INCLUDE CALCULATION OF POTENTIAL BEFORE AND, WHERE APPLICABLE, AFTER CONTROLS. CLEARLY STATE ANY ASSUMPTIONS MADE AND PROVIDE ANY REFERENCES AS NEEDED TO SUPPORT MATERIAL BALANCE CALCULATIONS.
B	**SPECIFIC EMISSION SOURCE (REGULATORY INFORMATION)(FORM E2 - TITLE V ONLY)** - PROVIDE AN ANALYSIS OF ANY REGULATIONS APPLICABLE TO INDIVIDUAL SOURCES AND THE FACILITY AS A WHOLE. INCLUDE A DISCUSSION OUTING METHODS (e.g. FOR TESTING AND/OR MONITORING REQUIREMENTS) FOR COMPLYING WITH APPLICABLE REGULATIONS, PARTICULARLY THOSE REGULATIONS LIMITING EMISSIONS BASED ON PROCESS RATES OR OTHER OPERATIONAL PARAMETERS. PROVIDE JUSTIFICATION FOR AVOIDANCE OF ANY FEDERAL REGULATIONS (PREVENTION OF SIGNIFICANT DETERIORATION (PSD), NEW SOURCE PERFORMANCE STANDARDS (NSPS), NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS), TITLE V), INCLUDING EXEMPTIONS FROM THE FEDERAL REGULATIONS WHICH WOULD OTHERWISE BE APPLICABLE TO THIS FACILITY. SUBMIT ANY REQUIRED TO DOCUMENT COMPLIANCE WITH ANY REGULATIONS. INCLUDE EMISSION RATES CALCULATED IN ITEM "A" ABOVE, DATES OF MANUFACTURE, CONTROL EQUIPMENT, ETC. TO SUPPORT THESE CALCULATIONS.
C	**CONTROL DEVICE ANALYSIS (FORM C)** - PROVIDE A TECHNICAL EVALUATION WITH SUPPORTING REFERENCES FOR ANY CONTROL EFFICIENCIES LISTED ON SECTION C FORMS, OR USED TO REDUCE EMISSION RATES IN CALCULATIONS UNDER ITEM "A" ABOVE. INCLUDE PERTINENT OPERATING PARAMETERS (e.g. OPERATING CONDITIONS, MANUFACTURING RECOMMENDATIONS, AND PARAMETERS AS APPLIED FOR IN THIS APPLICATION) CRITICAL TO ENSURING PROPER PERFORMANCE OF THE CONTROL DEVICES). INCLUDE AND LIMITATIONS OR MALFUNCTION POTENTIAL FOR THE PARTICULAR CONTROL DEVICES AS EMPLOYED AT THIS FACILITY. DETAIL PROCEDURES FOR ASSURING PROPER OPERATION OF THE CONTROL DEVICE INCLUDING MONITORING SYSTEMS AND MAINTENANCE TO BE PERFORMED.
D	**PROCESS AND OPERATIONAL COMPLIANCE ANALYSIS - (FORM E3 - TITLE V ONLY)** - SHOWING HOW COMPLIANCE WILL BE ACHIEVED WHEN USING PROCESS, OPERATIONAL, OR OTHER DATA TO DEMONSTRATE COMPLIANCE. REFER TO COMPLIANCE REQUIREMENTS IN THE REGULATORY ANALYSIS IN ITEM "B" WHERE APPROPRIATE. LIST ANY CONDITIONS OR PARAMETERS THAT CAN BE MONITORED AND REPORTED TO DEMONSTRATE COMPLIANCE WITH THE APPLICABLE REGULATIONS.
E	**PROFESSIONAL ENGINEERING SEAL** - PURSUANT TO 15A NCAC 2Q .0112 "APPLICATION REQUIRING A PROFESSIONAL ENGINEERING SEAL," A PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA SHALL BE REQUIRED TO SEAL TECHNICAL PORTIONS OF THIS APPLICATION FOR NEW SOURCES AND MODIFICATIONS OF EXISTING SOURCES. (SEE INSTRUCTIONS FOR FURTHER APPLICABILITY).

I, M. Dale Overcash, attest that this application for Enviva Pellets Sampson, LLC has been reviewed by me and is accurate, complete and consistent with the information supplied in the engineering plans, calculations, and all other supporting documentation to the best of my knowledge. I further attest that to the best of my knowledge the proposed design has been prepared in accordance with the applicable regulations. Although certain portions of this submittal package may have been developed by other professionals, inclusion of these materials under my seal signifies that I have reviewed this material and have judged it to be consistent with the proposed design. Note: In accordance with NC General Statutes 143-215.6A and 143-215.6B, any person who knowingly makes any false statement, representation, or certification in any application shall be guilty of a Class 2 misdemeanor which may include a fine not to exceed $10,000 as well as civil penalties up to $25,000 per violation.

(PLEASE USE BLUE INK TO COMPLETE THE FOLLOWING)

NAME: M. Dale Overcash
DATE: 10/28/15
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ADDRESS: One Copley Parkway, Suite 310 Morrisville, NC 27560
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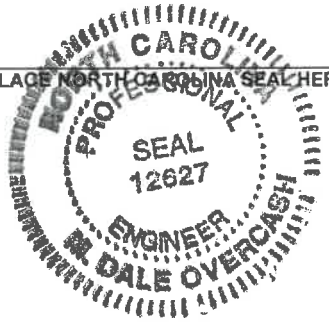
SIGNATURE:
PAGES CERTIFIED: Entire Application

(IDENTIFY ABOVE EACH PERMIT FORM AND ATTACHMENT THAT IS BEING CERTIFIED BY THIS SEAL)

PLACE NORTH CAROLINA SEAL HERE



Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **B**

EMISSION SOURCE DESCRIPTION: Green Wood Hammermills	EMISSION SOURCE ID NO: ES-GHM-1, 2, 3
	CONTROL DEVICE ID NO(S): CD-GHM-BV1, 2, and 3
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): EP-17, 18, and 22

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Green wood chips will undergo additional chipping as required.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1) ☐ Woodworking (Form B4) ☐ Manufact. of chemicals/coatings/inks (Form B7)
☐ Int.combustion engine/generator (Form B2) ☐ Coating/finishing/printing (Form B5) ☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3) ☐ Storage silos/bins (Form B6) ☒ Other (Form B9)

START CONSTRUCTION DATE:	TBD	OPERATION DATE:	TBD	DATE MANUFACTURED:	TBD
MANUFACTURER / MODEL NO.:	TBD	EXPECTED OP. SCHEDULE:	24 HR/DAY	7 DAY/WK	52 WK/YR
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):		NESHAP (SUBPART?):		MACT (SUBPART?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB	25%	MAR-MAY	25%	JUN-AUG	25% SEP-NOV 25%
EXPECTED ANNUAL HOURS OF OPERATION:	8,760	VISIBLE STACK EMISSIONS UNDER NORMAL OPERATION:	<20	% OPACITY	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)	See Emission Calculations in Appendix B						
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT AND CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) tons/yr
N/A							

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

INDICATE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS

TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/hr	lb/day	lb/yr
N/A				

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B9

EMISSION SOURCE (OTHER)

REVISED: 12/01/01 | NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate | B9

EMISSION SOURCE DESCRIPTION: Green Wood Hammermills	EMISSION SOURCE ID NO: ES-GHM-1, 2, 3
	CONTROL DEVICE ID NO(S): CD-GHM-BV1, 2, and 3
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): EP-17, 18, and 22

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):
Green wood chips will undergo additional chipping as required.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Green Wood	ODT	71.71	

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH)

MAXIMUM DESIGN (BATCHES / HOUR):

REQUESTED LIMITATION (BATCHES / HOUR): (BATCHES/YR):

FUEL USED: N/A	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): N/A
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTED CAPACITY ANNUAL FUEL USE: N/A

COMMENTS:

Attach Additional Sheets as Necessary

FORM C1

CONTROL DEVICE (FABRIC FILTER)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — C1

CONTROL DEVICE ID NO:	CD-GHM-BV1, 2, and 3	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S):	ES-GHM-1, 2, 3
EMISSION POINT (STACK) ID NO(S):	EP-17, 18 and 22	POSITION IN SERIES OF CONTROLS	NO. 1 OF 1 UNITS
MANUFACTURER:	Western Pneumatics, Inc	MODEL NO:	PR164
DATE MANUFACTURED:	TBD	PROPOSED OPERATION DATE:	TBD
OPERATING SCENARIO:		PROPOSED START CONSTRUCTION DATE:	TBD
1 OF 1		P.E. SEAL REQUIRED (PER 2Q .0112)?	(YES) NO

DESCRIBE CONTROL SYSTEM:
A bin vent filter is used to create a slight negative pressure on each green hammermill. The bin vent collects dust from the air volume present in the hammermill. The bin vent is sized to offset the air displacement created by the material feed to the hammermill.

