

ENVIRONMENT & HEALTH

William Willets, PE Chief, Permitting Section, Division of Air Quality NC Department of Environmental Quality 1641 Mail Service Center Raleigh, North Carolina 27609-1641

Re: Permit Modification Application for PSD Minor Source Status Enviva Pellets Northampton, LLC Garysburg, North Carolina Northampton County Permit No.: 10203R05 Facility ID: 6600167

Dear Mr. Willets:

Enclosed please find a North Carolina Department of Environment Quality (NC DEQ) permit application package for a permit modification to reclassify Enviva Pellets Northampton, LLC ("Enviva", "the Northampton plant", or "the facility") (NC DEQ Facility ID #6600167) in Northampton County as a Prevention of Significant Deterioration (PSD) and hazardous air pollutant (HAP) minor source.

The plant currently operates under Air Quality Permit No. 10203R05 issued by the North Carolina Department of Environmental Quality (NCDEQ), Division of Air Quality (DAQ) on March 3, 2017.

Enviva is submitting this permit modification application to reflect planned changes for the Northampton plant. These changes are being implemented to meet new customer softwood percentage and production rate demands and to incorporate significant emission reduction efforts to minimize emissions impacts associated with the project. Because of these changes, the Northampton plant's potential emissions for all criteria pollutants will be less than the PSD major source thresholds of 250 tpy and, thus, the facility will be classified as a PSD minor source. Additionally, the facility will be reclassified as a minor source under the hazardous air pollutant (HAP) program. The facility will continue to be classified as a major source under the Title V program.

Enviva is requesting 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. As required, three (3) copies of the complete permit application package

September 28, 2018

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and an application processing fee in an amount of \$947 are enclosed. In addition, Enviva has submitted the required zoning determination documents to both the City of Garysburg and Northampton County departments.

Thank you for your prompt attention to this matter. If you have any questions regarding this request, please contact me at (225) 408-2691 or Kai Simonsen, Air Permit Engineer at Enviva, at (984) 789-3628.

Yours sincerely,

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Enclosures: Permit Application including Appendices

Prepared for Enviva Pellets Northampton, LLC Northampton County, North Carolina

Prepared By Ramboll US Corporation Baton Rouge, Louisiana

Project Number **1690009489**

Date September 2018

MODIFICATION APPLICATION FOR PSD MINOR SOURCE STATUS ENVIVA PELLETS NORTHAMPTON, LLC





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ACRONYMS AND ABBREVIATIONS

AAL	Acceptable Ambient Level
AP-42	Compilation of Air Pollutant Emission Factors
bhp	brake horsepower
BMP	Best Management Practice
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CFR	Code of Federal Regulations
CI	Compression Ignition
СО	Carbon Monoxide
DAQ	Division of Air Quality
DENR	Department of Environment and Natural Resources
FSC	Forest Stewardship Council
HAP	Hazardous Air Pollutant
hp	horsepower
ICE	Internal Combustion Engine
lb	Pound
MACT	Maximum Achievable Control Technology
MMBtu	Million British thermal units
NAAQS	National Ambient Air Quality Standards
NCAC	North Carolina Administrative Code
NCASI	National Council for Air and Stream Improvement
NCDEQ	North Carolina Department of Environmental Quality
NESHAP	National Emission Standards for Hazardous Air Pollutants
NNSR	Nonattainment New Source Review
NO _X	Nitrogen Oxides (NO + NO ₂)
NSPS	New Source Performance Standards
NSR	New Source Review
NWS	National Weather Service
ODT	Oven Dried Tons
PEFC	Programme for the Endorsement of Forest Certifications
PM	Particulate Matter

ACRONYMS AND ABBREVIATIONS (Continued)

PM _{2.5}	Particulate Matter Less Than 2.5 Micrometers in Aerodynamic Diameter
PM ₁₀	Particulate Matter Less Than 10 Micrometers in Aerodynamic Diameter
PSD	Prevention of Significant Deterioration
PSEU	Pollutant Specific Emission Unit
RICE	Reciprocating Internal Combustion Engine
RCO	Regenerative Catalytic Oxidizer
RTO	Regenerative Thermal Oxidizer
SIP	State Implementation Plan
SO ₂	Sulfur Dioxide
SFI	Sustainable Forestry Initiative
ТАР	Toxic Air Pollutant
ТСО	Thermal Catalytic Oxidizer
tph	tons per hour
tpy	tons per year
EPA	US Environmental Protection Agency
VOC	Volatile Organic Compounds
WESP	Wet Electrostatic Precipitator

1. INTRODUCTION

Enviva Pellets Northampton, LLC (Enviva) owns and operates a wood pellet manufacturing plant (referred to herein as "the Northampton plant", "the plant", or "the facility") in Northampton County, North Carolina. The plant currently operates under Air Quality Permit No. 10203R05 issued by the North Carolina Department of Environmental Quality (NCDEQ), Division of Air Quality (DAQ) on March 3, 2017. The plant consists of the following processes: Log Chipper, Bark Hog, Green Wood Hammermills, Rotary Dryer, Dry Hammermills, Pellet Presses and Coolers, Product Loadout operations and other ancillary activities.

The Northampton plant is currently permitted as a major source with respect to the Title V and New Source Review (NSR) permitting programs because potential facility-wide emissions of one or more criteria pollutants were estimated to exceed the major source thresholds of 100 tons per year (tpy) and 250 tpy, respectively. Additionally, the plant is permitted as a major source of hazardous air pollutants (HAP) due to potential total HAP emissions and maximum individual HAP emissions estimated to remain below the major source threshold of 25 tpy, and 10 tpy, respectively.

Enviva is requesting that the procedures of 15A NCAC 2Q .0504 be utilized for this modification 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 Modification within one year after commencement of operations. These changes are being implemented to meet new customer softwood percentage and production rate demands and to incorporate significant emission reduction efforts to minimize emissions impacts associated with the project. Because of the significant emission reductions proposed as part of this modification, the Northampton plant's potential emissions will be less than the PSD and HAP major source thresholds, thus, the facility will be classified as a PSD and HAP minor source. The facility will, however, continue to be classified as a major source under the Title V program.

The following summarizes the proposed changes associated with this modification:

- Increase production rate from 535,260 ODT per year to 781,355 ODT per year and increase softwood processed from a maximum of 30% to a maximum of 80% annually;
- Upgrade existing pellet dies with a new 1500 mm prototype;
- Add a chiller, with air to air heat exchanger, to chill air used in the pellet coolers for product quality purposes;
- Install a new direct wood-fired dryer (ES-DRYER-2) equipped with multiclone separator, WESP, and RTO (CD-DC-2, CD-WESP-2, and CD-RTO-2);
- Add a regenerative thermal oxidizer (CD-RTO-1) to the existing dryer (ES-DRYER-1) following the existing wet electrostatic precipitator (CD-WESP-1). As such, the existing WESP stack will be replaced with the proposed RTO stack;
- Remove two existing closed-loop Green Wood Hammermills currently permitted as rechippers (ES-RCHP-1 and ES-RCHP-2) and construct five (5) new closed-loop Green Wood Hammermills (ES-GHM-1 through ES-GHM-5) and route the exhaust to the existing wet electrostatic precipitator (CD-WESP-1) and proposed RTO (CD-RTO-1);
- Add a second pre-screener prior to the dry hammermills and a baghouse to control emissions from existing and new pre-screeners (ES-PS-BF);

- Add a second pellet screener and route the exhaust to a baghouse;
- Add chip reclaim automation by adding up to three truck tippers and a chip stacker reclaimer, and removing most front-end loader usage;
- Add two (2) new dry hammermills (ES-DSHM-1 and ES-DSHM-2) dedicated to dry shavings and route exhaust to a proposed new wet scrubber and RCO/RTO;
- Route Pellet Cooler exhausts through a new wet scrubber to the Dry Hammermills which will exhaust through another new wet scrubber and Regenerative Catalytic Oxidizer (RCO) (CD-RCO-1) that can also operate as a Regenerative Thermal Oxidizer (RTO) to control emissions from the Pellet Coolers, Dry Hammermills, and proposed Dry Shavings Hammermills. Additionally, add four double duct burners (IES-DDB-5 through IES-DDB-8) to the associated Pellet Cooler and Dry Hammermill duct work to reduce the risk of moisture condensation; Add an additive silo (IES-ADD) and accompanying baghouse (CD-ADD-BF);
- Add a Propane Vaporizer (IES-PVAP) for RTOs/RCO;
- Add four (4) double duct burners (IES-DDB-1 through IES-DDB-4), two per dryer line on the exhaust and recirculation ducts, to reduce the risk of moisture condensation.;
- Add dryer and furnace bypass stacks (ES-DRYERBYP-1, ES-DRYERBYP-2, ES-FURNACEBYP-1, ES-FURNACEBYP-2);
- Add a mobile fuel diesel storage tank (IES-TK-3);
- Replace the TLO Bucket Elevator Belt & Buckets;
- Upgrade the Pellet Mill Fines Bin Screw and Pellet Screener;
- Replace the Dryer Furnace Fuel Surge Bin; and
- Replace Green Hammermill Wear Plates and upgrade Green Hammermill hydraulics.

In addition to the changes proposed above, Enviva also proposes the following reconciliations:

- Reconcile log chipper emissions (IES-CHIP-1) into electric powered wood chipper source ID (IES-EPWC);
- Incorporate emission points associated with the use of Dry Shavings (Dry Shavings Handling, Dry Shavings Baghouse, Dry Shavings Silo);
- Re-name the currently permitted dryer (ES-DRYER) and associated control devices to dryer line 1 (ES-DRYER-1), multiclone separator (CD-DC-1), and WESP (CD-WESP-1);
- Remove bark hog and debarker from IES-GWHS and permit as separate sources (IES-BARK and IES-DEBARK, respectively);
- Remove sources associated with the bagging system. These include ES-BSC-1 through ES-BSC-3, ES-BSS-1 and ES-BSS-2, and ES-BSB-1 and ES-BSB-2;
- Correct source IDs for the diesel storage tanks from IS-TK-1 and IS-TK-2 to IES-TK-1 and IES-TK-2;
- Correct source ID for dry line hopper from ES-DLH to IES-DLH reflect updated status as an insignificant activity;

- Correct source ID for dry wood handling from IES-DWH to ES-DWH;
- Remove Nuisance Dust System (ES-NDS); and
- Re-name the currently permitted Pellet Fines Bin (ES-PFB-1) and associated bin vent filter (CD-PFB-BV) to Pellet Cooler HP Fines Relay System (ES-PCHP) and baghouse (ES-PCHP-BF);

A description of the process is provided in Section 2 and methodologies used to quantify potential emissions are summarized in Section 3. Section 4 describes the applicability of federal and state permitting programs. Section 5 includes a detailed applicability analysis of both federal and state regulations. Finally, the completed air permit application forms are included in Appendix D.

2. PROCESS DESCRIPTION

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 lifecycle CO₂/greenhouse gases, 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), Programme for the Endorsement of Forest Certification (PEFC), and Sustainable Biomass Program (SBP). 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. A detailed description of Enviva's Responsible Wood Supply Program can be found at:

http://www.envivabiomass.com/sustainability/wood-sourcing/responsible-wood-supply-program/

The following sections provide a description of the proposed changes to the Northampton plant. An area map and process flow diagram are provided in Appendices A and B, respectively.

2.1 Green Wood Handling and Storage (IES-GWHS)

"Green" (i.e., fresh cut) wood is delivered to the plant via trucks as either pre-chipped wood or unchipped logs from commercial harvesting for on-site chipping. Pre-chipped wood will be screened to remove oversize material which goes to the furnace fuel pile. Logs will be debarked, chipped, and sized in the, debarker (IES-DEBARK), chipper (IES-EWPC) and green wood hammermills (ES-GHM-1 through 5). Chipped wood for drying is conveyed to a chipped wood storage pile and bark is conveyed to a bark fuel storage pile. All transfer points and storage piles are captured by the green wood handling and storage (IES-GWHS).

2.2 Debarking (IES-DEBARK), Chipping (IES-EWPC), Bark Hog (IES-BARK), and Green Wood Fuel Storage Bin (IES-GWFB)

Logs will be debarked by the electric-powered rotary drum Debarker (IES-DEBARK) and then sent to the electric powered green wood chipper (IES-EPWC) to chip the wood to specification and routed to Green Wood Storage Piles. Purchased chips received by three (3) truck dumps are also transferred to Green Wood Storage Piles. Bark from the Debarker is hogged and purchased bark/fuel chips from one truck dump or walking floor trailers are transferred to the bark pile. Following storage in the Bark Fuel and Chip Storage Piles, the bark will be transferred to a blend pile and then transferred via walking floor to a covered conveyor, then to an enclosed Green Wood Fuel Storage Bin (ES-GWFB) where the material will be pushed into the furnace.

With this application, Enviva proposes to automate the chip reclaim operations by using up to three (3) truck tippers and a stacker reclaimer, as well as removing most front-end loader

usage. Enviva also plans to install a second walking floor next to the existing one associated with a new fuel blend pile for the new dryer line.

2.3 Green Wood Hammermills (ES-GHM-1 through ES-GHM-5)

With this application, Enviva is proposing to remove the currently permitted re-chippers (IES-RCHP-1 and IES-RCHP2) and construct five (5) new closed-loop green wood hammermills (ES-GHM-1 and ES-GHM-5) and route the exhaust to the existing WESP (CD-WESP-1) and to the proposed new RTO (CD-RTO-1). Prior to drying, chips from the Green Wood Storage Piles will be processed in these Green Wood Hammermills to reduce material to the proper size.

2.4 Dryers (ES-DRYER-1 and ES-DRYER-2)

The existing dryer (ES-DRYER) uses direct contact heat provided to the system via a 153 million British thermal unit per hour (MMBtu/hr) total heat input furnace that uses bark and wood chips as fuel. Green wood is fed into the dryer (ES-DRYER-1) where the moisture content is reduced to the desired level and routed to a multiclone separator (CD-DC-1) in series with wet electrostatic precipitator (CD-WESP-1) for additional particulate, metallic HAP, and hydrogen chloride removal. With this application, Enviva proposes to rename the existing dryer from ES-DRYER to ES-DRYER-1 and equip the existing dryer with a RTO (CD-RTO-1) following the existing WESP (CD-WESP-1). Enviva also proposes to install a new direct contact rotary dryer system (ES-DRYER-2) equipped with a multiclone separator (CD-DC-2), WESP (CD-WESP-2), and RTO (CD-RTO-2) to provide PM, VOC, and HAP emissions control. The new dryer, similar to the existing dryer, will use direct contact heat provided to the system via a 180 million British thermal unit per hour (MMBtu/hr) total heat input furnace that uses bark and fuel chips as fuel.

As the flue gas exits the dryers and begins to cool, wood tar can condense and coat the inner walls of the dryer ducts creating a fire risk. To prevent condensation from occurring and thus reduce the fire risk, each dryer system will include double ducts which will be heated. The duct from the cyclone outlet to the ID fan will be heated by one low-NOx burner with a maximum heat input rating of 1 MMBtu/hr and a second 1 MMBtu/hr low-NOx burner will be used to heat the duct used for exhaust gas recirculation and the WESP. The double duct burners (IES-DDB-1 through IES-DDB-4) will combust natural gas, or propane as back-up, and will exhaust directly to atmosphere.

2.5 Bypass Stacks (ES-DRYERBYP-1, ES-DRYERBYP-2, ES-FURNACEBYP-1, ES-FURNACEBYP-2)

Bypass stacks for each furnace and rotary drum dryer may be used to exhaust hot gases during start-ups (for temperature control) and malfunctions. Specifically, the Furnace Bypass Stacks will be used in the following situations:

- **Cold Start-ups:** The furnace bypass stacks will be used when the furnace is started up from a cold shutdown until the refractory is sufficiently heated and can sustain operations at a low level. The bypass stack will then be closed, and the furnace will slowly be brought up to a normal operating rate.

- Malfunction: The furnace itself can abort and open the bypass stack in the event of a malfunction. This may occur as a result of a number of different interlocks such as power failure, dryer ID fan failure, etc. As soon as the furnace aborts it will automatically switch to "idle mode" (defined as operation at up to a maximum heat input rate of 5 MMBtu/hr). The fuel feed is significantly reduced, and the heat input rate drops rapidly.
- **Planned Shutdown:** In the event of a planned shutdown the furnace heat input will be decreased, and all remaining fuel will be moved through the system to prevent a fire during the shutdown period. The remaining fuel will be combusted prior to opening the furnace bypass stack.

Conditions under which the Dryer Bypass Stacks will be used are as follows:

- Malfunction: The dryer system can abort due to a number of different interlocks such as power failure, equipment failure, or as a result of a furnace abort. If the RTO goes offline as a result of interlock failure the dryer will immediately abort. This can occur for a number of reasons (e.g., temperature out of range, damper failure, power failure, etc.). Dryer abort may also be triggered if a spark is detected.
- **Planned Shutdown:** During planned shutdowns, as the remaining fuel is combusted by the furnace, the operator will reduce the chip input to the dryer. When only a small amount of chips remains, these will be emptied to clean the dryer drum out. The dryer bypass stack will then be opened, and a purge air fan used to ensure no explosive build-up occurs in the drum. Emissions during this time will be minimal as the furnace and dryer are no longer operating.

Use of the Furnace and Dryer Bypass Stacks for start-up, shutdown, and malfunctions will be limited to 100 hours per year for each dryer line (i.e., 50 hours of furnace bypass at full capacity and 50 hours of dryer bypass at full capacity).

Each furnace may also operate up to 500 hours per year in "idle mode" with emissions routed to the Furnace Bypass Stacks. The purpose of operation in "idle mode" is to maintain the temperature of the fire brick lining the furnaces which may be damaged if it cools too rapidly. Operation in "idle mode" also significantly reduces the amount of time required to restart the dryers.

2.6 Dried Wood Handling (ES-DWH) and Dry Hammermills (ES-HM-1 through ES-HM-8)

Dried materials from the Dryer product recovery cyclones will be conveyed to screening operations that remove smaller wood particles which bypass the Dry Hammermills. Prescreening is accomplished with one (1) existing and one (1) proposed new prescreener, both of which will be controlled by a new baghouse. Oversized wood is diverted to one of eight (8) existing Dry Hammermills (ES-HM-1 through ES-HM-8) for further size reduction prior to pelletization. Each Dry Hammermill includes a product recovery cyclone (CD-HM-CYC-1 through CD-HM-CYC-8) which are routed to one of three (3) baghouses (CD-HM-BF-1 through CD-HM-BF-3) for particulate matter control. With this application, Enviva proposes to route the exhaust from the existing dry hammermill baghouses to the proposed new scrubber and RCO/RTO (CD-RCO-1) to control PM, VOC and HAP emissions.

Smaller particles passing through the screens will bypass these hammermills and be pneumatically conveyed directly to the Dry Hammermill product recovery cyclones. Enviva estimates that approximately 15% of the total material leaving the Dryer will bypass the Dry Hammermills and be sent directly to the pelletizing operations. Product from the recovery cyclones is transferred to the hammermills system discharge collection enclosed drag chain conveyor and then to the pellet mill feed silo infeed screw via enclosed drag chain conveyors. These transfer points comprise the Dried Wood Handling (ES-DWH) emission source. Due to updated emission estimates, this source will no longer be considered insignificant and therefore Enviva requests the name be changed from IES-DWH to ES-DWH.

Purchased dry shavings are used to produce wood pellets in addition to green chips or logs, forgoing the drying process and thus minimizing onsite VOC and HAP emissions. Currently the plant receives dry shavings at the bark truck dump where they are moved to an open dry shavings pile via front end loader or are received via walking floor trailer at the pile. Dry shavings are added to the dry line hopper which transfers via dry line feed conveyor to the dry hammermill feed conveyor. This system will remain in use for feeding reclaimed materials after startup of the new dry shavings system. As part of this application, Enviva is proposing to add two new Dry Shavings Hammermills (ES-DSHM-1 and ES-DSHM-2), Dry Shavings Silo (IES-DSS) to store dry shavings used in pellet production and install a Dry Shavings Baghouse (CD-DSS-BF) to control PM emissions. The purchased dry shavings will be unloaded from trucks via a new truck dump into a hopper that feeds material via enclosed conveyors to a bucket elevator that ultimately fills a silo. These transfer points will be part of the Dry Shavings emission source ID (IES-DRYSHAVE). From the silo, the dry shavings will then be transferred via an enclosed conveyor to the proposed new Dry Shavings Hammermills (ES-DSHM-1 and ES-DSHM-2) for additional processing. Milled dry shavings will be transferred via pneumatic conveyance to the pellet mill feed silo where the excess conveyance gas will be controlled via the existing feed mill silo baghouse (ES-PMFS). The dry shavings hammermill exhaust will be routed to the new scrubber and RCO/RTO (CD-RCO-1) for control of VOC and HAP emissions.

2.7 Dry Line Feed Conveyor (ES-DLC-1) and Dry Line Hopper (IES-DLH)

The Dry Line Feed Conveyor introduces pre-dried wood material into the manufacturing process at the point of the hammermill pre-screens. This system consists of a single conveyor feeding material to the pre-screener in feed conveyor. Dry material is fed via front end loader into a feed hopper and metered onto the conveyor belt. Emissions from the transfer of the material from this conveyor belt to the pre-screen infeed system are controlled using the existing hammermill baghouse (CD-HM-BF-3). With this application, Enviva proposes to remove the Nuisance Dust System as the emissions will be included in the Dried Wood Handling emission point.

2.8 Pellet Mill Feed Silo (ES-PMFS) and Pellet Cooler HP Fines Relay System (ES-PCHP)

With this application, Enviva proposes to re-name the pellet fines bin (ES-PFB-1) and associated bin vent filter (CD-PFB-BV) to Pellet Cooler HP Fines Relay System (ES-PCHP) and associated baghouse (CD-PCHP-BF).

Milled wood from the Dry Hammermill product recovery cyclones will be transported by a set of conveyors to the Pellet Mill Feed Silo (ES-PMFS) prior to pelletization. Particulate emissions from the Pellet Mill Feed Silo are controlled by a bin vent filter (CD-PMFS-BV).

Fines from the hammermill pollution control system and screening operation is collected in the pellet fines bin which is controlled by a baghouse (CD-PCHP-BF).

2.9 Additive Handling and Storage (IES-ADD)

With this application, Enviva proposes to add an Additive Silo (IES-ADD) and baghouse (CD-ADD-BF). Additive will be used in the pellet production process to increase the durability of the final product. The additive will be added to milled wood from the Pellet Mill Feed Silo discharge screw conveyor prior to transfer to the Pellet Presses. The additive contains no hazardous chemicals or VOCs.

Bulk additive material will be delivered by truck and pneumatically unloaded into a storage silo equipped with a baghouse to control emissions from air displaced during the loading of additive material to the silo. The additive will then be conveyed via screw conveyor from the storage silo to the milled fiber conveyor which transfers milled wood to the Pellet Presses.

2.10 Pellet Press System and Pellet Coolers (ES-CLR-1 through ES-CLR-6)

Dried processed wood is mechanically compacted through twelve (12) presses in the Pellet Press System. Exhaust from the Pellet Press System and Pellet Press conveyors will be vented through the Pellet Cooler aspiration material recovery cyclones and pollutant controls as described below, and then to the atmosphere. Formed pellets are discharged into one of six (6) pellet coolers (ES-CLR-1 thru ES-CLR-6). Chilled 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 (6) cyclones (CD-CLR-1 thru CD-CLR-6).

As previously discussed, Enviva is proposing to upgrade the pellet press dies to a new design. Additionally, Enviva proposes to add a new scrubber to collect the Pellet Cooler exhaust prior to routing the exhaust through the existing Dry Hammermills. The combined Pellet Cooler exhaust and Dry Hammermill exhaust will be routed through the proposed new scrubber and RCO/RTO (CD-RCO-1), as detailed in Section 2.6 above, to control VOC and HAP emissions leaving the pellet coolers.

2.11 Finished Product Handling (ES-FPH) and Loadout (ES-PL-1, ES-PL-2, ES-PB-1 through ES-PB-12)

Final product will be conveyed to twelve (12) pellet load-out bins (ES-PB-1 through ES-PB-12) that will feed two (2) pellet truck loadout operations (ES-PL-1 and ES-PL-2). Pellet loadout is accomplished by gravity feed of the pellets through a covered chute to reduce emissions. Atmospheric emissions from pellet loadout will be minimal because dried wood fines will have been removed in the pellet screener, and a slight negative pressure will be maintained in the loadout building as a fire prevention measure to prevent any build-up of dust on surfaces within the building. This slight negative pressure is produced via an induced draft fan that exhausts to the Finished Product Handling baghouse (CD-FPH-BF). This baghouse will control

emissions from Finished Product Handling (ES-FPH) and the twelve (12) Pellet Loadout Bins (ES-PB-1 through ES-PB-12).

2.12 Emergency Generator (IES-GN), Fire Water Pump Engine (IES-FWP), and Diesel Storage Tanks (IES-TK-1 through IES-TK-3)

The plant has a 350 brake horsepower (bhp) diesel-fired Emergency Generator (IES-GN) for emergency operations and a 300 bhp diesel-fired Fire Water Pump Engine (IES-FWP). Aside from maintenance and readiness testing, the generator and fire water pump engines are only utilized for emergency operations.

With this application, Enviva proposes to rename the existing tanks from IS-TK-1 and IS-TK-2 to IES-TK-1 and IES-TK-2. Diesel for the emergency generator will be stored in a tank of up to 2,500 gallons capacity (IES-TK-1) and diesel for the fire water pump engine is stored in a storage tank of up to 500 gallon capacity (IES-TK-2).

With this application, Enviva proposes to add a third diesel storage tank with a capacity of up to 5,000 gallons (IES-TK-3) for distributing diesel fuel to mobile equipment.

2.13 Propane Vaporizer (IES-PVAP)

With this application, Enviva proposes to add a propane vaporizer. A direct-fired propane vaporizer (IES-PVAP) will be located on-site to vaporize propane gas for combustion by the RTO burners, RCO burners, and double duct burners (IES-DDB-1 through IES-DDB-8).¹ The vaporizer will have a maximum heat input capacity of 1 MMBtu/hr and will combust propane. Propane may be used initially until natural gas service is completed when natural gas will be the primary fuel for all burners and propane may be used as a back-up fuel.

¹ Any activity whose emissions would not violate any applicable emissions standard and whose potential emissions of criteria pollutants before air control devices are each no more than 5 tpy are considered insignificant per 15A NCAC 02Q .0503.

3. POTENTIAL EMISSIONS QUANTIFICATION

The following summarizes the data sources and calculation methodologies used in quantifying potential emissions from the Northampton plant. Detailed potential emissions calculations are provided in Appendix C. Note that Enviva has quantified potential greenhouse gas (GHG) emissions from all applicable emissions sources; however, GHG emission are not discussed in detail below. Please refer to the detailed emission calculations provided in Appendix C for GHG emission estimates.

3.1 Green Wood Handling and Storage (IES-GWHS)

Fugitive PM emissions will result from unloading purchased chips and bark from trucks into hoppers and transfer of these materials to storage piles via conveyors. Fugitive PM emissions from chip and bark transfer operations were calculated based on AP-42 Section 13.2.4, *Aggregate Handling and Storage Piles*.² Detailed potential emission calculations are included in Appendix C.

Green wood and bark contain a high moisture content approaching 50 percent water by weight. Therefore, Green Wood Handling will have insignificant PM emissions. Per 15A NCAC 02Q .0503, Green Wood Handling and Storage (IES-GWHS) is an insignificant activity, because potential uncontrolled PM emissions are less than 5 tpy.

3.2 Green Wood Storage Piles and Bark Fuel Storage Piles (IES-GWHS)

Particulate emission factors used to quantify emissions from storage pile wind erosion for the four (4) Green Wood Storage Piles and three (3) Bark Fuel Storage Piles were calculated based on USEPA's *Control of Open Fugitive Dust Sources*.³ The number of days with rainfall greater than 0.01 inch was obtained from AP-42 Section 13.2.2, *Unpaved Roads*⁴, and the percentage of time that wind speed exceeds 12 miles per hour (mph) was determined based on the AERMOD-ready meteorological dataset for the Maxton National Weather Service (NWS) Station provided by DAQ⁵. The mean silt content of 8.4% for unpaved roads at lumber mills from AP-42 Section 13.2.2 was conservatively applied in the absence of site-specific data. The exposed surface area of the pile was calculated based on worst-case pile dimensions.

VOC emissions from storage piles were quantified based on the exposed surface area of the pile and emission factors from the National Council for Air and Stream Improvement (NCASI). NCASI emission factors range from 1.6 to 3.6 pounds (lb) VOC as carbon/acre-day; however, emissions were conservatively based on the maximum emission factor. Detailed potential emission calculations are included in Appendix C.

² USEPA AP-42 Section 13.2.4, Aggregate Handling and Storage Piles (11/06).

³ USEPA *Control of Open Fugitive Dust Sources*, Research Triangle Park, North Carolina, EPA-450/3-88-008. September 1988.

⁴ USEPA AP-42 Section 13.2.2, Unpaved Roads (11/06).

⁵ Data provided via email to Aubrey Jones (Ramboll) by Matthew Porter (NC DAQ) on July 27, 2017.

3.3 Debarker (IES-DEBARK) and Bark Hog (IES-BARK)

PM emissions occur as a result of log debarking and processing. Potential PM emissions from debarking and the bark hog were quantified based on emission factors from EPA's *AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants* for Source Classification Code (SCC) 3-07-008-01 (Log Debarking).⁶ All PM was assumed to be larger than 2.5 microns in diameter. PM emissions from debarking will be minimal due to the high moisture content of green wood (~50%) and the fact that bark is removed in pieces larger than that which can become airborne. A 90% control efficiency was applied for use of water spray. The Bark Hog is also primarily enclosed, and a 90% control efficiency was applied for partial enclosure. VOC and methanol emissions were quantified based on emission factors for log chipping from AP-42 Section 10.6.3, *Medium Density Fiberboard*.⁷ Detailed potential emission calculations for the debarker and bark hog are included in Appendix C.

The Debarker (IES-DEBARK) and Bark Hog (IES-BARK) are considered insignificant activities per 15A NCAC 02Q .0503 due to potential uncontrolled PM emissions less than 5 tpy.

3.4 Chipper (IES-EPWC)

The chipping process will result in emissions of VOC and HAP. VOC and HAP emissions were quantified based on emission factors for log chipping from AP-42 Section 10.6.3, *Medium Density Fiberboard* and AP-42 Section 10.6.4, *Hardboard and Fiberboard*. Detailed emission calculations are included in Appendix C.

The chipper is considered an insignificant activity per 15A NCAC 02Q .0503 due to potential uncontrolled emissions less than 1 lb/hr.

3.5 Green Wood Fuel Storage Bin

Bark will be transferred from the fuel storage piles via a walking floor to a covered conveyor and then to the fully enclosed Fuel Storage Bin. Due to complete enclosure of the Fuel Storage Bin, emissions from transfer of material into the bin were not specifically quantified.

3.6 Dryers (ES-DRYER-1 and ES-DRYER-2) and Green Wood Hammermills (ES-GHM-1 through ES-GHM-5)

Exhaust from the dryers will be routed to two dedicated Multicyclone/WESP/RTO control systems (one for each dryer line) for control of PM, VOC, and HAP. The Green Wood Hammermills will share the existing dryer's WESP/RTO control system for control of PM, VOC, and HAP. Uncontrolled PM, PM less than 10 microns in diameter (PM₁₀), PM less than 2.5 microns in diameter (PM_{2.5}) emission factors for green wood combustion were provided by the WESP vendor. Carbon monoxide (CO) emissions generated during green wood combustion are based on data from similar Enviva facilities and information from the NCASI database. Oxides of nitrogen (NO_X) emissions are based on stack test results from similar facilities plus a

⁶ USEPA. Office of Air Quality Planning and Standards. *AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants*. EPA 450/4-90-003. March 1990.

⁷ USEPA AP-42 Section 10.6.3, *Medium Density Fiberboard Manufacturing* (08/02).

20% contingency. Potential emissions of sulfur dioxide (SO₂) from green wood combustion were calculated based on the heat input of the dryer burners and an emission factor for wood combustion from AP-42, Section 1.6, *Wood Residue Combustion in Boilers*. VOC emissions were calculated using an emission factor derived from stack testing conducted at Enviva and other similar wood pellet manufacturing facilities. HAP and toxics air pollutant (TAP) emissions from green wood combustion were calculated based on emission factors from several data sources including stack testing data from other similar facilities, engineering judgement/process knowledge, and emission factors from AP-42 Section 1.6, *Wood Residue Combustion in Boilers⁸*. Detailed potential emission calculations are provided in Appendix C.

Emissions from natural gas and propane combustion by the RTO were calculated based on AP-42 Section 1.4, *Natural Gas Combustion*, AP-42 Section 1.5, *Liquefied Petroleum Gas Combustion*, NC DAQ's Wood Waste Combustion Spreadsheet⁹, and emission factors from the South Coast Air Quality Management District's (SCAQMD) Air Emissions Reporting (AER) Tool. Detailed emission calculations are included in Appendix C.

3.6.1 Dryer Bypass (Full Capacity)

Bypass stacks following each furnace and rotary drum dryer will be used to exhaust hot gases during start-up (for temperature control), shutdown, and malfunctions. Potential emissions associated with dryer bypass were calculated based on stack testing data from comparable Enviva facilities with the exception of condensable PM and SO₂ emissions which were calculated based on emission factors from AP-42 Section 1.6, *Wood Residue Combustion in Boilers*. Emissions were based on the full capacity of the furnaces and 50 hours per year per dryer. Detailed potential emission calculations are included in Appendix C.

3.6.2 Furnace Bypass (Full Capacity)

Potential emissions of CO, NO_X, SO₂, PM, VOC, and HAP for furnace bypass conditions were calculated based on emission factors from AP-42 Section 1.6, *Wood Residue Combustion in Boilers*. Filterable PM emissions were calculated based on stack testing data from a comparable Enviva plant. Emissions were based on the full capacity of the furnaces and 50 hours per year per furnace. Detailed potential emission calculations are included in Appendix C.

3.6.3 Furnace Bypass (Idle Mode)

Each furnace will operate up to 500 hours per year in "idle mode", which is defined as operation up to a maximum heat input rate of 5 MMBtu/hr. During this time, emissions will exhaust out of the furnace bypass stacks. Potential emissions of CO, NO_X, SO₂, PM, VOC, and HAP were calculated based on emission factors from AP-42 Section 1.6, *Wood Residue Combustion in Boilers*. Detailed potential emission calculations are included in Appendix C.

⁸ USEPA AP-42 Section 1.6, Wood Residue Combustion in Boilers (09/03).

⁹ NCDAQ Wood Waste Combustion Spreadsheet for a wood stoker boiler. Available online at: https://files.nc.gov/ncdeq/Air%20Quality/permits/files/WWC_rev_K_20170308.xlsx.

3.6.4 Double Duct Burners (IES-DDB-1 through IES-DDB-8) and Propane Vaporizer (IES-PVAP)

Emissions from natural gas and propane combustion by the double duct burners (IES-DDB-1 through IES-DDB-8) and propane vaporizer (IES-PVAP) were calculated based on AP-42 Section 1.4, *Natural Gas Combustion*, AP-42 Section 1.5, *Liquefied Petroleum Gas Combustion*, NC DAQ's Wood Waste Combustion Spreadsheet, and emission factors from the South Coast Air Quality Management District's (SCAQMD) Air Emissions Reporting (AER) Tool. Detailed emission calculations are included in Appendix C.

Per 15A NCAC 02Q .0503, the double duct burners (IES-DDB-1 through IES-DDB-8) and propane vaporizer (IES-PVAP) are considered insignificant activities because potential uncontrolled emissions are less than 5 tpy.

3.7 Dried Wood Handling (ES-DWH)

As previously described in Section 2, Dried Wood Handling (ES-DWH) will include conveyor transfer points located between the Dryer and Dry Hammermills and the Dry Hammermills and Pellet Mills. Emissions from these transfers will be routed through a baghouse (CD-DWH-BF). Particulate emissions from the baghouse were calculated based on the exhaust flow rate and exit grain loading. Detailed potential emission calculations are provided in Appendix C.

3.8 Dry Shavings Handling (IES-DRYSHAVE), Dry Line Feed Conveyor (ES-DLC-1) and Dry Line Hopper (IES-DLH)

Particulate emissions will occur during unloading of dry shavings walking floor trucks to the dry shavings pile (IES-DRYSHAVE). Potential emissions were calculated based on AP-42, Section 13.2.4, *Aggregate Handling and Storage Piles*.¹⁰ A front end loader fills the Dry Line Hopper (IES-DLH) which feeds the dry line feed conveyor (ES-DLC-1) will introduce pre-dried wood into the process prior to the hammermills and is controlled by one baghouse (CD-HM-BF-3). PM emissions from the baghouse were calculated using the exhaust flow rate and exit grain loading. The exhaust of CD-HM-BF-3 will be routed to the proposed new scrubber and RCO/RTO. Detailed potential emissions calculations are provided in Appendix C.

Emissions from the dry line hopper were calculated using equation 1 in AP-42 Section 13.2.4. Wind speed reduction to 2 mph was added as a control due to the transfer being enclosed. Per 15A NCAC 02Q .0503, the dry line hopper will be re-classified as an insignificant activity due to emissions below 5 tpy. Detailed potential emissions calculations can be found in Appendix C.

3.9 Dry Shavings Handling and Silo (IES-DRYSHAVE-1 and IES-DSS)

Particulate emissions will occur during unloading of dry shavings from the new dry shavings truck dump. Potential emissions were calculated based on AP-42, Section 13.2.4, *Aggregate Handling and Storage Piles*.¹⁰ Dry shavings will be transferred into the new dry shavings silo via an enclosed conveyor and bucket elevator. Because the actual transfer will be enclosed within the silo, wind speed was reduced to 2 mph as a control for this material transfer point.

¹⁰ USEPA AP-42 Section 13.2.4, *Aggregate Handling and Storage Piles* (11/06).

Particulate emissions from the baghouse on the dry shavings silo were calculated based on the exhaust flow rate and exit grain loading. Detailed potential emission calculations are provided in Appendix C.

Per 15A NCAC 02Q .0503, Dry Shavings Handling (IES-DRYSHAVE) and the Dry Shavings Silo (IES-DSS) are considered insignificant activities because potential uncontrolled PM emissions are less than 5 tpy.

3.10 Dry Hammermills (ES-HM-1 through 8) and Dry Shavings Hammermills (ES-DSHM-1 and ES-DSHM-2)

The Dry Hammermills generate PM, VOC, and HAP emissions during the process of reducing wood chips to the required size. PM emissions from the existing Dry Hammermill cyclones are controlled using baghouses (CD-HM-BF-1 through CD-HM-BF-3). PM emissions from the proposed new Dry Shavings Hammermills (ES-DSHM-1 and ES-DSHM-2) will be controlled using existing baghouses (CD-HM-BF-1 through CD-HM-BF-3). Particulate emissions from each baghouse were calculated using a manufacturer guaranteed exit grain loading rate and the maximum nominal exhaust flow rate of the baghouse. Appendix C summarizes the potential PM emissions from each Dry Hammermill baghouse.

The Dry Hammermill and Dry Shavings Hammermill exhaust will be routed to the proposed new scrubber and RCO/RTO for HAP and VOC control. Detailed calculations are provided in Appendix C for the dry hammermills and dry shavings hammermill.

3.11 Pellet Cooler HP Fines Relay System (ES-PCHP)

As previously described in Section 2, an induced draft fan will be used to transfer dust generated from a number of enclosed transfer/handling sources around the Dry Hammermill Area to the Pellet Cooler HP Fines Relay System, controlled by a baghouse (CD-PCHP-BF). PM emissions from this baghouse, which will control emissions from ES-PCHP, were calculated based on a manufacturer guaranteed exit grain loading rate and the maximum nominal exhaust flow rate of the baghouse. Potential emission calculations are provided in Appendix C.

3.12 Pellet Mill Feed Silo (ES-PMFS)

The Pellet Mill Feed Silo is equipped with a bin vent filter (CD-PMFS-BV) to control PM emissions associated with silo loading and unloading operations. PM emissions are calculated based on a manufacturer guaranteed exit grain loading rate and the maximum nominal exhaust flow rate of the baghouse. Potential emission calculations are provided in Appendix C.

3.13 Additive Handling and Storage (IES-ADD)

An additive will be used in the pellet production process to increase the durability of the final product. Material will be pneumatically conveyed from the delivery trucks to the storage silo equipped with a baghouse (CD-ADD-BF). PM emissions from the baghouse were calculated based on an exit grain loading rate and the maximum nominal exhaust flow rate of the baghouse. Detailed potential emissions calculations are provided in Appendix C.

3.14 Pellet Press System and Pellet Coolers (ES-CLR-1 through ES-CLR-6)

Pellet Press and Pellet Cooler operations will generate PM, HAP, and VOC emissions during the forming and cooling of wood pellets. The Pellet Mills and Coolers are equipped with six (6) simple cyclones (CD-CLR-1 through CD-CLR-6) followed by a wet scrubber for PM control prior to exhausting through the Dry Hammermills and then through the proposed scrubber and RCO/RTO (CD-RCO-1), following the Dry Hammermill baghouses, for VOC and HAP control. PM emissions from the Pellet Press System (Pellet Mills) and Pellet Coolers were calculated based on a maximum exit grain loading rate and the maximum nominal exhaust flow rate for the proposed scrubber. Enviva also proposes to install a bypass allowing the Pellet Mill and Cooler exhaust to route directly to the proposed new scrubber and RCO/RTO to allow the Pellet Mills to continue to operate when the Dry Hammermills are shut down. Refer to Appendix C for detailed potential PM emissions calculations.

Uncontrolled VOC and HAP emissions at the outlet of the Pellet Cooler wet scrubber were quantified based on stack testing data from comparable Enviva plants and/or engineering judgement/process knowledge, including any appropriate contingency. This includes emissions from both the Pellet Mills and the Pellet Coolers. Controlled emissions were conservatively based on a 95% control efficiency for the RCO/RTO based on vendor data. Detailed calculations are provided in Appendix C.

3.15 Pellet Loadout Bins (ES-PB-1 through ES-PB-12), Pellet Mill Loadout (ES-PL-1 and ES-PL-2), and Finished Product Handling (ES-FPH)

PM emissions result from the transfer of finished product to the Pellet Loadout Bins. PM emissions from transfers associated with Finished Product Handling, Pellet Mill Loadout, and the Pellet Loadout Bins will be controlled by a baghouse (CD-FPH-BF). Potential PM emissions from the baghouse were calculated based on a maximum exit grain loading rate and the maximum nominal exhaust flow rate of the baghouse. Detailed potential emissions calculations are provided in Appendix C.

3.16 Emergency Generator (IES-GN) and Fire Water Pump Engine (IES-FWP)

Operation of the Emergency Generator and Fire Water Pump generates emissions of criteria pollutants and HAP. Potential PM, NO_X, VOC, and CO emissions from operation of the Emergency Generator and Fire Water Pump Engine were calculated based on emission factors from NSPS Subpart IIII (or 40 CFR 89 where applicable) and the maximum horsepower rating of the engines. Potential SO₂ emissions were calculated based on the fuel sulfur restriction in NSPS Subpart IIII, and by assuming that all the sulfur present in the diesel fuel becomes SO₂ air emissions.¹¹ Potential VOC and HAP emissions were quantified based on emission factors from AP-42 Section 3.3, *Stationary Internal Combustion Engines*.¹² Annual potential emissions were conservatively calculated based on 500 hours per year.

¹¹ Sulfur content in accordance with Year 2010 standards of 40 CFR 80.510(b) as required by NSPS Subpart IIII.

¹² USEPA AP-42 Section 3.3, *Stationary Internal Combustion Engines* (10/96).

The Emergency Generator and Fire Water Pump Engine are considered insignificant activities pursuant to 15A NCAC 02Q .0503. Refer to Appendix C for detailed potential emission calculations.

3.17 Diesel Storage Tanks (IES-TK-1 through IES-TK-3)

The storage of diesel in on-site storage tanks will generate emissions of VOC. VOC emissions from the three (3) Diesel Storage Tanks were calculated using EPA's TANKS 4.0 software based on actual tank characteristics (e.g., orientation, dimensions, etc.) and potential annual throughput. VOC emissions from the storage tanks are below 5 tpy and thus, per 15A NCAC 02Q .0503 they are listed as insignificant sources in the permit. Refer to Appendix C for detailed potential emission calculations.

3.18 Paved Roads

Fugitive PM emissions will occur as a result of trucks and employee vehicles traveling on paved roads on the Northampton plant property. Emission factors were calculated based on Equation 2 from AP-42 Section 13.2.1, *Paved Roads*¹³ using the mean silt loading for quarries (8.2 g/m²) and 120 days with rainfall greater than 0.01 inch based on Figure 13.2.1-2. A 90% control efficiency was applied for water/dust suppression activities. This control efficiency is based on data from the *Air Pollution Engineering Manual* of the Air and Waste Management Association. Refer to Appendix C for detailed potential emissions calculations.

3.19 Unpaved Roads

Fugitive PM emissions will occur as a result of trucks and employee vehicles traveling on unpaved roads on the Northampton plant property. Emission factors were calculated based on Equation 1a from AP-42 Section 13.2.2, *Unpaved Roads*¹⁴ using a surface material silt content (8.4%) and 120 days with rainfall greater than 0.01 inch based on Figure 13.2.1-2. A 90% control efficiency was applied for water/dust suppression activities. This control efficiency is based on data from the *Air Pollution Engineering Manual* of the Air and Waste Management Association. Refer to Appendix C for detailed potential emissions calculations.

¹³ USEPA AP-42 Section 13.2.1, Paved Roads (01/11).

¹⁴ USEPA AP-42 Section 13.2.2, Unpaved Roads (01/11).

4. STATE AND FEDERAL PERMITTING APPLICABILITY

The Enviva Northampton plant is potentially subject to numerous federal and state air quality permitting requirements. The following sections summarize the applicability of these requirements.

4.1 Federal Permitting Programs

The federal NSR permitting program includes requirements for construction of new sources, and modifications to existing sources, while the Title V Operating Permit Program includes requirements for operation of Title V major sources. The following sections discuss the applicability of these requirements to the Northampton plant.

4.1.1 New Source Review

NSR is a federal pre-construction permitting program that applies to certain major stationary sources. The federal NSR permitting program is implemented in North Carolina pursuant to 15A NCAC 2D .0530 and 15A NCAC 2D .0531. The primary purpose of NSR is to support the attainment and maintenance of ambient air quality standards across the country. There are two distinct permitting programs under NSR. The particular program that applies depends on the ambient air quality in the geographic area in which the source is located. The two programs are nonattainment NSR (NNSR) (15A NCAC 2D .0531) and PSD (15A NCAC 2D .0530). Because NNSR and PSD requirements are pollutant-specific, a stationary source can be subject to NNSR requirements for one or more regulated NSR pollutants and to PSD requirements for the remaining regulated NSR pollutants.

NNSR permitting requirements apply to an existing stationary source located in an area where concentrations of a "criteria pollutant"¹⁵ exceed the National Ambient Air Quality Standard (NAAQS) for that pollutant. PSD permitting requirements apply to stationary sources located in an area where concentrations of criteria pollutants do not exceed a NAAQS.

The Northampton plant is in Northampton County which is classified as attainment or unclassifiable for all criteria pollutants.¹⁶ The Northampton plant is currently permitted as a PSD major source because facility-wide potential emissions of one or more criteria pollutants have previously been estimated to exceed the major source threshold of 250 tpy. Enviva is submitting this permit application to authorize construction to meet new customer softwood percentage and production rate demands and to incorporate significant emission reduction efforts to minimize emissions impacts associated with the project. Because of these changes, the Northampton plant's potential emissions for all criteria pollutants will be less than the PSD major source thresholds of 250 tpy and, thus, the facility will be classified as a PSD minor source. A comparison of the currently permitted PTE to the proposed PTE after incorporating the changes proposed in this application is provided in Table 4.1.

¹⁵ The following are "criteria pollutants" under current NSR regulations: CO, nitrogen dioxide, SO₂, PM₁₀, PM_{2.5}, ozone (VOCs and NO_x), and lead.

^{16 40} CFR 81.334

Emissions Scenario	CO (tpy)	NO _x (tpy)	PM (tpy)	РМ₁₀ (tрy)	РМ _{2.5} (tру)	SO₂ (tpy)	VOC (tpy)	CO₂e (tpy)	Total HAPs (tpy)
Proposed PTE ¹	176.73	143.37	209.57	139.73	84.56	37.01	135.07	369,261.02	20.88
Previous PTE	61.88	126.57	128.84	121.79	93.79	19.20	456.40	162,292.20	37.82
Change in PTE	+114.85	+16.8	+80.73	+17.94	-9.23	+17.81	-321.33	+206,968.82	-16.94

Table 4-1. Change in Potential to Emit

^{1.} Proposed PTE (excluding fugitive emission sources) from Appendix C, Tables 2 and 3.

4.1.2 Title V Operating Permit Program

The federal Title V Operating Permit program is promulgated in 40 CFR Part 70 and is implemented in North Carolina via 15A NCAC 2Q .0500. The Northampton plant is and will remain a major source with respect to the Title V Operating Permit Program because facility-wide emissions of one or more criteria pollutants exceed the major source threshold of 100 tpy. Currently, the plant is considered a major source of HAP due to total HAP emissions exceeding the major source thresholds of 25 tpy. However, the emission reductions proposed as part of this modification will result in a net decrease in HAP emissions. After the project is completed, the Northampton plant will be a minor source of HAP.

4.2 North Carolina Permitting Program

In addition to the Title V permitting requirements in 15 NCAC 02Q .0500, specific requirements for permitting of construction and operation of new and modified sources are included in 15A NCAC 02Q .0300, in accordance with North Carolina's State Implementation Plan (SIP). The proposed changes are subject to the permitting procedures under 15A NCAC 02Q .0300, and the required application forms are included as Appendix D.

5. **REGULATORY APPLICABILITY**

The Northampton plant will be subject to federal and state air quality regulations. The following addresses all potentially applicable regulations.

5.1 New Source Performance Standards

New Source Performance Standards (NSPS) apply to new and modified sources and require sources to control emissions in accordance with standards set forth at 40 CFR Part 60. NSPS standards in 40 CFR Part 60 have been incorporated by reference in 15A NCAC 02D .0524.

5.1.1 40 CFR 60 Subpart A – General Provisions

All sources subject to a NSPS are subject to the general requirements under Subpart A unless excluded by the source-specific subpart. Subpart A includes requirements for initial notification, performance testing, recordkeeping, monitoring, and reporting. Subpart A is applicable because the Emergency Generator and Fire Water Pump Engine are subject to NSPS Subpart IIII.

5.1.2 40 CFR 60 Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

NSPS Subpart Dc applies to owners or operators of steam generating units for which construction, modification, or reconstruction is commenced after June 9, 1989 and that have a maximum design heat input of 100 MMBtu/hr or less but greater than or equal to 10 MMBtu/hr. The proposed Propane Vaporizer and double duct burners each have a maximum heat input of 1 MMBtu/hr and are not steam generating units; therefore, NSPS Subpart Dc does not apply.

5.1.3 40 CFR 60 Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

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. The 350 bhp Emergency Generator and 300 bhp Fire Water Pump Engine at the Northampton plant will be subject to NSPS Subpart IIII.

5.2 National Emission Standards for Hazardous Air Pollutants

National Emission Standards for Hazardous Air Pollutants (NESHAP) regulate HAP emissions and are applicable to certain major and area sources of HAP. NESHAP can be found in 40 CFR Part 63 and have been incorporated by reference in 15A NCAC 02D .1111. As previously discussed, the Northampton plant will be a minor source of HAP due to facility-wide total HAP emissions being below 25 tpy and maximum individual HAP emissions below 10 tpy. Please refer to emission calculations provided in Appendix C.

5.2.1 40 CFR 63 Subpart A – General Provisions

All sources subject to a NESHAP are subject to the general requirements under Subpart A unless excluded by the source-specific subpart. Subpart A includes requirements for initial notification, performance testing, recordkeeping, monitoring, and reporting. The Northampton plant has sources subject to Subpart ZZZZ of this part and thus, Subpart A is also applicable to these sources.

5.2.2 40 CFR 63 Subpart B – Requirements for Control Technology Determinations for Major Sources in Accordance with Clean Air Act Section 112(g)

Clean Air Act (CAA) Section 112(g)(2)(B) requires that a new or reconstructed stationary source that does not belong to a regulated "source category" for which a NESHAP has been promulgated must control emissions to levels that reflect "maximum achievable control technology" (MACT). As provided in §63.40(b), a case-by-case MACT evaluation is only required prior to the construction or reconstruction of a major source of HAP emissions. The Northampton plant will not be subject to 112(g) since they will be a minor source of HAP.

5.2.3 40 CFR 63 Subpart DDDD – NESHAP for Plywood and Composite Wood Products

Subpart DDDD regulates HAP emissions from plywood and composite wood products (PCWP) manufacturing facilities located at major sources of HAPs. A PCWP manufacturing facility is defined in §63.2292 as one that manufactures plywood and/or composite wood products by bonding wood material or agricultural fiber to form a panel, engineered wood product, or other product defined in §63.2292. Further, an engineered wood product is defined as a product made with wood elements that are bound together with resin, such as laminated strand lumber and glue-laminated beams. The wood pellets that will be manufactured at the Northampton plant will not meet the definition for any of the PCWP products defined in §63.2292 as being subject to Subpart DDDD. Specifically, the wood pellets are not an engineered wood product, as they will not be bound together with resin or other chemical agent. Further, the Northampton facility will not be a major source of HAPs following the changes proposed. As such, this regulation is not applicable.

5.2.4 40 CFR 63 Subpart ZZZZ – NESHAP for Stationary Reciprocating Internal Combustion Engines

Subpart ZZZZ applies to reciprocating internal combustion engines (RICE) located at a major or area source of HAP emissions. Emergency stationary RICE are defined in §63.6675 as any stationary RICE that operates in an emergency situation. These situations include engines used for power generation when a normal power source is interrupted, or when engines are used to pump water in the case of fire or flood. The Northampton plant's Emergency Generator and emergency Fire Water Pump Engine will both be classified as emergency RICE under Subpart ZZZZ. Further, the engines will both be classified as new sources, as they will be constructed after June 12, 2006.

New or reconstructed CI engines with ratings less than or equal to 500 bhp located at an area source of HAP, including the plant's 350 bhp Emergency Generator and 300 bhp Fire Water Pump Engine, are only subject to the requirement to comply with the applicable provisions of

NSPS Subpart IIII, per §63.6590(c)(1), and no further requirements apply under Subpart ZZZZ.

5.2.5 40 CFR 63 Subpart DDDDD – NESHAP for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters

Subpart DDDDD, also referred to as the Boiler MACT, provides emission standards for boilers and process heaters located at major sources of HAP emissions. The rule defines a process heater in §63.7575 as an enclosed device using a controlled flame, and the unit's primary purpose is to transfer heat <u>indirectly</u> to a process material (liquid, gas, or solid) or to a heat transfer material (e.g., glycol or a mixture of glycol and water) for use in a process unit, instead of generating steam. The Northampton plant's dryers will each be heated by a wood-fired furnace burner system; however, the furnace burner systems will provide <u>direct</u> heating of the wood chips, not indirect. As such, Subpart DDDDD does not apply to the wood-fired furnace burner systems.

As previously discussed, a Propane Vaporizer will be used to convert liquid propane to a gas for combustion by the RTO burners, RCO burners, and burners for the dryer double ducts. The vaporizer will be used to heat liquid propane which is a fuel and not a process material or heat transfer material. As such, the Propane Vaporizer is not a process heater and Subpart DDDDD does not apply.

Burners will be used to heat the dryer double ducts; however, these burners will provide direct heating of the ducts. As such, Subpart DDDDD does not apply.

5.3 Compliance Assurance Monitoring

Compliance Assurance Monitoring (CAM) under 40 CFR Part 64 applies to emission units located at a Title V major source that use a control device to achieve compliance with an emission limit and whose pre-controlled emissions exceed the major source thresholds. A CAM plan is required to be submitted with the initial Title V operating permit application for emission units whose post-controlled emissions exceed the major source thresholds (i.e., large pollutant-specific emission units [PSEU]).¹⁷ For emission units with post-controlled emissions below the major source thresholds, a CAM plan must be submitted with the first Title V permit renewal application.¹⁸

The Dryers (ES-DRYER-1 and ES-DRYER-2) and five (5) Green Wood Hammermills (ES-GHM-1 through ES-GHM-5) are each subject to a PM emission limit under 15A NCAC 02D .0515 and will utilize a WESP (CD-WESP-1 and CD-WESP-2) to meet this limit. However, combined, the Dryers and Green Wood Hammermills post-controlled PM emissions are below the major source threshold. The exhaust from both the Dryers and Green Wood Hammermills will be controlled by RTOs (CD-RTO-1 and CD-RTO-2) following the WESP; however, the RTO will not be installed to meet a specific emission limit but rather to reduce the plant's potential VOC emissions below the PSD major source threshold. There is no other applicable VOC limit for the Dryers or Green Wood Hammermills. As such, a CAM plan is not required for VOC. A CAM

^{17 §64.5(}a)

¹⁸ §64.5(b)

plan for PM is required to be submitted for the Dryers and Green Wood Hammermills with the initial Title V permit renewal application.

The Pellet Coolers (ES-CLR-1 through ES-CLR-6) are also subject to a PM emission limit under 15A NCAC 02D .0515 and will utilize six (6) individual high efficiency cyclones to meet this limit. Post-controlled PM emissions will be below the major source threshold. A scrubber and RCO/RTO (CD-RCO-1) will be installed to control VOC from the Pellet Mills and Pellet Coolers; however, the RCO/RTO will not be installed to meet a specific emission limit but rather to reduce the plant's potential VOC emissions below the PSD major source threshold. There is no other applicable VOC limit for the Pellet Coolers. As such, a CAM plan is not required for VOC. A CAM plan for PM will be submitted for the Pellet Press System and Pellet Coolers (ES-CLR-1 through ES-CLR-6) with the initial Title V permit renewal application.

All other emission units at the Northampton plant have pre-controlled emissions below the major source threshold and/or do not use a control device as defined in §64.1. For those with control devices, the post-controlled emissions are below the major source threshold and thus, if CAM is applicable, it will not need to be addressed until the first Title V permit renewal application.

5.4 Chemical Accident Prevention Provisions

The Chemical Accident Prevention Provisions, promulgated in 40 CFR Part 68, provide requirements for the development of risk management plans (RMP) for regulated substances. Applicability of RMP requirements is based on the types and amounts of chemicals stored at a facility. Propane, which is a regulated substance under Subpart F of this rule, will be stored at the Northampton facility to be used as a fuel for the RTO burners, RCO burners, and dryer system double duct burners. Per §68.126, substances used as a fuel or held for sale as a fuel at a retail facility are excluded from all provisions; therefore, an RMP is not required for the Northampton facility.

5.5 North Carolina Administrative Code

The Northampton plant sources will be subject to regulations contained within 15A NCAC 02D and 02Q. Potentially applicable regulations are addressed in the following sections.

5.5.1 15A NCAC 02D .0504 Particulates from Wood Burning Indirect Heat Exchangers

15A NCAC 02D .0504 provides PM emission limits for <u>indirect</u> heat exchangers combusting wood. An indirect heat exchanger is defined as equipment used for the alteration of the temperature of one fluid by the use of another fluid in which the two fluids are not mixed. The Dryers will each be heated by a wood-fired furnace burner system; however, the furnace burner systems provide <u>direct</u> heating of the wood chips, not indirect. As such, this regulation does not apply.

5.5.2 15A NCAC 02D .0515 Particulates from Miscellaneous Industrial Processes

PM emissions from all emission sources subject to permitting are regulated under 15A NCAC 02D .0515. This regulation limits 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 (tph), and $E=55 \times P^{0.11}$ -40 for process rates greater than or equal to 30 tph. All emissions from PM sources at the Northampton plant will either be negligible or controlled by cyclones, baghouses, a scrubber, or a WESP, and thus, will comply with this requirement. The process weight limit for each emission point is summarized in Table 5-1 below.

Table 5-1. Process Weight Limits for Northampton Emission Points							
Emission Point ID	Source Description	Control Device	Process Weight Input Rate (tph)	Allowable Emission Rate (lb/hr)			
ES-DRYER-1	One (1) 153 MMBtu/hr Wood-fired Direct	CD-DC-1; CD-WESP-1; CD-RTO-1	136	54.4			
ES-DRYER-2	One (1) 180 MMBtu/hr Wood-fired Direct	CD-DC-2; CD-WESP-2; CD-RTO-2	136	54.4			
ES-DWH	Dried Wood Handling	CD-DWH-BF	175	57.1			
IES-GWHS	Green Wood Handling and Storage	N/A	400	66.3			
IES-DLH	Dry Line Hopper	N/A	171	56.8			
IES- DRYSHAVE and IES- DRYSHAVE-1	Dry Shavings Handling and Storage	N/A	142	54.8			
IES-DSS	Dry Shaving Silo	CD-DSS-BF	48	44.2			
ES-DSHM-1 and ES- DSHM-2	Dry Shavings Hammermills	CD-DSHM- BF; CD-WS- 1; CD-RCO-1	25	35.8			
IES-EPWC	S-EPWC Electric Powered N/A Green Wood Chipper		239	60.4			
ES-GHM-1 through ES- GHM-5	Green Hammermills 1 through 5	CD-DC-1; CD-WESP-1; CD-RTO-1	299	63.0			
IES-BARK	Bark Hog	N/A	63	46.8			
IES-DEBARK	Debarker	N/A	210	59.0			
ES-HM-1 through ES- HM-8	Dry Hammermills 1 through 8	CD-HM-CYC- 1 through	152	55.6			

		CD-HM-CYC-		
		8;		
		CD-HM-BF-1		
		through		
		CD-HM-BF-3;		
		CD-WS-1;		
		CD-RCO-1		
ES-PS-1 and	Dry Hammermill	CD-PS-BF	175	57.1
ES-PS-2	Prescreeners 1 and 2		175	57.1
ES-PMFS	Pellet Mill Feed Silo	CD-PMFS-BV	150	/
			152	55.6
ES-CLR-1	Pellet Press and	CD-CLR-1		
through ES-	Coolers 1 through 6	through		
CLR-6		CD-CLR-6;	152	55.6
		CD-WS-1;		
		CD-RCO-1		
ES-PCHP	Pellet Cooler HP Fines	CD-PCHP-BF	10	19.0
	Relay System		10	17.0
IES-ADD	Additive Handling and	CD-ADD-BF	20	30.5
	Storage		20	30.5
ES-FPH; ES-	Finished Product	CD-FPH-BV		
PB-1 through	Handling; Twelve			
ES-PB-12;	pellet loadout bins;		152	55.6
ES-PL-1 and	Pellet mill load-out 1			
ES-PL-2	and 2			

5.5.3 15A NCAC 02D .0516 Sulfur Dioxide Emissions from Combustion Sources

Emissions of SO₂ from combustion sources may not exceed 2.3 pounds of SO₂ per MMBtu input. The Emergency Generator (IES-EG) and Fire Water Pump (IES-FWP) will use ultra-low sulfur diesel, the Dryer furnace burner systems will combust bark and wood chips, and the RTOs and RCO will utilize natural gas or propane, each of which contain low amounts of sulfur and will result in SO₂ emissions below the limit of 2.3 lb/MMBtu.

5.5.4 15A NCAC 02D .0521 Control of Visible Emissions

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 at the facility that may have visible emissions.

5.5.5 15A NCAC 02D .0540 Particulate from Fugitive Dust Emission Sources

15A NCAC 02D .0540 requires a fugitive dust control plan be prepared if ambient monitoring or air dispersion modeling show a violation or the potential for a violation of a PM NAAQS, or if NC DAQ observes excess fugitive dust emissions from the facility beyond the property boundary for six (6) minutes in any one hour using EPA Method 22. Based on the relatively low emissions from fugitive dust sources, Enviva does not believe a fugitive dust control plan is necessary.

5.5.6 15A NCAC 02D .1100 Control of Toxic Air Pollutant Emissions

15A NCAC 02D .1100 outlines the procedures that must be followed if a TAP permit and associated modeling are required under 15A NCAC 02Q .0700. Under 15A NCAC 02Q .0704(d), a TAP permit application is required to include an evaluation of the TAP emissions from a facility's sources, excluding exempt sources listed in Rule .0702 of this Section. Per NCAC 02Q .0706, the facility shall submit an application that complies with 15A NCAC 02 D .1100 if the modification results in a net increase in emissions or ambient concentration as determined in 15A NCAC 02D .1106 and 15A NCAC 02Q .0709 of any toxic air pollutant that the facility was emitting before the modification; or (2) emissions of any toxic air pollutant that the facility was not emitting before the modification if such emissions exceed the levels set forth in 15A NCAC 02Q .0711. Air Toxics Modeling was performed for this facility and is discussed in section 6 below.

6. TOXICS MODELING ANALYSIS

A TAP permit application is required to include an evaluation of TAP emissions from a facility's sources, excluding exempt sources listed under 15A NCAC 02Q .0702(a)(18). 15A NCAC 02D .1100 outlines the procedures that must be followed if a TAP permit and associated modeling is required under 15A NCAC 02Q .0700. The following sections outline the data sources and methodologies used in completing the TAP air quality analysis for the Northampton plant.

6.1 State Requirements

Dispersion modeling was conducted for each TAP with post-project facility-wide potential emissions in excess of its respective Toxic Permitting Emission Rate (TPER). The analysis was conducted consistent with the following state and federal guidance documents:

- NC DAQ's Guidelines for Evaluating the Air Quality Impacts of Toxic Pollutants in North Carolina (May 2018);
- North Carolina's PSD Modeling Guidance (January 6, 2012);
- EPA's Guideline on Air Quality Models 40 CFR 51, Appendix W (Revised, January 17, 2017), herein referred to as Appendix W; ¹⁹ and
- EPA's AERMOD Implementation Guide (Revised April 17, 2018).

6.2 Acceptable Ambient Levels

Enviva conducted air dispersion modeling for 13 TAPs with emissions in excess of the TPER thresholds in 15A NCAC 02Q .0711 to demonstrate compliance with the Acceptable Ambient Levels (AALs) in 15A NCAC 02D. The AALs are in place to ensure that emissions from a facility do not adversely affect human health. A comparison of facility-wide potential emissions to the TPERs is provided in Table 6-1 below.

Modeling for each TAP was conducted for the most recent year of meteorological data available (2017) and maximum concentrations were compared to the AALs.

¹⁹ Appendix W was revised on December 17, 2016 (Federal Register Vol. 82, No. 10); however, on January 26, 2017 the effective date of the final rule was delayed until March 21, 2017 (Federal Register Vol. 82, No. 16). On March 20, 2017 the effective date of the final rule was further delayed to May 22, 2017 (Federal Register Vol. 82, No. 52), upon which it became effective.

Dellestent	Potential Emissions			TPER (2Q .0711)			Modeling	
Pollutant	(lb/hr)	(lb/day)	(lb/yr)	(lb/hr)	(lb/day)	(lb/yr)	Required?	
1,3-Butadiene			0.09			11.0	No	
Acetaldehyde	24.1			6.8			Yes	
Acrolein	16.1			0.020			Yes	
Ammonia	0.26			0.68			No	
Arsenic			5.7			0.053	Yes	
Benzene			884			8.1	Yes	
Benzo(a)pyrene			0.34			2.2	No	
Beryllium			0.28			0.28	Yes	
Cadmium			1.89			0.37	Yes	
Carbon Tetrachloride			5.0			460	No	
Chlorine	0.26	6.3		0.23	0.79		Yes	
Chlorobenzene		0.2637			46		No	
Chloroform			2.0			290	No	
Chromic acid (Chromium VI)		0.0048			0.013		No	
Di(2-ethylhexyl)phthalate (DEHP)		3.76x10 ⁻⁴			0.63		No	
Ethylene dichloride (1,2-dichloroethane)			3.2			260	No	
Formaldehyde	20.7			0.040			Yes	
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8			1.31x10 ⁻⁶			5.10x10 ⁻³	No	
n-Hexane	0.148			23			No	
Hydrogen chloride (hydrochloric acid)	6.33			0.18			Yes	
Manganese & Compounds		12.79			0.63		Yes	
Mercury, vapor		0.03			0.013		Yes	
Methyl chloroform (1,1,1 trichloroethane)	1.03x10 ⁻²	0.248		64.0	250		No	
Methyl ethyl ketone	4.50x10 ⁻⁵	0.001		22.4	78.0		No	
Xylene	1.50x10 ⁻³	0.036		16.4	57.0		No	
Methylene chloride	1.39x10 ⁻³		21.1	0.39		1,600	No	
Nickel		0.268			0.13		Yes	
Pentachlorophenol	1.70x10 ⁻⁵	4.08x10 ⁻⁴		0.0064	0.063		No	
Perchloroethylene (tetrachloroethylene)			4.2			13,000	No	
Phenol	8.4			0.24			Yes	
Polychlorinated biphenyls			9.07x10 ⁻⁴			5.6	No	
Styrene	0.016			2.7			No	
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-			9.57x10 ⁻⁷			2.00x10 ⁻⁴	No	
Toluene	0.002	0.06		14.4	98.0		No	
Trichloroethylene			3.3			4,000	No	
Trichlorofluoromethane (CFC 111)	3.41x10 ⁻⁴			140			No	
Vinyl chloride			2.0			26.0	No	

Table 6-1. Comparison to Toxic Air Pollutant Permitting Emission Rates

6.3 Model Selection

Enviva utilized the latest version of the AERMOD model (Version 18081). AERMOD is the EPAapproved air dispersion model for near-field (within 50 km) modeling analyses. AERMOD was run using default regulatory options.

6.4 Receptor Grid and Elevation Data

A resolution of 25 meters was used for receptors along the ambient boundary and a nested Cartesian grid extending approximately 10 km from the center of the plant was modeled using the following resolutions:

- 100-meter resolution extending approximately 500 m from the property boundary; and
- 500-meter resolution between approximately 500 m and approximately 10 km from the property boundary.

Modeled concentrations were reviewed to ensure that the maximum concentration was captured with 100 m resolution.

Receptor elevations, in addition to source and building elevations, were determined using the AERMAP terrain pre-processor. Hill height parameters required by AERMOD are also calculated by AERMAP. Elevations were based on 1/3 arc-second National Elevation Dataset (NED) from the U.S. Geological Survey (USGS). AERMAP input and output files and a copy of the NED file are provided in Appendix E.

6.5 Meteorological Data

Enviva utilized AERMOD-ready meteorological data processed by NC DAQ for the Rocky Mount National Weather Service (NWS) surface station (ID: 93759) and upper air data from the Newport NWS Station (ID: 93768) for the period 2012-2016.²⁰ The meteorological data were processed by NC DAQ using version 18081 of AERMET. The base elevation for the Rocky Mount surface station was set to 48.8 m.²¹ The meteorological data files are provided in Appendix E for reference.

6.6 Modeled Sources and Release Parameters

As previously described in Section 2, there are several different operating scenarios for the Northampton plant dryers and furnaces. Normal operation was modeled to assess compliance with the AALs as it results in the maximum annual potential emissions. Use of the dryer and furnace bypass stacks occurs intermittently, and the frequency and duration are minimized to the extent possible, as previously described in Section 2.5.

Table 6-2 presents a summary of the modeled sources and associated release parameters. The emergency generator and fire water pump are subject to 40 CFR 63 Subpart ZZZZ and

²⁰ https://deq.nc.gov/about/divisions/air-quality/air-quality-permits/modeling-meteorology/meteorological-data

²¹ https://files.nc.gov/ncdeq/Air%20Quality/permits/mets/ProfileBaseElevations_2018.pdf

are therefore exempt from toxics permitting requirements per 15A NCAC 02Q .0702(a)(27)(B). These sources were excluded from the modeling analysis.

Modeled emission rates are consistent with the emission rates provided in the potential emissions calculations in Appendix C. A figure showing the modeled layout is provided in Appendix F.

6.6.1 Point Sources

Each modeled source has a defined stack and was thus represented as a point source. The duct burner stacks will have rain caps and were modeled using the POINTCAP option in accordance with the *AERMOD Implementation Guide*.²² Modeled stack parameters are summarized in Table 6-2 below.

Model I D	Source Type	UTM Easting ¹ (m)	UTM Northing ¹ (m)	Stack Height (m)	Exhaust Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
RTO1	POINT	266,018.70	4,042,780.20	28.66	352.59	7.58	3.05
RTO2	POINT	266,023.34	4,042,695.01	28.61	388.71	23.88	1.63
RCO	POINT	266,025.18	4,042,863.93	27.43	362.04	15.15	2.34
DWH	POINT	266,054.30	4,042,862.43	18.31	Ambient	5.63	0.40
PVAP	POINT	266,036.30	4,042,727.09	3.05	449.82	18.11	0.15
DB1	POINTCAP	266,032.87	4,042,801.89	3.05	449.82	18.11	0.15
DB2	POINTCAP	266,044.72	4,042,829.62	3.05	449.82	18.11	0.15
DB3	POINTCAP	266,016.15	4,042,742.63	3.05	449.82	18.11	0.15
DB4	POINTCAP	266,026.31	4,042,746.65	3.05	449.82	18.11	0.15
DB5	POINTCAP	266,070.76	4,042,919.37	3.05	449.82	18.11	0.15
DB6	POINTCAP	266,071.60	4,042,864.76	3.05	449.82	18.11	0.15
DB7	POINTCAP	266,031.39	4,042,855.66	3.05	449.82	18.11	0.15
DB8	POINTCAP	266,004.72	4,042,858.41	3.05	449.82	18.11	0.15

Table 6-2. Summary of Modeled Source Parameters

1. Coordinates reflect NAD83, UTM Zone 18.

6.7 GEP Stack Height Analysis

EPA has promulgated regulations that limit the maximum stack height that may be used in a modeling analysis to no more than Good Engineering Practice (GEP) stack height. The purpose of this requirement is to prevent the use of excessively tall stacks to reduce the modeled concentrations of a pollutant. GEP stack height is impacted by the heights of nearby structures. In general, the minimum value for GEP stack height is 65 meters. The stack

²² EPA. *AERMOD Implementation Guide*. Revised April 17, 2018.

heights for all sources at the Northampton plant are less than 65 meters and were thus modeled using actual stack heights.

6.8 Building Downwash

The AERMOD model incorporates Plume Rise Modeling Enhancements (PRIME) to account for downwash. The direction-specific building downwash dimensions used as inputs were determined by the latest version (04274) of the Building Profile Input Program, PRIME (BPIP PRIME.) BPIP PRIME uses building downwash algorithms incorporated into AERMOD to account for the plume dispersion effects of the aerodynamic wakes and eddies produced by buildings and structures. On-site structures at the Northampton plant were evaluated for downwash effects on each modeled point source. BPIP input and output files are included in Appendix E.

6.9 Modeling Results

As shown in Table 6-3 below, modeled concentrations for each of the 13 TAPs are less than 50% of the AAL based on 2017 meteorological data. As such, the Northampton plant will not cause an exceedance of the AAL for any TAP and no further modeling is required. AERMOD input and output files are provided in Appendix E.

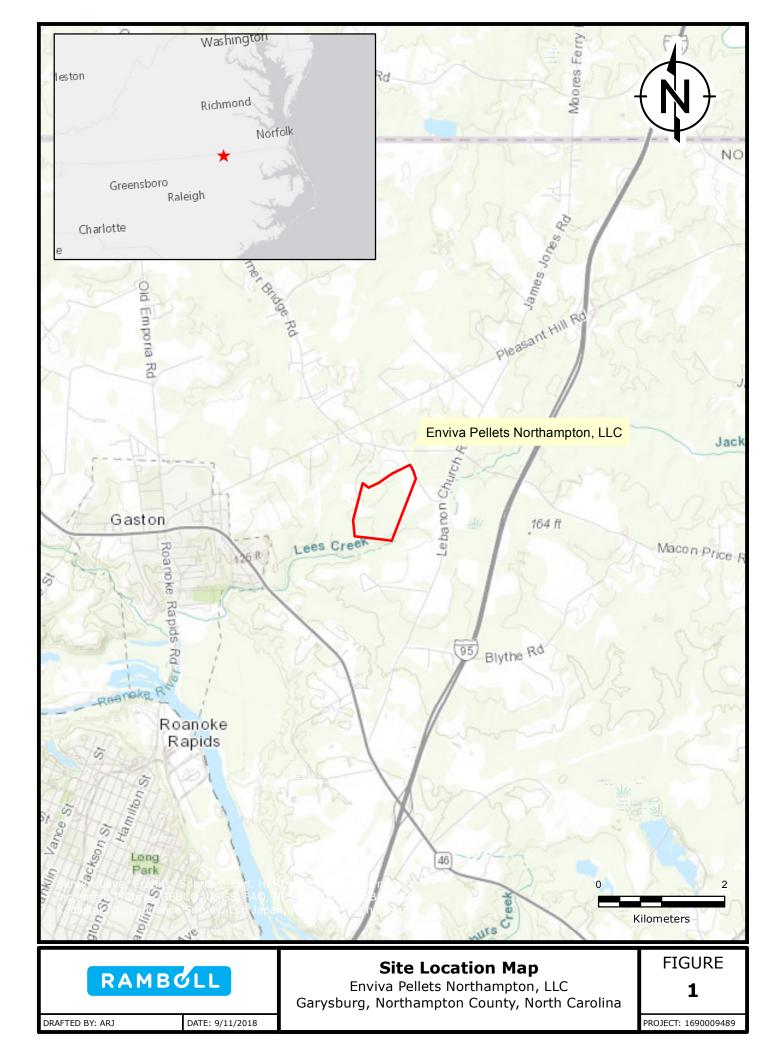
Pollutant	Averaging Period	UTM Easting ¹ (m)	UTM Northing ¹ (m)	Modeled Concentration (µg/m³)	AAL (µg∕m³)	Percent of AAL (%)
Acetaldehyde	1-hour	266167.00	4042616.00	0.60	27,000	0.002%
Acrolein	1-hour	265,879.90	4,043,255.60	0.49	80	0.62%
Arsenic	Annual	266,220.00	4,043,046.20	2.00E-05	2.10E-03	0.95%
Benzene	Annual	266,102.70	4,042,770.10	0.030	0.12	21.6%
Beryllium ²	Annual	266,220.00	4,043,046.20	1.03E-06	4.10E-03	0.025%
Cadmium Metal	Annual	266,102.70	4,042,770.10	3.00E-05	5.50E-03	0.55%
	1-hour	266,267.00	4,042,516.00	0.23	900	0.025%
Chlorine	24-hour	265,865.30	4,042,508.50	0.09	37.5	0.23%
Formaldehyde	1-hour	266,092.90	4,042,747.00	13.8	150	9.22%
Hydrochloric acid	1-hour	266,267.00	4,042,516.00	0.55	700	0.078%
Manganese	24-hour	265,865.30	4,042,508.50	0.012	31	0.040%
Mercury	24-hour	265,865.30	4,042,508.50	5.00E-05	0.6	0.008%
Nickel	24-hour	265,865.30	4,042,508.50	4.40E-04	6	0.007%
Phenol	1-hour	265,879.90	4,043,255.60	0.25	950	0.026%

Table 6-3. Comparison of Maximum Modeled Concentrations from 2017 to the AALs

1. Coordinates reflect NAD83, UTM Zone 18.

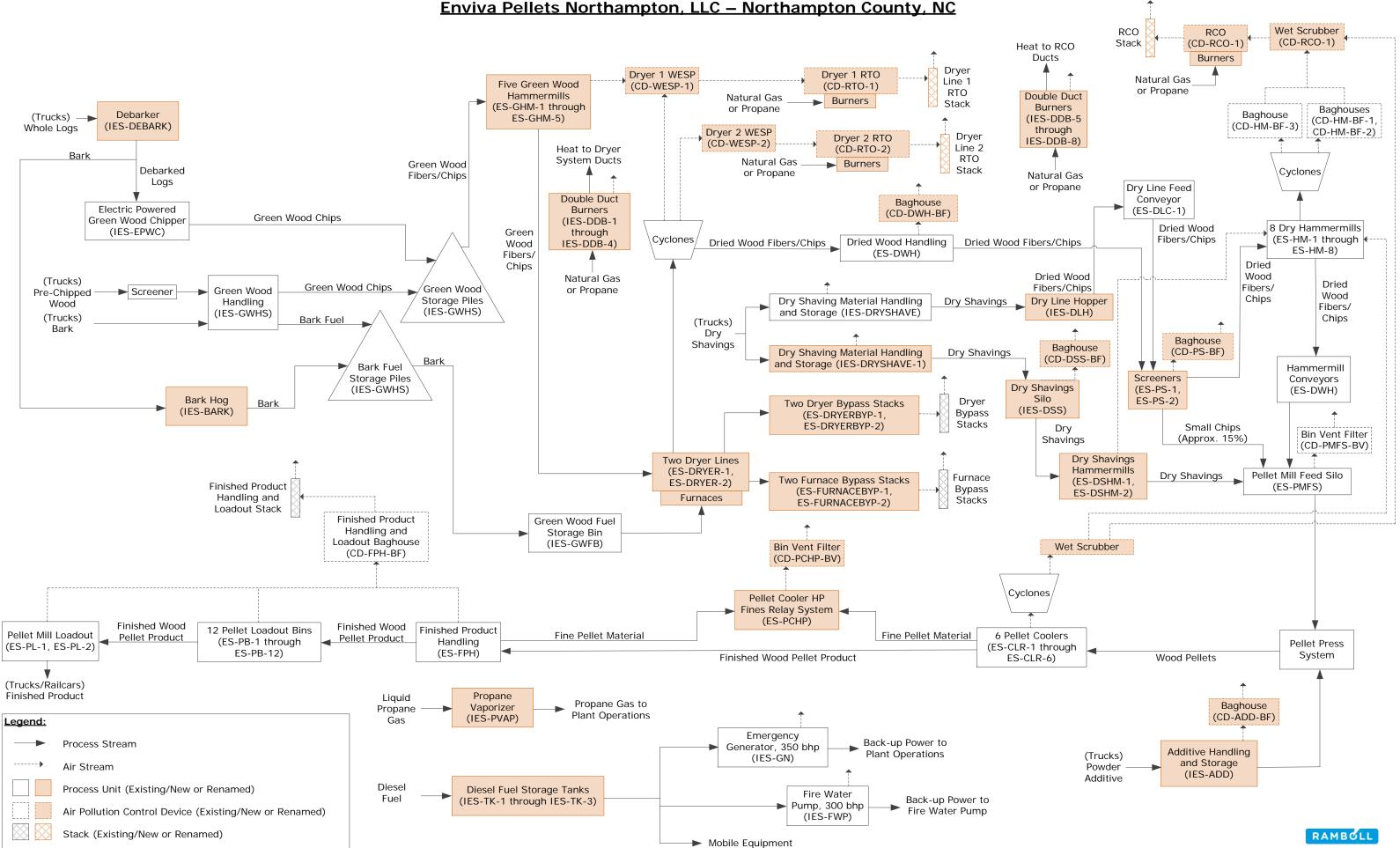
2. Concentrations in the AERMOD output files are in units of nanograms per cubic meter.