	PM	PM-10	PM-2.5	
POLLUTANT(S) COLLECTED:	PM	PM-10	PM-2.5	
BEFORE CONTROL EMISSION RATE (LB/HR):				
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	~99.9 %	~99.9 %	~99.9 %	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL EMISSION RATE (LB/HR):	See calculations in Appendix B			

PRESSURE DROP (IN. H_2O): MIN:	MAX: 4"	GAUGE? (YES) NO	WARNING ALARM? (YES) NO
BULK PARTICLE DENSITY (LB/FT^3):	1.43E-06	INLET TEMPERATURE (°F):	Ambient
POLLUTANT LOADING RATE:	0.1 LB/HR (GR/FT^3)	OUTLET TEMPERATURE (°F):	Ambient
INLET AIR FLOW RATE (ACFM):		FILTER MAX OPERATING TEMP. (°F):	N/A

NO. OF COMPARTMENTS:	1	NO. OF BAGS PER COMPARTMENT: 1	LENGTH OF BAG (IN.): 120
DIAMETER OF BAG (IN.):	5.875	DRAFT: (INDUCED/NEG.) (FORCED/POS.)	FILTER SURFACE AREA (FT^2): 377
AIR TO CLOTH RATIO:	6	FILTER MATERIAL:	WOVEN (FELTED)

DESCRIBE CLEANING PROCEDURES:
(AIR PULSE) SONIC
REVERSE FLOW SIMPLE BAG COLLAPSE
MECHANICAL/SHAKER RING BAG COLLAPSE
OTHER

PARTICLE SIZE DISTRIBUTION

SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
0-1	Unknown	
1-10		
10-25		
25-50		
50-100		
>100		
	TOTAL = 100	

DESCRIBE INCOMING AIR STREAM:
The air stream will contain wood dust particulate emissions

METHOD FOR DETERMINING WHEN TO CLEAN:
AUTOMATIC (TIMED) MANUAL

METHOD FOR DETERMINING WHEN TO REPLACE THE BAGS:
ALARM (INTERNAL INSPECTION) VISIBLE EMISSION OTHER

SPECIAL CONDITIONS: None
MOISTURE BLINDING CHEMICAL RESISTIVITY OTHER
EXPLAIN:

DESCRIBE MAINTENANCE PROCEDURES: Per manufacturer recommendations

ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):

Attach Additional Sheets As Necessary

[1]Final equipment selection has not yet occurred but will be similar in design to specifications shown.

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **B**

EMISSION SOURCE DESCRIPTION: **Pellet Sampling Transfer Bin**	EMISSION SOURCE ID NO: **ES-PSTB**
	CONTROL DEVICE ID NO(S): **CD-DC-BV3**
OPERATING SCENARIO **1** OF **1**	EMISSION POINT (STACK) ID NO(S): **EP-21**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Sized wood from the hammermills is transported to the pellet mill feed silo and the pellet sampling transfer bin prior to pelletization.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

- ☐ Coal,wood,oil, gas, other burner (Form B1)
- ☐ Woodworking (Form B4)
- ☐ Manufact. of chemicals/coatings/inks (Form B7)
- ☐ Int.combustion engine/generator (Form B2)
- ☐ Coating/finishing/printing (Form B5)
- ☐ Incineration (Form B8)
- ☐ Liquid storage tanks (Form B3)
- ■ Storage silos/bins (Form B6)
- ☐ Other (Form B9)

START CONSTRUCTION DATE: **TBD**	OPERATION DATE: **2016**	DATE MANUFACTURED: **TBD**
MANUFACTURER / MODEL NO.: **TBD**	EXPECTED OP. SCHEDULE: **24** HR/DAY **7** DAY/WK **52** WK/YR	
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):_____	NESHAP (SUBPART?):_____	MACT (SUBPART?):_____
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%**	MAR-MAY **25%**	JUN-AUG **25%** SEP-NOV **25%**
EXPECTED ANNUAL HOURS OF OPERATION **8,760**	VISIBLE STACK EMISSIONS UNDER NORMAL OPERATION: **<20** % OPACITY	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)	**See Emission Calculations in Appendix B**						
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT AND CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) tons/yr
N/A							

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

INDICATE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS

TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/hr	lb/day	lb/yr
N/A				

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B6
EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 12/01/01 | NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate | **B6**

EMISSION SOURCE DESCRIPTION:	Pellet Sampling Transfer Bin	EMISSION SOURCE ID NO:	ES-PSTB
		CONTROL DEVICE ID NO(S):	CD-DC-BV3
OPERATING SCENARIO:	1 OF 1	EMISSION POINT(STACK) ID NO(S):	EP-21

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Sized wood from the hammermills is transported to the pellet mill feed silo and the pellet sampling transfer bin prior to pelletization.

MATERIAL STORED:				DENSITY OF MATERIAL (LB/FT3):	40	
CAPACITY	CUBIC FEET:	TBD		TONS:	TBD	
DIMENSIONS (FEET)	HEIGHT:	DIAMETER:	*(OR)*	LENGTH:	WIDTH:	HEIGHT:
ANNUAL PRODUCT THROUGHPUT (TONS)		ACTUAL:		MAXIMUM DESIGN CAPACITY:		

PNEUMATICALLY FILLED	MECHANICALLY FILLED		FILLED FROM	
☐ BLOWER	☐ SCREW CONVEYOR	MOTOR HP:	☐ RAILCAR	
☐ COMPRESSOR	☐ **BELT CONVEYOR**		☐ TRUCK	
☐ OTHER:	☐ BUCKET ELEVATOR		☐ STORAGE PILE	
	☐ OTHER:		☐ **OTHER:**	**Conveyor**

NO. FILL TUBES:	
MAXIMUM ACFM:	

MATERIAL IS FILLED TO:

BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO?

MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR):	105
MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR):	105

COMMENTS:

Attach Additional Sheets As Necessary

FORM C1

CONTROL DEVICE (FABRIC FILTER)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — C1

CONTROL DEVICE ID NO:	CD-DC-BV3	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S):	ES-PSTB
EMISSION POINT (STACK) ID NO(S):	EP-21	POSITION IN SERIES OF CONTROLS	NO. 1 OF 1 UNITS
MANUFACTURER:	Western Pneumatics, Inc	MODEL NO:	PRBB40-6
DATE MANUFACTURED:	TBD	PROPOSED OPERATION DATE:	2016
OPERATING SCENARIO:		PROPOSED START CONSTRUCTION DATE:	TBD
1 OF 1		P.E. SEAL REQUIRED (PER 2Q .0112)?	(•) YES ( ) NO

DESCRIBE CONTROL SYSTEM:
A bin vent filter is used to create a slight negative pressure on the Pellet Sampling Transfer Bin. The bin vent collects dust from the air volume present in the silo. The bin vent is sized to offset the air displacement created by the material feed to the silo.

	PM	PM-10	PM-2.5	
POLLUTANT(S) COLLECTED:	PM	PM-10	PM-2.5	
BEFORE CONTROL EMISSION RATE (LB/HR):				
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	~99.9 %	~99.9 %	~99.9 %	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL EMISSION RATE (LB/HR):	See calculations in Appendix B			

PRESSURE DROP (IN. H_2O): MIN:	MAX: 4"	GAUGE? (•) YES ( ) NO	WARNING ALARM? ( ) YES ( ) NO
BULK PARTICLE DENSITY (LB/FT^3):	1.43E-06	INLET TEMPERATURE (°F):	Ambient
POLLUTANT LOADING RATE:	0.004 ( ) LB/HR (•) GR/FT^3	OUTLET TEMPERATURE (°F):	Ambient
INLET AIR FLOW RATE (ACFM):	1,000	FILTER MAX OPERATING TEMP. (°F):	N/A
NO. OF COMPARTMENTS:	1	NO. OF BAGS PER COMPARTMENT: 1	LENGTH OF BAG (IN.): 120
DIAMETER OF BAG (IN.):	5.875	DRAFT: (•) INDUCED/NEG. ( ) FORCED/POS.	FILTER SURFACE AREA (FT^2): 377
AIR TO CLOTH RATIO:	6	FILTER MATERIAL:	( ) WOVEN (•) FELTED

DESCRIBE CLEANING PROCEDURES:
(•) AIR PULSE ( ) SONIC
( ) REVERSE FLOW ( ) SIMPLE BAG COLLAPSE
( ) MECHANICAL/SHAKER ( ) RING BAG COLLAPSE
( ) OTHER

DESCRIBE INCOMING AIR STREAM:
The air stream will contain wood dust particulate emissions

PARTICLE SIZE DISTRIBUTION

SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
0-1	Unknown	
1-10		
10-25		
25-50		
50-100		
>100		
	TOTAL = 100	

METHOD FOR DETERMINING WHEN TO CLEAN:
( ) AUTOMATIC (•) TIMED ( ) MANUAL

METHOD FOR DETERMINING WHEN TO REPLACE THE BAGS:
( ) ALARM (•) INTERNAL INSPECTION ( ) VISIBLE EMISSION ( ) OTHER

SPECIAL CONDITIONS: None
( ) MOISTURE BLINDING ( ) CHEMICAL RESISTIVITY ( ) OTHER
EXPLAIN:

DESCRIBE MAINTENANCE PROCEDURES: **Per manufacturer recommendations**

ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):

Attach Additional Sheets As Necessary

[1]Final equipment selection has not yet occurred but will be similar in design to specifications shown.