APPENDIX A AREA MAP



APPENDIX B PROCESS FLOW DIAGRAM

Appendix B - Process Flow Diagram Enviva Pellets Northampton, LLC – Northampton County, NC



APPENDIX C POTENTIAL EMISSIONS CALCULATIONS

Table 1 Facility-wide Criteria and $\mbox{CO}_2\mbox{e}$ Emissions Summary Enviva Pellets Northampton, LLC

Emission Unit ID	Source Description	Control Device ID	Control Device Description	со	NOx	TSP	PM-10	PM-2.5	SO2	Total VOC	CO _{2e}
			Description	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)
ES-GHM-1 through ES-GHM-5	Green Hammermills 1 through 5	CD-DC-1; CD-WESP-1; CD		70.00	(0.70	00.00	00.00	00.00	4 / 75	14.04	1/0 /0/ 01
ES-DRYER-1	Dryer #1	RTO-1	Multiclone; WESP; RTO	78.32	62.78	33.29	33.29	33.29	16.75	16.04	160,424.01
ES-DRYERBYP-1	Dryer #1 Bypass			0.54	0.66	1.33	1.33	1.33	0.10	0.35	801.54
ES- FURNACEBYP-1	Furnace #1 Bypass			3.05	1.12	2.93	2.85	2.77	0.13	0.09	1,063.48
IES-DDB-1 and -2	Dryer #1 Double Duct Burners			0.72	0.62	0.07	0.07	0.07	0.01	0.10	1,219.07
ES-DRYER-2	Dryer #2	CD-DC-2; CD-WESP-2; CD RTO-2	Multiclone; WESP; RTO	78.13	62.55	33.29	33.29	33.29	19.71	12.89	184,716.95
ES-DRYERBYP-2	Dryer #2 Bypass			0.54	0.66	1.56	1.56	1.56	0.11	0.35	942.99
ES- FURNACEBYP-2	Furnace #2 Bypass			3.45	1.27	3.32	3.24	3.16	0.13	0.10	1,204.93
IES-DDB-3 and -4	Dryer #2 Double Duct Burners			0.72	0.62	0.07	0.07	0.07	0.01	0.10	1,219.07
IES-PVAP	Propane Vaporizer			0.36	0.62	0.03	0.03	0.03	0.003	0.05	609.53
ES-CLR-1 through ES-CLR-6 ES-HM-1 through ES-HM-8; ES-DLC-1	Pellet Coolers 1 through 6 Dry Hammermills 1 through 8; Dry Line Feed Conveyor	CD-CLR-1 through CD-CLR-6; CD-HM-CYC-1 through CD- HM-CYC-8; CD-HM-BF-1 through CD-HM-BF-3;	High Efficiency Cyclones; Baghouses; Wet Scrubbers;	8.54	10.17	62.45	33.99	2.29	0.05	45.26	14,435.21
ES-DSHM-1 and ES-DSHM-2	Dry Shavings Hammermills 1 and 2	CD-WS-1 and -2; CD-DSHM-BF; CD-RCO-1	RCO								
IES-DDB-5 through -8	RCO Double Duct Burners			1.44	1.24	0.13	0.13	0.13	0.01	0.19	2,438.13
ES-DWH	Dried Wood Handling	CD-DWH-BF	Baghouse			0.23	0.23	0.23		48.53	
ES-PS-1 and -2	Dry Hammermill Prescreeners 1 and 2	CD-PS-BF	Baghouse			2.57	2.57	2.57			
ES-PCHP	Pellet Cooler HP Fines Relay System	CD-PCHP-BF	Baghouse			0.54	0.54	0.54			
ES-PMFS	Pellet Mill Feed Silo	CD-PMFS-BV	Bin Vent Filter			0.38	0.38	0.38			
ES-FPH; ES-PB-1 through ES-PB-12; ES-PL-1 and ES-PL-2	Finished Product Handling; Twelve pellet loadout bins; Pellet mill load-out 1 and 2	CD-FPH-BV	Baghouse			5.33	4.85	0.09			
IES-ADD	Additive Handling and Storage	CD-ADD-BF	Baghouse			3.31E-03	3.31E-03	3.31E-03			
IES-DLH	Dry Line Hopper					0.02	0.01	0.001			
IES-DRYSHAVE and IES-	Dry Shaving Material Handling and					0.57	0.28	0.042		0.19	
DRYSHAVE-1	Storage					0.54					
IES-DSS	Dry Shaving Silo	CD-DSS-BF	Baghouse			0.54	0.54	0.54			
IES-GWHS	Green Wood Handling and Storage					16.32	8.35	1.22		8.30	
IES-EPWC	Electric Powered Green Wood Chipper									1.95	
IES-BARK	Bark Hog					0.47	0.26			0.59	
IES-DEBARK	Debarker					0.78	0.43				
IES-GWFB ¹	Green Wood Fuel Bin										
IES-GN	Emergency Generator			0.50	0.58	0.03	0.03	0.03	0.001	0.002	100.21
IES-FWP	Fire Water Pump			0.43	0.49	0.02	0.02	0.02	0.001	0.001	85.90
IES-TK-1	Diesel Storage Tank for Emergency Generator									5.75E-04	
IES-TK-2	Diesel Storage Tank for Fire Water Pump									1.60E-04	
IES-TK-3	Mobile Fuel Diesel Storage Tank									3.33E-03	
	Haul Road Emissions					43.31	11.41	0.923			
			Total Emissions:	176.73	143.37	209.57	139.73	84.56	37.01	135.07	369,261.02
		Το	tal Excluding Fugitives ² :	176.73	143.37	149.37	119.70	82.37	37.01	126.58	369,261.02
			Major Source Threshold:	250	250	250	250	250	250	250	
			-								

Notes: ^{1.} Bark is transferred from the raw wood chip storage pile by walking floor to covered conveyors which transfer the material into the fully enclosed Green Wood Fuel Storage Bin. There are no emissions expected from transfer of material into the bin. ^{2.} Fugitive emissions are not included in comparison against the major source threshold because the facility is not on the list of 28 source categories in 40 CFR 52.21.



Table 2 Facility-Wide HAP Emissions Summary Enviva Pellets Northampton, LLC

Description	НАР	CD-RTO-1	ES-DRYER BYP-1	ES- FURNACE BYP-1	ES-DDB-1 and -2	CD-RTO-2	ES-DRYER BYP-2	ES- FURNACE BYP-2	ES-DDB-3 and -4	ES-PVAP	CD-RCO-1	ES-DDB-5 through -8	ES-DWH	IES-GN	IES-FWP	IES-EPWC	IES-BARK	Total	Major
		(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	Source?
Acetaldehyde	Y	9.04E-01	2.98E-01	4.21E-03	1.31E-07	8.22E-01	2.98E-01	4.77E-03	1.31E-07	-	6.52E-01	2.61E-07	-	4.70E-04	4.03E-04	-	-	2.98E+00	No
Acrolein	Y	6.89E-01	1.95E-01	2.03E-02	1.55E-07	5.37E-01	1.95E-01	2.30E-02	1.55E-07	-	1.18E+00	3.09E-07	-	5.67E-05	4.86E-05	-	-	2.84E+00	No
Formaldehyde	Ý	9.58E-01	2.54E-01	2.23E-02	1.31E-02	9.11E-01	2.54E-01	2.53E-02	1.31E-02	6.57E-03	4.05E-01	2.63E-02	3.28E-01	7.23E-04	6.20E-04	-	-	3.22E+00	No
Methanol	Y	8.76E-01	1.86E-01	-	-	5.12E-01	1.86E-01	-	-	-	5.69E-01	-	7.62E-01	-	-	3.91E-01	1.17E-01	3.60E+00	No
Phenol	Y	3.26E-01	1.02E-01	2.59E-04	-	2.81E-01	1.02E-01	2.93E-04	-	-	5.53E-01	-	-	-	-	-	-	1.37E+00	No
Propionaldehyde	Y	2.00E-01	6.82E-02	3.10E-04	-	1.88E-01	6.82E-02	3.51E-04	-	-	5.56E-01	-	-	-	-	-	-	1.08E+00	No
Acetophenone	Y	5.36E-08	1.22E-08	1.62E-08	-	6.31E-08	1.44E-08	1.84E-08	-	-	-	-	-	-	-	-	-	1.78E-07	No
Ammonia	N	4.40E-01	-	-	2.75E-02	4.40E-01	-	-	2.75E-02	-	2.69E-01	5.50E-02	-	-	-	-	-	1.26E+00	No
Antimony and compounds	Y	3.84E-04	3.02E-05	4.01E-05	-	4.52E-04	3.56E-05	4.54E-05	-	-	-	-	-	-	-	-	-	9.87E-04	No
Arsenic	Y	1.10E-03	8.42E-05	1.12E-04	1.72E-06	1.28E-03	9.90E-05	1.27E-04	1.72E-06	-	1.68E-05	3.44E-06	-	-	-	-	-	2.83E-03	No
Benzene	Y	1.70E-01	-	-	6.22E-03	1.82E-01	-	-	6.22E-03	3.11E-03	6.10E-02	1.24E-02	-	5.71E-04	4.90E-04	-	-	4.42E-01	No
Benzo(a)pyrene	Y	4.37E-05	9.95E-06	1.32E-05	1.03E-08	5.14E-05	1.17E-05	1.50E-05	1.03E-08	-	1.01E-07	2.06E-08	-	2.39E-05	9.87E-08	-	-	1.69E-04	No
Beryllium	Y	5.51E-05	4.21E-06	5.58E-06	1.03E-07	6.45E-05	4.95E-06	6.33E-06	1.03E-07	-	1.01E-06	2.06E-07	-	-	-	-	-	1.42E-04	No
1,3-Butadiene	Y	-	-	-	-	-	-	-	-	-	-	-	-	2.39E-05	2.05E-05	-	-	4.45E-05	No
	Y	3.50E-04	1.57E-05	2.08E-05	9.45E-06	3.86E-04	1.85E-05	2.36E-05	9.45E-06	-	9.26E-05	1.89E-05	-	-	-	-	-	9.45E-04	No
Carbon tetrachloride	Y	7.54E-04	1.72E-04	2.28E-04	-	8.87E-04	2.03E-04	2.59E-04	-	-	-	-	-	-	-	-	-	2.50E-03	No
Chlorine	Y	5.29E-01	3.02E-03	4.01E-03	-	6.23E-01	3.56E-03	4.54E-03	-	-	-	-	-	-	-	-	-	1.17E+00	No
Chlorobenzene	Y	5.53E-04 4.69E-04	1.26E-04	1.67E-04	-	6.50E-04 5.52E-04	1.49E-04	1.90E-04	-	-	-	-	-	-	-	-	-	1.84E-03 1.02E-03	No
Chloroform Chromium VI	Ý	4.69E-04 3.62E-04	-	-	- 1.20E-05	3.92E-04	-	-	- 1.20E-05	-	- 1.18E-04	- 2.40E-05	-	-	-	-	-	9.21E-04	No
Chromium–Other compounds	r V	8.50E-04	- 6.69E-05	- 1.07E-04	1.20E-05	1.00E-03	- 7.88E-05	- 1.21E-04	1.20E-05	-	1.16E-04	2.40E-05	-	-	-	-	-	2.22E-03	No No
	r V	3.16E-04	2.49E-05	3.30E-05	-	3.72E-04	2.93E-05	3.74E-04	-	-	- 7.07E-06	-		-	-	-	-	8.19E-04	No
Cobalt compounds Dichlorobenzene	V I	1.65E-04	2.472-03	3.30L-03	1.03E-05	1.65E-04	2.732-03	-	1.03E-05	-	1.01E-04	2.06E-05	-	-	-	-	-	4.72E-04	No
Dichloroethane, 1,2-	Y	4.86E-04	1.11E-04	1.47E-04	-	5.72E-04	1.31E-04	1.67E-04	-	-	-	-		-			-	1.61E-03	No
Dichloropropane, 1,2-	Y	5.53E-04	1.26E-04	1.67E-04	-	6.50E-04	1.49E-04	1.90E-04		-	_	-	-	-	-		-	1.84E-03	No
Dinitrophenol, 2,4-	Ý	3.02E-06	6.89E-07	9.14E-07	-	3.55E-06	8.10E-07	1.04E-06	-	-	_	-	-	-	-	-	-	1.00E-05	No
Di(2-ethylhexyl)phthalate	Ý	7.87E-07	1.80E-07	1.80E-07	-	9.26E-07	2.12E-07	2.70E-07	-	-	-	-	-	-	-	-	-	2.56E-06	No
Ethyl benzene	Ý	5.19E-04	1.19E-04	1.57E-04	-	6.11E-04	1.40E-04	1.78E-04	-	-	-	-	-	-	-	-	-	1.72E-03	No
Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	N	3.00E-10	-	-	-	3.53E-10	-	-	-	-	-	-	-	-	-	-	-	6.53E-10	No
Hexane	Y	2.47E-01	-	-	1.55E-02	2.47E-01	-	-	1.55E-02	-	1.51E-01	3.09E-02	-	-	-	-	-	7.08E-01	No
Indeno(1,2,3-cd)pyrene	Y	2.47E-07	-	-	1.55E-08	2.47E-07	-	-	1.55E-08	-	1.51E-07	3.09E-08	-	-	-	-	-	7.08E-07	No
Hydrochloric acid	Y	1.27E+00	7.27E-02	9.64E-02	-	1.50E+00	8.55E-02	1.09E-01	-	-	-	-	-	-	-	-	-	3.14E+00	No
Lead	Y	2.40E-03	-	-	4.29E-06	2.81E-03	-	-	4.29E-06	-	4.21E-05	8.59E-06	-	-	-	-	-	5.27E-03	No
Manganese	Y	7.78E-02	6.12E-03	8.12E-03	3.26E-06	9.15E-02	7.20E-03	7.20E-03	3.26E-06	-	3.20E-05	6.53E-06	-	-	-	-	-	1.98E-01	No
Mercury	Y	2.06E-04	1.34E-05	1.78E-05	2.23E-06	2.36E-04	1.58E-05	2.01E-05	2.23E-06	-	2.19E-05	4.47E-06	-	-	-	-	-	5.39E-04	No
Methyl bromide	Y		5.74E-05	7.61E-05	-	2.96E-04			-	-	-	-	-	-	-	-	-	8.34E-04	No
Methyl chloride	Y	3.85E-04	8.80E-05	1.17E-04	-	4.53E-04	1.04E-04	1.32E-04	-	-	-	-	-	-	-	-	-	1.28E-03	No
Methyl ethyl ketone	N	9.05E-05	-	-	-	1.06E-04	-	-	-	-	-	-	-	-	-	-	-	1.97E-04	No
3-Methylchloranthrene	Y	2.47E-07	-	-	1.55E-08	2.47E-07	-	-	1.55E-08	-	1.51E-07	3.09E-08	-	-	-	-	-	7.08E-07	No
Methylene chloride	Y	4.86E-03	-	-	-	5.72E-03	-	-	-	-	-	-	-	-	-	-	-	1.06E-02	No
Naphthalene	Y	1.71E-03	3.71E-04	4.92E-04	5.24E-06	2.00E-03	4.37E-04	5.58E-04	5.24E-06	-	5.13E-05	1.05E-05	-	-	-	-	-	5.64E-03	No
Nickel	Y	1.89E-03	1.26E-04	1.67E-04	1.80E-05	2.17E-03	1.49E-04	1.90E-04	1.80E-05	-	1.77E-04	3.61E-05	-	-	-	-	-	4.95E-03	No
Nitrophenol, 4-	Y	1.84E-06	4.21E-07	5.58E-07	-	2.17E-06	4.95E-07	6.33E-07	-	-	-	-	-	-	-	-	-	6.12E-06	No
Pentachlorophenol	Y	8.54E-07	1.95E-07	2.59E-07	-	1.01E-06	2.30E-07	2.93E-07	-	-	-	-	-	-	-	-	-	2.84E-06	No
Perchloroethylene	Y	6.37E-04	1.45E-04	1.93E-04	-	7.49E-04	1.71E-04	2.19E-04	-	-	-	-	-	-	-	-	-	2.11E-03	No
Phosphorus metal, yellow or white	Y	1.31E-03	1.03E-04	1.37E-04	-	1.54E-03	1.22E-04	1.55E-04	-	-	-	-	-	-	-	-	-	3.37E-03	No
Polychlorinated biphenyls	Ý	1.37E-07 7.70E-03	3.12E-08 4.78E-04	4.14E-08 6.34E-04	- 3.50E-04	1.61E-07 8.07E-03	3.67E-08 5.63E-04	4.69E-08 7.19E-04	- 3.50E-04	- 1.75E-04	- 3.43E-03	- 7.01E-04	-	- 1.03E-04	- 8.82E-05	-	-	4.53E-07 2.34E-02	No No
Polycyclic Organic Matter Selenium compounds	Ý	1.39E-04	1.07E-05	1.42E-05	2.06E-04	1.63E-04	1.26E-05	1.61E-05	2.06E-04	1.75E-04 -	2.02E-06		-	1.03E-04	8.82E-05	-	-	2.34E-02 3.59E-04	No
Styrene	ř V	3.18E-02	1.07E-05	1.42E-05	2.00E-07	3.74E-02	1.20E-05	1.01E-05	2.00E-07	-	2.02E-06	4.12E-07	-	-	-	-	-	6.93E-04	No
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	Ý	1.44E-10	- 3.29E-11	- 4.36E-11	-	1.70E-10	 3.87E-11	- 4.95E-11	-	-	-	-	-	-		-	-	4.78E-10	No
Toluene	Y	9.70E-04	- -	4.30E-11	 2.92E-05	1.06E-03		4.93E-11	 2.92E-05	-	 2.86E-04	5.84E-05	-	 2.51E-04	2.15E-04	-	-	2.90E-03	No
Trichloroethane, 1,1,1-	Y	5.19E-04	 1.19E-04	 1.57E-04	- 2.92L-05	6.11E-04	 1.40E-04	1.78E-04	-	-	- 2.80E-04	- -		2.512-04	-	-	-	1.72E-03	No
Trichloroethylene	Y	5.03E-04	1.15E-04	1.15E-04	-	5.91E-04	1.35E-04	1.73E-04	-	-	-	-		-	-	-	-	1.63E-03	No
Trichlorofluoromethane	N	6.87E-04	-	-	-	8.08E-04	-	-		-	-	-		-	-	-	-	1.50E-03	No
Trichlorophenol, 2,4,6-	Y	3.69E-07	8.42E-08	1.12E-07	-	4.34E-07	9.90E-08	1.27E-07	_		-	-		-	-	-	-	1.22E-06	No
Vinyl chloride	Y	3.02E-04	6.89E-05	9.14E-05	-	3.55E-04	8.10E-05	1.04E-04	_	-	-	-		-	-	-	-	1.00E-03	No
Xylene	Y	4.19E-04	-	-	-	4.93E-04	-	-		-	-	-	-	1.75E-04	1.50E-04	-	_	1.24E-03	No
TOTAL HAP	<u> </u>	6.31	1.19	0.16	0.04	5.96	1.20	0.18	0.04	0.01	4.13	0.07	1.09		2.03E-03	0.39	0.12	20.88	No

Table 3a Potential Criteria Emissons Dryer #1 (ES-DRYER-1, CD-RTO-1) Enviva Pellets Northampton, LLC

Calculation Basis

Annual Dried Wood Throughput of Dryer	390,628 ODT/year
Max. Hourly Dried Wood Throughput of Dryer	70.83 ODT/hr
Burner Heat Input	153.0 MMBtu/hr
Percent Hardwood	20.0%
Percent Softwood	80.0%
Annual Operation	8,760 hr/yr
Annual Heat Input	1,340,280 MMBtu/yr
Number of RTO Burners	4
RTO Burner Rating	8 MMBtu/hr
Number of Duct Burners	2
Duct Burner Rating	1 MMBtu/hr
RTO Control Efficiency	97.50%

Potential Criteria Emissions

Pollutant	Biomass	Units	Emission Factor	Uncon Emis	trolled sions	Controlled Emissions	
ronatant	Emission Factor	Units	Source	Max (lb/hr)	Annual (tpy)	Max (Ib/hr)	Annual (tpy)
СО	0.4	lb/ODT	Note 1			28.33	78.1
NO _X	14.280	lb/hr	Note 1			14.28	62.5
PM/PM ₁₀ /PM _{2.5} (Filterable + Condensable)	7.6	lb/hr	Note 3			7.60	33.3
SO ₂	0.025	lb/MMBtu	AP-42, Section 1.6 ²			3.83	16.8
Total VOC (as propane)	2.640	lb/ODT	Note 4	186.99	515.6	4.67	12.9

Notes:

¹ CO emissions based on data from similar Enviva facilities and information from NCASI database.

NOx emissions based on stack test results from similar facility plus 20% contingency.

² No emission factor is provided in AP-42, Section 10.6.2 for SO_2 for rotary dryers. Enviva has conservatively calculated SO_2 emissions based upon the heat input of the dryer burners using an emission factor for wood combustion from AP-42, Section 1.6.

³ Particulate emission factor is based on data from similar Enviva facilities.

⁴ VOC emission factor based on source test data for similar pellet manufacturing facilities and represents uncontrolled emissions.



Table 3b Potential VOC Emissons Green Hammermills (ES-GHM-1 through ES-GHM-5, CD-RTO-1) Enviva Pellets Northampton, LLC

Calculation Basis

Hourly Throughput ¹	150.0 ODT/hr
Annual Throughput	781,255 ODT/yr
Hours of Operation	8,760 hr/yr
RTO Control Efficiency	97.50%

Potential VOC Emissions

Pollutant	CAS No.	НАР	Νር ΤΑΡ	Voc	Emission Factor ²	Potential Emissions		
					(lb/ODT)	Max (Ib/hr)	Annual (tpv)	
Acetaldehyde	75-07-0	Y	Y	Y	8.4E-03	0.032	0.082	
Acrolein	107-02-8	Y	Y	Y	1.6E-02	0.059	0.15	
Formaldehyde	50-00-0	Y	Y	Y	4.8E-03	0.018	0.047	
Methanol	67-56-1	Y	Ν	Y	3.7E-02	0.140	0.36	
Phenol	108-95-2	Y	Y	Y	4.6E-03	0.017	0.045	
Propionaldehyde	123-38-6	Y	Ν	Y	1.2E-03	0.005	0.012	
				Total T	AP Emissions	0.125	0.326	
	AP Emissions	0.27	0.70					
Total VOC (as propane)		N/A	N/A	Y	0.32	1.21	3.15	

Notes:

^{1.} The max hourly throughput is based on the maximum capacity for the 2 existing green hammermills

ratioed up to reflect 3 additional hammermills (i.e. 119.4 tph * 5/2).

^{2.} Emission factors were derived based on stack testing data from comparable Enviva facilities and/or engineering judgement and include contingency. The emission factors represent uncontrolled emissions.

Thermal Generated Potential Criteria Pollutant Emissions

Maximum high heating value of VOC constituents	0.018 MMBtu/lb
Uncontrolled VOC emissions	126 tons/yr
Heat input of uncontrolled VOC emissions	4,666 MMBtu/yr

	Emission		Potential Emissions			
Pollutant	Factor	Units	Max (Ib/hr)	Annual (tpy)		
CO	8.2E-02	lb/MMBtu ¹	0.04	0.19		
NO _X	9.8E-02	lb/MMBtu ¹	0.05	0.23		

Notes:

^{1.} CO and NO_x emission factors are from AP-42, Fifth Edition, Volume 1, Chapter 1.4 - Natural Gas Combustion, 07/98 for small boilers.

Abbreviations:

CAS - chemical abstract service HAP - hazardous air pollutant hr - hour lb - pound NC - North Carolina ODT - oven dried tons RTO - Regenerative Thermal Oxidizer TAP - toxic air pollutant tpy - tons per year VOC - volatile organic compound yr - year



Table 3cPotential HAP and TAP EmissionsDryer #1 and Green Hammermills (ES-DRYER-1, ES-GHM-1 through ES-GHM-5, CD-RTO-1)Enviva Pellets Northampton, LLC

Calculation Basis

Annual Dried Wood Throughput of Dryer	390,628 ODT/year
Max. Hourly Dried Wood Throughput of Dryer	70.83 ODT/hr
Burner Heat Input	153.0 MMBtu/hr
Percent Hardwood	20.0%
Percent Softwood	80.0%
Annual Operation	8,760 hr/yr
Annual Heat Input	1,340,280 MMBtu/yr
Number of RTO Burners	4
RTO Burner Rating	8 MMBtu/hr
RTO Control Efficiency	97.50%

Potential HAP and TAP Emissions

Dollutort			NOC	Emission	Linita	Footnata		Emissions
Pollutant	HAP	NC TAP	VOC	Factor	Units	Footnote	Max	Annual
Dryer Burner - Biomass Source							(lb/hr)	(yat)
Acetaldehyde	Y	Y	Y	1.7E-01	lb/ODT	1	0.30	0.82
Acrolein	Y	Y	Ŷ	1.1E-01	Ib/ODT	1	0.19	0.54
Formaldehyde	Y	Y	Ŷ	1.4E-01	Ib/ODT	1	0.25	0.70
Methanol	Y	N	Y	1.0E-01	Ib/ODT	1	0.23	0.51
Phenol	Y	Y	Y	5.8E-02	Ib/ODT	1	0.10	0.28
Propionaldehyde	Y	N	Y	3.9E-02	Ib/ODT	1	0.07	0.20
Acetophenone	Y	N	Y	3.2E-02	Ib/MMBtu	2,3	1.2E-08	5.4E-08
Antimony and compounds	Y	N	N	7.9E-06	Ib/MMBtu	2,3	8.8E-05	3.8E-04
Arsenic	Y	Y	N	2.2E-05	Ib/MMBtu	2,4	2.4E-04	1.1E-03
Benzene	Y	Y	Y	4.2E-03	Ib/MMBtu	2,4	1.6E-02	7.0E-02
Benzo(a)pyrene	Y	Y	Y	2.6E-06	Ib/MMBtu	2,3	9.9E-06	4.4E-05
Beryllium	Y	Y	n N	1.1E-06	Ib/MMBtu	2,3	9.9E-06	4.4E-05 5.3E-05
Cadmium	Y	Y	N	4.1E-08	Ib/MMBtu	2,4	4.5E-05	2.0E-04
								7.5E-04
Carbon tetrachloride	Y Y	Y Y	Y	4.5E-05	lb/MMBtu lb/MMBtu	2,3	1.7E-04	7.5E-04 5.3E-01
Chlorine	Y	Y	N Y	7.9E-04	Ib/MMBtu Ib/MMBtu	2,9	1.2E-01	
Chlorobenzene		Y	Y Y	3.3E-05		2,3	1.3E-04	5.5E-04
Chloroform	Y5			2.8E-05	Ib/MMBtu	2,3	1.1E-04	4.7E-04
Chromium VI		Y	N	3.5E-06	Ib/MMBtu	2,4,5	3.9E-05	1.7E-04
Chromium–Other compounds	Y	N	N	1.8E-05	Ib/MMBtu	2,4	1.9E-04	8.5E-04
Cobalt compounds	Y	N	N	6.5E-06	Ib/MMBtu	2,4	7.2E-05	3.2E-04
Dichloroethane, 1,2-	Y	Y	Y	2.9E-05	Ib/MMBtu	2,3	1.1E-04	4.9E-04
Dichloropropane, 1,2-	Y	N	Y	3.3E-05	Ib/MMBtu	2,3	1.3E-04	5.5E-04
Dinitrophenol, 2,4-	Y	N	Y	1.8E-07	Ib/MMBtu	2,3	6.9E-07	3.0E-06
Di(2-ethylhexyl)phthalate	Y	Y	Y	4.7E-08	Ib/MMBtu	2,3	1.8E-07	7.9E-07
Ethyl benzene	Y	N	Y	3.1E-05	Ib/MMBtu	2,3	1.2E-04	5.2E-04
Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	N	Y	Y	1.8E-11	Ib/MMBtu	2,3	6.8E-11	3.0E-10
Hydrochloric acid	Y	Y	N	1.9E-02	Ib/MMBtu	2,6	2.9E-01	1.3E+00
Lead	Y	N	N	4.8E-05	Ib/MMBtu	2,4	5.3E-04	2.3E-03
Manganese	Y	Y	N	1.6E-03	Ib/MMBtu	2,4	1.8E-02	7.8E-02
Mercury	Y	Y	N	3.5E-06	Ib/MMBtu	2,4	3.9E-05	1.7E-04
Methyl bromide	Y	N	Y	1.5E-05	lb/MMBtu	2,3	5.7E-05	2.5E-04
Methyl chloride	Y	N	Y	2.3E-05	lb/MMBtu	2,3	8.8E-05	3.9E-04
Methyl ethyl ketone	N	Y	Y	5.4E-06	lb/MMBtu	2,3	2.1E-05	9.0E-05
Methylene chloride	Y	Y	Y	2.9E-04	lb/MMBtu	2,3	1.1E-03	4.9E-03
Naphthalene	Y	N	Y	9.7E-05	lb/MMBtu	2,3	3.7E-04	1.6E-03
Nickel	Y	Y	N	3.3E-05	lb/MMBtu	2,4	3.7E-04	1.6E-03
Nitrophenol, 4-	Y	N	Y	1.1E-07	lb/MMBtu	2,3	4.2E-07	1.8E-06
Pentachlorophenol	Y	Y	N	5.1E-08	lb/MMBtu	2	2.0E-07	8.5E-07
Perchloroethylene	Y	Y	N	3.8E-05	lb/MMBtu	2	1.5E-04	6.4E-04
Phosphorus metal, yellow or white	Y	N	N	2.7E-05	lb/MMBtu	2,4	3.0E-04	1.3E-03
Polychlorinated biphenyls	Y	Y	Y	8.2E-09	lb/MMBtu	2,3	3.1E-08	1.4E-07
Polycyclic Organic Matter	Y	N	Ν	1.3E-04	lb/MMBtu	2	4.8E-04	2.1E-03
Selenium compounds	Y	N	Ν	2.8E-06	lb/MMBtu	2,4	3.1E-05	1.4E-04
Styrene	Y	Y	Y	1.9E-03	lb/MMBtu	2,3	7.3E-03	3.2E-02
Fetrachlorodibenzo-p-dioxin, 2,3,7,8-	Y	Y	Y	8.6E-12	lb/MMBtu	2,3	3.3E-11	1.4E-10
Foluene	Y	Y	Y	3.0E-05	lb/MMBtu	2,3	1.1E-04	5.0E-04
Frichloroethane, 1,1,1-	Y	Y	Ν	3.1E-05	lb/MMBtu	2	1.2E-04	5.2E-04
Frichloroethylene	Y	Y	Y	3.0E-05	lb/MMBtu	2,3	1.1E-04	5.0E-04
Frichlorofluoromethane	N	Y	Y	4.1E-05	lb/MMBtu	2,3	1.6E-04	6.9E-04
Frichlorophenol, 2,4,6-	Y	N	Y	2.2E-08	lb/MMBtu	2,3	8.4E-08	3.7E-07
/inyl chloride	Y	Y	Y	1.8E-05	lb/MMBtu	2,3	6.9E-05	3.0E-04
(ylene	Y	Y	Y	2.5E-05	lb/MMBtu	2,3	9.6E-05	4.2E-04
			T	otal HAP Emiss	sions (related	to biomass)	1.56	5.05
				otal TAP Emiss	-	÷	1.30	4.34



Table 3c Potential HAP and TAP Emissions Dryer #1 and Green Hammermills (ES-DRYER-1, ES-GHM-1 through ES-GHM-5, CD-RTO-1) Enviva Pellets Northampton, LLC

Pollutant RTO - Natural Gas/Propane Source P-Methylnaphthalene 3-Methylchloranthrene 7,12-Dimethylbenz(a)anthracene	НАР Y		VOC	Emission Factor	Units	Footnote	Max	Annual
-Methylnaphthalene -Methylchloranthrene		N						
-Methylnaphthalene -Methylchloranthrene		NI					(lb/hr)	(tpv)
-Methylchloranthrene		N I						
5	Y	N	Y	2.4E-05	lb/MMscf	7	7.5E-07	3.3E-06
,12-Dimethylbenz(a)anthracene		N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
• • • •	Y	N	Y	1.6E-05	lb/MMscf	7	5.0E-07	2.2E-06
cenaphthene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
cenaphthylene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
cetaldehyde	Y	Y	Y	1.5E-05	lb/MMscf	7	4.8E-07	2.1E-06
crolein	Y	Y	Y	1.8E-05	lb/MMscf	7	5.6E-07	2.5E-06
mmonia	N	Y	N	3.2	lb/MMscf	7	1.0E-01	4.4E-01
Inthracene	Y	N	Y	2.4E-06	lb/MMscf	7	7.5E-08	3.3E-07
rsenic	Y	Y	N	2.0E-04	lb/MMscf	7	6.3E-06	2.7E-05
Benz(a)anthracene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
Benzene	Y	N	Y	7.1E-04	lb/MMBtu	8	2.3E-02	1.0E-01
Benzo(a)pyrene	Y	Y	Y	1.2E-06	lb/MMscf	7	3.8E-08	1.6E-07
Benzo(b)fluoranthene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
Benzo(g,h,i)perylene	Y	N	Y	1.2E-06	lb/MMscf	7	3.8E-08	1.6E-07
Benzo(k)fluoranthene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
Beryllium	Y	Y	N	1.2E-05	lb/MMscf	7	3.8E-07	1.6E-06
Cadmium	Y	Y	N	1.1E-03	lb/MMscf	7	3.5E-05	1.5E-04
Chromium VI	Y	N	N	1.4E-03	lb/MMscf	7	4.4E-05	1.9E-04
Chrysene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
Cobalt	Y	N	N	8.4E-05	lb/MMscf	7	2.6E-06	1.2E-05
Dibenzo(a,h)anthracene	Y	N	Y	1.2E-06	lb/MMscf	7	3.8E-08	1.6E-07
Dichlorobenzene	Y	Y	Y	1.2E-03	lb/MMscf	7	3.8E-05	1.6E-04
luoranthene	Y	N	Y	3.0E-06	lb/MMscf	7	9.4E-08	4.1E-07
luorene	Y	N	Y	2.8E-06	lb/MMscf	7	8.8E-08	3.8E-07
ormaldehyde	Y	Y	Y	1.5E-03	lb/MMBtu	8	4.8E-02	2.1E-01
lexane	Y	Y	Y	1.8	lb/MMscf	7	5.6E-02	2.5E-01
ndeno(1,2,3-cd)pyrene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
ead	Y	N	N	5.0E-04	lb/MMscf	7	1.6E-05	6.9E-05
langanese	Y	Y	N	3.8E-04	lb/MMscf	7	1.2E-05	5.2E-05
lercury	Y	Y	N	2.6E-04	lb/MMscf	7	8.2E-06	3.6E-05
Japhthalene	Y	N	Y	6.1E-04	Ib/MMscf	7	1.9E-05	8.4E-05
lickel	Y	Y	N	2.1E-03	Ib/MMscf	7	6.6E-05	2.9E-04
olycyclic Organic Matter	Y	N	N	4.0E-05	lb/MMBtu	8	1.3E-03	5.6E-03
henanthrene	Y	N	Y	1.7E-05	Ib/MMscf	7	5.3E-07	2.3E-06
lyrene	Y	N	Y	5.0E-06	Ib/MMscf	7	1.6E-07	6.9E-07
Selenium compounds	Y	N	N	2.4E-05	Ib/MMscf	, 7	7.5E-07	3.3E-06
oluene	Y	Y	Y	3.4E-03	Ib/MMscf	7	1.1E-04	4.7E-04
ordene	1		•	issions (related			0.13	0.56
				issions (related				0.56

Notes:

^{1.} Emission factor derived based on stack testing data from comparable Enviva facilities and/or engineering judgement and include contingency. The emission factors represent uncontrolled emissions.

^{2.} Emission factors (criteria and HAP/TAP) for wood combustion in a stoker boiler from NCDAQ Wood Waste Combustion Spreadsheet/AP-42, Fifth Edition, Volume 1, Chapter 1.6 - Wood Residue Combustion in Boilers, 09/03.

^{3.} The control efficiency of 97.5% for the RTO is applied to all VOC hazardous and toxic pollutants.

^{4.} The control efficiency of the wet electrostatic precipitator (WESP) for filterable particulate matter is applied to all metal hazardous and toxic pollutants from the dryer and duct burners. Actual design filterable efficiency is estimated to 96.4%, but 92.75% is assumed for toxics permitting.

WESP Control Efficiency for metal HAP

^{5.} Chromium VI is a subset of chromium compounds, which is accounted for separately as a HAP. As such, Chromium VI is only calculated as a TAP.

92.8%

⁶ The WESP employs a caustic solution in its operation in which hydrochloric acid will have high water solubility. This caustic solution will neutralize the acid and effectively control it by

90%, per conversation on October 18, 2011 with Steven A. Jaasund, P.E. of Lundberg Associates, a manufacturer of WESPs.

WESP HCI Control Efficiency 90.00%

^{7.} Emission factors for natural gas combustion are from NCDAQ Natural Gas Combustion Spreadsheet and AP-42, Fifth Edition, Volume 1, Chapter 1.4 - Natural Gas Combustion, 07/98. The emission factors for acetaldehyde, acrolein, and ammonia are cited in the NCDAQ spreadsheet as being sourced from the USEPA's WebFIRE database.

⁸ The RTO burners can fire either natural gas or propane; Propane is worst-case for these HAP emissions. Emission factors for propane combustion from the South Coast Air Quality Management District's Air Emissions Reporting Tool for external combustion equipment fired with LPG.

^{9.} It was assumed that chlorine is not oxidized in the RTO.

Abbreviations:

N ₂ O - nitrous oxide
ODT - oven dried tons
PM - particulate matter
$\ensuremath{PM_{10}}\xspace$ - particulate matter with an aerodynamic diameter less than 10 microns
$\ensuremath{\text{PM}_{2.5}}\xspace$ - particulate matter with an aerodynamic diameter of 2.5 microns or less
RTO - regenerative thermal oxidizer
SO ₂ - sulfur dioxide
TAP - toxic air pollutant
tpy - tons per year
VOC - volatile organic compound
WESP - wet electrostatic precipitator
yr - year



Table 3dPotential EmissionsDryer #1 Bypass (ES-DRYERBYP-1) (Full Capacity)1Enviva Pellets Northampton, LLC

Calculation Basis

Hourly Throughput ¹	70.83 ODT/hr
Hourly Heat Input Capacity	153 MMBtu/hr
Annual Heat Input Capacity	7,650 MMBtu/yr
Hours of Operation ¹	50 hr/yr

Potential Criteria Pollutant and Greenhouse Gas Emissions per Dryer Line

Pollutant	Emission Factor	Units	Potential Emissions		
			Max (lb/hr)	Annual (tpv)	
со	21.4	lb/hr ²	21.4	0.54	
NO _X	26.3	lb/hr ²	26.3	0.66	
SO ₂	0.025	lb/MMBtu ³	3.83	0.096	
VOC	14.0	lb/hr ²	14.0	0.35	
PM/PM ₁₀ /PM _{2.5} Condensable	0.017	lb/MMBtu ⁴	2.60	0.065	
PM/PM ₁₀ /PM _{2.5} Filterable	0.33	lb/MMBtu ⁵	50.5	1.26	
Total PM/PM ₁₀ /PM _{2.5}	•	•	53.1	1.33	

Notes:

During startup and shutdown (for temperature control) or malfunction, excess emissions can be vented out either the dryer bypass stacks or the furnace bypass stacks. Use of the bypass stacks is limited to 2 hours in any 24-hour period and 50 hours per 12-month rolling period for each dryer line. As the feed to the dryer is typically stopped during shutdown and malfunction events, the hourly throughput is equal to the annual average of the dryer feed rate.

 $^{2\cdot}$ CO, NO_X, and VOC emission rates based on data from a comparable Enviva facility.

^{3.} No emission factor is provided in AP-42, Section 10.6.2 for SO₂ for rotary dryers. Enviva has conservatively calculated SO₂ emissions based on AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03.

^{4.} Emission factor for condensable PM based on AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03.

^{5.} Uncontrolled filterable PM emission factor is based on testing at a comparable Enviva facility.



Table 3d **Potential Emissions** Dryer #1 Bypass (ES-DRYERBYP-1) (Full Capacity)¹ **Enviva Pellets Northampton, LLC**

	Emission Factor		Footnote	Potential Emissions ¹		
Pollutant		Units		Max (Ib/hr)	Annual (tpv)	
Acetaldehyde	0.168	lb/ODT	2	11.9	0.30	
Acrolein	0.110	lb/ODT	2	7.79	0.195	
Formaldehyde	0.144	lb/ODT	2	10.16	0.25	
Methanol	0.105	lb/ODT	2	7.43	0.19	
Phenol	0.058	lb/ODT	2	4.08	0.10	
Propionaldehyde	0.039	lb/ODT	2	2.73	0.068	
Acetophenone	3.2E-09	lb/MMBtu	3	4.90E-07	1.22E-08	
Antimony and compounds	7.9E-06	lb/MMBtu	3	1.21E-03	3.02E-05	
Arsenic	2.2E-05	lb/MMBtu	3	3.37E-03	8.42E-05	
Benzo(a)pyrene	2.6E-06	lb/MMBtu	3	3.98E-04	9.95E-06	
Beryllium	1.1E-06	lb/MMBtu	3	1.68E-04	4.21E-06	
Cadmium	4.1E-06	lb/MMBtu	3	6.27E-04	1.57E-0	
Carbon tetrachloride	4.5E-05	lb/MMBtu	3	6.89E-03	1.72E-04	
Chlorine	7.9E-04	lb/MMBtu	3	1.21E-01	3.02E-03	
Chlorobenzene	3.3E-05	lb/MMBtu	3	5.05E-03	1.26E-04	
Chromium–Other compounds	1.8E-05	lb/MMBtu	3	2.68E-03	6.69E-0	
Cobalt compounds	6.5E-06	lb/MMBtu	3	9.95E-04	2.49E-0	
Dinitrophenol, 2,4-	1.8E-07	lb/MMBtu	3	2.75E-05	6.89E-07	
Di(2-ethylhexyl)phthalate	4.7E-08	lb/MMBtu	3	7.19E-06	1.80E-07	
Ethyl benzene	3.1E-05	Ib/MMBtu	3	4.74E-03	1.19E-04	
Dichloroethane, 1,2-	2.9E-05	lb/MMBtu	3	4.44E-03	1.11E-04	
Hydrochloric acid	1.9E-02	Ib/MMBtu	3	2.91E+00	7.27E-02	
Lead	4.8E-05	lb/MMBtu	3	7.34E-03	1.84E-04	
Manganese	1.6E-03	Ib/MMBtu	3	2.45E-01	6.12E-03	
Mercury	3.5E-06	Ib/MMBtu	3	5.36E-04	1.34E-05	
Methyl bromide	1.5E-05	lb/MMBtu	3	2.30E-03	5.74E-05	
Methyl chloride	2.3E-05	lb/MMBtu	3	3.52E-03	8.80E-05	
Trichloroethane, 1,1,1-	3.1E-05	Ib/MMBtu	3	4.74E-03	1.19E-04	
Naphthalene	9.7E-05	Ib/MMBtu	3	1.48E-02	3.71E-04	
Nickel	3.3E-05	lb/MMBtu	3	5.05E-03	1.26E-04	
Nitrophenol, 4-	1.1E-07	Ib/MMBtu	3	1.68E-05	4.21E-0	
Pentachlorophenol	5.1E-08	Ib/MMBtu	3	7.80E-06	1.95E-0	
Perchloroethylene	3.8E-05	Ib/MMBtu	3	5.81E-03	1.45E-04	
Phosphorus metal, yellow or white	2.7E-05	Ib/MMBtu	3	4.13E-03	1.03E-04	
Polychlorinated biphenyls	8.2E-09	Ib/MMBtu	3	1.25E-06	3.12E-08	
Polycyclic Organic Matter	1.3E-04	Ib/MMBtu	3	1.91E-02	4.78E-04	
Dichloropropane, 1,2-	3.3E-05	Ib/MMBtu	3	5.05E-03	1.26E-04	
Selenium compounds	2.8E-06	Ib/MMBtu	3	4.28E-04	1.07E-0	
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	8.6E-12	Ib/MMBtu	3	1.32E-04	3.29E-1	
Trichloroethylene						
	3.0E-05	Ib/MMBtu	3	4.59E-03	1.15E-04	
Trichlorophenol, 2,4,6- Vinyl chloride	2.2E-08	Ib/MMBtu	3	3.37E-06	8.42E-08	
vinyi chionae	1.8E-05	Ib/MMBtu Total HAP	3	2.75E-03 47.5	6.89E-05	

Notes:

^{1.} During dryer bypass emissions are not controlled by the WESP and RTO; however, combustion in the furnace still results in a reduction in organic HAP emission rates.

^{2.} Organic HAP emissions rates were derived based on stack testing data from other similar Enviva plants and/or engineering judgement.

^{3.} Emission factors for wood combustion in a stoker boiler from AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03.

Abbreviations:

CH₄ - methane CO - carbon monoxide CO2 - carbon dioxide CO2e - carbon dioxide equivalent HAP - hazardous air pollutant hr - hour kg - kilogram lb - pound MMBtu - Million British thermal units NO_X - nitrogen oxides N₂O - nitrous oxide

Reference:

AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03

ODT - oven dried tons PM - particulate matter $\ensuremath{\text{PM}_{10}}\xspace$ - particulate matter with an aerodynamic diameter less than 10 microns PM_{2.5} - particulate matter with an aerodynamic diameter of 2.5 microns or less RTO - regenerative thermal oxidizer SO_2 - sulfur dioxide tpy - tons per year VOC - volatile organic compound WESP - wet electrostatic precipitator yr - year



Table 3e **Potential Emissions** Dryer #1 Furnace Bypass (ES-FURNACEBYP-1) (Full Capacity)¹ Enviva Pellets Northampton, LLC

Calculation Basis

Hourly Heat Input Capacity	153 MMBtu/hr
Annual Heat Input Capacity	7,650 MMBtu/yr
Hours of Operation ¹	50 hr/yr

Potential Criteria Pollutant and Greenhouse Gas Emissions per Dryer Line

Pollutant	Emission Factor	Units	Potential Emissions		
	T dotoi		Max (lb∕hr)	Annual (tpy)	
со	0.60	lb/MMBtu ²	91.8	2.30	
NO _X	0.22	lb/MMBtu ²	33.66	0.84	
SO ₂	0.025	lb/MMBtu ²	3.83	0.096	
voc	0.017	lb/MMBtu ²	2.60	0.065	
Total PM/PM ₁₀ /PM _{2.5}	0.58	lb/MMBtu ²	88.3	2.21	

Notes:

^{1.} During startup and shutdown (for temperature control) or malfunction, excess emissions can be vented out either the dryer bypass stacks or the furnace bypass

stacks. Use of the bypass stacks is limited to 2 hours in any 24-hour period and 50 hours per 12-month rolling period for each dryer line. ² CO, NO_X, SO₂, PM, and VOC emission rates based on AP-42, Chapter 1.6 - Wood Residue Combustion in Boilers, 09/03 for bark/bark and wet wood/wet woodfired boilers. VOC emission factor excludes formaldehyde.



Table 3ePotential EmissionsDryer #1 Furnace Bypass (ES-FURNACEBYP-1) (Full Capacity)1Enviva Pellets Northampton, LLC

Dellutert	Emission Factor Units		Potential Emissions		
Pollutant		Units	Footnote	Max	Annual
				(lb/hr)	(tpy)
Acetaldehyde	8.30E-04	lb/MMBtu	1	1.27E-01	3.17E-03
Acrolein	4.00E-03	lb/MMBtu	1	6.12E-01	1.53E-02
Formaldehyde	4.40E-03	lb/MMBtu	1	6.73E-01	1.68E-02
Phenol	5.10E-05	lb/MMBtu	1	7.80E-03	1.95E-04
Propionaldehyde	6.10E-05	lb/MMBtu	1	9.33E-03	2.33E-04
Acetophenone	3.2E-09	lb/MMBtu	1	4.90E-07	1.22E-08
Antimony and compounds	7.9E-06	lb/MMBtu	1	1.21E-03	3.02E-05
Arsenic	2.2E-05	lb/MMBtu	1	3.37E-03	8.42E-05
Benzo(a)pyrene	2.6E-06	lb/MMBtu	1	3.98E-04	9.95E-06
Beryllium	1.1E-06	lb/MMBtu	1	1.68E-04	4.21E-06
Cadmium	4.1E-06	lb/MMBtu	1	6.27E-04	1.57E-05
Carbon tetrachloride	4.5E-05	lb/MMBtu	1	6.89E-03	1.72E-04
Chlorine	7.9E-04	lb/MMBtu	1	1.21E-01	3.02E-03
Chlorobenzene	3.3E-05	lb/MMBtu	1	5.05E-03	1.26E-04
Chromium–Other compounds	2.1E-05	lb/MMBtu	1	3.21E-03	8.03E-05
Cobalt compounds	6.5E-06	lb/MMBtu	1	9.95E-04	2.49E-05
Dinitrophenol, 2,4-	1.8E-07	lb/MMBtu	1	2.75E-05	6.89E-07
Di(2-ethylhexyl)phthalate	4.7E-08	lb/MMBtu	1	7.19E-06	1.80E-07
Ethyl benzene	3.1E-05	lb/MMBtu	1	4.74E-03	1.19E-04
Dichloroethane, 1,2-	2.9E-05	lb/MMBtu	1	4.44E-03	1.11E-04
Hydrochloric acid	1.9E-02	lb/MMBtu	1	2.91E+00	7.27E-02
Lead	4.8E-05	lb/MMBtu	1	7.34E-03	1.84E-04
Manganese	1.6E-03	lb/MMBtu	1	2.45E-01	6.12E-03
Mercury	3.5E-06	lb/MMBtu	1	5.36E-04	1.34E-05
Methyl bromide	1.5E-05	lb/MMBtu	1	2.30E-03	5.74E-05
Methyl chloride	2.3E-05	lb/MMBtu	1	3.52E-03	8.80E-05
Trichloroethane, 1,1,1-	3.1E-05	lb/MMBtu	1	4.74E-03	1.19E-04
Naphthalene	9.7E-05	lb/MMBtu	1	1.48E-02	3.71E-04
Nickel	3.3E-05	lb/MMBtu	1	5.05E-03	1.26E-04
Nitrophenol, 4-	1.1E-07	lb/MMBtu	1	1.68E-05	4.21E-07
Pentachlorophenol	5.1E-08	lb/MMBtu	1	7.80E-06	1.95E-07
Perchloroethylene	3.8E-05	lb/MMBtu	1	5.81E-03	1.45E-04
Phosphorus metal, yellow or white	2.7E-05	lb/MMBtu	1	4.13E-03	1.03E-04
Polychlorinated biphenyls	8.2E-09	lb/MMBtu	1	1.25E-06	3.12E-08
Polycyclic Organic Matter	1.3E-04	lb/MMBtu	1	1.91E-02	4.78E-04
Dichloropropane, 1,2-	3.3E-05	lb/MMBtu	1	5.05E-03	1.26E-04
Selenium compounds	2.8E-06	lb/MMBtu	1	4.28E-04	1.07E-05
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	8.6E-12	lb/MMBtu	1	1.32E-09	3.29E-11
Trichloroethylene	3.0E-05	lb/MMBtu	1	4.59E-03	1.15E-04
Trichlorophenol, 2,4,6-	2.2E-08	lb/MMBtu	1	3.37E-06	8.42E-08
Vinyl chloride	1.8E-05	lb/MMBtu	1	2.75E-03	6.89E-05
	HAP Emissions			4.81	0.12

Potential HAP Emissions per Dryer Line

Notes:

^{1.} Emission factors for wood combustion in a stoker boiler from AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03.

Abbreviations: CH₄ - methane

CO - carbon monoxide CO₂ - carbon dioxide CO₂e - carbon dioxide equivalent HAP - hazardous air pollutant hr - hour Ib - pound MMBtu - Million British thermal units NO_x - nitrogen oxides N_2O - nitrous oxide ODT - oven dried tons PM - particulate matter PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns PM_{2.5} - particulate matter with an aerodynamic diameter of 2.5 microns or less SO_2 - sulfur dioxide tpy - tons per year VOC - volatile organic compound yr - year

Reference:

AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03



Table 3fPotential EmissionsDryer #1 Furnace Bypass (ES-FURNACEBYP-1) (Idle Mode)1Enviva Pellets Northampton, LLC

Calculation Basis

Hourly Heat Input Capacity	5 MMBtu/hr
Annual Heat Input Capacity	2,500 MMBtu/yr
Hours of Operation ¹	500 hr/yr

Potential Criteria Pollutant and Greenhouse Gas Emissions per Dryer Line

Pollutant	Emission Factor	Units	Potential Emissions		
	i dotoi		Max (lb/hr)	Annual (tpv)	
со	0.60	lb/MMBtu ²	3.00	0.75	
NO _X	0.22	lb/MMBtu ²	1.10	0.28	
SO ₂	0.025	lb/MMBtu ²	0.13	0.031	
VOC	0.017	lb/MMBtu ²	0.085	0.021	
Total PM	0.58	lb/MMBtu ²	2.89	0.72	
Total PM ₁₀	0.52	lb/MMBtu ²	2.59	0.65	
Total PM _{2.5}	0.45	lb/MMBtu ²	2.24	0.56	

Notes:

^{1.} As part of this submittal Enviva is requesting a limit of 500 hours per year of "idle mode" for each furnace.

^{2.} CO, NO_X, SO₂, PM, PM₁₀, PM_{2.5}, and VOC emission rates based on AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03 for bark/bark and wet wood/wet wood-fired boilers. PM₁₀ and PM_{2.5} factors equal to the sum of the filterable and condensible factors from Table 1.6-1. VOC emission factor excludes formaldehyde.



Table 3fPotential EmissionsDryer #1 Furnace Bypass (ES-FURNACEBYP-1) (Idle Mode)1Enviva Pellets Northampton, LLC

Potential HAP Emissions per Dryer Line

Pollutant	Emission	Unito	Footnote	Potential E	missions
Ponutant	Factor	Units	FOOLIDIE	Max	Annual
				(lb/hr)	(tpv)
Acetaldehyde	8.30E-04	lb/MMBtu	1	4.15E-03	1.04E-03
Acrolein	4.00E-03	lb/MMBtu	1	2.00E-02	5.00E-03
Formaldehyde	4.40E-03	lb/MMBtu	1	2.20E-02	5.50E-03
Phenol	5.10E-05	lb/MMBtu	1	2.55E-04	6.38E-05
Propionaldehyde	6.10E-05	lb/MMBtu	1	3.05E-04	7.63E-05
Acetophenone	3.2E-09	lb/MMBtu	1	1.60E-08	4.00E-09
Antimony and compounds	7.9E-06	lb/MMBtu	1	3.95E-05	9.88E-06
Arsenic	2.2E-05	lb/MMBtu	1	1.10E-04	2.75E-05
Benzo(a)pyrene	2.6E-06	lb/MMBtu	1	1.30E-05	3.25E-06
Beryllium	1.1E-06	lb/MMBtu	1	5.50E-06	1.38E-06
Cadmium	4.1E-06	lb/MMBtu	1	2.05E-05	5.13E-06
Carbon tetrachloride	4.5E-05	lb/MMBtu	1	2.25E-04	5.63E-05
Chlorine	7.9E-04	lb/MMBtu	1	3.95E-03	9.88E-04
Chlorobenzene	3.3E-05	lb/MMBtu	1	1.65E-04	4.13E-05
Chromium–Other compounds	2.1E-05	lb/MMBtu	1	1.05E-04	2.63E-05
Cobalt compounds	6.5E-06	lb/MMBtu	1	3.25E-05	8.13E-06
Dinitrophenol, 2,4-	1.8E-07	lb/MMBtu	1	9.00E-07	2.25E-07
Bis(2-ethylhexyl)phthalate	4.7E-08	lb/MMBtu	1	2.35E-07	5.88E-08
Ethyl benzene	3.1E-05	lb/MMBtu	1	1.55E-04	3.88E-05
Dichloroethane, 1,2-	2.9E-05	lb/MMBtu	1	1.45E-04	3.63E-05
Hydrochloric acid	1.9E-02	lb/MMBtu	1	9.50E-02	2.38E-02
Lead	4.8E-05	lb/MMBtu	1	2.40E-04	6.00E-05
Manganese	1.6E-03	lb/MMBtu	1	8.00E-03	2.00E-03
Mercury	3.5E-06	lb/MMBtu	1	1.75E-05	4.38E-06
Methyl bromide	1.5E-05	lb/MMBtu	1	7.50E-05	1.88E-05
Methyl chloride	2.3E-05	lb/MMBtu	1	1.15E-04	2.88E-05
Trichloroethane, 1,1,1-	3.1E-05	lb/MMBtu	1	1.55E-04	3.88E-05
Naphthalene	9.7E-05	lb/MMBtu	1	4.85E-04	1.21E-04
Nickel	3.3E-05	lb/MMBtu	1	1.65E-04	4.13E-05
Nitrophenol, 4-	1.1E-07	lb/MMBtu	1	5.50E-07	1.38E-07
Pentachlorophenol	5.1E-08	lb/MMBtu	1	2.55E-07	6.38E-08
Perchloroethylene	3.8E-05	lb/MMBtu	1	1.90E-04	4.75E-05
Phosphorus metal, yellow or white	2.7E-05	lb/MMBtu	1	1.35E-04	3.38E-05
Polychlorinated biphenyls	8.2E-09	lb/MMBtu	1	4.08E-08	1.02E-08
Polycyclic Organic Matter	1.3E-04	lb/MMBtu	1	6.25E-04	1.56E-04
Dichloropropane, 1,2-	3.3E-05	lb/MMBtu	1	1.65E-04	4.13E-05
Selenium compounds	2.8E-06	lb/MMBtu	1	1.40E-05	3.50E-06
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	8.6E-12	lb/MMBtu	1	4.30E-11	1.08E-11
Trichloroethene	3.0E-05	lb/MMBtu	1	1.50E-04	3.75E-05
Trichlorophenol, 2,4,6-	2.2E-08	lb/MMBtu	1	1.10E-07	2.75E-08
Vinyl chloride	1.8E-05	lb/MMBtu	1	9.00E-05	2.25E-05
	AP Emissions		mbustion)	0.16	0.039

Notes:

^{1.} Emission factors for wood combustion in a stoker boiler from AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03.

Abbreviations:

 CH_4 - methane CO - carbon monoxide CO_2 - carbon dioxide CO_2e - carbon dioxide equivalent HAP - hazardous air pollutant hr - hour kg - kilogram Ib - pound MMBtu - Million British thermal units NO_x - nitrogen oxides N_2O - nitrous oxide ODT - oven dried tons PM - particulate matter PM₁₀ - particulate matter with an aerodynamic diameter less than 10 microns PM_{2.5} - particulate matter with an aerodynamic diameter of 2.5 microns or less SO₂ - sulfur dioxide tpy - tons per year VOC - volatile organic compound yr - year

Reference:

AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03

Table 3g

Potential Emissions Dryer #1 Double Duct Burners (IES-DDB-1 and -2) Enviva Pellets Northampton, LLC

Duct Burner Inputs

Duct Burner Rating	1 MMBtu/hr
Number of Duct Burners	2
Annual Operation	8,760 hr/yr

Potential Criteria Pollutant Emissions:

Potential Criteria Pollutant Emissions - Natural Gas Combustion

	Emission		Emission	Potential Emissions		
Pollutant	Factor	Units	Factor Source	Max (lb/hr)	Annual (tpy)	
СО	84.0	lb/MMscf	Note 1	0.16	0.72	
NO _X	50.0	lb/MMscf	Note 2	0.10	0.43	
SO ₂	0.60	lb/MMscf	Note 1	0.0012	0.005	
VOC	5.50	lb/MMscf	Note 1	0.01	0.05	
PM/PM ₁₀ /PM _{2.5} Condensable	5.70	lb/MMscf	Note 1	0.01	0.05	
PM/PM ₁₀ /PM _{2.5} Filterable	1.90	lb/MMscf	Note 1	0.004	0.02	
Total PM/PM ₁₀ /PM _{2.5}				0.015	0.065	



Table 3g Potential Emissions Dryer #1 Double Duct Burners (IES-DDB-1 and -2) Enviva Pellets Northampton, LLC

Potential Criteria Pollutant Emissions - Propane Combustion

Dellutert	Emission	Linita	Emission	Potential Emissions		
Pollutant	Factor ³	Units	Factor Source	Max (lb/hr)	Annual (tpy)	
СО	7.50	lb/Mgal	Note 3	0.16	0.72	
NO _X	6.50	lb/Mgal	Note 4	0.14	0.62	
SO ₂	0.054	lb/Mgal	Note 3,5	0.001	0.005	
VOC	1.00	lb/Mgal	Note 3	0.02	0.10	
PM/PM ₁₀ /PM _{2.5} Condensable	0.50	lb/Mgal	Note 3	0.01	0.05	
PM/PM ₁₀ /PM _{2.5} Filterable	0.20	lb/Mgal	Note 3	0.004	0.02	
Total PM/PM ₁₀ /PM _{2.5}				0.015	0.067	

Notes:

^{1.} Emission factors for natural gas combustion from AP-42 Section 1.4 - Natural Gas Combustion, 07/98. Natural gas heating value of 1,020 Btu/scf assumed per AP-42.

² Emission factors for NO_X assume burners are low NO_X burners, per email from Kai Simonsen (Enviva) on August 8, 2018.

^{3.} Emission factors for propane combustion obtained from AP-42 Section 1.5 - Liquefied Petroleum Gas Combustion, 07/08. Propane heating value of 91.5 MMBtu/Mgal assumed per AP-42.

⁴ AP-42 Section 1.5 does not include an emission factor for low NO_X burners. Per AP-42 Section 1.4, low NO_X burners reduce NO_X emissions by accomplishing combustion in stages, reducing NO_X emissions 40 to 85% relative to uncontrolled emission levels. A conservative control efficiency of 50% was applied to the uncontrolled NO_X emission factor from AP-42 Section 1.5. This reduction is consistent with the magnitude of reduction between the uncontrolled and low NO_X emission factors in AP-42 Section 1.4.

^{5.} SO₂ emissions are based on an assumed fuel sulfur content of 0.54 grains/100 ft³ per *A National Methodology and Emission Inventory for Residential Fuel Combustion*.



Table 3g Potential Emissions Dryer #1 Double Duct Burners (IES-DDB-1 and -2) Enviva Pellets Northampton, LLC

Potential HAP and TAP Emissions

D-11 · · ·				Emission			Potential	Potential Emissions	
Pollutant	HAP	HAP NC TAP	VOC	Factor	Units	Footnote	Max	Annual	
Duct Burners - Natural Gas/Propane S							(lb/hr)	(tpy)	
•		N	V			1	4 75 00	2 15 07	
2-Methylnaphthalene	Y	N	Y Y	2.4E-05	Ib/MMscf	1	4.7E-08	2.1E-07	
3-Methylchloranthrene	Y	N	-	1.8E-06	Ib/MMscf	1	3.5E-09	1.5E-08	
7,12-Dimethylbenz(a)anthracene	Y	N	Y	1.6E-05	Ib/MMscf	1	3.1E-08	1.4E-07	
Acenaphthene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08	
Acenaphthylene	Y	N	Y	1.8E-06	Ib/MMscf	1	3.5E-09	1.5E-08	
Acetaldehyde	Y	Y	Y	1.5E-05	lb/MMscf	1	3.0E-08	1.3E-07	
Acrolein	Y	Y	Y	1.8E-05	Ib/MMscf	1	3.5E-08	1.5E-07	
Ammonia	N	Y	N	3.2	lb/MMscf	1	6.3E-03	2.7E-02	
Anthracene	Y	N	Y	2.4E-06	lb/MMscf	1	4.7E-09	2.1E-08	
Arsenic	Y	Y	N	2.0E-04	lb/MMscf	1	3.9E-07	1.7E-06	
Benz(a)anthracene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08	
Benzene	Y	N	Y	7.1E-04	lb/MMBtu	2	1.4E-03	6.2E-03	
Benzo(a)pyrene	Y	Y	Y	1.2E-06	lb/MMscf	1	2.4E-09	1.0E-08	
Benzo(b)fluoranthene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08	
Benzo(g,h,i)perylene	Y	N	Y	1.2E-06	lb/MMscf	1	2.4E-09	1.0E-08	
Benzo(k)fluoranthene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08	
Beryllium	Y	Y	N	1.2E-05	lb/MMscf	1	2.4E-08	1.0E-07	
Cadmium	Y	Y	N	1.1E-03	lb/MMscf	1	2.2E-06	9.4E-06	
Chromium VI	Y	N	N	1.4E-03	lb/MMscf	1	2.7E-06	1.2E-05	
Chrysene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08	
Cobalt	Y	N	N	8.4E-05	lb/MMscf	1	1.6E-07	7.2E-07	
Dibenzo(a,h)anthracene	Y	N	Y	1.2E-06	lb/MMscf	1	2.4E-09	1.0E-08	
Dichlorobenzene	Y	Y	Y	1.2E-03	lb/MMscf	1	2.4E-06	1.0E-05	
Fluoranthene	Y	Ν	Y	3.0E-06	lb/MMscf	1	5.9E-09	2.6E-08	
Fluorene	Y	N	Y	2.8E-06	lb/MMscf	1	5.5E-09	2.4E-08	
Formaldehyde	Y	Y	Y	1.5E-03	lb/MMBtu	2	3.0E-03	1.3E-02	
Hexane	Y	Y	Y	1.8	lb/MMscf	1	3.5E-03	1.5E-02	
Indeno(1,2,3-cd)pyrene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08	
Lead	Y	N	N	5.0E-04	lb/MMscf	1	9.8E-07	4.3E-06	
Manganese	Y	Y	N	3.8E-04	lb/MMscf	1	7.5E-07	3.3E-06	
Mercury	Y	Y	N	2.6E-04	lb/MMscf	1	5.1E-07	2.2E-06	
Naphthalene	Y	N	Y	6.1E-04	lb/MMscf	1	1.2E-06	5.2E-06	
Nickel	Y	Y	N	2.1E-03	lb/MMscf	1	4.1E-06	1.8E-05	
Polycyclic Organic Matter	Y	N	N	4.0E-05	lb/MMBtu	8	8.0E-05	3.5E-04	
Phenanthrene	Y	N	Y	1.7E-05	lb/MMscf	1	3.3E-08	1.5E-07	
Pyrene	Y	N	Y	5.0E-06	lb/MMscf	1	9.8E-09	4.3E-08	
Selenium compounds	Y	N	N	2.4E-05	lb/MMscf	1	4.7E-08	2.1E-07	
Toluene	Y	Y	Y	3.4E-03	lb/MMscf	1	6.7E-06	2.9E-05	
	· ·			ssions (related			0.008	0.035	
				ssions (related			0.01	0.056	



Table 3g

Potential Emissions Dryer #1 Double Duct Burners (IES-DDB-1 and -2)

Enviva Pellets Northampton, LLC

Notes:

^{1.} Emission factors for natural gas combustion are from NCDAQ Natural Gas Combustion Spreadsheet and AP-42, Fifth Edition, Volume 1, Chapter 1.4 - Natural Gas Combustion, 07/98. The emission factors for acetaldehyde, acrolein, and ammonia are cited in the NCDAQ spreadsheet as being sourced from the USEPA's WebFIRE database.

^{2.} The duct burners can fire either natural gas or propane; Propane is worst-case for these HAP emissions. Emission factors for propane combustion from the South Coast Air Quality Management District's Air Emissions Reporting Tool for external combustion equipment fired with LPG.

Abbreviations:

CAS - chemical abstract service	N ₂ O - nitrous oxide
CH ₄ - methane	ODT - oven dried tons
CO - carbon monoxide	PM - particulate matter
CO2 - carbon dioxide	$\ensuremath{\text{PM}_{10}}\xspace$ - particulate matter with an aerodynamic diameter less than 10 microns
CO ₂ e - carbon dioxide equivalent	$\ensuremath{\text{PM}_{2.5}}\xspace$ - particulate matter with an aerodynamic diameter of 2.5 microns or less
HAP - hazardous air pollutant	RTO - regenerative thermal oxidizer
hr - hour	SO ₂ - sulfur dioxide
kg - kilogram	TAP - toxic air pollutant
lb - pound	tpy - tons per year
MMBtu - Million British thermal units	VOC - volatile organic compound
NC - North Carolina	WESP - wet electrostatic precipitator
NO _x - nitrogen oxides	yr - year



Table 4a Potential Criteria Emissons Dryer #2 (ES-DRYER-2, CD-RTO-2) Enviva Pellets Northampton, LLC

Calculation Basis Annual Dried Wood Throughput of Dryer 390,628 ODT/year Max. Hourly Dried Wood Throughput of Dryer 70.83 ODT/hr Burner Heat Input 180.0 MMBtu/hr 20.0% Percent Hardwood Percent Softwood 80.0% Annual Operation 8,760 hr/yr Annual Heat Input 1,576,800 MMBtu/yr Number of RTO Burners 4 8 MMBtu/hr RTO Burner Rating Number of Duct Burners 2 Duct Burner Rating 1 MMBtu/hr RTO Control Efficiency 97.50%

Potential Criteria Emissions

Pollutant	Biomass	Units	Emission Factor Source	Uncontrolled Emissions		Controlled Emissions	
Poliutant	Emission Factor	Units	Emission Factor Source	Max (Ib/hr)	Annual (tpy)	Max (Ib/hr)	Annual (tpy)
СО	0.4	lb/ODT	Note 1			28.33	78.1
NO _X	14.280	lb/hr	Note 1			14.28	62.5
PM/PM ₁₀ /PM _{2.5} (Filterable + Condensable)	7.6	lb/hr	Note 3			7.60	33.3
SO ₂	0.025	lb/MMBtu	AP-42, Section 1.6 ²			4.50	19.7
Total VOC (as propane)	2.640	lb/ODT	Note 4	186.99	515.6	4.67	12.9

Notes:

¹ CO emissions based on data from similar Enviva facilities and information from NCASI database.

NOx emissions based on stack test results from similar facility plus 20% contingency.

² No emission factor is provided in AP-42, Section 10.6.2 for SO₂ for rotary dryers. Enviva has conservatively calculated SO₂ emissions based upon

the heat input of the dryer burners using an emission factor for wood combustion from AP-42, Section 1.6.

³ Particulate emission factor is based on data from similar Enviva facilities.

⁴ VOC emission factor based on source test data for similar pellet manufacturing facilities and represents uncontrolled emissions.



Table 4bPotential HAP and TAP EmissionsDryer #2 (ES-DRYER-2, CD-RTO-2)Enviva Pellets Northampton, LLC

Calculation Basis

Annual Dried Wood Throughput of Dryer	390,628 ODT/year
Max. Hourly Dried Wood Throughput of Dryer	70.83 ODT/hr
Burner Heat Input	180.0 MMBtu/hr
Percent Hardwood	20.0%
Percent Softwood	80.0%
Annual Operation	8,760 hr/yr
Annual Heat Input	1,576,800 MMBtu/yr
Number of RTO Burners	4
RTO Burner Rating	8 MMBtu/hr
RTO Control Efficiency	97.50%

Potential HAP and TAP Emissions

Pollutant	НАР	HAP NC TAP		Emission	Units	Footpoto		Emissions
Pollutant	НАР	NC TAP	voc	Factor	Units	Footnote	Max (lb/hr)	Annual (tpv)
Biomass Source								
Acetaldehyde	Y	Y	Y	1.7E-01	lb/ODT	1	0.30	0.82
Acrolein	Y	Y	Ŷ	1.1E-01	Ib/ODT	1	0.19	0.54
Formaldehyde	Y	Y	Ŷ	1.4E-01	Ib/ODT	1	0.25	0.70
Methanol	Y	N	Ŷ	1.0E-01	Ib/ODT	1	0.19	0.51
Phenol	Y	Y	Ŷ	5.8E-02	Ib/ODT	1	0.10	0.28
Propionaldehyde	Y	N	Ŷ	3.9E-02	Ib/ODT	1	0.07	0.19
Acetophenone	Y	N	Y	3.2E-09	lb/MMBtu	2,3	1.4E-08	6.3E-08
Antimony and compounds	Y	N	N	7.9E-06	lb/MMBtu	2,3	1.0E-04	4.5E-04
Arsenic	Y	Y	N	2.2E-05	lb/MMBtu	2,4	2.9E-04	1.3E-03
Benzene	Y	Y	Y	4.2E-03	Ib/MMBtu	2,3	1.9E-02	8.3E-02
Benzo(a)pyrene	Y	Y	Ŷ	2.6E-06	Ib/MMBtu	2,3	1.2E-05	5.1E-05
Beryllium	Y	Y	N	1.1E-06	lb/MMBtu	2,3	1.4E-05	6.3E-05
Cadmium	Y	Y	N	4.1E-06	Ib/MMBtu	2,4	5.4E-05	2.3E-04
Carbon tetrachloride	Y	Y	Y	4.5E-05	lb/MMBtu	2,3	2.0E-04	8.9E-04
Chlorine	Y	Y	N	7.9E-04	lb/MMBtu	2,9	1.4E-01	6.2E-01
Chlorobenzene	Y	Y	Y	3.3E-05	Ib/MMBtu	2,9	1.4E-01 1.5E-04	6.5E-04
Chloroform	Y	Y	Y Y	2.8E-05	Ib/MMBtu	2,3	1.3E-04	5.5E-04
Chioroform Chromium VI	5	Y	Y N	2.8E-05 3.5E-06	Ib/MMBtu	2,3	4.6E-05	2.0E-04
Chromium–Other compounds	 Y	N	N	1.8E-05	Ib/MMBtu	2,4,5	2.3E-03	1.0E-04
Cobalt compounds	Y	N	N	6.5E-06	Ib/MMBtu	2,4	8.5E-04	3.7E-04
•		-						
Dichloroethane, 1,2-	Y	Y	Y Y	2.9E-05	Ib/MMBtu	2,3	1.3E-04	5.7E-04
Dichloropropane, 1,2-	Y	N		3.3E-05	Ib/MMBtu	2,3	1.5E-04	6.5E-04
Dinitrophenol, 2,4-	Y	N	Y	1.8E-07	Ib/MMBtu	2,3	8.1E-07	3.5E-06
Di(2-ethylhexyl)phthalate	Y	Y	Y	4.7E-08	Ib/MMBtu	2,3	2.1E-07	9.3E-07
Ethyl benzene	Y	N	Y	3.1E-05	Ib/MMBtu	2,3	1.4E-04	6.1E-04
Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	N	Y	Y	1.8E-11	Ib/MMBtu	2,3	8.1E-11	3.5E-10
Hydrochloric acid	Y	Y	N	1.9E-02	Ib/MMBtu	2,6	3.4E-01	1.5E+00
Lead	Y	N	N	4.8E-05	Ib/MMBtu	2,4	6.3E-04	2.7E-03
Manganese	Y	Y	N	1.6E-03	Ib/MMBtu	2,4	2.1E-02	9.1E-02
Mercury	Y	Y	N	3.5E-06	lb/MMBtu	2,4	4.6E-05	2.0E-04
Methyl bromide	Y	N	Y	1.5E-05	lb/MMBtu	2,3	6.8E-05	3.0E-04
Methyl chloride	Y	N	Y	2.3E-05	lb/MMBtu	2,3	1.0E-04	4.5E-04
Methyl ethyl ketone	N	Y	Y	5.4E-06	lb/MMBtu	2,3	2.4E-05	1.1E-04
Methylene chloride	Y	Y	Y	2.9E-04	lb/MMBtu	2,3	1.3E-03	5.7E-03
Naphthalene	Y	N	Y	9.7E-05	lb/MMBtu	2,3	4.4E-04	1.9E-03
Nickel	Y	Y	N	3.3E-05	lb/MMBtu	2,4	4.3E-04	1.9E-03
Nitrophenol, 4-	Y	N	Y	1.1E-07	lb/MMBtu	2,3	5.0E-07	2.2E-06
Pentachlorophenol	Y	Y	N	5.1E-08	lb/MMBtu	2	2.3E-07	1.0E-06
Perchloroethylene	Y	Y	N	3.8E-05	lb/MMBtu	2	1.7E-04	7.5E-04
Phosphorus metal, yellow or white	Y	N	N	2.7E-05	lb/MMBtu	2,4	3.5E-04	1.5E-03
Polychlorinated biphenyls	Y	Y	Y	8.2E-09	lb/MMBtu	2,3	3.7E-08	1.6E-07
Polycyclic Organic Matter	Y	N	N	1.3E-04	lb/MMBtu	2	5.6E-04	2.5E-03
Selenium compounds	Y	N	N	2.8E-06	lb/MMBtu	2,4	3.7E-05	1.6E-04
Styrene	Y	Y	Y	1.9E-03	lb/MMBtu	2,3	8.6E-03	3.7E-02
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	Y	Y	Y	8.6E-12	lb/MMBtu	2,3	3.9E-11	1.7E-10
Toluene	Y	Y	Y	3.0E-05	lb/MMBtu	2,3	1.4E-04	5.9E-04
Trichloroethane, 1,1,1-	Y	Y	Ν	3.1E-05	lb/MMBtu	2	1.4E-04	6.1E-04
Trichloroethylene	Y	Y	Y	3.0E-05	lb/MMBtu	2,3	1.4E-04	5.9E-04
Trichlorofluoromethane	N	Y	Y	4.1E-05	lb/MMBtu	2,3	1.8E-04	8.1E-04
Trichlorophenol, 2,4,6-	Y	N	Y	2.2E-08	lb/MMBtu	2,3	9.9E-08	4.3E-07
Vinyl chloride	Y	Y	Y	1.8E-05	lb/MMBtu	2,3	8.1E-05	3.5E-04
Xylene	Y	Y	Y	2.5E-05	lb/MMBtu	2,3	1.1E-04	4.9E-04
			T	otal HAP Emiss			1.64	5.40
				otal TAP Emiss	•	-	1.39	4.69



Table 4b Potential HAP and TAP Emissions Dryer #2 (ES-DRYER-2, CD-RTO-2) Enviva Pellets Northampton, LLC

				Emission	ssion		Potential	Emissions
Pollutant	POILUTANT I HAP I NC I AP I VOC I	Factor	Units	its Footnote	Max	Annual		
							(lb/hr)	(tpy)
RTO - Natural Gas/Propane Source						1	_	
2-Methylnaphthalene	Y	N	Y	2.4E-05	lb/MMscf	7	7.5E-07	3.3E-06
3-Methylchloranthrene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
7,12-Dimethylbenz(a)anthracene	Y	N	Y	1.6E-05	lb/MMscf	7	5.0E-07	2.2E-06
Acenaphthene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
Acenaphthylene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
Acetaldehyde	Y	Y	Y	1.5E-05	lb/MMscf	7	4.8E-07	2.1E-06
Acrolein	Y	Y	Y	1.8E-05	lb/MMscf	7	5.6E-07	2.5E-06
Ammonia	N	Y	N	3.2	lb/MMscf	7	1.0E-01	4.4E-01
Anthracene	Y	N	Y	2.4E-06	lb/MMscf	7	7.5E-08	3.3E-07
Arsenic	Y	Y	N	2.0E-04	lb/MMscf	7	6.3E-06	2.7E-05
Benz(a)anthracene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
Benzene	Y	N	Y	7.1E-04	lb/MMBtu	8	2.3E-02	1.0E-01
Benzo(a)pyrene	Y	Y	Y	1.2E-06	lb/MMscf	7	3.8E-08	1.6E-07
Benzo(b)fluoranthene	Y	Ν	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
Benzo(g,h,i)perylene	Y	Ν	Y	1.2E-06	lb/MMscf	7	3.8E-08	1.6E-07
Benzo(k)fluoranthene	Y	Ν	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
Beryllium	Y	Y	N	1.2E-05	lb/MMscf	7	3.8E-07	1.6E-06
Cadmium	Y	Y	N	1.1E-03	lb/MMscf	7	3.5E-05	1.5E-04
Chromium VI	Y	N	N	1.4E-03	lb/MMscf	7	4.4E-05	1.9E-04
Chrysene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
Cobalt	Y	N	N	8.4E-05	lb/MMscf	7	2.6E-06	1.2E-05
Dibenzo(a,h)anthracene	Y	N	Y	1.2E-06	lb/MMscf	7	3.8E-08	1.6E-07
Dichlorobenzene	Y	Y	Y	1.2E-03	lb/MMscf	7	3.8E-05	1.6E-04
Fluoranthene	Y	N	Y	3.0E-06	lb/MMscf	7	9.4E-08	4.1E-07
Fluorene	Y	N	Y	2.8E-06	lb/MMscf	7	8.8E-08	3.8E-07
Formaldehyde	Y	Y	Y	1.5E-03	lb/MMBtu	8	4.8E-02	2.1E-01
Hexane	Y	Y	Y	1.8	lb/MMscf	7	5.6E-02	2.5E-01
Indeno(1,2,3-cd)pyrene	Y	N	Y	1.8E-06	lb/MMscf	7	5.6E-08	2.5E-07
Lead	Y	N	N	5.0E-04	lb/MMscf	7	1.6E-05	6.9E-05
Manganese	Y	Y	N	3.8E-04	lb/MMscf	7	1.2E-05	5.2E-05
Mercury	Y	Y	N	2.6E-04	lb/MMscf	7	8.2E-06	3.6E-05
Naphthalene	Y	N	Y	6.1E-04	lb/MMscf	7	1.9E-05	8.4E-05
Nickel	Y	Y	N	2.1E-03	lb/MMscf	7	6.6E-05	2.9E-04
Polycyclic Organic Matter	Y	N	N	4.0E-05	lb/MMBtu	8	1.3E-03	5.6E-03
Phenanthrene	Y	N	Y	1.7E-05	lb/MMscf	7	5.3E-07	2.3E-06
Pyrene	Y	N	Y	5.0E-06	lb/MMscf	7	1.6E-07	6.9E-07
Selenium compounds	Y	N	N	2.4E-05	lb/MMscf	7	7.5E-07	3.3E-06
Toluene	Y	Y	Y	3.4E-03	lb/MMscf	7	1.1E-04	4.7E-04
		-		ssions (relate		•	0.13	0.56
				ssions (relate				0.36

Notes:

^{1.} Emission factor derived based on stack testing data from comparable Enviva facilities and/or engineering judgement and include contingency. The emission factors represent uncontrolled emissions.

^{2.} Emission factors (criteria and HAP/TAP) for wood combustion in a stoker boiler from NCDAQ Wood Waste Combustion Spreadsheet/AP-42, Fifth Edition, Volume 1, Chapter 1.6 - Wood Residue Combustion in Boilers, 09/03.

^{3.} The control efficiency of 97.5% for the RTO is applied to all VOC hazardous and toxic pollutants

^{4.} The control efficiency of the wet electrostatic precipitator (WESP) for filterable particulate matter is applied to all metal hazardous and toxic pollutants from the dryer and duct burners. Actual design filterable efficiency is estimated to 96.4%, but 92.75% is assumed for toxics permitting.

WESP Control Efficiency for metal HAP

^{5.} Chromium VI is a subset of chromium compounds, which is accounted for separately as a HAP. As such, Chromium VI is only calculated as a TAP.

92.8%

90.00%

^{6.} The WESP employs a caustic solution in its operation in which hydrochloric acid will have high water solubility. This caustic solution will neutralize the acid and effectively control it by 90%, per conversation on October 18, 2011 with Steven A. Jaasund, P.E. of Lundberg Associates, a manufacturer of WESPs.

WESP HCI Control Efficiency

^{7.} Emission factors for natural gas combustion are from NCDAQ Natural Gas Combustion Spreadsheet and AP-42, Fifth Edition, Volume 1, Chapter 1.4 - Natural Gas Combustion, 07/98. The emission factors for acetaldehyde, acrolein, and ammonia are cited in the NCDAQ spreadsheet as being sourced from the USEPA's WebFIRE database.

^{8.} The RTO burners can fire either natural gas or propane; Propane is worst-case for these HAP emissions. Emission factors for propane combustion from the South Coast Air Quality Management District's Air Emissions Reporting Tool for external combustion equipment fired with LPG.

^{9.} It was assumed that chlorine is not oxidized in the RTO.



Table 4bPotential HAP and TAP EmissionsDryer #2 (ES-DRYER-2, CD-RTO-2)Enviva Pellets Northampton, LLC

Abbreviations:

CAS - chemical abstract service CH₄ - methane CO - carbon monoxide CO2 - carbon dioxide CO₂e - carbon dioxide equivalent HAP - hazardous air pollutant hr - hour kg - kilogram Ib - pound MMBtu - Million British thermal units NC - North Carolina NO_x - nitrogen oxides N₂O - nitrous oxide
ODT - oven dried tons
PM - particulate matter
PM₁₀ - particulate matter with an aerodynamic diameter less than 10 microns
PM_{2.5} - particulate matter with an aerodynamic diameter of 2.5 microns or less
RTO - regenerative thermal oxidizer
SO₂ - sulfur dioxide
TAP - toxic air pollutant
tpy - tons per year
VOC - volatile organic compound
WESP - wet electrostatic precipitator

yr - year



Table 4cPotential EmissionsDryer #2 Bypass (ES-DRYERBYP-2) (Full Capacity)1Enviva Pellets Northampton, LLC

Calculation Basis

Hourly Throughput	70.83 ODT/hr
Hourly Heat Input Capacity	180 MMBtu/hr
Annual Heat Input Capacity	9,000 MMBtu/yr
Hours of Operation ¹	50 hr/yr

Potential Criteria Pollutant and Greenhouse Gas Emissions per Dryer Line

Pollutant	Emission Factor	Units	Potential Emissions				
	Factor		Max (lb/hr)	Annual (tpy)			
СО	21.4	lb/hr ²	21.4	0.54			
NO _X	26.3	lb/hr ²	26.3	0.66			
SO ₂	0.025	lb/MMBtu ³	4.50	0.113			
VOC	14.0	lb/hr ²	14.0	0.35			
PM/PM ₁₀ /PM _{2.5} Condensable	0.017	lb/MMBtu ⁴	3.06	0.077			
PM/PM ₁₀ /PM _{2.5} Filterable	0.33	lb/MMBtu⁵	59.4	1.49			
Total PM/PM ₁₀ /PM _{2.5}			62.5	1.56			

Notes:

^{1.} During startup and shutdown (for temperature control) or malfunction, excess emissions can be vented out either the dryer bypass stacks or the furnace bypass stacks. Use of the bypass stacks is limited to 2 hours in any 24-hour period and 50 hours per 12-month rolling period for each dryer line. As the feed to the dryer is typically stopped during shutdown and malfunction events, the hourly throughput is equal to the annual average of the dryer feed rate.

 2 CO, NO_X, and VOC emission rates based on data from a comparable Enviva facility.

^{3.} No emission factor is provided in AP-42, Section 10.6.2 for SO₂ for rotary dryers. Enviva has conservatively calculated SO₂ emissions based on AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03.

^{4.} Emission factor for condensable PM based on AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03.

^{5.} Uncontrolled filterable PM emission factor is based on testing at a comparable Enviva facility.