FORM B

SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — **B**

EMISSION SOURCE DESCRIPTION: **Pellet Cooler Recirculation**	EMISSION SOURCE ID NO: **ES-CLR1 through 6**
	CONTROL DEVICE ID NO(S): **CD-PCR-BV**
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): **EP-23**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
Six (6) Pellet Coolers follow the pellet presses to cool the newly formed pellets down to an acceptable storage temperature. The recirculation for the pellet coolers will now be controlled by a bin vent filter.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

- ☐ Coal,wood,oil, gas, other burner (Form B1)
- ☐ Woodworking (Form B4)
- ☐ Manufact. of chemicals/coatings/inks (Form B7)
- ☐ Int.combustion engine/generator (Form B2)
- ☐ Coating/finishing/printing (Form B5)
- ☐ Incineration (Form B8)
- ☐ Liquid storage tanks (Form B3)
- ☐ Storage silos/bins (Form B6)
- ■ Other (Form B9)

START CONSTRUCTION DATE: **TBD**	OPERATION DATE: **2Q2014**	DATE MANUFACTURED: **TBD**	
MANUFACTURER / MODEL NO.: **TBD**	EXPECTED OP. SCHEDULE: **24** HR/DAY **7** DAY/WK **52** WK/YR		
IS THIS SOURCE SUBJECT TO? NSPS (SUBPART?):_____	NESHAP (SUBPART?):_____	MACT (SUBPART?):_____	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25%**	MAR-MAY **25%**	JUN-AUG **25%**	SEP-NOV **25%**
EXPECTED ANNUAL HOURS OF OPERATION **8,760**	VISIBLE STACK EMISSIONS UNDER NORMAL OPERATION: **<20** % OPACITY		

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)	See Emission Calculations in Appendix B						
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT AND CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) tons/yr
N/A							

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

INDICATE EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS

TOXIC AIR POLLUTANT AND CAS NO.	EF SOURCE	lb/hr	lb/day	lb/yr
N/A				

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary

FORM B9
EMISSION SOURCE (OTHER)

REVISED: 12/01/01 | NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate | **B9**

EMISSION SOURCE DESCRIPTION:	EMISSION SOURCE ID NO: **ES-PCR**
Pellet Cooler Recirculation	CONTROL DEVICE ID NO(S): **CD-PCR-BV**
OPERATING SCENARIO: 1 OF 1	EMISSION POINT (STACK) ID NO(S): **EP-23**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Six (6) Pellet Coolers follow the pellet presses to cool the newly formed pellets down to an acceptable storage temperature. The recirculation for the pellet coolers will now be controlled by a bin vent filter.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Pellet Cooler Particulate		**1,000 CFM**	

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH)

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED: **N/A**	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): **N/A**
MAX. CAPACITY HOURLY FUEL USE: **N/A**	REQUESTED CAPACITY ANNUAL FUEL USE: **N/A**

COMMENTS:

Attach Additional Sheets as Necessary

FORM C1

CONTROL DEVICE (FABRIC FILTER)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — C1

CONTROL DEVICE ID NO:	CD-PCR-BV	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S):	ES-PCR
EMISSION POINT (STACK) ID NO(S):	EP-23	POSITION IN SERIES OF CONTROLS	NO. 1 OF 1 UNITS
MANUFACTURER:	Western Pneumatics, Inc	MODEL NO:	PR60
DATE MANUFACTURED:	TBD	PROPOSED OPERATION DATE:	2016
OPERATING SCENARIO:		PROPOSED START CONSTRUCTION DATE:	TBD
1 OF 1		P.E. SEAL REQUIRED (PER 2Q .0112)?	○ YES ○ NO

DESCRIBE CONTROL SYSTEM:
A bin vent filter is used to create a slight negative pressure on the Pellet Cooler Recirculation. The bin vent collects dust from the air volume present in the pellet cooler recirculation.

	PM	PM-10	PM-2.5	
POLLUTANT(S) COLLECTED:				
BEFORE CONTROL EMISSION RATE (LB/HR):				
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	~99.9 %	~99.9 %	~99.9 %	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL EMISSION RATE (LB/HR):	See calculations in Appendix B			

PRESSURE DROP (IN. H_2O): MIN:	MAX: 4"	GAUGE? ○ YES ○ NO	WARNING ALARM? ○ YES ○ NO
BULK PARTICLE DENSITY (LB/FT^3):	1.43E-06	INLET TEMPERATURE (°F):	Ambient
POLLUTANT LOADING RATE:	0.004 ○ LB/HR ○ GR/FT^3	OUTLET TEMPERATURE (°F):	Ambient
INLET AIR FLOW RATE (ACFM):	1,000	FILTER MAX OPERATING TEMP. (°F):	N/A
NO. OF COMPARTMENTS:	1	NO. OF BAGS PER COMPARTMENT: 1	LENGTH OF BAG (IN.): 120
DIAMETER OF BAG (IN.):	5.875	DRAFT: ○ INDUCED/NEG. ○ FORCED/POS.	FILTER SURFACE AREA (FT^2): 942
AIR TO CLOTH RATIO:	6	FILTER MATERIAL:	○ WOVEN ○ FELTED

DESCRIBE CLEANING PROCEDURES:
○ AIR PULSE ○ SONIC ○ REVERSE FLOW ○ SIMPLE BAG COLLAPSE ○ MECHANICAL/SHAKER ○ RING BAG COLLAPSE ○ OTHER

DESCRIBE INCOMING AIR STREAM:
The air stream will contain wood dust particulate emissions

PARTICLE SIZE DISTRIBUTION

SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
0-1	Unknown	
1-10		
10-25		
25-50		
50-100		
>100		
	TOTAL = 100	

METHOD FOR DETERMINING WHEN TO CLEAN:
○ AUTOMATIC ○ TIMED ○ MANUAL

METHOD FOR DETERMINING WHEN TO REPLACE THE BAGS:
○ ALARM ○ INTERNAL INSPECTION ○ VISIBLE EMISSION ○ OTHER

SPECIAL CONDITIONS: None
○ MOISTURE BLINDING ○ CHEMICAL RESISTIVITY ○ OTHER
EXPLAIN:

DESCRIBE MAINTENANCE PROCEDURES: **Per manufacturer recommendations**

ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):

Attach Additional Sheets As Necessary

[1]Final equipment selection has not yet occurred but will be similar in design to specifications shown.

APPENDIX B - EMISSIONS CALCULATIONS

TABLE B-1
PSD APPLICABILITY ANALYSIS
ENVIVA PELLET SAMPSON, LLC

Source Description	Unit ID	CO (tpy)	NOx (tpy)	TSP (tpy)	PM-10 (tpy)	PM-2.5 (tpy)	SO2 (tpy)	VOC (tpy)	Pb (tpy)	CO_{2e} (tpy)
Emergency Generator	ES-EG	0.77	0.88	0.04	0.04	0.04	0.0005	0.88		143
Fire Water Pump	ES-FWP	0.27	0.22	0.02	0.02	0.02	0.0001	0.22		35
Green Wood Hammermills	ES-GHM-3			2.25	2.25	2.25		21.65		
Pellet Sampling Transfer Bin	ES-PSTB			0.15	0.15	0.15				
Pellet Cooler Recirculation	ES-PCR			0.15	0.15	0.15				
Total Emissions		**1.04**	**1.10**	**2.61**	**2.61**	**2.61**	**0.00**	**23**	**0.00E+00**	**178**
PSD Significant Emission Rate		**100**	**40**	**25**	**15**	**10**	**40**	**40**	**0.60**	**75,000**
PSD Review Required		**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

1. Note the PM increase is shown only for the GHM-3 based on additional air flow and the exit grain loading. The 21.65 tpy VOC emissions increase is a result of the throughput increase through all of the green hammermills, not the result of an additional green hammermill.