Table 4cPotential EmissionsDryer #2 Bypass (ES-DRYERBYP-2) (Full Capacity)1Enviva Pellets Northampton, LLC

	Emission						
Pollutant	Factor	Units	Footnote	Max	Annual		
				(lb/hr)	(tpv)		
Acetaldehyde	0.168	lb/ODT	2	11.9	0.30		
Acrolein	0.110	lb/ODT	2	7.79	0.19		
Formaldehyde	0.144	lb/ODT	2	10.16	0.25		
Methanol	0.105	lb/ODT	2	7.43	0.19		
Phenol	0.058	lb/ODT	2	4.08	0.10		
Propionaldehyde	0.039	lb/ODT	2	2.73	0.068		
Acetophenone	3.2E-09	lb/MMBtu	3	5.76E-07	1.44E-08		
Antimony and compounds	7.9E-06	lb/MMBtu	3	1.42E-03	3.56E-05		
Arsenic	2.2E-05	lb/MMBtu	3	3.96E-03	9.90E-05		
Benzo(a)pyrene	2.6E-06	lb/MMBtu	3	4.68E-04	1.17E-05		
Beryllium	1.1E-06	lb/MMBtu	3	1.98E-04	4.95E-06		
Cadmium	4.1E-06	lb/MMBtu	3	7.38E-04	1.85E-05		
Carbon tetrachloride	4.5E-05	lb/MMBtu	3	8.10E-03	2.03E-04		
Chlorine	7.9E-04	lb/MMBtu	3	1.42E-01	3.56E-03		
Chlorobenzene	3.3E-05	lb/MMBtu	3	5.94E-03	1.49E-04		
Chromium–Other compounds	1.8E-05	lb/MMBtu	3	3.15E-03	7.88E-05		
Cobalt compounds	6.5E-06	lb/MMBtu	3	1.17E-03	2.93E-05		
Dinitrophenol, 2,4-	1.8E-07	lb/MMBtu	3	3.24E-05	8.10E-07		
Di(2-ethylhexyl)phthalate	4.7E-08	lb/MMBtu	3	8.46E-06	2.12E-07		
Ethyl benzene	3.1E-05	lb/MMBtu	3	5.58E-03	1.40E-04		
Dichloroethane, 1,2-	2.9E-05	lb/MMBtu	3	5.22E-03	1.31E-04		
Hydrochloric acid	1.9E-02	lb/MMBtu	3	3.42E+00	8.55E-02		
Lead	4.8E-05	lb/MMBtu	3	8.64E-03	2.16E-04		
Manganese	1.6E-03	lb/MMBtu	3	2.88E-01	7.20E-03		
Mercury	3.5E-06	lb/MMBtu	3	6.30E-04	1.58E-05		
Methyl bromide	1.5E-05	lb/MMBtu	3	2.70E-03	6.75E-05		
Methyl chloride	2.3E-05	lb/MMBtu	3	4.14E-03	1.04E-04		
Trichloroethane, 1,1,1-	3.1E-05	lb/MMBtu	3	5.58E-03	1.40E-04		
Naphthalene	9.7E-05	lb/MMBtu	3	1.75E-02	4.37E-04		
Nickel	3.3E-05	lb/MMBtu	3	5.94E-03	1.49E-04		
Nitrophenol, 4-	1.1E-07	lb/MMBtu	3	1.98E-05	4.95E-07		
Pentachlorophenol	5.1E-08	lb/MMBtu	3	9.18E-06	2.30E-07		
Perchloroethylene	3.8E-05	lb/MMBtu	3	6.84E-03	1.71E-04		
Phosphorus metal, yellow or		lb/MMBtu	3	4.945.02			
white	2.7E-05	ID/ IVIIVIBLU		4.86E-03	1.22E-04		
Polychlorinated biphenyls	8.2E-09	lb/MMBtu	3	1.47E-06	3.67E-08		
Polycyclic Organic Matter	1.3E-04	lb/MMBtu	3	2.25E-02	5.63E-04		
Dichloropropane, 1,2-	3.3E-05	lb/MMBtu	3	5.94E-03	1.49E-04		
Selenium compounds	2.8E-06	lb/MMBtu	3	5.04E-04	1.26E-05		
Tetrachlorodibenzo-p-dioxin,	0 (5 4 0		2	1			
2,3,7,8-	8.6E-12	lb/MMBtu	3	1.55E-09	3.87E-11		
Trichloroethylene	3.0E-05	lb/MMBtu	3	5.40E-03	1.35E-04		
Trichlorophenol, 2,4,6-	2.2E-08	lb/MMBtu	3	3.96E-06	9.90E-08		
Vinyl chloride	1.8E-05	Ib/MMBtu	3	3.24E-03	8.10E-05		
	1.02.00		P Emissions		1.20		

Potential HAP Emissions per Dryer Line

Notes:

¹. During dryer bypass emissions are not controlled by the WESP and RTO; however, combustion in the furnace still results in a reduction in organic HAP emission rates.

^{2.} Organic HAP emissions rates were derived based on stack testing data from other similar Enviva plants and/or engineering judgement.

^{3.} Emission factors for wood combustion in a stoker boiler from AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03.

Abbreviations: CH₄ - methane

- CO_{4} methane CO_{2} - carbon monoxide CO_{2} - carbon dioxide $CO_{2}e$ - carbon dioxide equivalent HAP - hazardous air pollutant hr - hour kg - kilogram Ib - pound MMBtu - Million British thermal units NO_{X} - nitrogen oxides $N_{2}O_{2}$ - nitrous oxide
- ODT oven dried tons PM particulate matter PM_{10} particulate matter with an aerodynamic diameter less than 10 microns $PM_{2.5}$ particulate matter with an aerodynamic diameter of 2.5 microns or less RTO regenerative thermal oxidizer SO_2 sulfur dioxide tpy tons per year VOC volatile organic compound WESP wet electrostatic precipitator yr year

Reference:



Table 4cPotential EmissionsDryer #2 Bypass (ES-DRYERBYP-2) (Full Capacity)1Enviva Pellets Northampton, LLC

AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03



Table 4d **Potential Emissions** Dryer #2 Furnace Bypass (ES-FURNACEBYP-2) (Full Capacity)¹ **Enviva Pellets Northampton, LLC**

Calculation Basis

Hourly Heat Input Capacity	180 MMBtu/hr
Annual Heat Input Capacity	9,000 MMBtu/yr
Hours of Operation ¹	50 hr/yr

Potential Criteria Pollutant and Greenhouse Gas Emissions per Dryer Line

Pollutant	Emission Factor	Units	Potential Emissions		
	Factor		Max (lb/hr)	Annual (tpy)	
со	0.60	lb/MMBtu ²	108.0	2.70	
NO _X	0.22	lb/MMBtu ²	39.60	0.99	
SO ₂	0.025	lb/MMBtu ²	4.50	0.113	
VOC	0.017	lb/MMBtu ²	3.06	0.077	
Total PM/PM ₁₀ /PM _{2.5}	0.58	lb/MMBtu ²	103.9	2.60	

Notes:

During startup and shutdown (for temperature control) or malfunction, excess emissions can be vented out either the dryer bypass stacks or the furnace bypass stacks. Use of the bypass stacks is limited to 2 hours in any 24-hour period and 50 hours per 12-month rolling period for each dryer line. 2. CO, NO_X, SO₂, PM, and VOC emission rates based on AP-42, Chapter 1.6 - Wood Residue Combustion in Boilers, 09/03 for bark/bark and wet wood/wet wood-

fired boilers. VOC emission factor excludes formaldehyde.



Table 4d **Potential Emissions** Dryer #2 Furnace Bypass (ES-FURNACEBYP-2) (Full Capacity)¹ **Enviva Pellets Northampton, LLC**

_	Ilutant Emission Units			Potential Emissions		
Pollutant		Footnote	Мах	Annual		
				(lb/hr)	(tpy)	
Acetaldehyde	8.30E-04	lb/MMBtu	1	1.49E-01	3.74E-03	
Acrolein	4.00E-03	lb/MMBtu	1	7.20E-01	1.80E-02	
Formaldehyde	4.40E-03	lb/MMBtu	1	7.92E-01	1.98E-02	
Phenol	5.10E-05	lb/MMBtu	1	9.18E-03	2.30E-04	
Propionaldehyde	6.10E-05	lb/MMBtu	1	1.10E-02	2.75E-04	
Acetophenone	3.2E-09	lb/MMBtu	1	5.76E-07	1.44E-08	
Antimony and compounds	7.9E-06	lb/MMBtu	1	1.42E-03	3.56E-05	
Arsenic	2.2E-05	lb/MMBtu	1	3.96E-03	9.90E-05	
Benzo(a)pyrene	2.6E-06	lb/MMBtu	1	4.68E-04	1.17E-05	
Beryllium	1.1E-06	lb/MMBtu	1	1.98E-04	4.95E-06	
Cadmium	4.1E-06	lb/MMBtu	1	7.38E-04	1.85E-05	
Carbon tetrachloride	4.5E-05	lb/MMBtu	1	8.10E-03	2.03E-04	
Chlorine	7.9E-04	lb/MMBtu	1	1.42E-01	3.56E-03	
Chlorobenzene	3.3E-05	lb/MMBtu	1	5.94E-03	1.49E-04	
Chromium–Other compounds	2.1E-05	lb/MMBtu	1	3.78E-03	9.45E-05	
Cobalt compounds	6.5E-06	lb/MMBtu	1	1.17E-03	2.93E-05	
Dinitrophenol, 2,4-	1.8E-07	lb/MMBtu	1	3.24E-05	8.10E-07	
Di(2-ethylhexyl)phthalate	4.7E-08	lb/MMBtu	1	8.46E-06	2.12E-07	
Ethyl benzene	3.1E-05	lb/MMBtu	1	5.58E-03	1.40E-04	
Dichloroethane, 1,2-	2.9E-05	lb/MMBtu	1	5.22E-03	1.31E-04	
Hydrochloric acid	1.9E-02	lb/MMBtu	1	3.42E+00	8.55E-02	
Lead	4.8E-05	lb/MMBtu	1	8.64E-03	2.16E-04	
Manganese	1.6E-03	lb/MMBtu	1	2.88E-01	7.20E-03	
Mercury	3.5E-06	lb/MMBtu	1	6.30E-04	1.58E-05	
Methyl bromide	1.5E-05	lb/MMBtu	1	2.70E-03	6.75E-05	
Methyl chloride	2.3E-05	lb/MMBtu	1	4.14E-03	1.04E-04	
Trichloroethane, 1,1,1-	3.1E-05	lb/MMBtu	1	5.58E-03	1.40E-04	
Naphthalene	9.7E-05	lb/MMBtu	1	1.75E-02	4.37E-04	
Nickel	3.3E-05	lb/MMBtu	1	5.94E-03	1.49E-04	
Nitrophenol, 4-	1.1E-07	lb/MMBtu	1	1.98E-05	4.95E-07	
Pentachlorophenol	5.1E-08	lb/MMBtu	1	9.18E-06	2.30E-07	
Perchloroethylene	3.8E-05	lb/MMBtu	1	6.84E-03	1.71E-04	
Phosphorus metal, yellow or white	2.7E-05	lb/MMBtu	1	4.86E-03	1.22E-04	
Polychlorinated biphenyls	8.2E-09	lb/MMBtu	1	1.47E-06	3.67E-08	
Polycyclic Organic Matter	1.3E-04	lb/MMBtu	1	2.25E-02	5.63E-04	
Dichloropropane, 1,2-	3.3E-05	lb/MMBtu	1	5.94E-03	1.49E-04	
Selenium compounds	2.8E-06	lb/MMBtu	1	5.04E-04	1.26E-05	
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	8.6E-12	lb/MMBtu	1	1.55E-09	3.87E-11	
Trichloroethylene	3.0E-05	lb/MMBtu	1	5.40E-03	1.35E-04	
Trichlorophenol, 2,4,6-	2.2E-08	lb/MMBtu	1	3.96E-06	9.90E-08	
Vinyl chloride	1.8E-05	lb/MMBtu	1	3.24E-03	8.10E-05	
Total H	AP Emissions	(Biomass Co	mbustion)	5.66	0.14	

Notes:

^{1.} Emission factors for wood combustion in a stoker boiler from AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03.

Abbreviations: CH₄ - methane

CO - carbon monoxide CO2 - carbon dioxide $\mathrm{CO}_2\mathrm{e}$ - carbon dioxide equivalent HAP - hazardous air pollutant hr - hour lb - pound MMBtu - Million British thermal units NO_X - nitrogen oxides

 N_2O - nitrous oxide ODT - oven dried tons PM - particulate matter $\ensuremath{\text{PM}_{10}}\xspace$ - particulate matter with an aerodynamic diameter less than 10 microns $\text{PM}_{2.5}$ - particulate matter with an aerodynamic diameter of 2.5 microns or less SO₂ - sulfur dioxide tpy - tons per year VOC - volatile organic compound yr - year

Reference:

AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03



Table 4e **Potential Emissions** Dryer #2 Furnace Bypass (ES-FURNACEBYP-2) (Idle Mode)¹ Enviva Pellets Northampton, LLC

Calculation Basis

Hourly Heat Input Capacity	5 MMBtu/hr
Annual Heat Input Capacity	2,500 MMBtu/yr
Hours of Operation ¹	500 hr/yr

Potential Criteria Pollutant and Greenhouse Gas Emissions per Dryer Line

Pollutant	Emission Factor	Units	Potential Emissions		
	Factor		Max (Ib/hr)	Annual (tpy)	
СО	0.60	lb/MMBtu ²	3.00	0.75	
NO _X	0.22	lb/MMBtu ²	1.10	0.28	
SO ₂	0.025	lb/MMBtu ²	0.13	0.031	
VOC	0.017	lb/MMBtu ²	0.085	0.021	
Total PM	0.58	lb/MMBtu ²	2.89	0.72	
Total PM ₁₀	0.52	lb/MMBtu ²	2.59	0.65	
Total PM _{2.5}	0.45	lb/MMBtu ²	2.24	0.56	

Notes:

^{1.} As part of this submittal Enviva is requesting a limit of 500 hours per year of "idle mode" for each furnace. ^{2.} CO, NO_X, SO₂, PM₁₀, PM_{2.5}, and VOC emission rates based on AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03 for bark/bark and wet wood/wet woodfired boilers. PM₁₀ and PM_{2.5} factors equal to the sum of the filterable and condensible factors from Table 1.6-1. VOC emission factor excludes formaldehyde.



Table 4ePotential EmissionsDryer #2 Furnace Bypass (ES-FURNACEBYP-2) (Idle Mode)1Enviva Pellets Northampton, LLC

	Emission Factor Units Footnote			Potential Emissions	
Pollutant		Footnote	Max (Ib/hr)	Annual (tpy)	
Acetaldehyde	8.30E-04	lb/MMBtu	1	4.15E-03	1.04E-03
Acrolein	4.00E-03	lb/MMBtu	1	2.00E-02	5.00E-03
Formaldehyde	4.40E-03	lb/MMBtu	1	2.20E-02	5.50E-03
Phenol	5.10E-05	lb/MMBtu	1	2.55E-04	6.38E-05
Propionaldehyde	6.10E-05	lb/MMBtu	1	3.05E-04	7.63E-05
Acetophenone	3.2E-09	lb/MMBtu	1	1.60E-08	4.00E-09
Antimony and compounds	7.9E-06	lb/MMBtu	1	3.95E-05	9.88E-06
Arsenic	2.2E-05	lb/MMBtu	1	1.10E-04	2.75E-05
Benzo(a)pyrene	2.6E-06	lb/MMBtu	1	1.30E-05	3.25E-06
Beryllium	1.1E-06	lb/MMBtu	1	5.50E-06	1.38E-06
Cadmium	4.1E-06	lb/MMBtu	1	2.05E-05	5.13E-06
Carbon tetrachloride	4.5E-05	lb/MMBtu	1	2.25E-04	5.63E-05
Chlorine	7.9E-04	lb/MMBtu	1	3.95E-03	9.88E-04
Chlorobenzene	3.3E-05	lb/MMBtu	1	1.65E-04	4.13E-05
Chromium–Other compounds	2.1E-05	lb/MMBtu	1	1.05E-04	2.63E-05
Cobalt compounds	6.5E-06	lb/MMBtu	1	3.25E-05	8.13E-06
Dinitrophenol, 2,4-	1.8E-07	lb/MMBtu	1	9.00E-07	2.25E-07
Di(2-ethylhexyl)phthalate	4.7E-08	lb/MMBtu	1	2.35E-07	5.88E-08
Ethyl benzene	3.1E-05	lb/MMBtu	1	1.55E-04	3.88E-05
Dichloroethane, 1,2-	2.9E-05	lb/MMBtu	1	1.45E-04	3.63E-05
Hydrochloric acid	1.9E-02	lb/MMBtu	1	9.50E-02	2.38E-02
Lead	4.8E-05	lb/MMBtu	1	2.40E-04	6.00E-05
Manganese	1.6E-03	lb/MMBtu	1	8.00E-03	2.00E-03
Mercury	3.5E-06	lb/MMBtu	1	1.75E-05	4.38E-06
Methyl bromide	1.5E-05	lb/MMBtu	1	7.50E-05	1.88E-05
Methyl chloride	2.3E-05	lb/MMBtu	1	1.15E-04	2.88E-05
Trichloroethane, 1,1,1-	3.1E-05	lb/MMBtu	1	1.55E-04	3.88E-05
Naphthalene	9.7E-05	lb/MMBtu	1	4.85E-04	1.21E-04
Nickel	3.3E-05	lb/MMBtu	1	1.65E-04	4.13E-05
Nitrophenol, 4-	1.1E-07	lb/MMBtu	1	5.50E-07	1.38E-07
Pentachlorophenol	5.1E-08	lb/MMBtu	1	2.55E-07	6.38E-08
Perchloroethylene	3.8E-05	lb/MMBtu	1	1.90E-04	4.75E-05
Phosphorus metal, yellow or white	2.7E-05	lb/MMBtu	1	1.35E-04	3.38E-05
Polychlorinated biphenyls	8.2E-09	lb/MMBtu	1	4.08E-08	1.02E-08
Polycyclic Organic Matter	1.3E-04	lb/MMBtu	1	6.25E-04	1.56E-04
Dichloropropane, 1,2-	3.3E-05	lb/MMBtu	1	1.65E-04	4.13E-05
Selenium compounds	2.8E-06	lb/MMBtu	1	1.40E-05	3.50E-06
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	8.6E-12	lb/MMBtu	1	4.30E-11	1.08E-11
Trichloroethylene	3.0E-05	lb/MMBtu	1	1.50E-04	3.75E-05
Trichlorophenol, 2,4,6-	2.2E-08	lb/MMBtu	1	1.10E-07	2.75E-08
Vinyl chloride	1.8E-05	lb/MMBtu	1	9.00E-05	2.25E-05
	HAP Emissions		mbustion)	0.16	0.039

Potential HAP Emissions per Dryer Line

Notes:

^{1.} Emission factors for wood combustion in a stoker boiler from AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03.

Abbreviations:

 CH_4 - methane CO - carbon monoxide CO_2 - carbon dioxide CO_2e - carbon dioxide equivalent HAP - hazardous air pollutant hr - hour kg - kilogram Ib - pound MMBtu - Million British thermal units NO_X - nitrogen oxides N_2O - nitrous oxide ODT - oven dried tons PM - particulate matter PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns PM_{2.5} - particulate matter with an aerodynamic diameter of 2.5 microns or less SO_2 - sulfur dioxide tpy - tons per year VOC - volatile organic compound yr - year

Reference:

AP-42, Section 1.6 - Wood Residue Combustion in Boilers, 09/03



Table 4f Potential Emissions Dryer #2 Double Duct Burners (IES-DDB-3 and -4) Enviva Pellets Northampton, LLC

Duct Burner Inputs

Duct Burner Rating	1 MMBtu/hr
Number of Duct Burners	2
Annual Operation	8,760 hr/yr

Potential Criteria Pollutant Emissions: Potential Criteria Pollutant Emissions - Natural Gas Combustion

Pollutant	Emission	Units	Emission Factor Source	Potential Emissions	
	Factor			Max (lb/hr)	Annuai (tpy)
СО	84.0	lb/MMscf	Note 1	0.16	0.72
NO _X	50.0	lb/MMscf	Note 2	0.10	0.43
SO ₂	0.60	lb/MMscf	Note 1	0.0012	0.005
VOC	5.50	lb/MMscf	Note 1	0.01	0.05
PM/PM ₁₀ /PM _{2.5} Condensable	5.70	lb/MMscf	Note 1	0.01	0.05
PM/PM ₁₀ /PM _{2.5} Filterable	1.90	lb/MMscf	Note 1	0.004	0.02
Total PM/PM ₁₀ /PM _{2.5}				0.015	0.065



Table 4f Potential Emissions Dryer #2 Double Duct Burners (IES-DDB-3 and -4) Enviva Pellets Northampton, LLC

Potential Criteria Pollutant Emissions - Propane Combustion

Pollutant	Emission Factor	Units	Emission Factor Source	Potential Emissions	
				Max (lb/hr)	Annual (tpy)
со	7.50	lb/Mgal	Note 3	0.16	0.72
NO _X	6.50	lb/Mgal	Note 4	0.14	0.62
SO ₂	0.054	lb/Mgal	Note 3,5	0.001	0.005
VOC	1.00	lb/Mgal	Note 3	0.02	0.10
PM/PM ₁₀ /PM _{2.5} Condensable	0.50	lb/Mgal	Note 3	0.01	0.05
PM/PM ₁₀ /PM _{2.5} Filterable	0.20	lb/Mgal	Note 3	0.004	0.02
Total PM/PM ₁₀ /PM _{2.5}				0.015	0.067

Notes:

- ^{1.} Emission factors for natural gas combustion from AP-42 Section 1.4 Natural Gas Combustion, 07/98. Natural gas heating value of 1,020 Btu/scf assumed per AP-42.
- ^{2.} Emission factors for NO_X assume burners are low NO_X burners, per email from Kai Simonsen (Enviva) on August 8, 2018.
- ^{3.} Emission factors for propane combustion obtained from AP-42 Section 1.5 Liquefied Petroleum Gas Combustion, 07/08. Propane heating value of 91.5 MMBtu/Mgal assumed per AP-42.
- ^{4.} AP-42 Section 1.5 does not include an emission factor for low NO_X burners. Per AP-42 Section 1.4, low NO_X burners reduce NO_X emissions by accomplishing combustion in stages, reducing NO_X emissions 40 to 85% relative to uncontrolled emission levels. A conservative control efficiency of 50% was applied to the uncontrolled NO_X emission factor from AP-42 Section 1.5. This reduction is consistent with the magnitude of reduction between the uncontrolled and low NO_X emission factors in AP-42 Section 1.4.
- ^{5.} SO₂ emissions are based on an assumed fuel sulfur content of 0.54 grains/100 ft³ per A National Methodology and Emission Inventory for Residential Fuel Combustion.



Table 4f Potential Emissions Dryer #2 Double Duct Burners (IES-DDB-3 and -4) Enviva Pellets Northampton, LLC

Potential HAP and TAP Emissions

		NOTO	1/00	Emission		_	Potential Emissions		
Pollutant	HAP	NC TAP	VOC	Factor	Units	Footnote	Max	Annual	
Duct Burners - Natural Gas/Propane S	ource						(lb/hr)	(tpy)	
2-Methylnaphthalene	Y	N	Y	2.4E-05	lb/MMscf	1	4.7E-08	2.1E-07	
3-Methylchloranthrene	Y	N	Y	1.8E-06	Ib/MMscf	1	3.5E-09	1.5E-08	
7,12-Dimethylbenz(a)anthracene	Y	N	Y	1.6E-05	Ib/MMscf	1	3.1E-08	1.4E-07	
Acenaphthene	Y	N	Y	1.8E-06	Ib/MMscf	1	3.5E-09	1.5E-08	
Acenaphthylene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08	
Acetaldehyde	Y	Y	Y	1.5E-05	Ib/MMscf	1	3.0E-08	1.3E-07	
Acrolein	Y	Y	Y	1.8E-05	lb/MMscf	1	3.5E-08	1.5E-07	
Ammonia	N	Y	N	3.2	lb/MMscf	1	6.3E-03	2.7E-02	
Anthracene	Y	N	Y	2.4E-06	Ib/MMscf	1	4.7E-09	2.1E-02	
Arsenic	Y	Y	N	2.4E-08	Ib/MMscf	1	4.7E-09 3.9E-07	1.7E-06	
Benz(a)anthracene	Y	N	Y	1.8E-06	Ib/MMscf	1	3.9E-07 3.5E-09	1.7E-08	
Benzene	Y	N	Y	7.1E-04	Ib/MMBtu	2	1.4E-03	6.2E-03	
	Y	Y	Y Y	1.2E-04	Ib/MMscf	1	2.4E-03	1.0E-08	
Benzo(a)pyrene			Y Y	_	ł	1			
Benzo(b)fluoranthene	Y	N		1.8E-06	Ib/MMscf	1	3.5E-09 2.4E-09	1.5E-08	
Benzo(g,h,i)perylene	Y	N	Y	1.2E-06	Ib/MMscf	1		1.0E-08	
Benzo(k)fluoranthene	Y	N	Y	1.8E-06	Ib/MMscf	1	3.5E-09	1.5E-08	
Beryllium	Y	Y	N	1.2E-05	Ib/MMscf	1	2.4E-08	1.0E-07	
Cadmium	Y	Y	N	1.1E-03	Ib/MMscf	1	2.2E-06	9.4E-06	
Chromium VI	Y	N	N	1.4E-03	lb/MMscf	1	2.7E-06	1.2E-05	
Chrysene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08	
Cobalt	Y	N	N	8.4E-05	lb/MMscf	1	1.6E-07	7.2E-07	
Dibenzo(a,h)anthracene	Y	N	Y	1.2E-06	lb/MMscf	1	2.4E-09	1.0E-08	
Dichlorobenzene	Y	Y	Y	1.2E-03	lb/MMscf	1	2.4E-06	1.0E-05	
Fluoranthene	Y	N	Y	3.0E-06	lb/MMscf	1	5.9E-09	2.6E-08	
Fluorene	Y	N	Y	2.8E-06	lb/MMscf	1	5.5E-09	2.4E-08	
Formaldehyde	Y	Y	Y	1.5E-03	lb/MMBtu	2	3.0E-03	1.3E-02	
Hexane	Y	Y	Y	1.8	lb/MMscf	1	3.5E-03	1.5E-02	
Indeno(1,2,3-cd)pyrene	Y	N	Y	1.8E-06	lb/MMscf	1	3.5E-09	1.5E-08	
Lead	Y	N	N	5.0E-04	lb/MMscf	1	9.8E-07	4.3E-06	
Manganese	Y	Y	N	3.8E-04	lb/MMscf	1	7.5E-07	3.3E-06	
Mercury	Y	Y	N	2.6E-04	lb/MMscf	1	5.1E-07	2.2E-06	
Naphthalene	Y	N	Y	6.1E-04	lb/MMscf	1	1.2E-06	5.2E-06	
Nickel	Y	Y	N	2.1E-03	lb/MMscf	1	4.1E-06	1.8E-05	
Polycyclic Organic Matter	Y	N	N	4.0E-05	lb/MMBtu	8	8.0E-05	3.5E-04	
Phenanthrene	Y	Ν	Y	1.7E-05	lb/MMscf	1	3.3E-08	1.5E-07	
Pyrene	Y	Ν	Y	5.0E-06	lb/MMscf	1	9.8E-09	4.3E-08	
Selenium compounds	Y	N	N	2.4E-05	lb/MMscf	1	4.7E-08	2.1E-07	
oluene	Y	Y	Y	3.4E-03	lb/MMscf	1	6.7E-06	2.9E-05	
	•	То	tal HAP Emi	ssions (related	l to natural ga	as/propane)	0.008	0.035	
				ssions (related		• • •	0.01	0.056	



Table 4f Potential Emissions Dryer #2 Double Duct Burners (IES-DDB-3 and -4) Enviva Pellets Northampton, LLC

Notes:

- Emission factors for natural gas combustion are from NCDAQ Natural Gas Combustion Spreadsheet and AP-42, Fifth Edition, Volume 1, Chapter 1.4 Natural Gas Combustion, 07/98. The emission factors for acetaldehyde, acrolein, and ammonia are cited in the NCDAQ spreadsheet as being sourced from the USEPA's WebFIRE database.
- 2. The duct burners can fire either natural gas or propane; Propane is worst-case for these HAP emissions. Emission factors for propane combustion from the South Coast Air Quality Management District's Air Emissions Reporting Tool for external combustion equipment fired with LPG.

Abbreviations:

CAS - chemical abstract service CH_4 - methane CO - carbon monoxide CO_2 - carbon dioxide CO_2e - carbon dioxide equivalent HAP - hazardous air pollutant hr - hour kg - kilogram Ib - pound MMBtu - Million British thermal units NC - North Carolina NO_X - nitrogen oxides N₂O - nitrous oxide ODT - oven dried tons PM - particulate matter PM₁₀ - particulate matter with an aerodynamic diameter less than 10 microns PM_{2.5} - particulate matter with an aerodynamic diameter of 2.5 microns or less RTO - regenerative thermal oxidizer SO₂ - sulfur dioxide TAP - toxic air pollutant tpy - tons per year VOC - volatile organic compound WESP - wet electrostatic precipitator yr - year



Table 5Potential EmissionsPropane Vaporizer (IES-PVAP)Enviva Pellets Northampton, LLC

Calculation Basis

Heat Content ¹	91.5 MMBtu/10 ³ gal propane
Hours of Operation	8,760 hr/yr
Vaporizer Heat Input ²	1.00 MMBtu/hr

Notes:

Propane heat content from AP-42 Section 1.5 - Liquefied Petroleum Gas Production, 7/08, Table 1.5-1, footnote a.
 Heat input based on information provided by Enviva in August 2018.

Potential Criteria Pollutant Emissions

	Emission		Potential Emissions		
Pollutant	Factor ¹	Units	Max (Ib∕hr)	Annual (tpy)	
СО	7.5	lb/10 ³ gal	0.08	0.36	
NO _X	13.0	lb/10 ³ gal	0.14	0.62	
SO ₂ ²	0.05	lb/10 ³ gal	0.001	0.003	
ТОС	1.0	lb/10 ³ gal	0.01	0.05	
PM/PM ₁₀ /PM _{2.5} ³	0.70	lb/10 ³ gal	0.01	0.03	

Notes:

^{1.} Emission factors obtained from AP 42 1.5, Liquefied Petroleum Gas Production, 10/96, Table 1.5-1.

- ^{2.} AP 42 1.5, Liquefied Petroleum Gas Production, 10/96, Table 1.5-1 provides an SO₂ emission factor of 0.10S, where S equals the sulfur content of the fuel. The national sulfur fuel content for LPG of 0.54 grains/100 ft³ as assigned by EPA was used (Source: A National Methodology and Emission Inventory for Residential Fuel Combustion).
- ³ All particulate matter was conservatively assumed to be less than 2.5 microns in size.

Potential HAP Emissions

Pollutant	CAS No.	Emission Factor ¹	Potential Emissions		
Ponutant	CAS NO.	(lb/MMBtu)	Max (lb/hr)	Annual (tpy)	
Benzene	71-43-2	7.1E-04	7.10E-04	3.11E-03	
Formaldehyde	50-00-0	1.5E-03	1.50E-03	6.57E-03	
PAHs		4.0E-05	4.0E-05	1.75E-04	
Total HAP Emissions 0.002 0.010					

Notes:

¹ Emission factors for propane combustion from the South Coast Air Quality Management District's Air Emissions Reporting Tool for external combustion equipment fired with LPG.

Abbreviations:

Btu - British thermal unit	MW - megawatt
CAS - chemical abstract service	MMBtu - Million British thermal units
CH ₄ - methane	NO _x - nitrogen oxides
CO - carbon monoxide	N ₂ O - nitrous oxide
CO2 - carbon dioxide	ODT - oven dried tons
CO ₂ e - carbon dioxide equivalent	PAH - polycyclic aromatic hydrocarbon
g - gram	PM - particulate matter
gal - gallon	PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns
HAP - hazardous air pollutant	PM _{2.5} - particulate matter with an aerodynamic diameter of 2.5 microns or less
hp - horsepower	POM - polycyclic organic matter
hr - hour	SO ₂ - sulfur dioxide
kg - kilogram	tpy - tons per year
kW - kilowatt	VOC - volatile organic compound
lb - pound	yr - year

References:

Advanced Environmental Interface, Inc. (1998). General Permits for Emergency Engines. INSIGHTS, 98-2, 3. AP-42 Chapter 3.3, Stationary Internal Combustion Engines, 10/96.



Table 6a Potential VOC and HAP Emissions Pellet Coolers (ES-CLR-1 through ES-CLR-6) Enviva Pellets Northampton, LLC

Calculation Basis	
Annual Throughput	781,255 ODT/yr
Hourly Throughput	144 ODT/hr
Hours of Operation	8,760 hr/yr
Number of Burners	2 burners
RCO/RTO Burner Rating	9.8 MMBtu/hr
RCO/RTO Control Efficiency	95.0%

Pellet Cooler and Pellet Mill Potential Process VOC and HAP Emissions

Pollutant	CAS No.	NC TAP VOC		Emission Factor ¹	Emissions at RCO Outlet ²		
				(lb/ODT)	Max (lb/hr)	Annual (tpv)	
Acetaldehyde	75-07-0	Y	Y	0.025	0.181	0.49	
Acrolein	107-02-8	Y	Y	0.050	0.36	0.97	
Formaldehyde	50-00-0	Y	Y	0.006	0.04	0.12	
Methanol	67-56-1	Ν	Y	0.021	0.15	0.41	
Phenol	108-95-2	Y	Y	0.025	0.18	0.49	
Propionaldehyde	123-38-6	Ν	Y	0.015	0.105	0.29	
			Total	HAP Emissions	1.02	2.78	
	Total TAP Emissions				0.77	2.08	
Total VOC (as propane)			Y	1.4	10.17	27.60	

Notes:

¹ Emission factors were derived based on stack testing data from comparable Enviva facilities and/or engineering judgement and include contingency. The emission factors represent uncontrolled emissions.

^{2.} A 95.0% control efficiency is applied to the potential emissions for the RCO.

Emissions from the pellet mills and pellet coolers will be controlled by an RCO that will operate primarily in catalytic mode with thermal (RTO) mode as a backup. The RTO and RCO modes have the same control efficiency so there will be no impact on emissions when operating in thermal mode.

Thermal Generated Potential Criteria Pollutant Emissions

Maximum high heating value of VOC constituents	1.8E-02 MMBtu/Ib
Uncontrolled VOC emissions ¹	632 tons/yr
Heat input of uncontrolled VOC emissions	23,391 MMBtu/yr

	Emission		Potential Emissions		
Pollutant	Factor ²	Units	Max (lb/hr)	Annual (tpv)	
со	8.2E-02	lb/MMBtu	0.22	0.96	
NO _X	9.8E-02	lb/MMBtu	0.26	1.15	

Natural Gas Combustion Potential Criteria Pollutant Emissions

	Emission		Potential Emissions		
Pollutant	Factor ²	Units	Units Max (lb/hr) Annual (tpv) o/MMBtu 1.6 7.07 o/MMBtu 1.9 8.42 o/MMBtu 1.2E-02 0.05 o/MMBtu 0.11 0.46 o/MMBtu 0.15 0.64		
СО	8.2E-02	lb/MMBtu	1.6	7.07	
NO _X	9.8E-02	lb/MMBtu	1.9	8.42	
SO ₂	5.9E-04	lb/MMBtu	1.2E-02	0.05	
VOC	5.4E-03	lb/MMBtu	0.11	0.46	
Total PM	7.5E-03	lb/MMBtu	0.15	0.64	
Total PM ₁₀	7.5E-03	lb/MMBtu	0.15	0.64	
Total PM _{2.5}	7.5E-03	lb/MMBtu	0.15	0.64	

Potential Criteria Pollutant Emissions - Propane Combustion

Pollutant	Emission		Potential Emissions		
	Factor ³	Units	™ax (lb/hr)	Annuai (tpy)	
СО	7.50	lb/Mgal	1.61	7.04	
NO _X	6.50	lb/Mgal	1.39	6.10	
SO ₂	0.054	lb/Mgal	0.01	0.05	
VOC	1.00	lb/Mgal	0.21	0.94	
PM/PM ₁₀ /PM _{2.5} Condensable	0.50	lb/Mgal	0.11	0.47	
PM/PM ₁₀ /PM _{2.5} Filterable	0.20	lb/Mgal	0.04 0.19		
Total PM/PM ₁₀ /PM _{2.5}	0.15	0.66			



Table 6a Potential VOC and HAP Emissions Pellet Coolers (ES-CLR-1 through ES-CLR-6) Enviva Pellets Northampton, LLC

Natural Gas Combustion Potential HAP and TAP Emissions

Pollutant				Emission		Footnote		ntial sions
	НАР	NC TAP	P VOC	Factor	Units		Max (lb/hr)	Annual (tpv)
Natural Gas Source								
2-Methylnaphthalene	Y	Ν	Y	2.4E-05	lb/MMscf	4	4.6E-07	2.0E-06
3-Methylchloranthrene	Y	Ν	Y	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-07
7,12-Dimethylbenz(a)anthracene	Y	N	Y	1.6E-05	lb/MMscf	4	3.1E-07	1.3E-06
Acenaphthene	Y	Ν	Y	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-07
Acenaphthylene	Y	N	Y	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-07
Acetaldehyde	Y	Y	Y	1.5E-05	lb/MMscf	4	2.9E-07	1.3E-06
Acrolein	Y	Y	Y	1.8E-05	lb/MMscf	4	3.5E-07	1.5E-06
Ammonia	N	Y	Ν	3.2	lb/MMscf	4	0.06	0.27
Anthracene	Y	N	Y	2.4E-06	lb/MMscf	4	4.6E-08	2.0E-07
Arsenic	Y	Y	Ν	2.0E-04	lb/MMscf	4	3.8E-06	1.7E-05
Benz(a)anthracene	Y	N	Y	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-07
Benzene	Y	N	Y	7.1E-04	lb/MMBtu	5	1.4E-02	6.1E-02
Benzo(a)pyrene	Y	Y	Y	1.2E-06	lb/MMscf	4	2.3E-08	1.0E-07
Benzo(b)fluoranthene	Y	Ν	Y	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-07
Benzo(g,h,i)perylene	Y	Ν	Y	1.2E-06	lb/MMscf	4	2.3E-08	1.0E-07
Benzo(k)fluoranthene	Y	Ν	Y	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-07
Beryllium	Y	Y	Ν	1.2E-05	lb/MMscf	4	2.3E-07	1.0E-06
Cadmium	Y	Y	Ν	1.1E-03	lb/MMscf	4	2.1E-05	9.3E-05
Chromium VI	Y	Ν	Ν	1.4E-03	lb/MMscf	4	2.7E-05	1.2E-04
Chrysene	Y	Ν	Y	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-07
Cobalt Compounds	Y	Ν	Ν	8.4E-05	lb/MMscf	4	1.6E-06	7.1E-06
Dibenzo(a,h)anthracene	Y	Ν	Y	1.2E-06	lb/MMscf	4	2.3E-08	1.0E-07
Dichlorobenzene	Y	Y	Y	1.2E-03	lb/MMscf	4	2.3E-05	1.0E-04
Fluoranthene	Y	Ν	Y	3.0E-06	lb/MMscf	4	5.8E-08	2.5E-07
Fluorene	Y	Ν	Y	2.8E-06	lb/MMscf	4	5.4E-08	2.4E-07
Formaldehyde	Y	Y	Y	1.5E-03	lb/MMBtu	5	2.9E-02	1.3E-01
Hexane	Y	Y	Y	1.8	lb/MMscf	4	3.5E-02	0.15
Indeno(1,2,3-cd)pyrene	Y	Ν	Y	1.8E-06	lb/MMscf	4	3.5E-08	1.5E-07
Lead	Y	Ν	Ν	5.0E-04	lb/MMscf	4	9.6E-06	4.2E-05
Manganese	Y	Y	Ν	3.8E-04	lb/MMscf	4	7.3E-06	3.2E-05
Mercury	Y	Y	Ν	2.6E-04	lb/MMscf	4	5.0E-06	2.2E-05
Naphthalene	Y	Ν	Y	6.1E-04	lb/MMscf	4	1.2E-05	5.1E-05
Nickel	Y	Y	Ν	2.1E-03	lb/MMscf	4	4.0E-05	1.8E-04
Polycyclic Organic Matter	Y	Ν	Ν	4.0E-05	lb/MMBtu	5	7.8E-04	3.4E-03
Phenanthrene	Y	Ν	Y	1.7E-05	lb/MMscf	4	3.3E-07	1.4E-06
Pyrene	Y	Ν	Y	5.0E-06	lb/MMscf	4	9.6E-08	4.2E-07
Selenium compounds	Y	Ν	Ν	2.4E-05	lb/MMscf	4	4.6E-07	2.0E-06
Toluene	Y	Y	Y	3.4E-03	lb/MMscf	4	6.5E-05	2.9E-04
	•	•	Total H	AP Emissions (r		ombustion)	0.079	0.35
				AP Emissions (r			0.13	0.55

Notes:

^{1.} Includes uncontrolled emissions from the dry shavings hammermill.

^{2.} Emission factors from AP-42, Section 1.4 - Natural Gas Combustion, 07/98. Emission factors converted from Ib/MMscf to Ib/MMBtu based on assumed heating value of 1,020 Btu/scf for natural gas per AP-42 Section 1.4.

^{3.} Emission factors for propane combustion obtained from AP-42 Section 1.5 - Liquefied Petroleum Gas Combustion, 07/08.

^{4.} Emission factors for natural gas combustion are from NCDAQ Natural Gas Combustion Spreadsheet and AP-42, Fifth Edition, Volume 1, Chapter 1.4 - Natural Gas Combustion, 07/98 for small boilers. The emission factors for acetaldehyde, acrolein, and ammonia are cited in the NCDAQ spreadsheet as being sourced from the USEPA's WebFIRE database.

^{5.} The RCO burner can fire either natural gas or propane; Propane is worst-case for these HAP emissions. Emission factors for propane combustion from the South Coast Air Quality Management District's Air Emissions Reporting Tool for external combustion equipment fired with LPG.

Abbreviations:

CAS - chemical abstract service HAP - hazardous air pollutant hr - hour Ib - pound NC - North Carolina ODT - oven dried tons RCO - regenerative catalytic oxidizer RTO - regenerative thermal oxidizer TAP - toxic air pollutant tpy - tons per year VOC - volatile organic compound yr - year



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Table 6b Potential VOC and HAP Emissions Dry Hammermills (ES-HM-1 through ES-HM-8) Enviva Pellets Northampton, LLC

Calculation Basis

Total Plant Throughput	781,255	ODT/yr
% of Total Throughput to the Hammermills	85%	
Hours of Operation	8760	hr/yr

Hammermills Annual Throughput	664,067	ODT/yr
Hammermills Hourly Throughput	144	ODT/hr
Control Efficiency ¹	95.0%	

Potential VOC and HAP Emissions

Pollutant	CAS No. HAP NC TAP		voc	Emission Factor ²	Potential Emissions		
Pollutant		VOC	(lb/ODT)	Max (lb/hr)	Annual (tpy)		
Acetaldehyde	75-07-0	Y	Y	Y	0.0073	0.05	0.12
Acrolein	107-02-8	Y	Y	Y	0.0092	0.07	0.15
Formaldehyde	50-00-0	Y	Y	Y	0.0071	0.05	0.12
Methanol	67-56-1	Y	N	Y	0.0071	0.05	0.12
Phenol	108-95-2	Y	Y	Y	0.0028	0.02	0.05
Propionaldehyde	123-38-6	Y	N	Y	0.0124	0.09	0.21
				Total H	AP Emissions	0.33	0.76
				Total T	AP Emissions	0.19	0.44
Total VOC (as propane)				Y	0.77	5.51	12.70

Thermal Generated Potential Criteria Pollutant Emissions

Maximum high heating value of VOC constituents	1.8E-02 MMBtu/lb
Uncontrolled VOC emissions	254 tons/yr
Heat input of uncontrolled VOC emissions	9,396 MMBtu/yr

	Emission		Potential Emissions		
Pollutant	Factor ³	Units	Max	Annual	
			(lb/hr)	(tpy)	
СО	8.2E-02	lb/MMBtu	0.09	0.39	
NO _X	9.8E-02	lb/MMBtu	0.11	0.46	

Notes:

^{1.} Emissions from the dry hammermills are controlled by the RCO with estimated control efficiency of 95.0%.

- ^{2.} Emission factors were derived based on stack testing data from comparable Enviva facilities and/or engineering judgement and include contingency. The emission factors represent uncontrolled emissions.
- ^{3.} CO and NOx emission factors are from AP-42, Fifth Edition, Volume 1, Chapter 1.4 Natural Gas Combustion, 07/98 for small boilers.

Abbreviations:

CAS - chemical abstract service	ODT - oven dried tons
HAP - hazardous air pollutant	TAP - toxic air pollutant
hr - hour	tpy - tons per year
lb - pound	VOC - volatile organic compound
NC - North Carolina	yr - year

Table 6c Potential VOC and HAP Emissions Dry Shavings Hammermills (ES-DSHM-1 and -2) Enviva Pellets Northampton, LLC

Calculation Basis

Hammermills Hourly Throughput	24	ODT/hr
Hammermills Annual Throughput	210,240	ODT/yr
Control Efficiency ¹	95.0%	

Potential VOC and HAP Emissions

Pollutant	CAS No			NOC	Emission Factor ²	Potential Emissions					
Ponutant	CAS NO.		ПАГ	CAS No. HAP		HAP NC TAP VC		VOC	(lb/ODT)	Max (Ib/hr)	Annual (tpy)
Acetaldehyde	75-07-0	Y	Y	Y	0.0073	0.009	0.04				
Acrolein	107-02-8	Y	Y	Y	0.0092	0.011	0.05				
Formaldehyde	50-00-0	Y	Y	Y	0.0071	0.009	0.04				
Methanol	67-56-1	Y	N	Y	0.0071	0.009	0.04				
Phenol	108-95-2	Y	Y	Y	0.0028	0.003	0.01				
Propionaldehyde	123-38-6	Y	N	Y	0.0124	0.015	0.07				
				Total H	AP Emissions	0.06	0.24				
				Total T	AP Emissions	0.03	0.14				
Total VOC (as propane)				Y	0.765	0.92	4.02				

Thermal Generated Potential Criteria Pollutant Emissions

Maximum high heating value of VOC constituents Uncontrolled VOC emissions Heat input of uncontrolled VOC emissions 1.8E-02 MMBtu/lb 80 tons/yr 2,975 MMBtu/yr

	Emission		Potential Emissions		
Pollutant	Factor ³	Units	Max (Ib/hr)	Annual (tpv)	
со	8.2E-02	lb/MMBtu	0.03	0.12	
NO _X	9.8E-02	lb/MMBtu	0.03	0.15	

Notes:

Exhaust from the two drying sahvings hammermills will be routed to the RCO at the pellet building, which controls VOC and HAP emissions with a 95.0% control efficiency. ^{2.} Emission factors were derived based on stack testing data from comparable Enviva facilities and/or engineering judgement and include contingency. The emission factors represent uncontrolled emissions.

^{3.} CO and NOx emission factors are from AP-42, Fifth Edition, Volume 1, Chapter 1.4 - Natural Gas Combustion, 07/98 for small boilers.

Abbreviations:

CAS - chemical abstract service	ODT - oven dried tons
HAP - hazardous air pollutant	TAP - toxic air pollutant
hr - hour	tpy - tons per year
lb - pound	VOC - volatile organic compound
NC - North Carolina	yr - year

Potential Emissions RCO Double Duct Burners (IES-DDB-5 through -8) Enviva Pellets Northampton, LLC

Duct Burner Inputs

Duct Burner Rating	1 MMBtu/hr
Number of Duct Burners	4
Annual Operation	8,760 hr/yr

Potential Criteria Pollutant Emissions:

Potential Criteria Pollutant Emissions - Natural Gas Combustion

	Emission		Emission	Potential	Emissions
Pollutant	Factor	Units	Factor Source	Max (lb/hr)	Annual (tpy)
СО	84.0	lb/MMscf	Note 1	0.33	1.44
NO _X	50.0	lb/MMscf	Note 2	0.20	0.86
SO ₂	0.60	lb/MMscf	Note 1	0.0024	0.010
VOC	5.50	lb/MMscf	Note 1	0.02	0.09
PM/PM ₁₀ /PM _{2.5} Condensable	5.70	lb/MMscf	Note 1	0.02	0.10
PM/PM ₁₀ /PM _{2.5} Filterable	1.90	lb/MMscf	Note 1	0.007	0.03
Total PM/PM ₁₀ /PM _{2.5}				0.030	0.131



Potential Emissions RCO Double Duct Burners (IES-DDB-5 through -8) Enviva Pellets Northampton, LLC

Potential Criteria Pollutant Emissions - Propane Combustion

Pollutant	Emission		Emission	Potential Emissions			
Pollutant	Factor ³	Units	Factor Source	Max (Ib/hr)	Annual (tpy)		
СО	7.50	lb/Mgal	Note 3	0.33	1.44		
NO _X	6.50	lb/Mgal	Note 4	0.28	1.24		
SO ₂	0.054	lb/Mgal	Note 3,5	0.002	0.010		
VOC	1.00	lb/Mgal	Note 3	0.04	0.19		
PM/PM ₁₀ /PM _{2.5} Condensable	0.50	lb/Mgal	Note 3	0.02	0.10		
PM/PM ₁₀ /PM _{2.5} Filterable	0.20	lb/Mgal	Note 3	0.009	0.04		
Total PM/PM ₁₀ /PM _{2.5}				0.031	0.134		

Notes:

^{1.} Emission factors for natural gas combustion from AP-42 Section 1.4 - Natural Gas Combustion, 07/98. Natural gas heating value of 1,020 Btu/scf assumed per AP-42.

² Emission factors for NO_X assume burners are low NO_X burners, per email from Kai Simonsen (Enviva) on August 8, 2018.

- ^{3.} Emission factors for propane combustion obtained from AP-42 Section 1.5 Liquefied Petroleum Gas Combustion, 07/08. Propane heating value of 91.5 MMBtu/Mgal assumed per AP-42.
- ⁴ AP-42 Section 1.5 does not include an emission factor for low NO_x burners. Per AP-42 Section 1.4, low NO_x burners reduce NO_x emissions by accomplishing combustion in stages, reducing NO_x emissions 40 to 85% relative to uncontrolled emission levels. A conservative control efficiency of 50% was applied to the uncontrolled NO_x emission factor from AP-42 Section 1.5. This reduction is consistent with the magnitude of reduction between the uncontrolled and low NO_x emission factors in AP-42 Section 1.4.

^{5.} SO₂ emissions are based on an assumed fuel sulfur content of 0.54 grains/100 ft³ per *A National Methodology and Emission Inventory for Residential Fuel Combustion*.



Potential Emissions RCO Double Duct Burners (IES-DDB-5 through -8) Enviva Pellets Northampton, LLC

Potential HAP and TAP Emissions

				Emission			Potential	Emissions
Pollutant	HAP	NC TAP	VOC	Factor	Units	Footnote	Max	Annual
							(lb/hr)	(tpy)
Duct Burners - Natural Gas/Propane So			N	0.45.05		1	0.45.00	
2-Methylnaphthalene	Y	N	Y	2.4E-05	Ib/MMscf	1	9.4E-08	4.1E-07
3-Methylchloranthrene	Y	N	Y	1.8E-06	Ib/MMscf	1	7.1E-09	3.1E-08
7,12-Dimethylbenz(a)anthracene	Y	N	Y	1.6E-05	Ib/MMscf	1	6.3E-08	2.7E-07
Acenaphthene	Y	N	Y	1.8E-06	Ib/MMscf	1	7.1E-09	3.1E-08
Acenaphthylene	Y	N	Y	1.8E-06	Ib/MMscf	1	7.1E-09	3.1E-08
Acetaldehyde	Y	Y	Y	1.5E-05	Ib/MMscf	1	6.0E-08	2.6E-07
Acrolein	Y	Y	Y	1.8E-05	Ib/MMscf	1	7.1E-08	3.1E-07
Ammonia	N	Y	N	3.2	lb/MMscf	1	1.3E-02	5.5E-02
Anthracene	Y	N	Y	2.4E-06	lb/MMscf	1	9.4E-09	4.1E-08
Arsenic	Y	Y	N	2.0E-04	Ib/MMscf	1	7.8E-07	3.4E-06
Benz(a)anthracene	Y	N	Y	1.8E-06	Ib/MMscf	1	7.1E-09	3.1E-08
Benzene	Y	N	Y	7.1E-04	lb/MMBtu	2	2.8E-03	1.2E-02
Benzo(a)pyrene	Y	Y	Y	1.2E-06	lb/MMscf	1	4.7E-09	2.1E-08
Benzo(b)fluoranthene	Y	N	Y	1.8E-06	lb/MMscf	1	7.1E-09	3.1E-08
Benzo(g,h,i)perylene	Y	N	Y	1.2E-06	lb/MMscf	1	4.7E-09	2.1E-08
Benzo(k)fluoranthene	Y	N	Y	1.8E-06	lb/MMscf	1	7.1E-09	3.1E-08
Beryllium	Y	Y	N	1.2E-05	lb/MMscf	1	4.7E-08	2.1E-07
Cadmium	Y	Y	N	1.1E-03	lb/MMscf	1	4.3E-06	1.9E-05
Chromium VI	Y	N	N	1.4E-03	lb/MMscf	1	5.5E-06	2.4E-05
Chrysene	Y	N	Y	1.8E-06	lb/MMscf	1	7.1E-09	3.1E-08
Cobalt	Y	N	N	8.4E-05	lb/MMscf	1	3.3E-07	1.4E-06
Dibenzo(a,h)anthracene	Y	N	Y	1.2E-06	lb/MMscf	1	4.7E-09	2.1E-08
Dichlorobenzene	Y	Y	Y	1.2E-03	lb/MMscf	1	4.7E-06	2.1E-05
Fluoranthene	Y	N	Y	3.0E-06	lb/MMscf	1	1.2E-08	5.2E-08
Fluorene	Y	N	Y	2.8E-06	lb/MMscf	1	1.1E-08	4.8E-08
Formaldehyde	Y	Y	Y	1.5E-03	lb/MMBtu	2	6.0E-03	2.6E-02
Hexane	Y	Y	Y	1.8	lb/MMscf	1	7.1E-03	3.1E-02
Indeno(1,2,3-cd)pyrene	Y	N	Y	1.8E-06	lb/MMscf	1	7.1E-09	3.1E-08
Lead	Y	N	N	5.0E-04	lb/MMscf	1	2.0E-06	8.6E-06
Manganese	Y	Y	N	3.8E-04	lb/MMscf	1	1.5E-06	6.5E-06
Mercury	Y	Y	N	2.6E-04	lb/MMscf	1	1.0E-06	4.5E-06
Naphthalene	Y	N	Y	6.1E-04	lb/MMscf	1	2.4E-06	1.0E-05
Nickel	Y	Y	N	2.1E-03	lb/MMscf	1	8.2E-06	3.6E-05
Polycyclic Organic Matter	Y	N	N	4.0E-05	lb/MMBtu	8	1.6E-04	7.0E-04
Phenanthrene	Y	N	Y	1.7E-05	lb/MMscf	1	6.7E-08	2.9E-07
Pyrene	Y	N	Y	5.0E-06	lb/MMscf	1	2.0E-08	8.6E-08
Selenium compounds	Y	N	N	2.4E-05	lb/MMscf	1	9.4E-08	4.1E-07
Toluene	Y	Y	Y	3.4E-03	lb/MMscf	1	1.3E-05	5.8E-05
	•	То	tal HAP Emi	ssions (related	l to natural ga	as/propane)	0.016	0.071
				ssions (related			0.03	0.112

Potential Emissions RCO Double Duct Burners (IES-DDB-5 through -8)

Enviva Pellets Northampton, LLC

Notes:

^{1.} Emission factors for natural gas combustion are from NCDAQ Natural Gas Combustion Spreadsheet and AP-42, Fifth Edition, Volume 1, Chapter 1.4 - Natural Gas Combustion, 07/98. The emission factors for acetaldehyde, acrolein, and ammonia are cited in the NCDAQ spreadsheet as being sourced from the USEPA's WebFIRE database.

^{2.} The duct burners can fire either natural gas or propane; Propane is worst-case for these HAP emissions. Emission factors for propane combustion from the South Coast Air Quality Management District's Air Emissions Reporting Tool for external combustion equipment fired with LPG.

Abbreviations:

CAS - chemical abstract service	N ₂ O - nitrous oxide
CH ₄ - methane	ODT - oven dried tons
CO - carbon monoxide	PM - particulate matter
CO2 - carbon dioxide	$\ensuremath{PM_{10}}\xspace$ - particulate matter with an aerodynamic diameter less than 10 microns
CO ₂ e - carbon dioxide equivalent	$PM_{2.5}$ - particulate matter with an aerodynamic diameter of 2.5 microns or less
HAP - hazardous air pollutant	RTO - regenerative thermal oxidizer
hr - hour	SO ₂ - sulfur dioxide
kg - kilogram	TAP - toxic air pollutant
lb - pound	tpy - tons per year
MMBtu - Million British thermal units	VOC - volatile organic compound
NC - North Carolina	WESP - wet electrostatic precipitator
NO _x - nitrogen oxides	yr - year



Table 7 Potential VOC and HAP Emissions Dried Wood Handling (ES-DWH) Enviva Pellets Northampton, LLC

Calculation Basis

Hourly Throughput ¹	142 ODT/hr
Annual Throughput ¹	781,255 ODT/yr

Potential Criteria Pollutant Emissions

Delludend	Emission Factor	Potential Emissions					
Pollutant	(Ib/ODT)	Max (lb/hr)	Annual (tpv)				
Formaldehyde	8.4E-04	0.119	0.33				
Methanol	2.0E-03	0.28	0.76				
Т	otal HAP Emissions	0.40	1.09				
VOC as carbon ²	0.10	14.3	39.5				
VOC as propane ³	0.12	17.6	48.5				

Notes:

^{1.} Hourly and annual throughputs assumed to be the same as dry hammermill throughput.

^{2.} Emission factors derived from NCASI's Wood Products Database (February 2013) for dry wood handling operations at an OSB mill, mean emission factors. The emission factors were converted from lb/MSF (3/8") to lb/ODT using the typical density and moisture content of an OSB panel.

^{3.} VOC as propane = $(1.22 \times VOC \text{ as carbon}) + \text{ formaldehyde}$.

Abbreviations:

hr - hour Ib - pound ODT - oven dried tons tpy - tons per year VOC - volatile organic compound yr - year



				Exhaust	Exit Grain	Annual	Particulate	Speciation			Potential	Emissions		
Emission Unit ID	Source Description	Control Device	Control Device	Flow Rate ¹	Loading ²	Operation	Particulate	Speciation	Р	М	PN	/I ₁₀	PN	M _{2.5}
		ID	Description	(cfm)	(gr/cf)	(hours)	PM ₁₀ (% of PM)	PM _{2.5} (% of PM)	Max (Ib/hr)	Annual (tpy)	Max (Ib/hr)	Annual (tpy)	Max (Ib/hr)	Annual (tpy)
ES-HM-1 through 3	Dry Hammermills 1 through 3	CD-HM-BF-1	One (1) existing baghouse and one (1) new wet scrubber ^{3,4}	45,000	0.004	8760	100%	1.7%	1.54	6.76	1.54	6.76	0.03	0.11
-	Dry Hammermills 4 through 6	CD-HM-BF-2	One (1) existing baghouse and one (1) new wet scrubber ^{3,4}	45,000	0.004	8760	100%	1.7%	1.54	6.76	1.54	6.76	0.03	0.11
ES-HM-7 and 8; ES-NDS; ES-DLC-1	Dry Hammermills 7 through 8; Dry Line Feed Conveyor	CD-HM-BF-3	One (1) existing baghouse and one (1) new wet scrubber ^{3,4}	45,000	0.004	8760	100%	1.7%	1.54	6.76	1.54	6.76	0.03	0.11
ES-PS-1 and -2	Dry Hammermill Prescreeners 1 and 2	CD-PS-BF	One (1) baghouse ⁵	17,100	0.004	8760	100%	100%	0.59	2.57	0.59	2.57	0.59	2.57
ES-PCHP	Pellet Cooler HP Fines Relay System	CD-PCHP-BF	One (1) baghouse ⁵	3,600	0.004	8760	100%	100%	0.12	0.54	0.12	0.54	0.12	0.54
ES-PMFS	Pellet Mill Feed Silo	CD-PMFS-BV	Bin Vent Filter ⁵	2,500	0.004	8760	100%	100%	0.09	0.38	0.09	0.38	0.09	0.38
ES-CLR-1	Pellet Cooler	CD-CLR-1	One (1) existing Cyclone and one new wet scrubber ⁶	17,100	0.01	8760	26.1%	3.2%	1.47	6.42	0.38	1.68	0.05	0.21
ES-CLR-2	Pellet Cooler	CD-CLR-2	One (1) existing Cyclone and one new wet scrubber ⁶	17,100	0.01	8760	26.1%	3.2%	1.47	6.42	0.38	1.68	0.05	0.21
ES-CLR-3	Pellet Cooler	CD-CLR-3	One (1) existing Cyclone and one new wet scrubber ⁶	17,100	0.01	8760	26.1%	3.2%	1.47	6.42	0.38	1.68	0.05	0.21
ES-CLR-4	Pellet Cooler	CD-CLR-4	One (1) existing Cyclone and one new wet scrubber ⁶	17,100	0.01	8760	26.1%	3.2%	1.47	6.42	0.38	1.68	0.05	0.21
ES-CLR-5	Pellet Cooler	CD-CLR-5	One (1) existing Cyclone and one new wet scrubber ⁶	17,100	0.01	8760	26.1%	3.2%	1.47	6.42	0.38	1.68	0.05	0.21
ES-CLR-6	Pellet Cooler	CD-CLR-6	One (1) existing Cyclone and one new wet scrubber ⁶	17,100	0.01	8760	26.1%	3.2%	1.47	6.42	0.38	1.68	0.05	0.21
ES-DWH	Dried Wood Handling	CD-DWH-BF	One (1) baghouse ⁶	1,500	0.004	8760	100%	100%	0.05	0.23	0.05	0.23	0.05	0.23
	Dry shavings Hammermills 1 and 2	CD-DSHM-BF	Three (3) existing DHM/HMA baghouses, one (1) new wet scrubber ⁶	20,000	0.004	8760	100%	1.7%	0.69	3.00	0.69	3.00	0.01	0.05
ES-FPH; ES-PB-1 through 12; ES-PL-1 and -2	Finished Product Handling; Twelve pellet loadout bins; Pellet mill load-out 1 and 2	CD-FPH-BV	One (1) baghouse ^{4,7}	35,500	0.004	8760	91%	2%	1.22	5.33	1.11	4.85	0.02	0.09
IES-DSS	Dry Shavings Silo	CD-DSS-BF	One (1) baghouse ⁵	3,600	0.004	8760	100%	100%	0.12	0.54	0.12	0.54	1.2E-01	0.54
IES-ADD	Additive Handling and Storage	CD-ADD-BF	One (1) baghouse ⁵	1,652	0.004	117	100%	100%	0.057	0.00	0.057	0.00	0.057	0.00

Table 8 Potential Emissions from Baghouses/Cyclones Enviva Pellets Northampton, LLC

Notes:

^{1.} Filter, Vent, and Cyclone inlet flow rate (cfm) provided by design engineering firm (Mid-South Engineering Co.). The exit flowrate was conservataively assumed to be the same as the inlet flowrate.

² Pollutant loading provided by Aircon. For Pellet Coolers, pollutant loading based on data from other Enviva facilities reflecting addition of either a WESP or baghouse.

^{3.} No speciation data is available for PM_{10} . Therefore, it is conservatively assumed to be equal to total PM.

^{4.} Dry Hammermills and finished product handling PM_{2.5} speciation based on April 2014 Enviva Southampton PM_{2.5} speciation tests.

^{5.} No speciation data is available for PM₁₀/PM_{2.5}. Therefore, it is conservatively assumed to be equal to total PM.

⁶ Pellet cooler PM₁₀/PM_{2.5} speciation based on data for similar Enviva facility.

⁷ 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 a pellet cooler is anticipated to be larger than flyash, this factor is believed to be a conservative indicator of speciation.

⁸ Exhaust flow and grain loading for the Dry Shavings Hammermill Baghouse was estimated based on the flow and loading for the existing dry hammermills.

Abbreviations:

cf - cubic feet cfm - cubic feet per minute ES - Emission Sources IES - Insignificant Emission Source gr - grain

hr - hour

lb - pound PM - particulate matter PM₁₀ - particulate matter with an aerodynamic diameter less than 10 microns PM_{2.5} - particulate matter with an aerodynamic diameter of 2.5 microns or less tpy - tons per year



Table 9a Potential Emissions from Material Handling Enviva Pellets Northampton, LLC

Source Transfer Activity ¹		Control	Control Description	Number of Drop	Material Moisture Content	PM Emission Factor ²	PM ₁₀ Emission Factor ²	PM _{2.5} Emission Factor ²		ential Ighput ³		tial PM ssions		ial PM ₁₀ sions		ial PM _{2.5} sions
			Description	Points	(%)	(lb/ton)	(lb/ton)	(lb/ton)	(tph)	(tpy)	Max (Ib/hr)	Annual (tpy)	Max (Ib/hr)	Annual (tpy)	Max (Ib/hr)	Annual (tpy)
	Material feed conveyance system to dryer burner fuel storage bin			4	48%	3.7E-05	1.8E-05	2.7E-06	30	252,692	4.5E-03	1.9E-02	2.1E-03	8.9E-03	3.2E-04	1.4E-03
	Material feed conveyance system to raw wood chip storage pile			1	48%	3.7E-05	1.8E-05	2.7E-06	400	1,502,414	1.5E-02	2.8E-02	7.1E-03	1.3E-02	1.1E-03	2.0E-03
IES-GWHS	Material feed conveyance system to dryer burner			0	45%	4.1E-05	1.9E-05	2.9E-06	30	545,455	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
	Material feed conveyance system to rotary drum wood dryer			0	48%	3.7E-05	1.8E-05	2.7E-06	300	1,652,655	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
	Material feed conveyance system to fuel storage piles			3	45%	4.1E-05	1.9E-05	2.9E-06	30	238,909	3.7E-03	1.5E-02	1.7E-03	6.9E-03	2.6E-04	1.0E-03
IES-DLH	Drop point for dry line transfer from dry line hopper to dry line feed conveyor	Enclosed	Reduction to 2 mph mean wind speed	1	17%	3.6E-05	1.7E-05	2.6E-06	170.7	941,271	6.1E-03	1.7E-02	2.9E-03	8.0E-03	4.4E-04	1.2E-03
	Existing dry shaving walking floor truck dump			1	8.0%	4.6E-04	2.2E-04	3.3E-05	48.0	219,000	2.2E-02	5.0E-02	1.0E-02	2.4E-02	1.6E-03	3.6E-03
IES-DRYSHAVE	Existing dry shaving loader to hopper and hopper conveyor to conveyor to DHM	Enclosed	Reduction to 2 mph mean wind speed	2	8.0%	1.0E-04	4.9E-05	7.4E-06	141.7	750,000	2.9E-02	7.7E-02	1.4E-02	3.7E-02	2.1E-03	5.5E-03
and IES-	New dry shavings truck dump			1	8.0%	4.6E-04	2.2E-04	3.3E-05	48.0	219,000	2.2E-02	5.0E-02	1.0E-02	2.4E-02	1.6E-03	3.6E-03
DRISHAVE-I	New dry shaving bucket elevator	Enclosed	Reduction to 2 mph mean wind speed	1	8.0%	1.0E-04	4.9E-05	7.4E-06	48.0	219,000	5.0E-03	1.1E-02	2.3E-03	5.4E-03	3.6E-04	8.1E-04
									Total	Emissions:	1.08E-01	2.68E-01	5.09E-02	1.27E-01	7.70E-03	1.92E-02

where:

Notes: ¹ These dry wood handling emissions are representative of the fugitive emissions at the site.

^{2.} Emission factor calculation based on formula from AP-42, Section 13.2.4 - Aggregate Handling and Storage Piles, Equation 1, (11/06).

- E = emission factor (lb/ton)
 - k = particle size multiplier (dimensionless) for PM0.74
 - $k = particle size multiplier (dimensionless) for PM_{10}$ 0.35
 - k = particle size multiplier (dimensionless) for $PM_{2.5}$ 0.053
 - U = mean wind speed (mph)
 - 6.3 2 U = mean wind speed (mph) for enclosed drop points

^{3.} Throughputs represent dry weight of materials, calculated based on listed material moisture contents. Throughput for dry shaving material handling is based on comparable Enviva facilities.

Abbreviations:

hr - hour

lb - pound

PM - particulate matter

- PM_{10} particulate matter with an aerodynamic diameter less than 10 microns
- $PM_{2.5}$ particulate matter with an aerodynamic diameter of 2.5 microns or less

tpy - tons per year

yr - year



Table 9b Potential Emissions from Wood Storage Pile Wind Erosion Enviva Pellets Northampton, LLC

Source	Description	PM Emission		VOC Emissio	n Factor ²	Pile Width/ Diamter	Pile Length	Pile Height	Outer Surface Area of Pile ³		tial PM sions		ial PM ₁₀ sions	Potenti Emis	al PM _{2.5} sions	Emiss	tial VOC ions as pane ⁴
		(lb/day/acre)	(lb/hr/ft ²)	(lb/day/acre)	(lb/hr/ft²)	(ft)	(ft)	(ft)	(ft ²)	Max (lb/hr)	Annual (tpy)	Max (Ib/hr)	Annual (tpy)	Max (Ib/hr)	Annual (tpy)	Max (Ib/hr)	Annual (tpy)
IES-DRYSHAVE and IES- DRYSHAVE-1	Dry Shaving Storage Pile	8.6	8.2E-06	3.6	3.4E-06	100		25	10,537	0.09	0.4	0.04	0.2	0.007	0.03	0.04	0.2
	Green Wood Storage Pile No. 1	8.6	8.2E-06	3.6	3.4E-06	155		72	30,907	0.25	1.1	0.13	0.6	0.019	0.08	0.13	0.6
	Green Wood Storage Pile No. 2	8.6	8.2E-06	3.6	3.4E-06	350	400	25	213,000	1.75	7.7	0.88	3.8	0.131	0.58	0.89	3.9
	Green Wood Storage Pile No. 3	8.6	8.2E-06	3.6	3.4E-06	150	150	25	45,000	0.37	1.6	0.19	0.8	0.028	0.12	0.19	0.8
IES-GWHS	Green Wood Storage Pile No. 4	8.6	8.2E-06	3.6	3.4E-06	200	200	25	72,000	0.59	2.6	0.30	1.3	0.044	0.19	0.30	1.3
	Bark Fuel Storage Pile No. 1	8.6	8.2E-06	3.6	3.4E-06	150	150	25	45,000	0.37	1.62	0.185	0.81	2.8E-02	0.122	0.189	0.83
	Bark Fuel Storage Pile No. 2	8.6	8.2E-06	3.6	3.4E-06	100	200	25	42,000	0.345	1.513	0.173	0.757	2.6E-02	1.1E-01	0.176	0.773
	Bark Fuel Storage Pile No. 3	8.6	8.2E-06	3.6	3.4E-06	50		25	3,332	0.027	0.120	0.014	0.060	2.1E-03	9.0E-03	0.014	0.061
								Т	otal Emissions:	3.80	16.64	1.90	8.32	0.28	1.25	1.94	8.50

Notes:

TSP emission factor based on U.S. EPA Control of Open Fugitive Dust Sources. Research Triangle Park, North Carolina, EPA-450/3-88-008. September 1988, Page 4-17.

$$E = 1.7 \left(\frac{s}{1.5}\right) \left(\frac{(365-p)}{235}\right) \left(\frac{f}{15}\right) (lb/day/acre)$$

where:

- s, silt content of wood chips (%):
- p, number of days with rainfall greater than 0.01 inch:

f (time that wind exceeds 5.36 m/s - 12 mph) (%): PM₁₀/TSP ratio:

s - silt content (%) for lumber sawmills (mean) from AP-42, Section 13.2.2 - Unpaved Roads, 11/06, Table 13.2.2-1 8.4

- Based on AP-42, Section 13.2.2 Unpaved Roads, 11/06, Figure 13.2.1-2. 110 Based on meteorological data averaged for 2012-2016 for Maxton, NC National Weather Service (NWS) Station 12.5 PM₁₀ is assumed to equal 50% of TSP based on U.S. EPA Control of Open Fugitive Dust Sources, Research Triangle Park, North Carolina, EPA-450/3-88-008. September 1988.
- PM_{2.5}/TSP ratio:
- 50% PM_{2.5} is assumed to equal 7.5 % of TSP U.S. EPA Background Document for Revisions to Fine Fraction Ratios Used for AP-42 Fugitive Dust Emission Factors. November 2006. 7.5%

² Emission factors obtained from NCASI document provided by the South Carolina Department of Health and Environmental Control (DHEC) for the calculation of fugitive VOC emissions from Douglas Fir wood storage piles. Emission factors ranged from 1.6 to 3.6 lb C/acre-day. Enviva chose to employ the maximum emission factor for purposes of conservatism.

^{3.} The surface area for rectangular piles is calculated as [2*H*L+2*W*H+L*W] + 20% to consider the sloping pile edges. Pile dimensions were provided by Enviva.

- The surface area for circular piles is calculated as $[\Pi^*R^*(R^2+H^2)^{0.5}] + 20\%$ to consider the sloping pile edges. Diameter and height were provided by Enviva.
- ^{4.} Emissions are calculated in tons of carbon per year by the following formula:

tons C/year = 5 acres * 365 days * 1.6 lb C/acre-day / 2000 lb/ton

Emission factor converted from as carbon to as propane by multiplying by 1.22.

Abbreviations:

EPA - Environmental Protection Agency

- ft feet ft² - square feet lb - pound mph - miles per hour
- NC North Carolina
- NCASI National Council for Air and Stream Improvement, Inc.

NWS - National Weather Service

PM - particulate matter

 $\ensuremath{\text{PM}_{10}}\xspace$ - particulate matter with an aerodynamic diameter less than 10 microns

PM_{2.5} - particulate matter with an aerodynamic diameter of 2.5 microns or less

tpy - tons per year TSP - total suspended particulate

yr - year

VOC - volatile organic compound



Table 10Potential EmissionsElectric Powered Green Wood Chipper (IES-EPWC)Enviva Pellets Northampton, LLC

Calculation Basis		
Annual Throughput of Chipper	781,255	tons/year (dry wood) ¹
Short Term Throughput	119.40	tons/hr (dry wood) ¹
Approximate Moisture Content	50%	of total weight

			Emis	sions
Pollutant	Emissic	on Factor	Max (Ib/hr)	Annual (tpy)
THC as Carbon ²	0.0041	lb/ODT	0.49	1.60
VOC as propane ³	0.0050	lb/ODT	0.60	1.95
Methanol ²	0.0010	lb/ODT	0.12	0.39

Notes:

¹ The hourly and annual throughputs used for the chipper are conservatively assumed to be the same as the throughput of the dryer (note that 50% of the dryer throughput normally comes from purchased chips).

² Emission factor obtained from available emissions factors for chippers in AP-42 Section 10.6.3, Medium Density Fiberboard, 08/02, Table 7 and Section 10.6.4, Hardboard and Fiberboard, 10/02, Tables 7 and 9. Emission factors for THC and Methanol are the same across all three tables.

³ Emission factor for VOC as propane is from AP-42, Section 10.6.3., Medium Density Fiberboard, 08/02, Table 7.



Table 11 Potential Emissions Bark Hog (IES-BARK) Enviva Pellets Northampton, LLC

Calculation Basis		
Annual Throughput of Bark Hog	234,377	tons/year (dry wood) ¹
Short-term Throughput of Bark Hog	31.50	tons/hr (dry wood) ¹
Approximate Moisture Content	50%	of total weight

			Emis	ssions		
Pollutant	Emiss	ion Factor	Max (Ib/hr)	Annual (tpy)		
THC as Carbon ²	0.0041	lb/ODT	0.13	0.48		
VOC as propane ³	0.0050	lb/ODT	0.16	0.59		
PM ⁴	0.02	lb/ton	0.13	0.47		
PM ₁₀ ⁴	0.011	lb/ton	0.07	0.26		
Methanol ²	0.0010	lb/ODT	0.03	0.12		

Notes:

¹ The annual throughput used for the bark hog is 30% of the annual throughput of the facility. The short-term throughput is 15% of maximum hourly capacity of the debarker.

² Emission factor obtained from available emissions factors for chippers in AP-42 Section 10.6.3, Medium Density Fiberboard, 08/02, Table 7 and Section 10.6.4, Hardboard and Fiberboard, 10/02, Tables 7 and 9. Emission factors for THC and Methanol are the same across all three tables.

³ Emission factor for VOC as propane is from AP-42, Section 10.6.3., Medium Density Fiberboard, 08/02, Table 7.

⁴ Particulate matter emission factors from the USEPA document titled *AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants. Source Classification Code 3-07-008-01 (Log Debarking)*. All PM is assumed to be larger than 2.5 microns. PM emissions are assumed to be controlled due to the bark hog being partially enclosed (assumed 90% control).



Table 12 Potential Emissions Debarker (IES-DEBARK) Enviva Pellets Northampton, LLC

Calculation Basis

Hourly Throughput ¹	210 ton/hr
Annual Throughput ¹	781,255 ton/yr

Potential Criteria Pollutant Emissions

6	Pollutant	Emission Factor	Potential Emissions				
Source	Pollutant	(lb/ton)	Max (Ib/hr)	Annual (tpy)			
IES-DEBARK	TSP ²	2.0E-02	0.42	0.78			
	-DEBARK PM_{10}^2		0.23	0.43			

Notes:

^{1.} The annual throughput used for the debarker is equal to the annual throughput of the dryers. The short-term throughput is based upon the maximum capacity of the debarker.

² Particulate matter emission factors from the USEPA document titled AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants. Source Classification Code 3-07-008-01 (Log Debarking). All PM is assumed to be larger than 2.5 microns in diameter. PM emissions are assumed to be controlled due to the use of water spray and the bark hog being partially enclosed (assumed 90% control).

Abbreviations:

hr - hour Ib - pound ODT - oven dried tons tpy - tons per year yr - year



Table 13Potential EmissionsEmergency Generator (IES-GN) and Fire Water Pump (IES-FWP)Enviva Pellets Northampton, LLC

Emergency Generator Emissions

Equipment and Fuel Characteristics

Engine Output	0.26 MW
Engine Power	350 hp (brake)
Hours of Operation	500 hr/yr ¹
Heating Value of Diesel	19,300 Btu/lb
Power Conversion	7,000 Btu/hr/hp

Criteria Pollutant Emissions

				Emissi	
Pollutant	Category	Emission Factor	Units	Max	Annual
				lb/hr	tpy
TSP	PSD	4.41E-04	lb/kW-hr (2)	0.12	2.88E-02
PM ₁₀	PSD	4.41E-04	lb/kW-hr (2)	0.12	2.88E-02
PM _{2.5}	PSD	4.41E-04	lb/kW-hr (2)	0.12	2.88E-02
NO _x	PSD	8.82E-03	lb/kW-hr (5)	2.30	5.75E-01
SO ₂	PSD	15	ppmw (3)	3.81E-03	9.52E-04
СО	PSD	7.72E-03	lb/kW-hr (2)	2.01	5.03E-01
VOC (NMHC)	PSD	2.51E-03	Ib/MMBtu (4)	6.15E-03	1.54E-03
				Fmissi	ions
Pollutant	Category	Emission Factor	Units	Emissi Max	
Pollutant	Category	Emission Factor	Units	Emissi Max Ib/hr	ions Annual tpy
	Category			Max Ib∕hr	Annual tpy
Pollutant Acetaldehyde Acrolein		Emission Factor 5.37E-06 6.48E-07	Units	Max	Annual
Acetaldehyde	НАР	5.37E-06	lb/hp-hr (4)	Max Ib/hr 1.88E-03	Annual tpy 4.70E-04
Acetaldehyde Acrolein Benzene	HAP HAP	5.37E-06 6.48E-07	lb/hp-hr (4) lb/hp-hr (4)	Max lb/hr 1.88E-03 2.27E-04	Annual tpy 4.70E-04 5.67E-05
Acetaldehyde Acrolein	HAP HAP HAP	5.37E-06 6.48E-07 6.53E-06	lb/hp-hr (4) lb/hp-hr (4) lb/hp-hr (4)	Max Ib/hr 1.88E-03 2.27E-04 2.29E-03	Annual tpy 4.70E-04 5.67E-05 5.71E-04
Acetaldehyde Acrolein Benzene Benzo(a)pyrene ⁶	HAP HAP HAP HAP	5.37E-06 6.48E-07 6.53E-06 1.32E-09	lb/hp-hr (4) lb/hp-hr (4) lb/hp-hr (4) lb/hp-hr (4)	Max Ib/hr 1.88E-03 2.27E-04 2.29E-03 4.61E-07	Annual tpy 4.70E-04 5.67E-05 5.71E-04 1.15E-07
Acetaldehyde Acrolein Benzene Benzo(a)pyrene ⁶ 1,3-Butadiene	HAP HAP HAP HAP HAP HAP	5.37E-06 6.48E-07 6.53E-06 1.32E-09 2.74E-07	lb/hp-hr (4) lb/hp-hr (4) lb/hp-hr (4) lb/hp-hr (4) lb/hp-hr (4) lb/hp-hr (4)	Max Ib/hr 1.88E-03 2.27E-04 2.29E-03 4.61E-07 9.58E-05	Annual tpy 4.70E-04 5.67E-05 5.71E-04 1.15E-07 2.39E-05
Acetaldehyde Acrolein Benzene Benzo(a)pyrene ⁶ 1,3-Butadiene Formaldehyde	HAP HAP HAP HAP HAP HAP HAP HAP HAP	5.37E-06 6.48E-07 6.53E-06 1.32E-09 2.74E-07 8.26E-06	lb/hp-hr (4) lb/hp-hr (4)	Max Ib/hr 1.88E-03 2.27E-04 2.29E-03 4.61E-07 9.58E-05 2.89E-03	Annual tpy 4.70E-04 5.67E-05 5.71E-04 1.15E-07 2.39E-05 7.23E-04 1.03E-04 2.51E-04
Acetaldehyde Acrolein Benzene Benzo(a)pyrene ⁶ 1,3-Butadiene Formaldehyde Total PAH (POM)	HAP HAP HAP HAP HAP HAP HAP HAP	5.37E-06 6.48E-07 6.53E-06 1.32E-09 2.74E-07 8.26E-06 1.18E-06	lb/hp-hr (4)	Max Ib/hr 1.88E-03 2.27E-04 2.29E-03 4.61E-07 9.58E-05 2.89E-03 4.12E-04	Annual tpy 4.70E-04 5.67E-05 5.71E-04 1.15E-07 2.39E-05 7.23E-04 1.03E-04
Acetaldehyde Acrolein Benzene Benzo(a)pyrene ⁶ 1,3-Butadiene Formaldehyde Total PAH (POM) Toluene	HAP HAP HAP HAP HAP HAP HAP HAP HAP	5.37E-06 6.48E-07 6.53E-06 1.32E-09 2.74E-07 8.26E-06 1.18E-06 2.86E-06 2.00E-06	lb/hp-hr (4) lb/hp-hr (4)	Max Ib/hr 1.88E-03 2.27E-04 2.29E-03 4.61E-07 9.58E-05 2.89E-03 4.12E-04 1.00E-03	Annual tpy 4.70E-04 5.67E-05 5.71E-04 1.15E-07 2.39E-05 7.23E-04 1.03E-04 2.51E-04

Notes:

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.

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



Table 13Potential EmissionsEmergency Generator (IES-GN) and Fire Water Pump (IES-FWP)Enviva Pellets Northampton, LLC

Firewater Pump Emissions

Equipment and Fuel Characteristics

Engine Output	0.22 MW
Engine Power	300 hp
Hours of Operation	500 hr/yr ¹
Heating Value of Diesel	19,300 Btu/lb
Power Conversion	7,000 Btu/hr/hp

Criteria Pollutant Emissions

				Emiss	
Pollutant	Category	Emission Factor	Units	Max	Annual
				lb/hr	tpy
TSP	PSD	4.41E-04	lb/kW-hr (2)	0.10	2.47E-02
PM ₁₀	PSD	4.41E-04	lb/kW-hr (2)	0.10	2.47E-02
PM _{2.5}	PSD	4.41E-04	lb/kW-hr (2)	0.10	2.47E-02
NO _x	PSD	8.82E-03	lb/kW-hr (5)	1.97	4.93E-01
SO ₂	PSD	15	ppmw (3)	3.26E-03	8.16E-04
СО	PSD	7.72E-03	lb/kW-hr (2)	1.73	4.32E-01
VOC (NMHC)	PSD	2.51E-03	Ib/MMBtu (4)	5.27E-03	1.32E-03
Pollutant	Category	Emission Factor	Units	Emiss Max	Annual
Pollutant	Category	Emission Factor	Units		
				lb/hr	tpy
Acetaldehyde	HAP	5.37E-06	lb/hp-hr (4)	1.61E-03	4.03E-04
Acrolein	HAP	6.48E-07	lb/hp-hr (4)	1.94E-04	4.86E-05
Benzene	HAP	6.53E-06	lb/hp-hr (4)	1.96E-03	4.90E-04
Benzo(a)pyrene ⁶	HAP	1.32E-09	lb/hp-hr (4)	3.95E-07	9.87E-08
1,3-Butadiene	HAP	2.74E-07	lb/hp-hr (4)	8.21E-05	2.05E-05
Formaldehyde	HAP	8.26E-06	lb/hp-hr (4)	2.48E-03	6.20E-04
Total PAH (POM)	HAP	1.18E-06	lb/hp-hr (4)	3.53E-04	8.82E-05
Toluene	HAP	2.86E-06	lb/hp-hr (4)	8.59E-04	2.15E-04
Xylenes	HAP	2.00E-06	lb/hp-hr (4)	5.99E-04	1.50E-04
		Highest	HAP (Formaldehyde)	2.48E-03	6.20E-04
			Total HAPs	8.13E-03	2.03E-03

Notes:

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.

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



Table 14 Potential Emissions Diesel Storage Tanks (IES-TK-1 through IES-TK-3) Enviva Pellets Northampton, LLC

		Design	Working	Tank Dim	nensions⁵					
Source ID	Description	Volume ¹	Volume ²	Diameter	Height/ Length	Orientation	Throughput ³	Turnovers	VOC Em	issions⁴
		(gal)	(gal)	(ft)	(ft)		(gal/yr)		(lb/hr)	(tpy)
IES-TK-1	Emergency Generator Fuel Storage Tank ²	2,500	1,250	6.0	12	Horizontal	8,803	7.0	1.3E-04	5.8E-04
IES-TK-2	Fire Pump Fuel Storage Tank ²	500	250	3.0	10.0	Horizontal	7,554	30.2	3.7E-05	1.6E-04
IES-TK-3	Mobile Fuel Diesel Storage Tank	5,000	2,500	6.0	23.7	Horizontal	200,000	80.0	7.6E-04	3.3E-03
				Total Emissions:						4.1E-03

Notes:

^{1.} Conservative design specifications.