TABLE B-2
FACILITY-WIDE EMISSIONS SUMMARY
ENVIVA PELLET SAMPSON, LLC

Source Description	Unit ID	CO (tpy)	NOx (tpy)	TSP (tpy)	PM-10 (tpy)	PM-2.5 (tpy)	SO2 (tpy)	VOC (tpy)	Pb (tpy)	CO_{2e} (tpy)	$CO_{2e\ biomass\ deferral}$ [1] (tpy)
Dryer System	ES-DRYER	230.45	219.35	51.55	51.55	51.55	27.42	288.25	0.00E+00	229,828	3,064
Emergency Generator	ES-EG	0.77	0.88	0.04	0.04	0.04	0.0005	0.88	-	143	143
Fire Water Pump	ES-FWP	0.27	0.22	0.02	0.02	0.02	0.0001	0.22	-	35	35
Hammermills	ES-HM-1 thru 8	-	-	18.02	18.02	0.31	-	34.37	-	-	-
Pellet Mill Feed Silo	ES-PMFS	-	-	0.37	0.37	0.37	-	-	-	-	-
Pellet Mill Fines Bin/ Hammermill Area	ES-PFB, ES-HMA	-	-	0.47	0.47	0.47	-	-	-	-	-
Pellet Presses and Coolers	ES-CLR1 thru -6	-	-	74.33	19.36	2.37	-	227.64	-	-	-
Log Bark Hog	ES-BARKHOG							0.37			
Log Chipping	ES-CHIP-1	-	-	-	-	-	-	1.25	-	-	-
Green Wood Hammermills	ES-GHM-1, ES-GHM-2, ES-GHM-3	-	-	6.76	6.76	6.76	-	72.18	-	-	-
Finished Product Handling/ Pellet Loadout Bins/ Pellet Loadout Area	ES-FPH/ ES-PL/ ES-PB-1 & 2	-	-	1.28	1.16	0.02	-	-	-	-	-
Paved Roads		-	-	2.42	0.48	0.12	-	-	-	-	-
Dried Wood Handling	ES-DWH			0.30	0.30	0.30					
Pellet Sampling Transfer Bin	ES-PSTB			0.15	0.15	0.15					
Pellet Cooler Recirculation	ES-PCR			0.15	0.15	0.15					
Green Wood Sizing & Handling	IES-GWH	-	-	0.016	0.008	0.001	-	-	-	-	-
Green Wood Storage Piles	IES-GWSP1 & 2	-	-	4.01	2.00	0.30	-	2.93	-	-	-
Diesel Storage Tanks	TK1, TK2, & TK3	-	-	-	-	-	-	4.00E-03	-	-	-
	Total Emissions	**231.49**	**220.45**	**159.87**	**100.84**	**62.92**	**27.42**	**628**	**0.00E+00**	**230,006**	**3,242**

1. CO_{2e} does not include CO_2 from biomass combustion.

TABLE B-3
BAGFILTER AND CYCLONE EMISSIONS
ENVIVA PELLET SAMPSON, LLC

Emission Unit	Emission Source ID	Filter, Vent -or- Cyclone ID	Flowrate[1] (cfm)	Pollutant Loading[2] (gr/cf)	Annual Operation (hours)	% PM that is PM_{10}	% PM that is $PM_{2.5}$	Reference	Potential Emissions PM (lb/hr)	PM (tpy)	PM_{10}[3] (lb/hr)	PM_{10}[3] (tpy)	$PM_{2.5}$[3] (lb/hr)	$PM_{2.5}$[3] (tpy)
Green Wood Hammermills	ES-GHM-1	CD-GHM-BV1	15,000	0.004	8,760	100.0%	100.0%		0.51	2.25	0.51	2.25	0.514	2.25
Green Wood Hammermills	ES-GHM-2	CD-GHM-BV2	15,000	0.004	8,760	100.0%	100.0%		0.51	2.25	0.51	2.25	0.514	2.25
Green Wood Hammermills	ES-GHM-3	CD-GHM-BV3	15,000	0.004	8,760	100.0%	100.0%		0.51	2.25	0.51	2.25	0.514	2.25
Hammermills Bagfilter 1	ES-HM-1	CD-HM-BF1	15,000	0.004	8,760	100.0%	1.70%	4, 6	0.51	2.25	0.51	2.25	0.009	0.04
Hammermills Bagfilter 2	ES-HM-2	CD-HM-BF2	15,000	0.004	8,760	100.0%	1.70%	4, 6	0.51	2.25	0.51	2.25	0.009	0.04
Hammermills Bagfilter 3	ES-HM-3	CD-HM-BF3	15,000	0.004	8,760	100.0%	1.70%	4, 6	0.51	2.25	0.51	2.25	0.009	0.04
Hammermills Bagfilter 4	ES-HM-4	CD-HM-BF4	15,000	0.004	8,760	100.0%	1.70%	4, 6	0.51	2.25	0.51	2.25	0.009	0.04
Hammermills Bagfilter 5	ES-HM-5	CD-HM-BF5	15,000	0.004	8,760	100.0%	1.70%	4, 6	0.51	2.25	0.51	2.25	0.009	0.04
Hammermills Bagfilter 6	ES-HM-6	CD-HM-BF6	15,000	0.004	8,760	100.0%	1.70%	4, 6	0.51	2.25	0.51	2.25	0.009	0.04
Hammermills Bagfilter 7	ES-HM-7	CD-HM-BF7	15,000	0.004	8,760	100.0%	1.70%	4, 6	0.51	2.25	0.51	2.25	0.009	0.04
Hammermills Bagfilter 8	ES-HM-8	CD-HM-BF8	15,000	0.004	8,760	100.0%	1.70%	4, 6	0.51	2.25	0.51	2.25	0.009	0.04
Dry Wood Handling	Dryer Out Conv. #1	CD-DC-BV1	1,000	0.004	8,760	100%	100%	4	0.03	0.15	0.03	0.15	0.034	0.15
Dry Wood Handling	Dryer Out Conv. #2	CD-DC-BV2	1,000	0.004	8,760	100%	100%	4	0.03	0.15	0.03	0.15	0.034	0.15
Pellet Sampling Transfer Bin	ES-PSTB	CD-DC-BV3	1,000	0.004	8,760	100%	100%	4	0.03	0.15	0.03	0.15	0.034	0.15
Pellet Mill Feed Silo Bin Vent Baghouse	ES-PMFS	CD-PMFS-BV	2,444	0.004	8,760	100%	100%	4	0.08	0.37	0.08	0.37	0.084	0.37
Pellet Mill Fines Bin & Hammermill Filter	ES-PFB, ES-HMA	CD-PFB-BV	3,102	0.004	8,760	100%	100%	4	0.11	0.47	0.11	0.47	0.106	0.47
Pellet Cooler Recirculation Filter	ES-PCR	CD-PCR-BV	1,000	0.004	8,760	100%	100%	4	0.03	0.15	0.03	0.15	0.034	0.15
Pellet Coolers Cyclone 1	ES-CLR-1	CD-CLR-1	15,000	0.022	8,760	26.1%	3.2%	3	2.83	12.39	0.74	3.23	0.090	0.40
Pellet Coolers Cyclone 2	ES-CLR-2	CD-CLR-2	15,000	0.022	8,760	26.1%	3.2%	3	2.83	12.39	0.74	3.23	0.090	0.40
Pellet Coolers Cyclone 3	ES-CLR-3	CD-CLR-3	15,000	0.022	8,760	26.1%	3.2%	3	2.83	12.39	0.74	3.23	0.090	0.40
Pellet Coolers Cyclone 4	ES-CLR-4	CD-CLR-4	15,000	0.022	8,760	26.1%	3.2%	3	2.83	12.39	0.74	3.23	0.090	0.40
Pellet Coolers Cyclone 5	ES-CLR-5	CD-CLR-5	15,000	0.022	8,760	26.1%	3.2%	3	2.83	12.39	0.74	3.23	0.090	0.40
Pellet Coolers Cyclone 6	ES-CLR-6	CD-CLR-6	15,000	0.022	8,760	26.1%	3.2%	3	2.83	12.39	0.74	3.23	0.090	0.40
Pellet Loadout Bin Vent	ES-FPH, ES-PL, ES-PB-1 & 2	CD-FPH-BF	8,500	0.004	8,760	91%	1.70%	5, 6	0.29	1.28	0.27	1.16	0.005	0.02
								TOTAL	23.25	101.82	10.67	46.74	2.49	10.89

Note:

[1] Filter, Vent, and Cyclone inlet flow rate (cfm) provided by design engineering firm (Mid-South Engineering Co.).

[2] Pollutant Loading (gr/cf) provided by Aircon, a control device vendor.

[3] Based on September 2013 Enviva Northampton Engineering Tests

[4] No speciation data is available for PM 10. Therefore, it is assumed PM=PM10.

[5] Finished product handling PM10 speciation based on AP-42 factors for wet wood combustion (Section 1.6) controlled by a mechanical separator. Since the particle size of particulate matter from finished product handling is anticipated to be larger than flyash, this factor is believed to be a conservative indicator of speciation.

[6] Dry Hammermills and Finished product handling PM2.5 speciation based on April 2014 Enviva Southampton PM2.5 speciation tests.

TABLE B-4
UPDATED GREEN HAMMERMILLS - VOC, HAP, AND TAP EMISSIONS
ENVIVA PELLET SAMPSON, LLC

Calculation Inputs:

Total Plant Throughput ODT/yr	537,625
% of Total Throughput to the Green Hammermills	100.0%

Annual Composition and Throughput

Green Hammermills Throughput ODT/yr	537,625
Hardwood Composition	25%
Softwood Composition	75%

Short Term Composition and Throughput

ODT/hr	71.71
Hardwood Composition	25%
Softwood Composition	75%

Emission Calculations:

Pollutant	CAS Number	HAP (Yes/No)	NC TAP (Yes/No)	VOC (Yes/No)	Emission Factor Comparison						Weighted Emission Factor			Potential Emissions [4]	
					Stack Tests		AP-42 Calculated Direct wood-fired, hardwood factors		AP-42 Green, Direct wood-fired softwood factors						
					Emission Factor (lb/ODT)	Reference	Emission Factor (lb/ODT)	Reference	Emission Factor (lb/ODT)	Reference	Short-term EF (lb/ODT)	Annual EF (lb/ODT)	EF Source	(lb/hr)	(tpy)
Total VOC	N/A	N/A	N/A	N/A	**0.27**	[5]	4.75E-02	[2,3]	1.25E+00	[1,3]	**0.27**	**0.27**	stack test	**19.26**	**72.18**
Acetaldehyde	75-07-0	Yes	Yes	Yes	0.007	[5]	8.46E-04	[2,3]	1.66E-02	[1,3]	6.89E-03	6.89E-03	stack test	4.94E-01	1.85E+00
Acrolein	107-02-8	Yes	Yes	Yes	0.000	[5]	2.59E-04	[2,3]	5.08E-03	[1,3]	0.00E+00	0.00E+00	stack test	0.00E+00	0.00E+00
Formaldehyde	50-00-0	Yes	Yes	Yes	0.004	[5]	1.58E-03	[2,3]	3.09E-02	[1,3]	4.11E-03	4.11E-03	stack test	2.94E-01	1.10E+00
Methanol	67-56-1	Yes	No	Yes	0.003	[5]	1.24E-03	[2,3]	2.43E-02	[1,3]	3.05E-03	3.05E-03	stack test	2.19E-01	8.21E-01
Phenol	108-95-2	Yes	Yes	Yes	0.000	[5]	3.16E-04	[2,3]	6.18E-03	[1,3]	0.00E+00	0.00E+00	stack test	0.00E+00	0.00E+00
Propionaldehyde	123-38-6	Yes	No	Yes	0.001	[5]	1.47E-04	[2,3]	2.87E-03	[1,3]	1.00E-03	1.00E-03	stack test	7.17E-02	2.69E-01
													Total VOC	**19.26**	**72.18**
													Total HAPs	**1.08**	**4.05**

Notes:

[1] HAP & TAP emission factors for "Rotary Dryer, green, direct wood-fired, (inlet moisture content >50%, dry basis) softwood were obtained from AP-42, Section 10.6.2, Table 10.6.2-3.

[2] To account for hardwood emissions since no HAP/TAP emission factors are given for direct hardwood-fired, factors were conservatively calculated by multiplying AP-42 Section 10.6.2-3 HAP factors for green, direct softwood fired by the ratio of the VOC emission factors for hardwood to softwood drying (0.24/4.7).

[3] Both AP-42 hardwood and softwood factor emissions from dryers were adjusted to represent the hammermills by multiplying the emission facotr time the ratio of the VOC from hammermills to dryers based on engineering testing conducted at the Enviva Wiggins facility (19.8%).

[4] Short-term emissions were calculated based upon a worst-case scenario of 25% softwood firing on an hourly basis.
Annual emissions were calculated based on the Annual average % Hardwood and Softwood Composition.

[5] HAP emissions from Enviva Wigginis October 2013 Stack Testing with a throughput of 62.5% softwood.

TABLE B-4
PREVIOUS GREEN HAMMERMILLS - VOC, HAP, AND TAP EMISSIONS
ENVIVA PELLET SAMPSON, LLC

Calculation Inputs:

Total Plant Throughput ODT/yr	537,625
% of Total Throughput to the Green Hammermills	70.0%

30% will bypass the green hammermills due to pre-screener

Annual Composition and Throughput

Green Hammermills Throughput ODT/yr	376,338
Hardwood Composition	25%
Softwood Composition	75%

Short Term Composition and Throughput

ODT/hr	50.20
Hardwood Composition	25%
Softwood Composition	75%

Emission Calculations:

Pollutant	CAS Number	HAP (Yes/No)	NC TAP (Yes/No)	VOC (Yes/No)	Emission Factor Comparison						Weighted Emission Factor			Potential Emissions [4]	
					Stack Tests		AP-42 Calculated Direct wood-fired, hardwood factors		AP-42 Green, Direct wood-fired softwood factors		Short-term EF	Annual EF			
					Emission Factor (lb/ODT)	Reference	Emission Factor (lb/ODT)	Reference	Emission Factor (lb/ODT)	Reference	(lb/ODT)	(lb/ODT)	EF Source	(lb/hr)	(tpy)
Total VOC	N/A	N/A	N/A	N/A	**0.27**	[5]	4.75E-02	[2,3]	1.25E+00	[1,3]	**0.27**	**0.27**	stack test	**13.48**	**50.53**
Acetaldehyde	75-07-0	Yes	Yes	Yes	0.007	[5]	8.46E-04	[2,3]	1.66E-02	[1,3]	6.89E-03	6.89E-03	stack test	3.46E-01	1.30E+00
Acrolein	107-02-8	Yes	Yes	Yes	0.000	[5]	2.59E-04	[2,3]	5.08E-03	[1,3]	0.00E+00	0.00E+00	stack test	0.00E+00	0.00E+00
Formaldehyde	50-00-0	Yes	Yes	Yes	0.004	[5]	1.58E-03	[2,3]	3.09E-02	[1,3]	4.11E-03	4.11E-03	stack test	2.06E-01	7.72E-01
Methanol	67-56-1	Yes	No	Yes	0.003	[5]	1.24E-03	[2,3]	2.43E-02	[1,3]	3.05E-03	3.05E-03	stack test	1.53E-01	5.74E-01
Phenol	108-95-2	Yes	Yes	Yes	0.000	[5]	3.16E-04	[2,3]	6.18E-03	[1,3]	0.00E+00	0.00E+00	stack test	0.00E+00	0.00E+00
Propionaldehyde	123-38-6	Yes	No	Yes	0.001	[5]	1.47E-04	[2,3]	2.87E-03	[1,3]	1.00E-03	1.00E-03	stack test	5.02E-02	1.88E-01
													Total VOC	**13.48**	**50.53**
													Total HAPs	**0.76**	**2.83**

Notes:

[1] HAP & TAP emission factors for "Rotary Dryer, green, direct wood-fired, (inlet moisture content >50%, dry basis) softwood were obtained from AP-42, Section 10.6.2, Table 10.6.2-3.

[2] To account for hardwood emissions since no HAP/TAP emission factors are given for direct hardwood-fired, factors were conservatively calculated by multiplying AP-42 Section 10.6.2-3 HAP factors for green, direct softwood fired by the ratio of the VOC emission factors for hardwood to softwood drying (0.24/4.7).