^{2.} Working volume conservatively assumed to be 50% of tank design volume because tanks will not be full at all times.

^{3.} Throughput for IES-TK-1 and IES-TK-2 based on fuel consumption provided by Enviva and 500 hours of operation per year. Throughput for IES-TK-3 provided by Enviva.

^{4.} Emissions calculated using EPA TANKS 4.0 software. A minimum tank length for the TANKS program of 5 feet was used to estimate the emissions for IES-TK-2.

 $^{\rm 5.}$ IES-TK-3 length was estimated based on the capacity of the tank and the diameter.

Abbreviations:

EPA - Environmental Protection Agency ft - feet gal - gallon

lb - pound

yr - year VOC - volatile organic compound



Table 15a Potential Fugitive PM Emissions from Paved Roads Enviva Pellets Northampton, LLC

Vehicle Activity	Distance Traveled per	Trips Per	Daily VMT	Events Per Year	Empty Truck Weight	Loaded Truck Weight	Average Truck Weight	Annual VMT	PM Emission Factor ²	PM ₁₀ Emission Factor ²	PM _{2.5} Emission Factor ²	Potent Emiss	_	Potentia Emiss		Potentia Emiss	2.0
	Roundtrip ¹ (ft)	Day		(days)	(lb)	(lb)	(ton)		(Ib/VMT)	(lb/VMT)	(Ib/VMT)	(lb/day)	(tpy)	(lb/day)	(tpy)	(lb/day)	(tpy)
Bark Delivery - Dumper	2,800	11	6	365	41,000	81,000	30.5	2,134	2.24	0.45	0.11	1.31	0.24	0.26	0.05	0.06	0.01
Bark Delivery - Self Unload	3,730	11	8	365	41,000	81,000	30.5	2,842	2.24	0.45	0.11	1.74	0.32	0.35	0.06	0.09	0.02
Log Delivery to Crane Storage Area	2,800	93	49	365	40,400	85,400	31.5	18,004	2.31	0.46	0.11	11.39	2.08	2.28	0.42	0.56	0.10
Log Delivery to Log Storage Area	2,800	93	49	365	40,400	85,400	31.5	18,004	2.31	0.46	0.11	11.39	2.08	2.28	0.42	0.56	0.10
Purchased Chip Delivery	2,800	114	61	365	41,000	91,000	33.0	22,095	2.42	0.48	0.12	14.68	2.68	2.94	0.54	0.72	0.13
Additive Delivery	2,000	0.26	0.1	365	41,000	91,000	33.0	36	2.42	0.48	0.12	0.02	0.00	0.00	0.00	0.00	0.00
Pellet Truck Delivery to Pellet Loadout Area (Normal Operations)	3,730	86	61	365	41,000	91,000	33.0	22,182	2.42	0.48	0.12	14.73	2.69	2.95	0.54	0.72	0.13
Dry Shavings	3,730	32	23	365	41,000	77,000	29.5	8,251	2.16	0.43	0.11	4.89	0.89	0.98	0.18	0.24	0.04
Contractor Vehicle	2,000	18	7	365	4,000	4,000	2.0	2,462	0.14	0.03	0.01	0.09	0.02	0.02	0.00	0.00	0.00
Employee Car Parking	2,000	68	26	365	4,000	4,000	2.0	9,470	0.14	0.03	6.8E-03	0.36	0.07	0.07	0.01	0.02	0.00
										Tota	Emissions:	60.60	11.06	12.12	2.21	2.97	0.54

Notes:

^{1.} Distance traveled per round trip and daily trip counts were provided by Enviva.

² Emission factors calculated based on Equation 2 from AP-42 Section 13.2.1 - Paved Roads, 01/11.

where:

E = emission factor (lb/ton)

k = particle size multiplier (dimensionless) for PM 0.011

 $k = particle size multiplier (dimensionless) for PM_{10} 0.0022$

 $k = particle size multiplier (dimensionless) for PM_{2.5}$ 0.00054

sL - mean road surface silt loading from AP-42 Table 13.2.1-3 for quarries (g/m²) 8.2

P - No. days with rainfall greater than 0.01 inch 120 Per AP-42, Section 13.2.1, Figure 13.2.1-2 (Northampton County, NC). ^{3.} Potential emissions calculated from appropriate emission factor times vehicle miles traveled with control efficiency of 90% for water / dust suppression activities followed by sweeping. Per Table 5 in Chapter 4 of the Air Pollution Engineering Manual, Air and Waste Management Association, page 141. Control efficiency (%) = 96-0.263*V, where V is the number of vehicle passes since application of water.

Abbreviations:

ft - feet

- hr hour
- lb pound PM - particulate matter

 PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns $\ensuremath{\text{PM}_{2.5}}$ - particulate matter with an aerodynamic diameter of 2.5 microns or less tpy - tons per year yr - year VMT - vehicle miles traveled VOC - volatile organic compound

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Table B-15b Potential Fugitive PM Emissions from Unpaved Roads **Enviva Pellets Northampton, LLC**

Vehicle Activity	Distance Traveled per Roundtrip ¹ (ft)	Trips Per Day ¹	Daily VMT	Events Per Year (days)	Empty Truck Weight (Ib)	Loaded Truck Weight (Ib)	Average Truck Weight (ton)	Annual VMT
Log Delivery to Crane Storage Area	2,000	93	35	365	40,400	85,400	31.5	12,860
Log Delivery to Log Storage Area	2,000	93	35	365	40,400	85,400	31.5	12,860
Purchased Chip Delivery	7,000	114	151	365	41,000	91,000	33.0	55,238
Bark Delivery - Dumper	7,000	11	15	365	41,000	81,000	30.5	5,334
Additive Delivery	500	0.26	0.02	365	41,000	91,000	33.0	9
							32.4	86,300

Notes:

Distance traveled per round trip and daily trip counts were provided by Enviva.

Emission Calculations Unpaved Roads:

Pollutant	Emeperical Constant (k) ¹	Silt Content (S) ²	Particle Constant a ¹	Particle Constant b ¹	Emission Factor ³	Potential Emissions ⁴
	(Ib/VMT)	(%)	(-)	(-)	(Ib/VMT)	(tpy)
РМ	4.9	8.4	0.7	0.45	7.47	32.25
PM ₁₀	1.5	8.4	0.9	0.45	2.13	9.19
PM _{2.5}	0.15	8.4	0.9	0.45	0.21	0.92

Notes:

^{1.} Constants (k, a, & b) based on AP-42, Section 13.2.2 (Unpaved Roads), Table 13.2.2-2 for Industrial Roads, November 2006

^{2.} Silt loading factor based on AP-42, Section 13.2.2 (Unpaved Roads), Table 13.2.2-1, Lumber Sawmills, November 2006

^{3.} Emission factors calculated based on Equation 1a from AP-42 Section 13.2.2 - Unpaved Roads, 11/06.

Particulate Emission Factor: $E_{ext} = k (s/12)^a x (W/3)^b * (365-P/365)$

k = particle size multiplier for particle size range and units of interest

E = size-specific emission factor (Ib/VMT)

s = surface material silt content (%)

W = mean vehicle weight (tons)

P=number of days with at least 0.01 in of precipitation during the averaging period =

= 120 Per AP-42, Section 13.2.1, Figure 13.2.1-2 (Northampton, VA).

^{4.} Potential emissions calculated from appropriate emission factor times vehicle miles traveled with control efficiency of 90% for water / dust suppression activities.

Abbreviations:

ft - feet

hr - hour lb - pound

PM - particulate matter

 PM_{10} - particulate matter with an aerodynamic diameter less than 10 microns $PM_{2.5}$ - particulate matter with an aerodynamic diameter of 2.5 microns or less tpy - tons per year yr - year VMT - vehicle miles traveled VOC - volatile organic compound



Table 16 Potential GHG Emissions Facility-wide Enviva Pellets Northampton, LLC

Operating Data:

Operating Data:		
Dryer-1 Heat Input Annual Heat Input	153.0 1,344,946	MMBtu/hr MMBtu/yr
Duct Burner 1 Heat Input Number of Burners	1 2	MMBtu/hr
Operating Schedule	8,760	hrs/yr
Dryer 1 Bypass Heat Input Operating Schedule		MMBtu/hr hrs/yr
Dryer-2 Heat Input Annual Heat Input	180.0 1,576,800	MMBtu/hr MMBtu/yr
Duct Burner 2 Heat Input Number of Burners Operating Schedule	2	MMBtu/hr hrs/yr
Dryer 2 Bypass Heat Input Operating Schedule		MMBtu/hr hrs/yr
RTO-1 Heat Input Operating Schedule		MMBtu/hr hrs/yr
Furnace 1 Bypass Heat Input Operating Schedule		MMBtu/hr hrs/yr
Furnace 1 Idle Heat Input Operating Schedule		MMBtu/hr hrs/yr
RTO-2 Heat Input Operating Schedule		MMBtu/hr hrs/yr
Furnace 2 Bypass Heat Input Operating Schedule		MMBtu/hr hrs/yr
Furnace 2 Idle Heat Input Operating Schedule		MMBtu/hr hrs/yr
RCO-1 Heat Input Operating Schedule	207,458.0 8,760	MMBtu/yr hrs/yr
Duct Burners 3 and 4 Heat Input Number of Burners	4	MMBtu/hr
Operating Schedule		hrs/yr
Propane Vaporizer Heat Input Operating Schedule		MMBtu/hr hrs/yr
Emergency Generator Output Operating Schedule	500	bhp hrs/yr
Power Conversion Energy Input		Btu/hr/hp MMBtu/hr
Fire Water Pump Output Operating Schedule Power Conversion Energy Input	500 7,000	bhp hrs/yr Btu/hr/hp MMBtu/hr



Table 16 Potential GHG Emissions Facility-wide Enviva Pellets Northampton, LLC

	Evel Toma	Emission Fac	tors from Table C-1	(kg/MMBtu) ^{1, 2}	Tier	1 Emissior	ns (short te	ons) ²
Emission Unit ID	Fuel Type	CO ₂	CH4	N ₂ O	CO ₂	CH4	N ₂ O	Total CO ₂ e
ES-DRYER-1	Wood and Wood Residuals	93.80	1.80E-01	1.07E+00	139,061.64	267	1,590	140,919
DDB-1	Propane	62.87	7.50E-02	1.79E-01	1214.16	1.45	3.45	1,219
Dryer 1 Bypass	Wood and Wood Residuals	93.80	1.80E-01	1.07E+00	790.98	1.52	9.05	802
ES-DRYER-2	Wood and Wood Residuals	93.80	1.80E-01	1.07E+00	163,034.40	313	1,865	165,212
DDB-2	Propane	62.87	7.50E-02	1.79E-01	1214.16	1.45	3.45	1,219
Dryer 2 Bypass	Wood and Wood Residuals	93.80	1.80E-01	1.07E+00	930.56	1.79	10.64	943
ES-RTO-1	Propane	62.87	7.50E-02	1.79E-01	19426.62	23.17	55.25	19,505
Furnace 1 Bypass	Wood and Wood Residuals	93.80	1.80E-01	1.07E+00	790.98	1.52	9.05	802
Furnace 1 Idle	Wood and Wood Residuals	93.80	1.80E-01	1.07E+00	258.49	0.50	2.96	262
ES-RTO-2	Propane	62.87	7.50E-02	1.79E-01	19426.62	23.17	55.25	19,505
Furnace 2 Bypass	Wood and Wood Residuals	93.80	1.80E-01	1.07E+00	930.56	1.79	10.64	943
Furnace 2 Idle	Wood and Wood Residuals	93.80	1.80E-01	1.07E+00	258.49	0.50	2.96	262
ES-RCO-1	Propane	62.87	7.50E-02	1.79E-01	14377.17	17.15	40.89	14,435
DDB-3 and -4	Propane	62.87	7.50E-02	1.79E-01	2428.33	2.90	6.91	2,438
ES-PVAP	Propane	62.87	7.50E-02	1.79E-01	607.08	0.72	1.73	610
ES-GN	No. 2 Fuel Oil (Distillate)	73.96	7.50E-02	1.79E-01	100	1.01E-01	2.41E-01	100
ES-FWP	No. 2 Fuel Oil (Distillate)	73.96	7.50E-02	1.79E-01	86	8.68E-02	2.07E-01	86

¹ Emission factors from Table C-1 and C-2 of GHG Reporting Rule. Emission factors for methane and N₂O already multiplied by their respective GWPs of 25 and 298.

 2 As per VADEQ guidance, VADEQ has adopted the GHG Biomass Deferral Rule which excludes CO₂ emissions from biomass combustion.



APPENDIX D PERMIT APPLICATION FORMS

FORM A

REVISED 09/22/16 NCDEQ/Division of Air Quality - App	lication for Air Permit to Construct/Operate
	ROCESSED WITHOUT THE FOLLOWING:
Local Zoning Consistency Determination (new or	
modification only)	propriate Number of Copies of Application I Application Fee (if required)
	. Seal (if required)
GENERAL I	NFORMATION
Legal Corporate/Owner Name: Enviva Pellets Northampton, LLC	
Site Name: Enviva Pellets Northampton, LLC	
Site Address (911 Address) Line 1: 874 Lebanon Church Road	
Site Address Line 2:	
City: Garysburg	State: NC
Zip Code: 27866	County: Northampton
CONTACT I	NFORMATION
Responsible Official/Authorized Contact:	Invoice Contact:
Name/Title: Royal Smith, Vice President Operations	Name/Title: Joe Harrell, Corporate Environmental Health & Safety Manager
Mailing Address Line 1: 7200 Wisconsin Avenue	Mailing Address Line 1: 142 N.C. Route 561 East
Mailing Address Line 2: Suite 1000	Mailing Address Line 2:
City: Bethesda State: MD Zip Code: 20814	City: Ahoskie State: NC Zip Code: 27910
Primary Phone No.: (240) 482-3770 Fax No.:	Primary Phone No.: (252) 209-6032 Fax No.:
Secondary Phone No.:	Secondary Phone No.:
Email Address: Royal.Smith@envivabiomass.com	Email Address: Joe.Harrell@envivabiomass.com
Facility/Inspection Contact:	Permit/Technical Contact:
Name/Title: Heath Lucy, Environmental Health & Safety Manager	Name/Title: Joe Harrell, Corporate Environmental Health & Safety Manager
Mailing Address Line 1: 874 Lebanon Church Road	Mailing Address Line 1: 142 N.C. Route 561 East
Mailing Address Line 2:	Mailing Address Line 2:
City: Garysburg State: NC Zip Code: 27866	City: Ahoskie State: NC Zip Code: 27910
Primary Phone No.: (910) 318-2743 Fax No.:	Primary Phone No.: (252) 209-6032 Fax No.:
Secondary Phone No.:	Secondary Phone No.:
Email Address: Heath.Lucy@envivabiomass.com	Email Address: Joe.Harrell@envivabiomass.com
APPLICATION IS	BEING MADE FOR
New Non-permitted Facility/Greenfield Modification of Facility (permitted)	Renewal Title V Renewal Non-Title V
🗖 Name Change 🔲 Ownership Change 🗖 Administrative Amendment	Renewal with Modification
FACILITY CLASSIFICATION AFTE	R APPLICATION (Check Only One)
General Small	Prohibitory Small Synthetic Minor Itile V
FACILITY (Plant S	Site) INFORMATION
Describe nature of (plant site) operation(s): Wood pellet manufacturing facility.	
Drimony SIC/MAICS Code: 2400 (Wash Bredwetz, Nat Flandshar, Classified)	Facility ID No. 6600167
Primary SIC/NAICS Code: 2499 (Wood Products, Not Elsewhere Classified)	Current/Previous Air Permit No. 10203R05 Expiration Date: February 28, 2025
Facility Coordinates: Latitude: 36.5025	Longitude: -77.6135 f yes, please contact the DAQ Regional Office prior to submitting this
	lication.*** (See Instructions)
PERSON OR FIRM THAT	PREPARED APPLICATION
Person Name: Michael Carbon	Firm Name: Ramboll US Corporation
Mailing Address Line 1: 8235 YMCA Plaza Drive	Mailing Address Line 2: Suite 300
City: Baton Rouge State: LA	Zip Code: 70810 County: East Baton Rouge
Phone No.: (225) 408-2691 Fax No.:	Email Address: mcarbon@ramboll.com
SIGNATURE OF RESPONSIBLE OF	OFFICIAL/AUTHORIZED CONTACT
Name (typed): Royal Smith	Title: Vice President Operations
X Signature(Blue Ink)	Date: 9-24-18
Attach Additional Shee	ts As Necessary Page 1 of 1

FORMS A2, A3 EMISSION SOURCE LISTING FOR THIS APPLICATION - A2 112r APPLICABILITY INFORMATION - A3

	112r APPLICABILI		N - A3				
REVISED 09/22/16 NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate A2							
	EMISSION SOURCE LISTING: New, Modifi	ed, Previously Unpe	rmitted, Replaced, Deleted				
EMISSION SOURCE	EMISSION SOURCE	CONTROL DEVICE	CONTROL DEVICE				
ID NO.	DESCRIPTION	ID NO.	DESCRIPTION				
E	quipment To Be ADDED By This Application	n (New, Previously	Unpermitted, or Replacement)				
ES-GHM-1 through		CD-WESP-1	Wet Electrostatic Precipitator				
ES-GHM-5	Five (5) Green Wood Hammermills (new)	CD-RTO-1 (new)	Regenerative Thermal Oxidizer				
		CD-WESP-2 (new)	Wet Electrostatic Precipitator				
ES-DRYER-2	Green Wood Direct-Fired Rotary Dryer System (new)	CD-RTO-2 (new)	Regenerative Thermal Oxidizer				
ES-DRYERBYP-1	Dryer #1 Bypass	N/A	N/A				
ES-FURNACEBYP-1	Furnace #1 Bypass	N/A	N/A				
ES-DRYERBYP-2	Dryer #2 Bypass	N/A	N/A				
ES-FURNACEBYP-2	Furnace #2 Bypass	N/A	N/A				
IES-ADD	Additive Handling and Storage (new)	CD-ADD-BF (new)	Baghouse				
ES-PCHP	Pellet Cooler HP Fines Relay System (new)	ES-PCHP-BF	Baghouse				
ES-DSHM-1 and ES-			-				
DHM-2	Two (2) Dry Shavings Hammermills (new)	CD-RCO-1 (new)	Recuperative Catalytic Oxidizer				
IES-DRYSHAVE-1	Dry Shaving Material Handling and Storage (new)	N/A	N/A				
IES-DSS	Dry Shavings Silo (new)	CD-DSS-BF (new)	Baghouse				
IES-TK3	One diesel storage tank (5,000 gallon capacity) (new)	N/A	N/A				
IES-Bark	Bark Hog (renamed/new)	N/A	N/A				
IES-Debark	Debarker (renamed/new)	N/A	N/A				
IES-DDB-1 through							
IES-DDB-4	Dryer Line Double Duct Burners (new)	N/A	N/A				
IES-DDB-5 through IES-DDB-8	RCO System Double Duct Burners (new)	N/A	N/A				
IES-PVAP	Liquid Propane Vaporizer (new)	N/A	N/A				
	Existing Permitted Equipment To	Be MODIFIED By	This Application				
	Green Wood Direct-Fired Rotary Dryer System	CD-WESP-1	Wet Electrostatic Precipitator				
ES-DRYER-1	(modified)	CD-RTO-1 (new)	Regenerative Thermal Oxidizer				
		CD-CLR-1 through					
ES-CLR-1 through ES-CLR-6	Six (6) Pellet Coolers (modified)	CD-CLR-6	Baghouses (one per pellet cooler)				
E3-CLK-0		CD-RCO-1 (new)	Recuperative Catalytic Oxidizer				
ES-HM-1 through 8	Eight (8) Dry Hammermills (modified)	CD-HM-BH-1 through CD-HM-BH-8	Baghouses (one per hammermill)				
5		CD-RCO-1 (new)	Recuperative Catalytic Oxidizer				
ES-PFB	Pellet Fines Bin (renamed to ES-PCHP)	CD-PFB-BF	Baghouse				
ES-PMFS	Pellet Mill Feed Silo (modified)	CD-PMFS-BV	Baghouse				
ES-FPH	Finished Product Handling (modified)						
ES-PB-1 through							
ES-PB-12	Pellet Loadout Bins (modified)	CD-FPH-BF	Baghouse				
ES-PL-1 through	Pollot Londout 1 and 2 (modified)						
ES-PL-2	Pellet Loadout 1 and 2 (modified) Dried Wood Handling (re-named to ES-DWH and		+				
ES-DWH	modified)	CD-DWH-BF	Baghouse				
	Equipment To Be DEL	ETED By This App	lication				
IES-RCHP-1 and IES- RCHIP 2	Two electric powered wood re-chippers (renamed to ES GHM-1 and ES-GHM-2)	5- N/A	N/A				
ES-NDS	Nuisance Dust System (removed)	CD-HM-BF-3 (remains)	N/A N/A				
LJ-11DJ	ruisance Dust system (removeu)	Co-mains) cremains)	МА				

112(r) APPLICABILITY INFORMATION								
Is your facility subject to 40 CFR Part 68 "Prevention of Accident If No, please specify in detail how your facility avoided applicabili		Section 112(r) of the Federal Clean Air Act? Yes Enviva Pellets Northampton, LLC will not handle any of the substance	✓ No ces					
		subject to Section 112(r) of the Federal Clean Air Act.						
If your facility is Subject to 112(r), please complete the following: A. Have you already submitted a Risk Management Plan (RM Yes No Specify required RMP subm B. Are you using administrative controls to subject your facilit Yes No If yes, please specify: C. List the processes subject to 112(r) at your facility:	MP) to EPA Purs	If submitted, RMP submittal date:						
PROCESS DESCRIPTION	LEVEL (1, 2, MAXIMUM INTENDED							
	<u> </u>							
	1							

FORM D1 FACILITY-WIDE EMISSIONS SUMMARY

REVISED 09/22/16 NCDEQ/Div	ision of Air Qual	ity - Applicatio	on for Air Perm	nit to Construc	:t/Operate		D1
CRITERIA A	AIR POLLUTAN	IT EMISSION		TION - FACIL	ITY-WIDE		
		EMIS: (AFTER CO	D ACTUAL SIONS DNTROLS / .TIONS)	(BEFORE C	EMISSIONS CONTROLS /	(AFTER C	- EMISSIONS ONTROLS / ATIONS)
AIR POLLUTANT EMITTED			s/yr		ns/yr		ns/yr
PARTICULATE MATTER (PM)				lations in Appe			,
PARTICULATE MATTER < 10 MICRONS (PM10)						
PARTICULATE MATTER < 2.5 MICRONS (PM ₂							
SULFUR DIOXIDE (SO ₂)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
GREENHOUSE GASES (GHG) (SHORT TONS	5)						
OTHER							
HAZARDOUS	AIR POLLUTA	NT EMISSIO	NS INFORM	ATION - FAC	ILITY-WIDE	-	
		EMIS: (AFTER CO	D ACTUAL SIONS ONTROLS /	(BEFORE C	EMISSIONS	(AFTER C	ONTROLS /
HAZARDOUS AIR POLLUTANT EMITTED CAS			TIONS)	1	TIONS)		ATIONS)
HAZARDOUS AIR POLLUTANT EMITTED	CAS NO.		s/yr	tor lations in Appe	ns/yr	tor	ns/yr
		Jee E		lations in Appe	liuix C		
TOXIC AIF	R POLLUTANT	EMISSIONS	INFORMATIC	ON - FACILIT	Y-WIDE		
INDICATE REQUESTED ACTUAL EMISSIONS (TPER) IN 15A NCAC 2Q .0711 MAY REQUIRE					NECESSARY.		N RATE
TOXIC AIR POLLUTANT EMITTED	CAS NO.	lb/hr	lb/day	lb/year	Yes	No	
		See E	mission Calcul	lations in Appe	ndix C		
	ļ	 			 		ļ
COMMENTS							
COMMENTS:							

FORM D4

EXEMPT AND INSIGNIFICANT ACTIVITIES SUMMARY

REVISED 09/22/16 NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate D4							
	EMPTED PER 2Q						
INSIGNIFICANT ACTIVITIES	9 PER 2Q .0503 FC	DR TITLE V SOURCES					
	SIZE OR						
	PRODUCTION	BASIS FOR EXEMPTION OR					
DESCRIPTION OF EMISSION SOURCE	RATE	INSIGNIFICANT ACTIVITY					
1. Green Wood Handling and Storage Operations	Varia	15A NCAC 02Q .0503(8)-low emissions, see					
IES-GWHS	Varies	Appendix C					
2. Bark Hog	234377 ODT/yr	15A NCAC 02Q .0503(8)-low emissions, see					
IES-BARK	234377 OD1/yi	Appendix C					
4. Emergency Generator Diesel Fuel Storage Tank	2,500 gallons	15A NCAC 02Q .0503(8)-low emissions, see					
IES-TK1	_,000 ganono	Appendix C					
5. Firewater Pump Engine Diesel Fuel Storage Tank		15A NCAC 02Q .0503(8)-low emissions, see					
IES-TK2	500 gallons	Appendix C					
6. Mobile Sources Diesel Fuel Storage Tank	5,000 gallons	15A NCAC 02Q .0503(8)-low emissions, see					
IES-TK3		Appendix C					
8. Debarker IES-DEBARK	781255 ODT/yr	15A NCAC 02Q .0503(8)-negligible emissions, see Appendix C					
9. Green Wood Fuel Bin		15A NCAC 02Q .0503(8)-no quantifiable					
IES-GWFB	13.93 ODT/hr	emissions					
10. Dry Line Hopper							
IES-DLH	10 ODT/hr	15A NCAC 02Q .0503(8)-negligible emissions					
13. Dry Shaving Material Handling	Varies	15A NCAC 02Q .0503(8)-low emissions, see					
IES-DRYSHAVE, IES-DRYSHAVE-1	varies	Appendix C					
15. Electric Powered Green Wood Chipper	781255 ODT/yr	15A NCAC 02Q .0503(8)-low emissions, see					
IES-EPWC	/01200 00 1/91	Appendix C					
16. Additive Handling and Storage	2344 ODT/yr	15A NCAC 02Q .0503(8)-negligible emissions,					
IES-ADD	,,,	see Appendix C					
17. Diesel-Fired Emergency Generator IES-GN	350 bhp	15A NCAC 02Q .0503(8)-low emissions, see Appendix C					
18. Diesel-Fired Fire Water Pump		15A NCAC 02Q .0503(8)-low emissions, see					
IS. Diesei-Fired Fire water Pump IES-FWP	300 bhp	Appendix C					
		Appendix 0					

Attach Additional Sheets As Necessary

FORM D5 TECHNICAL ANALYSIS TO SUPPORT PERMIT APPLICATION

		TECHNICAL ANALYSIS TO SUPPOR		
RE	VISED 09/22/16	NCDEQ/Division of Air Quality - Application for Air Pe		D5
		VIDE DETAILED TECHNICAL CALCULATIONS TO SUPPOR INSTRATIONS MADE IN THIS APPLICATION. INCLUDE A CO NECESSARY TO SUPPORT AND CLARIFY CALCULATION FOLLOWING SPECIFIC ISSUES ON	DMPREHENSIVE PROCESS FLOW DIAGRAM AS NS AND ASSUMPTIONS. ADDRESS THE	
^	FACTORS, MATER DERIVED, INCLUD	NS SOURCE (EMISSION INFORMATION) (FORM B and B1 throug IAL BALANCES, AND/OR OTHER METHODS FROM WHICH THE P E CALCULATION OF POTENTIAL BEFORE AND, WHERE APPLIC/ DE ANY REFERENCES AS NEEDED TO SUPPORT MATERIAL BAL	DLLUTANT EMISSION RATES IN THIS APPLICATION WER BLE, AFTER CONTROLS, CLEARLY STATE ANY ASSUMF	E
В	TO INDIVIDUAL SO REQUIREMENTS) F PROCESS RATES (PREVENTION OF HAZARDOUS AIR F APPLICABLE TO T	IN SOURCE (REGULATORY INFORMATION)(FORM E2 - TITLE V C URCES AND THE FACILITY AS A WHOLE. INCLUDE A DISCUSSI- FOR COMPLYING WITH APPLICABLE REGULATIONS, PARTICULA OR OTHER OPERATIONAL PARAMETERS. PROVIDE JUSTIFICAT SIGNIFICANT DETERIORATION (PSD), NEW SOURCE PERFORM/ OCLUTANTS (NESHAPS), TITLE V), INCLUDING EXEMPTIONS FR HIS FACILITY, SUBMIT ANY REQUIRED INFORMATION TO DOCU CALCULATED IN ITEM "A" ABOVE, DATES OF MANUFACTURE, C	DN OUTING METHODS (e.g., FOR TESTING AND/OR MONI RLY THOSE REGULATIONS LIMITING EMISSIONS BASED ION FOR AVOIDANCE OF ANY FEDERAL REGULATIONS INCE STANDARDS (NSPS), NATIONAL EMISSION STANDA OM THE FEDERAL REGULATIONS WHICH WOULD OTHEI MENT COMPLIANCE WITH ANY REGULATIONS. INCLUDE	TORING OON ARDS FOR RWISE BE
с	CONTROL EFFICIE INCLUDE PERTINE APPLIED FOR IN TI MALFUNCTION PO	ANALYSIS (FORM C and C1 through C9) - PROVIDE A TECHNIC/ NCIES LISTED ON SECTION C FORMS, OR USED TO REDUCE EI NT OPERATING PARAMETERS (e.g. OPERATING CONDITIONS, M HIS APPLICATION) CRITICAL TO ENSURING PROPER PERFORM. TENTIAL FOR THE PARTICULAR CONTROL DEVICES AS EMPLO ON OF THE CONTROL DEVICE INCLUDING MONITORING SYSTE	MISSION RATES IN CALCULATIONS UNDER ITEM "A" ABO IANUFACTURING RECOMMENDATIONS, AND PARAMETE INCE OF THE CONTROL DEVICES), INCLUDE AND LIMITA YED AT THIS FACILITY, DETAIL PROCEDURES FOR ASSI	VE. RS AS ATIONS OR
D	USING PROCESS, REGULATORY ANA	ERATIONAL COMPLIANCE ANALYSIS - (FORM E3 - TITLE V ONL OPERATIONAL, OR OTHER DATA TO DEMONSTRATE COMPLIAN ALYSIS IN ITEM "B" WHERE APPROPRIATE, LIST ANY CONDITIO E COMPLIANCE WITH THE APPLICABLE REGULATIONS.	CE. REFER TO COMPLIANCE REQUIREMENTS IN THE	
ε	A PROFESSIONAL	NGINEERING SEAL - PURSUANT TO 15A NCAC 2Q.0112 ENGINEER REGISTERED IN NORTH CAROLINA SHALL BE REQU ID MODIFICATIONS OF EXISTING SOURCES. (SEE INSTRUCTIO		
	l, Russell Kemp	attest that this application	n for Enviva Pellets Northampton, LLC	
	proposed design has by other professiona design_Note: In ac	has been reviewed by me and is accur lans, calculations, and all other supporting documentation to the best s been prepared in accordance with the applicable regulations. Althou ils, inclusion of these materials under my seal signifies that I have revi cordance with NC General Statutes 143-215.6A and 143-215.6B, any oplication shall be guilty of a Class 2 misdemeanor which may include	gh certain portions of this submittal package may have been ewed this material and have judged it to be consistent with the person who knowingly makes any false statement, represent	developed e proposed ation, or
	(PLEASE USE BLU	E INK TO COMPLETE THE FOLLOWING)	PLACE NORTH CAROLINA SEAL HE	RE
	NAME:	Russell Kemp, MS, PE 1962. 6		
	DATE:	27 SEPTEMBER ZOIB	TH CARO	
	COMPANY:	REUS Engineers, P.C.	O COTESSION A	
	ADDRESS:	1600 Parkwood Circle, Suite 310, Atlanta, GA 30339	A Company and a	
	TELEPHONE:	(678) 388-1654	19628	
	SIGNATURE:		151 181	
	PAGES CERTIFIED	: Forms B, B1, B6, B9, C1, C2, C3, C4	A STANGINE ENTRY	
		Appendix C with emission calculations Application Narrative	AND STEPHERSON	
		(IDENTIFY ABOVE EACH PERMIT FORM AND ATTACHMENT THAT IS BEING CERTIFIED BY THIS SEAL)		

Attach Additional Sheets As Necessary

FORM E1

	TITLE V GENERAL INFOR			-						
REVISED 06/01/16	NCDEQ/Division of Air Quality - Application for	r Air Permit to	o Construct/Operate		E1					
	ACILITY IS CLASSIFIED AS "MAJOR" FO									
_										
If subject to Title V by "OTHER", specify why:	NSPS OTHER (specify)		NESHAP (MACT)							
	hievable control technology standards (MACT) issued pursua	ant to section								
112(d) of the Clean Air Act, specify below:	EMISSION SOURCE									
EMISSION SOURCE ID	DESCRIPTION			MACT						
IES-GN, IES-FWP	Emergency Generator and Fire Water Pump	-	Subpart ZZZZ							
		-								
		-								
		-								
List any additional regulation which are request the shield should be granted:	ed to be included in the shield and provide a detailed explan	ation as to why	у							
REGULATION	EMISSION SOURCE (Include ID)			EXPLANATION						
		-								
		•								
		-								
		-								
Comments:										

Attach Additional Sheets As Necessary

FORM E2

EMISSION SOURCE APPLICABLE REGULATION LISTING

REVISED 09/22/10 NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate E2							
EMISSION	EMISSION	OPERATING SCENARIO					
SOURCE	SOURCE	INDICATE PRIMARY (P)		APPLICABLE			
ID NO.	DESCRIPTION	OR ALTERNATIVE (A)		REGULATION			
ES 1	Coal/Wood Boiler	P - Coal	РM	NCAC 2D .0503			
		A - Wood	РM	NCAC 2D .0504			
See attached	table following Form E3 for a	summary of regulatory	y requirements	and associated compliance requirements			

FORM E3 EMISSION SOURCE COMPLIANCE METHOD

			ermit to Construct/Operate	
		Regulated Pollutant		
ission Source ID N	NO.	Applicable Regulation		
ernative Operating	Scenario (AOS) NO:			
		GE TO EXPAND ON ANY OF 1		
	Μ	IONITORING REQUIREMENTS		
Is Compliance	Assurance Monitoring (CAM) 40 CFR	Part 64 Applicable? YES	□ NO	
	Plan Attached (if applicable, CAM plan toring Device Type:	must be attached)? YES	NO	
Describe Moni	toring Location:			
Other Monitori	ng Methods (Describe In Detail):	CAM applicability and, if	applicable, submission of CAM plans, will be	
addressed as	part of future Title V operating permi	t applications.		
	irequency and duration of monitoring a n to produce an hourly average):	nd how the data will be recorded (i.e	., every 15 minutes, 1 minute instantaneous	
	REC	ORDKEEPING REQUIREMEN	TS	
Data (Paramet	ter) being recording:			
	ter) being recording: recordkeeping (How often is data recor			
		ded?):		
		ded?):		
		ded?):		
	ecordkeeping (How often is data recor	ded?):		
Frequency of r	recordkeeping (How often is data recor			
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Frequency of r	recordkeeping (How often is data recor			
Frequency of r	recordkeeping (How often is data recor			
Frequency of r	recordkeeping (How often is data recor		EVERY 6 MONTHS	
Generally desc	recordkeeping (How often is data recor	REPORTING REQUIREMENTS	EVERY 6 MONTHS	
Frequency of r	recordkeeping (How often is data recor	REPORTING REQUIREMENTS	EVERY 6 MONTHS	
Frequency of r	recordkeeping (How often is data recor		EVERY 6 MONTHS	
Frequency of r	recordkeeping (How often is data recor		EVERY 6 MONTHS	

NOTE - Proposed test method subject to approval and possible change during the test protocol process

Summary of Regulatory Requirements and Associated Compliance Requirements Enviva Pellets Northampton, LLC

Emission Source Description	ID No.	Pollutant	Regulation	Final Control Device	Monitoring Method/Frequency/Duration	Recordkeeping	Reporting
		PM/PM ₁₀ /PM _{2.5}	15A NCAC 02D .0515				
Wood-fired Dryers & Green Wood Hammermills	ES-DRYER, ES-DRYER-2 & ES-GHM-1 to ES- GHM-5	SO ₂	15A NCAC 02D .0516	RTO	None required because inherently low sulfur content	of wood fuel achieves compliance.	
		Opacity	15A NCAC 02D .0521		Monthly visible observation for "normal" opacity. If above normal, correct action or Method 9 observation required.	Written or electronic log of date/time/result of each observation, results of each non- compliant observation and actions taken to correct, and results of corrective action.	N/A
Decilierenerrille	ES-HM-1 to ES-HM-8	PM/PM ₁₀ /PM _{2.5}	15A NCAC 02D .0515	RCO			
Dry Hammermills	ES-HWI-1 (0 ES-HWI-8	Opacity	15A NCAC 02D .0521		Monthly visible observation for "normal" opacity. If above normal, correct action or Method 9 observation required.	Written or electronic log of date/time/result of each observation, results of each non- compliant observation and actions taken to correct, and results of corrective action.	N/A
Pellet Mill Feed Silo	ES-PMFS	PM/PM ₁₀ /PM _{2.5}	15A NCAC 02D .0515		collection unit for leaks, and annual internal	each inspection, results of inspection and maintenance, and variance from	Submit results of any maintenance performed on the baghouse within 30 days of a written request by DAQ.
רפופנ אוווו רפפע אווט	E3-FIVIF3	Opacity	15A NCAC 02D .0521		Monthly visible observation for "normal" opacity. If above normal, correct action or Method 9 observation required.	Written or electronic log of date/time/result of each observation, results of each non- compliant observation and actions taken to correct, and results of corrective action.	N/A

Summary of Regulatory Requirements and Associated Compliance Requirements Enviva Pellets Northampton, LLC

Emission Source Description	ID No.	Pollutant	Regulation	Final Control Device	Monitoring Method/Frequency/Duration	Recordkeeping	Reporting
Finished Product Handling	ES-FPH, ES-PB-1 to ES-PB-12,	PM/PM ₁₀ /PM _{2.5}	15A NCAC 02D .0515	A NCAC 02D .0515	Baghouse inspections and maintenance, including monthly inspection of ductwork and material collection unit for leaks, and annual internal inspection of control device/baghouse integrity.	Written or electronic log of date and time of each inspection, results of inspection and maintenance, and variance from manufacturer's recommendation.	Submit results of any maintenance performed on the baghouse within 30 days of a written request by DAQ.
	ES-PL-1, ES-PL-2	Opacity	15A NCAC 02D .0521	-	Monthly visible observation for "normal" opacity. If above normal, correct action or Method 9 observation required.	Written or electronic log of date/time/result of each observation, results of each non- compliant observation and actions taken to correct, and results of corrective action.	N/A
Pellet Coolers	ES-CLR-1 to ES-CLR-6	PM/PM ₁₀ /PM _{2.5}	15A NCAC 02D .0515	RCO			
		Opacity	15A NCAC 02D .0521	l ā	Monthly visible observation for "normal" opacity. If above normal, correct action or Method 9 observation required.	Written or electronic log of date/time/result of each observation, results of each non- compliant observation and actions taken to correct, and results of corrective action.	N/A
	ES-PCHP	PM/PM ₁₀ /PM _{2.5}	15A NCAC 02D .0515		Baghouse inspections and maintenance, including monthly inspection of ductwork and material collection unit for leaks, and annual internal inspection of control device/baghouse integrity.	Written or electronic log of date and time of each inspection, results of inspection and maintenance, and variance from manufacturer's recommendation.	Submit results of any maintenance performed on the baghouse within 30 days of a written request by DAQ.
Pellet Cooler HP Fines Relay System		Opacity	15A NCAC 02D .0521	bagnouse	Monthly visible observation for "normal" opacity. If above normal, correct action or Method 9 observation required.	Written or electronic log of date/time/result of each observation, results of each non- compliant observation and actions taken to correct, and results of corrective action.	N/A
Dried Wood Handling	ES-DWH	PM/PM ₁₀ /PM _{2.5}	15A NCAC 02D .0515	Baghouses	Baghouse inspections and maintenance, including monthly inspection of ductwork and material collection unit for leaks, and annual internal inspection of control device/baghouse integrity.	Written or electronic log of date and time of each inspection, results of inspection and maintenance, and variance from manufacturer's recommendation.	Submit results of any maintenance performed on the baghouse within 30 days of a written request by DAQ.
	E3-DWH	Opacity	15A NCAC 02D .0521	Dagnouses	Monthly visible observation for "normal" opacity. If above normal, correct action or Method 9 observation required.	Written or electronic log of date/time/result of each observation, results of each non- compliant observation and actions taken to correct, and results of corrective action.	N/A
Additive Handling and Storage	IES-ADD	PM/PM ₁₀ /PM _{2.5}	15A NCAC 02D .0515	Paghouro	Baghouse inspections and maintenance, including monthly inspection of ductwork and material collection unit for leaks, and annual internal inspection of control device/baghouse integrity.	Written or electronic log of date and time of each inspection, results of inspection and maintenance, and variance from manufacturer's recommendation.	Submit results of any maintenance performed on the baghouse within 30 days of a written request by DAQ.
Additive Handling and Storage	IE3-ADD	Opacity	15A NCAC 02D .0521	Baghouse	Monthly visible observation for "normal" opacity. If above normal, correct action or Method 9 observation required.	Written or electronic log of date/time/result of each observation, results of each non- compliant observation and actions taken to correct, and results of corrective action.	N/A

Summary of Regulatory Requirements and Associated Compliance Requirements Enviva Pellets Northampton, LLC