[3] Both AP-42 hardwood and softwood factor emissions from dryers were adjusted to represent the hammermills by multiplying the emission facotr time the ratio of the VOC from hammermills to dryers based on engineering testing conducted at the Enviva Wiggins facility (19.8%).

[4] Short-term emissions were calculated based upon a worst-case scenario of 25% softwood firing on an hourly basis. Annual emissions were calculated based on the Annual average % Hardwood and Softwood Composition.

[5] HAP emissions from Enviva Wigginis October 2013 Stack Testing with a throughput of 62.5% softwood.

TABLE B-5
EMERGENCY GENERATOR AND FIRE PUMP EMISSIONS
ENVIVA PELLET SAMPSON, LLC

Emergency Generator Emissions (ES-EG)

Equipment and Fuel Characteristics

Engine Output	0.40	MW
Engine Power	536	hp (brake)
Hours of Operation	500	hr/yr[1]
Heating Value of Diesel	19,300	Btu/lb
Power Conversion	2,545	Btu/hr/hp

Criteria Pollutant Emissions

Pollutant	Category	Emission Factor	Units	Potential Emissions	
				lb/hr	tpy
TSP	PSD	0.20	g/KW-hr	0.18	0.04
PM_{10}	PSD	0.20	g/KW-hr	0.18	0.04
$PM_{2.5}$	PSD	0.20	g/KW-hr	0.18	0.04
NO_x	PSD	4.00	g/KW-hr	3.52	0.88
SO_2	PSD	15.00	ppmw (3)	2.12E-03	5.30E-04
CO	PSD	3.50	g/KW-hr	3.08E+00	7.70E-01
VOC (NMHC)	PSD	4.00	g/KW-hr	3.52E+00	8.80E-01
Toxic/Hazardous Air Pollutant Emissions					
Acetaldehyde	HAP/TAP	5.37E-06	lb/hp-hr (4)	2.88E-03	7.19E-04
Acrolein	HAP/TAP	6.48E-07	lb/hp-hr (4)	3.47E-04	8.68E-05
Benzene	HAP/TAP	6.53E-06	lb/hp-hr (4)	3.50E-03	8.75E-04
Benzo(a)pyrene[6]	HAP/TAP	1.32E-09	lb/hp-hr (4)	7.05E-07	1.76E-07
1,3-Butadiene	HAP/TAP	2.74E-07	lb/hp-hr (4)	1.47E-04	3.67E-05
Formaldehyde	HAP/TAP	8.26E-06	lb/hp-hr (4)	4.43E-03	1.11E-03
Total PAH (POM)	HAP	1.18E-06	lb/hp-hr (4)	6.30E-04	1.58E-04
Toluene	HAP/TAP	2.86E-06	lb/hp-hr (4)	1.53E-03	3.84E-04
Xylene	HAP/TAP	2.00E-06	lb/hp-hr (4)	1.07E-03	2.67E-04
Highest HAP (Formaldehyde)		8.26E-06	lb/hp-hr (4)	4.43E-03	1.11E-03
Total HAPs				1.45E-02	3.63E-03

Note:

[1] NSPS allows for only 100 hrs/yr of non-emergency operation of these engines (not the 500 hours shown). The PTE for the emergency generator is based on 500 hr/yr, though, because the regs allow non-emergency operation and EPA guidance is 500 hr/yr for emergency generators.

[2] Emissions factors from NSPS Subpart IIII (or 40 CFR 89.112 where applicable) in compliance with post-2010 construction.

[3] Sulfur content in accordance with Year 2013 standards of 40 CFR 80.510(a) as required by NSPS Subpart IIII.

[4] Emission factor obtained from AP-42 Section 3.3, Tables 3.3-1 Table 3.3-2.

[5] Emission factor for NOx is listed as NOx and NMHC (Non-Methane Hydrocarbons or VOC) in Table 4 of NSPS Subpart IIII. Conservatively assumed entire limit attributable to NOx and VOC.

[6] Benzo(a)pyrene is included as a HAP in Total PAH.

TABLE B-5
EMERGENCY GENERATOR AND FIRE PUMP EMISSIONS
ENVIVA PELLET SAMPSON, LLC

Firewater Pump Emissions (ES-FWP)

Equipment and Fuel Characteristics

Engine Output	0.10	MW
Engine Power	131	hp
Hours of Operation	500	hr/yr[1]
Heating Value of Diesel	19,300	Btu/lb
Power Conversion	2,545	Btu/hr/hp

Criteria Pollutant Emissions

Pollutant	Category	Emission Factor	Units	Potential Emissions	
				lb/hr	tpy
TSP	PSD	0.30	g/KW-hr	0.06	0.02
PM_{10}	PSD	0.30	g/KW-hr	0.06	0.02
$PM_{2.5}$	PSD	0.30	g/KW-hr	0.06	0.02
NO_x	PSD	4.00	g/KW-hr	0.86	0.22
SO_2	PSD	15.00	ppmw (3)	5.18E-04	1.30E-04
CO	PSD	5.00	g/KW-hr	1.08E+00	2.69E-01
VOC (NMHC)	PSD	4.00	g/KW-hr	8.61E-01	2.15E-01
Toxic/Hazardous Air Pollutant Emissions					
Acetaldehyde	HAP/TAP	5.37E-06	lb/hp-hr (4)	7.03E-04	1.76E-04
Acrolein	HAP/TAP	6.48E-07	lb/hp-hr (4)	8.48E-05	2.12E-05
Benzene	HAP/TAP	6.53E-06	lb/hp-hr (4)	8.56E-04	2.14E-04
Benzo(a)pyrene[6]	HAP/TAP	1.32E-09	lb/hp-hr (4)	1.72E-07	4.31E-08
1,3-Butadiene	HAP/TAP	2.74E-07	lb/hp-hr (4)	3.59E-05	8.96E-06
Formaldehyde	HAP/TAP	8.26E-06	lb/hp-hr (4)	1.08E-03	2.71E-04
Total PAH (POM)	HAP	1.18E-06	lb/hp-hr (4)	1.54E-04	3.85E-05
Toluene	HAP/TAP	2.86E-06	lb/hp-hr (4)	3.75E-04	9.38E-05
Xylene	HAP/TAP	2.00E-06	lb/hp-hr (4)	2.61E-04	6.53E-05
Highest HAP (Formaldehyde)		8.26E-06	lb/hp-hr (4)	1.08E-03	2.71E-04
Total HAPs				3.55E-03	8.88E-04

Note:

[1] NSPS allows for only 100 hrs/yr of non-emergency operation of these engines (not the 500 hours shown). The PTE for the emergency generator is based on 500 hr/yr, though, because the regs allow non-emergency operation and EPA guidance is 500 hr/yr for emergency generators.

[2] Emissions factors from NSPS Subpart IIII (or 40 CFR 89.112 where applicable) in compliance with post-2009 construction.

[3] Sulfur content in accordance with Year 2010 standards of 40 CFR 80.510(a) as required by NSPS Subpart IIII.

[4] Emission factor obtained from AP-42 Section 3.3, Tables 3.3-1 Table 3.3-2.

[5] Emission factor for NOx is listed as NOx and NMHC (Non-Methane Hydrocarbons or VOC) in Table 4 of NSPS Subpart IIII. Conservatively assumed entire limit attributable to NOx and VOC.

[6] Benzo(a)pyrene is included as a HAP in Total PAH.

APPENDIX C - LOCAL ZONING CONSISTENCY DETERMINATION

Trinity Consultants

One Copley Parkway, Suite 310, Morrisville, North Carolina 27560 U.S.A. ■ (919) 462-9693 ■ Fax (919) 462-9694

September 28, 2015

Mary M. Rose
Planning and Zoning Director
Sampson County Planning and Zoning
227 Lisbon Street
Clinton, NC 28329

Subject: Air Permit Application Zoning Consistency Determination Request
Enviva Pellets Sampson, LLC

Dear Ms. Mary Rose,

This letter is a request for a determination of whether the modifications to the construction project of a wood pellet manufacturing facility located at US Highway 117 in Faison, NC is consistent with current local zoning requirements. As a part of this application, Enviva will be adding a third green wood hammermill (ES-GHM-3) to the facility with a bin vent filter, a pellet sampling transfer bin (ES-PSTB) with bin vent filter, and a pellet cooler recirculation (ES-PCR) bin vent filter. In addition, Enviva would like to modify the emergency generator and fire pump sizes from the 250 hp (each) that were originally proposed, to 536 horsepower and 131 horsepower. A copy of the air permit application being submitted to the North Carolina Division of Air Quality (NCDAQ) is attached.

Your confirmation of zoning consistency is needed by the NCDAQ prior to issuance of the air quality construction permit. Please complete the attached form and send to the address shown on the form as soon as possible. In the interim, we would appreciate it if you would stamp this cover letter with your department's seal, sign and date next to your seal and return the sealed cover letter via FAX to my attention at (919) 462-9694. This stamp is needed to be considered administratively complete by the NC Division of Air Quality. Should you require additional information to complete your review, please do not hesitate to contact me at (919) 462-9693.

Sincerely,

Gina Faust
Senior Consultants

Attachment

APPENDIX D - MODELING PLOTS

Figure D-2. Enviva Sampson Site Layout

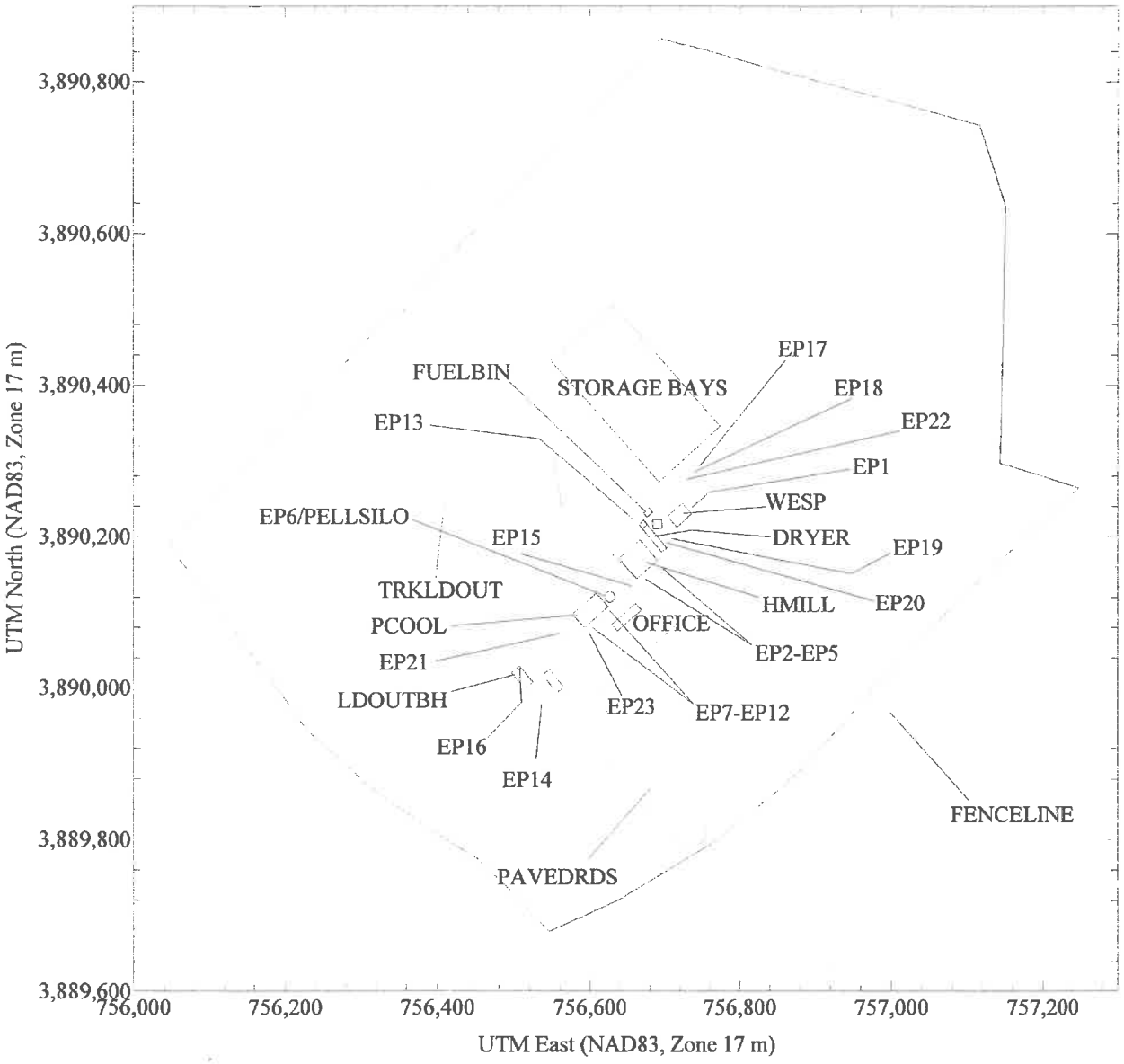
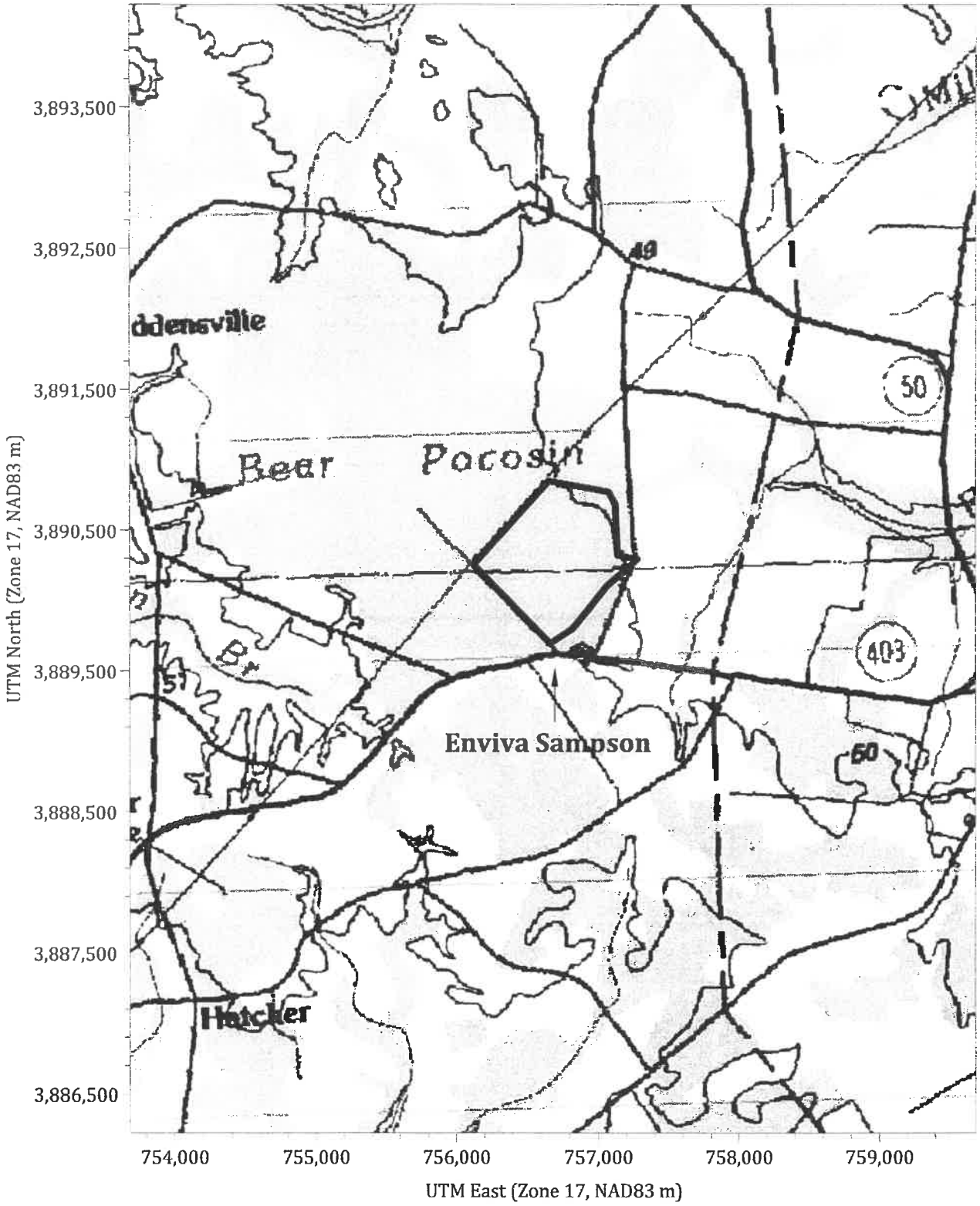


Figure D-1. Topographic Map of Enviva Sampson Area



APPENDIX E - ELECTRONIC MODELING FILES

Received
NOV 06 2015
Air Permits Section

Trinity Consultants
One Copley Parkway, Suite 310, Morrisville, North Carolina 27560 U.S.A. ■ (919) 462-9693 ■ Fax (919) 462-9694

September 28, 2015

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Sincerely,

Gina Faust
Senior Consultants

Attachment

RECEIVED
OCT 28 2015

Zoning Consistency Determination

Facility Name	Enviva Pellets Sampson, LLC
Facility Street Address	5 Connector Road
Facility City	Faison
Description of Process	Wood pellet manufacturing facility
SIC Code/NAICS	SIC – 2499 ; NAICS - 321999
Facility Contact	Joe Harrell
Phone Number	(252) 209-6032
Mailing Address	142 NC Route 561 East
Mailing City, State Zip	Ahoskie, NC 27910

Received
NOV 06 2015
Air Permits Section

Based on the information given above:

☑ I have received a copy of the air permit application (draft or final) AND...

☐ There are no applicable zoning and subdivision ordinances for this facility at this time

☑ The proposed operation IS consistent with applicable zoning and subdivision ordinances

☐ The proposed operation IS NOT consistent with applicable zoning and subdivision ordinances (please include a copy of the rules in the package sent to the air quality office)

☐ The determination is pending further information and can not be made at this time

☐ Other:

Agency	Clinton - Sampson Planning Dept.
Name of Designated Official	Mary M. Rose
Title of Designated Official	Planning Director
Signature	Mary M Rose
Date	10-28-15

Please forward to the mailing address listed above and the air quality office at the appropriate address as checked on the back of this form.

Courtesy of the Small Business Assistance Program
toll free at 1-877-623-6748 or on the web at www.envhelp.org/sb

FORM C1

CONTROL DEVICE (FABRIC FILTER)

REVISED 12/01/01 — NCDENR/Division of Air Quality - Application for Air Permit to Construct/Operate — C1

CONTROL DEVICE ID NO: CD-GHM-BF1, 2, and 3	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-GHM-1, 2, 3
EMISSION POINT (STACK) ID NO(S): EP-17, 18 and 22	POSITION IN SERIES OF CONTROLS NO. 1 OF 1 UNITS
MANUFACTURER: Western Pneumatics, Inc	MODEL NO: PR164
DATE MANUFACTURED: TBD	PROPOSED OPERATION DATE: TBD
OPERATING SCENARIO:	PROPOSED START CONSTRUCTION DATE: TBD
1 OF 1	P.E. SEAL REQUIRED (PER 2Q .0112)? ◉ YES ○ NO

DESCRIBE CONTROL SYSTEM:
A bagfilter is used to create a slight negative pressure on each green hammermill. The bagfilter collects dust from the air volume present in the hammermill. The bagfilter is sized to offset the air displacement created by the material feed to the hammermill.

	PM	PM-10	PM-2.5	
POLLUTANT(S) COLLECTED:	PM	PM-10	PM-2.5	
BEFORE CONTROL EMISSION RATE (LB/HR):				
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	~99.9 %	~99.9 %	~99.9 %	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL EMISSION RATE (LB/HR):	See calculations in Appendix B			

PRESSURE DROP (IN. H_20): MIN:	MAX: 4"	GAUGE? ◉ YES ○ NO	WARNING ALARM? ◉ YES ○ NO
BULK PARTICLE DENSITY (LB/FT^3):	1.43E-06	INLET TEMPERATURE (°F):	Ambient
POLLUTANT LOADING RATE:	0.1 ○ LB/HR ◉ GR/FT^3	OUTLET TEMPERATURE (°F):	Ambient
INLET AIR FLOW RATE (ACFM):	15000	FILTER MAX OPERATING TEMP. (°F):	N/A
NO. OF COMPARTMENTS:	NO. OF BAGS PER COMPARTMENT 164 bags total	LENGTH OF BAG (IN.):	120
DIAMETER OF BAG (IN.): 5.875	DRAFT: ○ INDUCED/NEG. ◉ FORCED/POS.	FILTER SURFACE AREA (FT^2):	2577
AIR TO CLOTH RATIO: 5.82	FILTER MATERIAL:	○ WOVEN ◉ FELTED	

DESCRIBE CLEANING PROCEDURES:
◉ AIR PULSE ○ SONIC
○ REVERSE FLOW ○ SIMPLE BAG COLLAPSE
○ MECHANICAL/SHAKER ○ RING BAG COLLAPSE
○ OTHER

DESCRIBE INCOMING AIR STREAM:
The air stream will contain wood dust particulate emissions

PARTICLE SIZE DISTRIBUTION

SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
0-1	Unknown	
1-10		
10-25		
25-50		
50-100		
>100		
	TOTAL = 100	

METHOD FOR DETERMINING WHEN TO CLEAN:
○ AUTOMATIC ◉ TIMED ○ MANUAL

METHOD FOR DETERMINING WHEN TO REPLACE THE BAGS:
○ ALARM ◉ INTERNAL INSPECTION ○ VISIBLE EMISSION ○ OTHER

SPECIAL CONDITIONS: None
○ MOISTURE BLINDING ○ CHEMICAL RESISTIVITY ○ OTHER
EXPLAIN:

DESCRIBE MAINTENANCE PROCEDURES: Per manufacturer recommendations

ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):

Attach Additional Sheets As Necessary

[1]Final equipment selection has not yet occurred but will be similar in design to specifications shown.

Comprehensive Application Report for 8200152.15A

Enviva Pellets Sampson, LLC - Faison (8200152)

Sampson County

10/30/2015

General Information:

Permit/Latest Revision:	10386/ R01
Permit code:	TV-Sign-501(c)(2)
Application type:	Modification
Engineer/Rev. location:	Kevin Godwin/RCO
Regional Contact:	Gregory Reeves
Facility location:	Fayetteville Regional Office
Facility classification:	Title V
Clock is ON	Application is COMPLETE
Status is :	In progress

Application Dates

Received	Completeness Due	Clock Start	Calculated Issue Due
10/29/2015	12/13/2015	10/29/2015	01/27/2016

Fee Information

Initial amount:	Date received:	Amount Due:	Add. Amt Rcv'd:	Date Rcv'd:
$918.00	10/29/2015	0.00		

Fund type:	Deposit Slip #:	Location rec'd:	Location deposited:
2333			

Contact Information

Type	Name	Address	City State ZIP	Telephone
Authorized	Maitland J. W. Horner, Vice President	7200 Wisconsin Avenue, Suite	Bethesda, MD 20814	(301) 657-5560
Technical/Permit	Joe Harrell, Corporate EHS Manager	142 NC Route 561 East	Ahoskie, NC 27910	(252) 209-6032

Acceptance Criteria

Received?	Acceptance Criteria Description
Yes	Application fee
Yes	Appropriate number of apps submitted
Yes	Zoning Addressed
Yes	Authorized signature
Yes	PE Seal
N/A	Application contains toxic modification(s)

Completeness Criteria

Received?	Complete Item Description

Comprehensive Application Report for 8200152.15A

Enviva Pellets Sampson, LLC - Faison (8200152)

Sampson County

Application Events

Event	Start	Due	Complete	Comments	Staff
TV - Acknowledgment/Complete	10/29/2015	11/08/2015	10/30/2015		kmhash

Regulations Pertaining to this Permit

Reference Rule		Regulation Description
2D	.0515	Particulates Miscellaneous Industrial Processes
2D	.0516	Sulfur Dioxide Emissions Combustion Sources
2D	.0521	Control of Visible Emissions

Audit Information Pertaining to this Application

Column Name	Date Changed	Old Value	New Value	Editor

North Carolina Department of Environmental Quality

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

October 30, 2015

Mr. Maitland Horner
Vice President
Enviva Pellets Sampson, LLC
7200 Wisconsin Avenue, Suite 1000
Bethesda, MD 20814

SUBJECT: Receipt of Permit Application
Modification of Permit No. 10386R01
Application No. 8200152.15A
Enviva Pellets Sampson, LLC
Facility ID: 8200152, Faison, Sampson County

Dear Mr. Horner:

Your air permit application (8200152.15A) for Enviva Pellets Sampson, LLC, located in Sampson County, North Carolina was received by this division on October 29, 2015.

This application submittal **did** contain all the required elements as indicated and has been accepted for processing. Your application will be considered complete as of October 29, 2015, unless informed otherwise by this office within 60 days.

Should you have any questions concerning this matter, please contact Kevin Godwin at 919-707-8480.

Sincerely,

William D. Willets, P.E., Chief, Permitting Section
Division of Air Quality, NCDEQ

cc: Fayetteville Regional Office Files