Emission Source Description	ID No.	Pollutant	Regulation	Final Control Device	Monitoring Method/Frequency/Duration	Recordkeeping	Reporting
		РМ, СО, NO _X , NMHC, SO ₂	40 CFR Part 60 Subpart IIII	N/A	All requirement are outlined in the regulation, including the following: use certified emergency engines, operate according to manufacturers procedures, use fuel oil with fuel content of no more than 15 ppmw sulfur and cetane index of at least 40, install non-resettable hour meter.	Maintain records of engine certification, fuel certifications and hours/year of operation of each engine.	N/A
Emergency Generator	IES-EG	SO ₂	15A NCAC 02D .0516	N/A	Non required because inherently low sulfur content of		
		Opacity	15A NCAC 02D .0521	N/A	Monthly visible observation for "normal" opacity. If above normal, correct action or Method 9 observation required.	Written or electronic log of date/time/result of each observation, results of each non- compliant observation and actions taken to correct, and results of corrective action.	N/A
		HAPs	40 CFR Part 63 Subpart ZZZZ	N/A	Comply with the NSPS requirements. No other requirements apply.	Comply with the NSPS requirements. No other requirements apply.	N/A
		PM, CO, NO _X , NMHC, SO ₂	40 CFR Part 60 Subpart IIII	N/A	All requirement are outlined in the regulation, including the following: use certified emergency engines, operate according to manufacturers procedures, use fuel oil with fuel content of no more than 15 ppmw sulfur and cetane index of at least 40, install non-resettable hour meter.	Maintain records of engine certification, fuel certifications and hours/year of operation of each engine.	N/A
Fire Water Pump	IES-FWP	SO ₂	15A NCAC 02D .0516	N/A	Non required because inherently low sulfur content of	of fuel achieves compliance.	
		Opacity	15A NCAC 02D .0521	N/A	Monthly visible observation for "normal" opacity. If above normal, correct action or Method 9 observation required.	Written or electronic log of date/time/result of each observation, results of each non- compliant observation and actions taken to correct, and results of corrective action.	N/A
		HAPs	40 CFR Part 63 Subpart ZZZZ	N/A	Comply with the NSPS requirements. No other requirements apply.	Comply with the NSPS requirements. No other requirements apply.	N/A

FORM E4

EMISSION SOURCE COMPLIANCE SCHEDULE

REVISED 09/22/16	6	NC	DEQ/Division of Ai	r Quality - Application for Air Permit to Construct/Op	erate	E4
	<u>cc</u>	OMPLIANC	<u>CE STATUS WI</u>	TH RESPECT TO ALL APPLICABLE REQU	IREMENTS	
Will each emiss comply with the			facility be in compli	ance with all applicable requirements at the time of pern	nit issuance and continue to	
		' YES	NO NO	If NO, complete A through F below for each requirem compliance is not achieved.	ent for which	
			liance with all ap a timely basis?	oplicable requirements taking effect during the	e term of the permit and	ł
	- N	YES	NO NO	If NO, complete A through F below for each requirem compliance is not achieved.	ent for which	
If this application requirements?	on is fo	or a modificat	ion of existing emis	sions source(s), is each emission source currently in cor	mpliance with all applicable	
	✓ Y	YES	NO NO	If NO, complete A through F below for each requirem compliance is not achieved.	ent for which	
A	. Emis	sion Source	Description (Include	e ID NO.)		
B	. Ident	ify applicable	e requirement for wh	nich compliance is not achieved:		
c.	. Narra	ative descript	ion of how compliar	nce will be achieved with this applicable requirements:		
D	. Deta	iled Schedule	e of Compliance:			
	<u>Step</u>				Date Expected	
						_
E	. Freq	uency for sub	omittal of progress r	eports (6 month minimum):		
F	. Start	ing date of su	ubmittal of progress	reports:		

FORM E5

TITLE V COMPLIANCE CERTIFICATION (Required)

REVISED 09/22/16	NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate	E5
In accordance with the p	provisions of Title 15A NCAC 2Q .0520 and .0515(b)(4) the responsible company officia	l of:
SITE NAME:	Enviva Pellets Northampton, LLC	
SITE ADDRESS:	874 Lebanon Church Road	
CITY, NC :	Garysburg NC	2
COUNTY:	Northampton	0
PERMIT NUMBER :	10203R05	8
CERTIFIES THAT (Che	eck the appropriate statement(s):	
✓ The facility is in co	ompliance with all applicable requirements	
In accordance wit modification meet the permit applica	th the provisions of Title 15A NCAC 2Q .0515(b)(4) the responsible company official certifies that the proposed minor ts the criteria for using the procedures set out in 2Q .0515 and requests that these procedures be used to process ation.	
	currently in compliance with all applicable requirements ked, you must also complete Form E4 "Emission Source Compliance Schedule"	
The undersigned certifies u on information and belief fo	nder the penalty of law, that all information and statements provided in the application prmed after reasonable inquiry, are true, accurate, and complete.	ı, based
Eng	Date: 9/26/13	
Signature of respon	nsible company official (REQUIRED, USE BLUE INK)	
	ith, Vice President Operations	
Name, Title of respo	onsible company official (Type or print)	

Attach Additional Sheets As Necessary

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCL	DEQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		B
EMISSION SOURCE DESCRIPTION:				EMISSION S		O: IES-BARK		
Bark Hog					DEVICE ID NO			
OPERATING SCENARIO 1	OF	1				K) ID NO(S): 1	N/A	
DESCRIBE IN DETAILTHE EMISSION S Bark from the Debarker and purchased		•		GRAM):				g.
TYPE OF EMISSION SOUF	RCE (CHECK A		TE APPROPI	RIATE FORM	B1-B9 ON T	HE FOLLOW	ING PAGES)	:
Coal,wood,oil, gas, other burner (For	m B1)	Woodwo	rking (Form E	34)	Manuf	. of chemicals	/coatings/inks	(Form B7)
Int.combustion engine/generator (For	m B2)		inishing/printi	• • •		ration (Form B	8)	
Liquid storage tanks (Form B3)		Storage s	silos/bins (Fo		-	(Form B9)		
START CONSTRUCTION DATE:			DATE MANU	JFACTURED	:			
MANUFACTURER / MODEL NO.:			EXPECTED	OP. SCHEDI	JLE: <u>24</u> H	R/DAY <u>7</u>	_DAY/WK _	<u>52</u> _WK/YR
IS THIS SOURCE SUBJECT TC	NSPS (SUBPAR	RTS?):			HAP (SUBPAR	RTS?):		
PERCENTAGE ANNUAL THROUGHPU			/AR-MAY 2			EP-NOV 25%		
CRITERIA A	IR POLLUT	ANT EMISS	SIONS INF	ORMATIO	N FOR TH	IS SOURC	E	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	j
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	Calculation	s in Appendix	C			
PARTICULATE MATTER<10 MICRONS (P	'M ₁₀)							
PARTICULATE MATTER<2.5 MICRONS (F	PM _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (VO	C)							
LEAD	,							
OTHER								
HAZARDOUS	AIR POLLU	TANT EMIS	SSIONS IN	IFORMAT	ION FOR T	HIS SOUR	RCE	
		SOURCE OF		D ACTUAL			EMISSIONS	
		EMISSION		ROLS / LIMITS)	(BEFORE CONTROLS / LIMITS) (AFTER CONTRO			
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	n Calculations	,				
						1		
						1		
						1		
TOXIC AIR	POLLUTA	NT EMISSIO	ONS INFO	RMATION	FOR THIS	SOURCE	<u>.</u>	•
		OF						
		EMISSION	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	ROLS / LIMI	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/	day	lb	o/yr
		See Emission	n Calculations	s in Appendix				
Attachments: (1) emissions calculations and si	upporting docume	entation: (2) indic	ate all request	ed state and fe	deral enforceab	le permit limite	(e.a. hours of a	peration

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.

FORM B9 EMISSION SOURCE (OTHER)

REVISED 09/22/16 NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate						
EMISSION SOURCE DESCRIPTION:		EMISSION SOURCE ID NO:	IES-BARK			
Bark Hog		CONTROL DEVICE ID NO(S): None			
OPERATING SCENARIO: OF		EMISSION POINT (STACK) I	D NO(S): N/A			
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM Bark from the Debarker and purchased bark/chips will be transfe	rred to the B					
MATERIALS ENTERING PROCESS - CONTINUOUS PRO	1	4	MAX. DESIGN REQUESTED C			
ТҮРЕ	UNITS	CAPACITY (UNIT/HR)		UNII/HR)		
Dried Wood Materials	ODT/yr	781,255	N/A			
MATERIALS ENTERING PROCESS - BATCH OPERAT	ION	MAX. DESIGN	REQUESTED	CAPACITY		
ТҮРЕ	UNITS	CAPACITY (UNIT/BATCH)				
MAXIMUM DESIGN (BATCHES / HOUR):	1					
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/\	/R):				
FUEL USED: N/A		IMUM FIRING RATE (MILLIO				
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTE	D CAPACITY ANNUAL FUEL	USE: N/A			
COMMENTS:						

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCI	DEQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		B
EMISSION SOURCE DESCRIPTION:				EMISSION S		O: IES-DEBAI	RK	
Debarker								
OPERATING SCENARIO 1	OF	1				K) ID NO(S): I	N/A	
DESCRIBE IN DETAILTHE EMISSION		^				(0) ID NO(0). I	ЧА	
Logs will be debarked by the electric-po		•		•				
TYPE OF EMISSION SOU	RCE (CHECK A	ND COMPLE	TE APPROPI	RIATE FORM	B1-B9 ON T	HE FOLLOWI	NG PAGES):	
Coal,wood,oil, gas, other burner (For	m B1)	🗌 Woodwo	rking (Form E	84)	Manuf	. of chemicals/	coatings/inks	(Form B7)
Int.combustion engine/generator (For	rm B2)	Coating/f	inishing/printi	ng (Form B5)		ration (Form B	8)	. ,
Liquid storage tanks (Form B3)	,		silos/bins (Fo	• • •		(Form B9)	,	
START CONSTRUCTION DATE:				JFACTURED:		,		
MANUFACTURER / MODEL NO.:			EXPECTED	OP. SCHEDI	JLE: <u>24</u> H	IR/DAY <u>7</u>	_DAY/WK _	<u>52</u> WK/YR
IS THIS SOURCE SUBJECT T(NSPS (SUBPAR	TS?):			IAP (SUBPAF	RTS?):		
PERCENTAGE ANNUAL THROUGHPU				5% JUN-AU		EP-NOV 25%	-	
CRITERIA A	IR POLLUT	ANT EMISS	SIONS INF	ORMATIO	N FOR TH	IIS SOURC	Ε	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)				s in Appendix		torio, yr	10/111	torio, yi
PARTICULATE MATTER (1 M)	DM)	See Linission						
PARTICULATE MATTER<2.5 MICRONS (I	10,							
,	F IVI _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (V	OC)							
LEAD								
OTHER								
HAZARDOUS	AIR POLLU	TANT EMIS	SSIONS IN	IFORMATI	ON FOR 1	THIS SOUR	CE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	Calculation	s in Appendix	C			
TOXIC AI	R POLLUTAI					SOURCE		L
	FOLLUTAI	VI ENISSI	JNS INFU		FUR THIS	SUURCE		
		OF	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	ROLS / LIMI	TATIONS
		EMISSION			1			
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	-	/hr		/day	lb	/yr
		See Emission	n Calculation	s in Appendix	C			
Attachments: (1) emissions calculations and s	upporting docume	entation: (2) indic	ate all request	ed state and fe	deral enforceat	le permit limits (e a hours of o	peration

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours or 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.

FORM B9 EMISSION SOURCE (OTHER)

REVISED 09/22/16 NCDEQ/Division of Air Quality	y - Application f	for Air Permit to Construct/O	perate	B9		
EMISSION SOURCE DESCRIPTION:		EMISSION SOURCE ID NO:	IES-DEBARK			
Debarker		CONTROL DEVICE ID NO(S): None				
OPERATING SCENARIO: OF		EMISSION POINT (STACK) I	D NO(S): N/A			
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGR						
Logs will be debarked by the electric-powered rotary drum Del	barker (IES-DEB	ARK).				
MATERIALS ENTERING PROCESS - CONTINUOUS PR	ROCESS	MAX. DESIGN	REQUESTE	D CAPACITY		
ТҮРЕ	UNITS	CAPACITY (UNIT/HR)	LIMITATION			
Dried Wood Materials	ODT/yr	781,255	N/A	· · · ·		
		,				
MATERIALS ENTERING PROCESS - BATCH OPER	ATION	MAX. DESIGN	REQUESTEI	O CAPACITY		
ТҮРЕ	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (L	JNIT/BATCH)		
MAXIMUM DESIGN (BATCHES / HOUR):			<u></u>			
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/	YR) [.]				
FUEL USED: N/A		(IMUM FIRING RATE (MILLIO	N BTU/HR)·N/A			
MAX. CAPACITY HOURLY FUEL USE: N/A		D CAPACITY ANNUAL FUEL				
COMMENTS:			,,			

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCDE	Q/Division o	f Air Quality -	Application	for Air Permi	it to Constru	ct/Operate		В	
EMISSION SOURCE DESCRIPTION:				EMISSION SOURCE ID NO: IES-EPWC					
Electric Powered Green Wood Chipper				CONTROL DEVICE ID NO(S): None					
OPERATING SCENARIO 1	OF	1				K) ID NO(S): I	N/A		
DESCRIBE IN DETAILTHE EMISSION SO		ESS (ATTAC	H FI OW DIA				1 /11		
Logs are debarked and sent to an electric p	oowered gree	en wood chipp	er.						
TYPE OF EMISSION SOURC	E (CHECK A		TE APPROP	RIATE FORM	B1-B9 ON T	HE FOLLOWI	NG PAGES):		
Coal,wood,oil, gas, other burner (Form I	31)	Woodwo	rking (Form E	34)	Manuf.	of chemicals/	coatings/inks	(Form B7)	
Int.combustion engine/generator (Form	B2)	Coating/f	inishing/printi	ng (Form B5)		ation (Form B	8)		
Liquid storage tanks (Form B3)		Storage s	silos/bins (Fo	rm B6)	√Other	(Form B9)			
START CONSTRUCTION DATE: 2013			DATE MANU	JFACTURED:					
MANUFACTURER / MODEL NO.: CEM 112" 15KN SUS Pellet Process					ШЕ'24. Н	R/DAY _ <u>7</u>		52 W/K/YR	
IS THIS SOURCE SUBJECT T(NSPS (SUBPARTS?):				1	IAP (SUBPAF			<u>52</u> WIVIII	
PERCENTAGE ANNUAL THROUGHPUT (,	,	AR-MAY 2	5% JUN-AU		EP-NOV 25%		1	
CRITERIA AIR							-		
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS		
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	FROLS / LIMITS)	(AFTER CONTI	ROLS / LIMITS)	
AIR POLLUTANT EMITTED	AIR POLLUTANT EMITTED		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
PARTICULATE MATTER (PM)		See Emission	Calculation	s in Appendix	С				
PARTICULATE MATTER<10 MICRONS (PM1	₀)								
PARTICULATE MATTER<2.5 MICRONS (PM)	2.5)								
SULFUR DIOXIDE (SO2)									
NITROGEN OXIDES (NOx)									
CARBON MONOXIDE (CO)									
VOLATILE ORGANIC COMPOUNDS (VOC)								
LEAD)								
OTHER									
HAZARDOUS A	IR POLLU	TANT EMIS	SSIONS IN	IFORMATI	ON FOR T	THIS SOUR	CE		
		SOURCE OF		D ACTUAL			OTENTIAL EMISSIONS		
		EMISSION	(AFTER CONT	ROLS / LIMITS)			(AFTER CONTI	ROLS / LIMITS)	
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
				s in Appendix					
		See Emission	Curculation						
<u> </u>									
<u> </u>									
TOXIC AIR F	OLLUTAI	NT EMISSIO	ONS INFO	RMATION	FOR THIS	SOURCE			
		OF				AFTER CONT			
		EMISSION	EAFEGI	ED ACTUAL	EIVIISSIONS	AFTER CONT	ROLS / LIIVII	TATIONS	
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/	day	lb	/yr	
		See Emission	Calculation	s in Appendix					
Attachments: (1) emissions calculations and supp	orting docume	ntation: (2) indic	ate all request	ad state and for	l leral enforceab	lo pormit limite (a hours of a	noration	

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.

FORM B9 EMISSION SOURCE (OTHER)

	EMISSION SOURCE ID NO: CONTROL DEVICE ID NO(S EMISSION POINT (STACK) I): None	
<u></u>	EMISSION POINT (STACK) I	D NO(S): N/A	
1).			
ipper.			
0500		REQUESTED CAPACITY	
1			
		LIMITATION(UNIT/HR)	
UD1/yr	/81,255	N/A	
ION	MAX. DESIGN	REQUESTED CAPACITY	
UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH)	
<u> </u>		<u> </u>	
		, ,	
REQUESTE	D CAPACITY ANNUAL FUEL	JSE. N/A	
	CESS UNITS ODT/yr ON UNITS UNITS (BATCHES/ TOTAL MA>	CESS MAX. DESIGN UNITS CAPACITY (UNIT/HR) 0DT/yr 781,255	

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCDE	Q/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	O: IES-GWHS		
Green Wood Handling and Storage				CONTROL D	DEVICE ID NO	D(S): None		
OPERATING SCENARIO	OF	1		EMISSION F	POINT (STAC	K) ID NO(S): I	N/A	
DESCRIBE IN DETAILTHE EMISSION SO Green wood is delivered to the plant via tr transfer points and storage piles are captu	ucks as eithe	r pre-chipped	wood or und	hipped logs f			ng for on-site	chipping. All
TYPE OF EMISSION SOURC Coal,wood,oil, gas, other burner (Form Int.combustion engine/generator (Form Liquid storage tanks (Form B3) START CONSTRUCTION DATE:	B1)	Woodwood Coating/f	rking (Form E inishing/printi silos/bins (Fo	34) ng (Form B5)	Manuf.	HE FOLLOWI of chemicals/ ation (Form B (Form B9)	/coatings/inks	
MANUFACTURER / MODEL NO.: EXPECTED OP. SCHEDULE: <u>24</u> HR/DAY <u>7</u> DAY/WK <u>52</u>					<u>52</u> WK/YR			
IS THIS SOURCE SUBJECT TC S	PS (SUBPAR	TS?):			IAP (SUBPAF	RTS?):		
PERCENTAGE ANNUAL THROUGHPUT (,			5% JUN-AU		EP-NOV 25%	÷	
CRITERIA AIR	POLLUI				N FOR IH			
		SOURCE OF		D ACTUAL			EMISSIONS	
		EMISSION	,	ROLS / LIMITS)		FROLS / LIMITS)	(AFTER CONT	
		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	n Calculation:	s in Appendix	: C			
PARTICULATE MATTER<10 MICRONS (PM								
PARTICULATE MATTER<2.5 MICRONS (PM	2.5)							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (VOC	;)							
LEAD								
OTHER								
HAZARDOUS A	IR POLLU	TANT EMIS	SSIONS IN	IFORMATI	ION FOR T	HIS SOUR	RCE	
		SOURCE OF	EXPECTE	TED ACTUAL POTENTIAL EMISSIONS				
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	FROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	Calculation	s in Appendix	C			
TOXIC AIR F			ONS INFO	PMATION		SOURCE	<u> </u>	
		OF						
		EMISSION			1			
TOXIC AIR POLLUTANT	CAS NO.	FACTOR See Emission	-	/hr s in Appendix		day	lb	/yr
				,				
					1			
					1			
					1			
	1		h				1	
					1			
Attachments: (1) emissions calculations and supp	orting docume	ntation: (2) indic	ate all request	ed state and fe	deral enforceab	le permit limits	e.a. hours of o	peration.

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.

FORM B9 EMISSION SOURCE (OTHER)

REVISED 09/22/16 NCDEQ/Division of Air Quality	- Application f	or Air Permit to Construct/O	perate	B9		
EMISSION SOURCE DESCRIPTION:		EMISSION SOURCE ID NO: IES-GWHS				
Green Wood Handling and Storage		CONTROL DEVICE ID NO(S): None			
OPERATING SCENARIO: OF		EMISSION POINT (STACK) I	D NO(S): N/A			
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGR/						
Green wood is delivered to the plant via trucks as either pre-chi All transfer points and storage piles are captured by the green w	pped wood or u vood handling a	inchipped logs from commerc and storage emission ID (IES-(ial harvesting for or WHS).	i-site chipping.		
MATERIALS ENTERING PROCESS - CONTINUOUS PR	OCESS	MAX. DESIGN	REQUESTE			
ТҮРЕ	UNITS	CAPACITY (UNIT/HR)	LIMITATION	(UNIT/HR)		
Dried Wood Materials	0DT/yr	781,255	N/A			
MATERIALS ENTERING PROCESS - BATCH OPERA	TION	MAX. DESIGN REQUESTED CAPA				
ТҮРЕ	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (L	NIT/BATCH)		
MAXIMUM DESIGN (BATCHES / HOUR):						
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/	YR):				
FUEL USED: N/A	TOTAL MAX	IMUM FIRING RATE (MILLIO	N BTU/HR): N/A			
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTE	D CAPACITY ANNUAL FUEL	USE: N/A			
COMMENTS:						

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NC	DEQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S	MISSION SOURCE ID NO: IES-GWFB			
Green Wood Fuel Bin					DEVICE ID NO			
OPERATING SCENARIO 1	OF	1				K) ID NO(S): I	N/A	
DESCRIBE IN DETAILTHE EMISSION		ESS (ATTAC	H FLOW DIA				.,	
Following storage in the raw wood stor Green Wood Fuel Storage Bin (ES-GWF	rage piles, the ba	•			or to a covere	d conveyor, th	ien to a fully	enclosed
	•							
Coal,wood,oil, gas, other burner (Fo	,	_	rking (Form E	,		. of chemicals/	0	(Form B7)
Int.combustion engine/generator (Fo	orm B2)	v	inishing/printi			ration (Form B	8)	
Liquid storage tanks (Form B3)		✓ Storage s	silos/bins (For	,		(Form B9)		
START CONSTRUCTION DATE:			DATE MANC	IFACTURED:				
MANUFACTURER / MODEL NO.:			EXPECTED	OP. SCHEDI	JLE: <u>24</u> H	R/DAY <u>7</u>	_DAY/WK _	<u>52</u> _WK/YR
IS THIS SOURCE SUBJECT TC	NSPS (SUBPAR	RTS?):		NESH	AP (SUBPAR	RTS?):		_
PERCENTAGE ANNUAL THROUGHPU	JT (%): DEC-FE	B 25% N	AR-MAY 2	5% JUN-AU	G 25% S	EP-NOV 25%	6	
	AIR POLLUT		SIONS INF	ORMATIO	N FOR TH	IS SOURC	E	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	1
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	n Calculations	s in Appendix	C C			
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 (V	/OC)							
LEAD								
OTHER								
HAZARDOUS	S AIR POLLU	TANT EMIS	SSIONS IN	IFORMATI	ION FOR 1	THIS SOUR	RCE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	n Calculations	in Appendix	C			
TOXIC AII	R POLLUTAI	NT EMISSIO	ONS INFO	RMATION	FOR THIS	SOURCE		
		OF	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	ROLS / LIMI	TATIONS
		EMISSION	_					
TOXIC AIR POLLUTANT	CAS NO.	FACTOR		/hr		day	lb	o/yr
		See Emission	n Calculations	s in Appendix	C		L	
							ļ	
					ļ			
							ļ	
					ļ			
							ļ	
Attachments: (1) emissions calculations and	supporting docume	entation: (2) indic	ate all request	ed state and fe	deral enforceab	le nermit limits i	(e.a. hours of a	neration

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.

FORM B6 EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16	NCDEQ/Divisio	on of Air Quality - App	licatio	n for Air Permi	it to Construct/Operate	B6
EMISSION SOURCE DESCRI					ION SOURCE ID NO: IES-GWFB	
Green Wood Fuel Bin					ROL DEVICE ID NO(S): None	
OPERATING SCENARIO:	1	OF1		_ EMISSI	ION POINT(STACK) ID NO(S): N/A	
DESCRIBE IN DETAIL THE P Following storage in the raw Green Wood Fuel Storage Bin	wood storage pile	,	sferred	via a walking f	floor to a covered conveyor, then to	a fully enclosed
MATERIAL STORED: Bark				DENSITY OF I	MATERIAL (LB/FT3): TBD	
	CUBIC FEET:			TONS:		
	HEIGHT:	DIAMETER: TBD	(OR)	LENGTH:	WIDTH: HEIGHT:	
ANNUAL PRODUCT THRO	UGHPUT (TONS)	ACTUAL:			IUM DESIGN CAPACITY:	
PNEUMATICALLY FI	LLED	MECHANIC	ALLY F	ILLED	FILLED FRC	M
BLOWER COMPRESSOR OTHER: NO. FILL TUBES: MAXIMUM ACFM: MATERIAL IS UNLOADED TO BY WHAT METHOD IS MATE		SCREW CONVEYOR BELT CONVEYOR BUCKET ELEVATO OTHER: Covered C	R	9 r	□ RAILCAR □ TRUCK □ STORAGE PILE □ OTHER:	
MAXIMUM DESIGN FILLING	RATE OF MATERI	AL (TONS/HR): TBD				
MAXIMUM DESIGN UNLOAD	ING RATE OF MA	TERIAL (TONS/HR): T	BD			
COMMENTS:						

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/1 NCDE	Q/Division of	i Air Quality -	Application	for Air Permi	it to Constru	ct/Operate		В	
EMISSION SOURCE DESCRIPTION:				EMISSION SOURCE ID NO: ES-GHM-1, 2, 3, 4, 5					
Green Wood Hammermills						D(S): CD-DC-1		CD-RTO-1	
OPERATING SCENARIO	OF	1				K) ID NO(S): I			
DESCRIBE IN DETAILTHE EMISSION S Green wood chips are processed in the g narrative.		•			diagram prov	rided in the pe	ermit applica	tion	
TYPE OF EMISSION SOUR	CE (CHECK	AND COMPLE	TE APPROF	RIATE FORM	/I B1-B9 ON "	THE FOLLOW	ING PAGES):	
Coal,wood,oil, gas, other burner (For	m B1)	Woodwo	rking (Form B	64)	Manuf.	of chemicals/	coatings/inks	(Form B7)	
Int.combustion engine/generator (For	rm B2)	Coating/f	inishing/printi	ng (Form B5)	Inciner	ation (Form B	8)		
Liquid storage tanks (Form B3)		Storage s	silos/bins (For	m B6)	√Other	(Form B9)			
START CONSTRUCTION DATE: GHM-1, 2: 2013 GHM 3, 4, 5: TBD				IFACTURED: 013 GHM 3, 4					
			GIIM-1, 2. 20	15 din 5, 4	, J. I DD				
MANUFACTURER / MODEL NO.: GHM-1, 2: Williams #490 GHM 3, 4, 5: T	BD		EXPECTED	OP. SCHEDI	川F:24 H	R/DAY _ <u>7</u>	DAY/WK	52_WK/YR	
	PS (SUBPAR				IAP (SUBPAF				
PERCENTAGE ANNUAL THROUGHPU	,	,	MAR-MAY	25% JUN-/	1	SEP-NOV 2	5%		
CRITERIA AI	()			-			-		
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS		
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	FROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)	
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
PARTICULATE MATTER (PM)		See Emission	Calculations	in Appendix	С				
PARTICULATE MATTER<10 MICRONS (F	νM ₁₀)								
PARTICULATE MATTER<2.5 MICRONS (PM2.5)									
SULFUR DIOXIDE (SO2)									
NITROGEN OXIDES (NOx)									
CARBON MONOXIDE (CO)									
VOLATILE ORGANIC COMPOUNDS (VO	OC)								
LEAD									
OTHER									
HAZARDOUS A	AIR POLLU	JTANT EM	ISSIONS I	NFORMAT	TION FOR	THIS SOU	RCE		
		SOURCE OF	EXPECTE	D ACTUAL	POTENTIAL EMISSIONS				
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ONTROLS / LIMITS)	
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
		See Emission	Calculations	in Appendix	С				
TOXIC AIR	POLLUTA	NT EMISS	IONS INFO	ORMATION	I FOR THI	S SOURCE			
		OF	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	ROLS / LIMI	TATIONS	
	0.0.0.00	EMISSION		<i>h</i> .		1.		1 .	
TOXIC AIR POLLUTANT	CAS NO.	FACTOR		/hr		day	۵I	/yr	
		See Emission	a calculations	s in Appendix	ւ				
							ļ		
Attachments: (1) emissions calculations and s		montation: (2) in	dicato all rocur	otod ototo ord	fodoral onforce	abla normit limi	to (o a hours a	fonoration	

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.

FORM B9 EMISSION SOURCE (OTHER)

REVISED 09/22/16 NCDEQ/Division	n of Air Quality - Application	for Air Permit to Construct/O	perate	B9
EMISSION SOURCE DESCRIPTION: Green Wood Hammermills		EMISSION SOURCE ID NO:	ES-GHM-1, 2, 3, 4, 5	
Green wood Hammermins		CONTROL DEVICE ID NO(S): CD-WESP-1, CD-RT	0-1
OPERATING SCENARIO: OF	11	EMISSION POINT (STACK) I	D NO(S): EP-1	
DESCRIBE IN DETAIL THE PROCESS (ATTACH Green wood chips are processed in the green woo				
MATERIALS ENTERING PROCESS - COI	NTINUOUS PROCESS	MAX. DESIGN	REQUESTED	CAPACITY
ТҮРЕ	UNITS	CAPACITY (UNIT/HR)	LIMITATION	
Green Wood	ODT/hr	298.5	N/A	×
	,		,	
MATERIALS ENTERING PROCESS - E	BATCH OPERATION	MAX. DESIGN	REQUESTED	CAPACITY
ТҮРЕ	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (U	NIT/BATCH)
MAXIMUM DESIGN (BATCHES / HOUR):				
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/	YR):		
FUEL USED: N/A	TOTAL MAX	KIMUM FIRING RATE (MILLIO	N BTU/HR): N/A	
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTE	D CAPACITY ANNUAL FUEL	USE: N/A	
COMMENTS:				

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NC	EQ/Division of	Air Quality -	Application	for Air Perm	it to Constru	uct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID I	NO: ES-DRYEF	R-1	
Green Wood Direct-Fired Dryer System	m (Dryer #1)			CONTROL [DEVICE ID N	O(S): CD-DC-1	, CD-WESP-1	, CD-RTO-1
OPERATING SCENARIO	OF	1		EMISSION F	POINT (STAC	CK) ID NO(S):	EP-1	
DESCRIBE IN DETAILTHE EMISSION	SOURCE PRO	DCESS (ATTA	CH FLOW D	AGRAM):				
Green wood is conveyed to a rotary di	ryer system. Di	rect contact h	eat is provid	ed to the syst	em via a 175	.3 MMBtu/hr	burner syste	m. Air
emissions will be controlled utilizing								
controlled by a regenerative thermal be used to exhaust hot gases during st			-	he dryer (ES-)	DRYERBYP-1) and furnace	(ES-FURNAC	EBYP-1) will
TYPE OF EMISSION SOU	RCE (CHECK A		TE APPROF	RIATE FORM	/ B1-B9 ON	THE FOLLOW	ING PAGES):
Coal,wood,oil, gas, other burner (F	orm B1)	Woodwo	rking (Form I	34)	Manuf	f. of chemicals	/coatings/inks	s (Form B7)
Int.combustion engine/generator (F	form B2)	Coating/f	finishing/print	ing (Form B5)) 🗌 Incine	ration (Form B	8)	
Liquid storage tanks (Form B3)		Storage :	silos/bins (Fo	orm B6)	Other	(Form B9)		
START CONSTRUCTION DATE:				JFACTURED	:			
2012			2012					
MANUFACTURER / MODEL NO.:								
Buettner 5x26R			EXPECTED			HR/DAY <u>7</u>	_DAY/WK	<u>52</u> WK/YR
	NSPS (SUBPAR	;			HAP (SUBPA			
PERCENTAGE ANNUAL THROUGHP						SEP-NOV 2		
CRITERIA A	AIR POLLUT	ANT EMIS	SIONS IN	FORMATIC	ON FOR TH	HIS SOURC	ЭE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	ITROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	n Calculation	s in Appendiz	x C			
PARTICULATE MATTER<10 MICRONS	(PM ₁₀)							
PARTICULATE MATTER<2.5 MICRONS	6 (PM _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD	· · · ·							
OTHER								
HAZARDOUS	S AIR POLLU	JTANT EM	SSIONS I	NFORMAT	ION FOR	THIS SOUF	RCE	
		SOURCE OF		D ACTUAL		POTENTIAL		
		EMISSION		ROLS / LIMITS)	(BEFORE CON	ITROLS / LIMITS)	(AFTER CONT	
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
				s in Appendix		(0.1.0, y)		toriory
	1	1		1	1			
		<u> </u>						
ΤΟΧΙΟ ΔΙ	R POLLUTA		ONS INFO	RMATION	I FOR THI	S SOURCE		
		JUUNUE						
		OF	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	FROLS / LIMI	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	EMISSION FACTOR	F	/hr	lh	/day	lb	/yr
	CAS NO.			s in Appendix		udy	u	/ yı
		300 E111155101	i carculation	s in Appendix				
		<u> </u>						
	cupporting docur		<u> </u>				. , .	

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.

EMISSION SOURCE (WOOD, COAL, OIL, GAS, OTHER FUEL-FIRED BURNER)

REVISED 09/22/16 NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate B1								
EMISSION SOURCE DESCRIPTI Green Wood Direct-Fired Dryer S			EMISS	ION SOURCE ID N	NO: ES-DRYER-1			
Green wood Direct-Fired Diyer S	ystem (Diyel #1)		CONTR	OL DEVICE ID NO	O(S): CD-DC-1, CI	D-WESP-1, CE	9-RTO-1	
OPERATING SCENARIO:	OF	1	EMISS	ION POINT (STAC	CK) ID NO(S): EP-	1		
DESCRIBE USE: PROCE	SS HEAT	SPACE HEAT		ELECTRICAL GE	NERATION			
		STAND BY/EMERGENCY		OTHER (DESCRI	BE):			
HEATING MECHANISM:		J DIRECT	-					
MAX. FIRING RATE (MMBTU/HO	UR): 153							
		WOOD-FIRED BU	IRNER					
WOOD TYPE: DARK	WOOD/BARK	WET WOOD	DF	RY WOOD		DESCRIBE):		
PERCENT MOISTURE OF FUEL:	<u>~50%</u>							
		D WITH FLYASH REINJE	CTION	✓ C	CONTROLLED W	O REINJEC	ΓΙΟΝ	
FUEL FEED METHOD: N/A	FUEL FEED METHOD: N/A HEAT TRANSFER MEDIA: STEAM 🗹 AIR 🗌 OTHER (DESCRIBE)							
		COAL-FIRED BU	RNER					
TYPE OF BOILER	IF OTHER DESCR	IBE:						
		EADER	STOKER					
	_		ONTROL	LED				
DRY BED CONTROLLED FLYASH REINJECTION RECIRCULATING						ATING		
				REINJECTION				
OIL/GAS-FIRED BURNER								
TYPE OF FIRING:		INTIAL LOW N			IO LOW NOX BU	RNER		
	(DURI					
			IERCIAL		NSTITUTIONAL			
		STRIAL COMM CONTROL(S) (IF ANY):	IERCIAL	II	NSTITUTIONAL			
		E (INCLUDE START	UP/B/	ACKUP FUELS	5)			
		MAXIMUM				STED CAPA	CITY	
FUEL TYPE	UNITS	CAPACITY	(UNIT/H	R)	LIMITA	TION (UNIT/	HR)	
F	UEL CHARACTERIS	STICS (COMPLETE	ALL TI	HAT ARE APP	LICABLE)			
		SPECIFIC		SULFUR CONTE	ENT	ASH CONTE	NT	
FUEL TYP	E	BTU CONTENT		(% BY WEIGH	T)	(% BY WEIG	HT)	
Bark/Wet We	ood	Nominal 4,200 BTU/	lb	0.011				
COMMENTS:								
	Attach	Additional Sheets		00000071				

CONTROL DEVICE (CYCLONE, MULTICYCLONE, OR OTHER MECHANICAL)

REVISED 09/22/16	NCDEQ/Divi	sion of Air Qua	ality - Appl	lication f	or Air Pei	rmit to C	Construc	t/Operate	C4
CONTROL DEVICE ID NO: CD-D	0C-1	CONTROLS E	EMISSION	S FROM	WHICH E	MISSIO	N SOURC	CE ID NO(S): I	ES-DRYER-1
EMISSION POINT (STACK) ID N	O(S): EP-1	POSITION IN	SERIES O	F CONT	ROLS	N	0.	1 OF	3 UNITS
OPERATIN	G SCENARIO:								
1 DESCRIBE CONTROL SYSTEM Three identical cyclones are equ combined into a common duct a	ipped to control the o	0		yer syste	em to cap	ture bul	k PM emi		ions from each cyclone are
POLLUTANT(S) COLLECTED:			РМ	_	PM ₁₀		PM _{2.5}		
BEFORE CONTROL EMISSION	RATE (LB/HR):								
CAPTURE EFFICIENCY:			98.5	%	98.5	%	98.5	%	%
CONTROL DEVICE EFFICIENC	Y :			%		%		%	%
CORRESPONDING OVERALL E	FFICIENCY:			%		%		%	%
EFFICIENCY DETERMINATION			_						
TOTAL AFTER CONTROL EMISSION RATE (LB/HR): See Emission Calculations in Appendix C									
PRESSURE DROP (IN. H ₂ 0):	MIN	<u>6"</u> MA	Х						
INLET TEMPERATURE (°F):	MIN	Nominal 400	D_MAX	OUTLET	TEMPER	RATURE	: (°F):	MIN	_ <u>Nominal 400</u> _ MAX
INLET AIR FLOW RATE (ACFM)	: 117,000			BULK P	ARTICLE	DENSIT	Y (LB/FT	³): 3.43E-05	
POLLUTANT LOADING RATE (G	GR/FT ³): 0.24								
SETTLING CHAMBER			CYCLONE						MULTICYCLONE
LENGTH (INCHES):	INLET VELOCITY (F	T/SEC): 95			ULAR		ANGLE	NO. TUBES:	
WIDTH (INCHES):	DIMENSIONS (INC	CHES) See inst	tructions	IF W	'ET SPRA	Y UTILIZ	ZED	DIAMETER C	OF TUBES:
HEIGHT (INCHES):	H:	Dd:		LIQUID	USED:			HOPPER AS	PIRATION SYSTEM?
VELOCITY (FT/SEC.):	W:	Lb: 156"		FLOW F	RATE (GP	'M):		S YES	
NO. TRAYS:	De: 79 "	Lc: 312"		MAKE U	P RATE ((GPM):		LOUVERS?	_
NO. BAFFLES:	D: 156"	S:						∐ YES	LI NO
	TYPE OF CYCLONE	: 🗹 CONVEN	TIONAL	Lι	IIGH EFF	ICIENCY			
DESCRIBE MAINTENANCE PRO Periodic inspection of mechanic		ant outages as	specified b	ov the					
manufacturer.							ZE RONS)	WEIGHT % OF TOTAL	
DESCRIBE INCOMING AIR STR		ad thuanah a a		an al a m a a	hafana	0.	-1		Unknown
The flue gas from the dryer will being routed to the WESP and R						1-	10		
single duct and directed to the V	VESP inlet point.					10	-25		
						25	-50		
						50-	100		
						>1	00		
TOTAL = 100									
DESCRIBE ANY MONITORING I N/A ON A SEPARATE PAGE, ATTAC				TE CONT	ROL DE\	VICE TO	ITS EMIS	SSION SOUR	

CONTROL DEVICE (Electrostatic Precipitator)

REVISED 09/22/16	NCDEQ/Divisi	on of Air Quality - App	lication for Air Permit to Construct/Op	erate C2
CONTROL DEVICE ID NO: (CD-WESP-1		CONTROLS EMISSIONS FROM WHICH E ES-GHM-1 through ES-GHM-5	EMISSION SOURCE ID NO(S): ES-DRYER-1,
EMISSION POINT (STACK) I	D NO(S): EP-1		POSITION IN SERIES OF CONTROL	NO. 2 OF 3 UNITS
MANUFACTURER: Lundber	g E-Tube 115719		MODEL NO. Lundberg E-Tube 1157	19
OF	PERATING SCENARIO:			
OPERATING SCENA	ARIO:1	OF <u>1</u>	P.E. SEAL REQUIRED (PER 2Q .011	2)?
DESCRIBE CONTROL SYST				
Emissions from the Dryer, di through a common duct for a			rmills, and three of the Dry Wood Ham	mermills will be controlled by the WESP
EQUIPMENT SPECIFICATIO	ONS		GAS DISTRIBUTION GRIDS:	YES NO
TYPE:	WET	DRY	SINGLE-STAGE	TWO-STAGE
TOTAL COLLECTION PLATE	E AREA (FT ²): 29,904		NO. FIELDS 2 NO. COLLE	CTOR PLATES PER FIELD: 567 tubes
COLLECTOR PLATE SIZE (F	FT): LENGTH: TBD	WIDTH: TBD	SPACING BETWEEN COLLECTOR F	PLATES (INCHES): 12" hextube
TOTAL DISCHARGE ELECT	RODE LENGTH (FT): 19)"	GAS VISCOSITY (POISE): 2.054E-04	4 Poise
NUMBER OF DISCHARGE E	ELECTRODES: 667		NUMBER OF COLLECTING ELECTR	RODE RAPPERS: none
MAXIMUM INLET AIR FLOW	RATE (ACFM): 117,00	0	PARTICLE MIGRATION VELOCITY (FT/SEC): 0.234
MINIMUM GAS TREATMENT	TTIME (SEC): 2.3		BULK PARTICLE DENSITY (LB/FT ³):	45 lb/cu. Ft.
FIELD STRENGTH (VOLTS)	CHARGING: 83 kVA	COLLECTIN(N/A	CORONA POWER (WATTS/1000 CF	FM): 4000
ELECTRICAL USAGE (KW/H	IOUR): 141.5			
CLEANING PROCEDURES:		DIATE VI	BRATING VASHING	OTHER
OPERATING PARAME	TERS PRESSURE	DROP (IN. H20): MI	N MAX WARNING	ALARM? 🗹 YES 🗌 NO
RESISTIVITY OF POLLUTAN	NT (OHM-CM): N/A		GAS CONDITIONING VES NO	TYPE OF AGENT (IF YES):
INLET GAS TEMPERATURE	(°F): 240 nominal		OUTLET GAS TEMPERATURE (°F):	180 nominal
VOLUME OF GAS HANDLED	D (ACFM): 117,000		INLET MOISTURE PERCENT: 40%	MIN 50% MAX
POWER REQUIREME	IS AN ENER	RGY MANAGEMENT SY	STEM USED? YES	NO
FIELD NO.	NO. OF SETS	CHARGING	EACH TRANSFORMER (kVA)	EACH RECTIFIER Kv Ave/Peak Ma Dc
1	1		118	83/1265
2	1		118	83/1265
POLLUTANT(S) COLLECTE	D:	РМ	PM ₁₀ PM _{2.5}	
BEFORE CONTROL EMISSI	ON RATE (LB/HR):			
CAPTURE EFFICIENCY:		%	%	% %
CONTROL DEVICE EFFICIE	NCY:	%	%	%
CORRESPONDING OVERAI	LL EFFICIENCY:	%	%	%
EFFICIENCY DETERMINATI	ON CODE:			
TOTAL AFTER CONTROL E	MISSION RATE (LB/HR):	See Emission Calculati	ons in Appendix C	
			DESCRIBE STARTUP PROCEDURE	S: TBD
SIZE	WEIGHT %	CUMULATIVE	=	
(MICRONS)	OF TOTAL	%		
0-1			DESCRIBE MAINTENANCE PROCEI	DURES: TBD
1-10			_	
10-25			-	
25-50			DESCRIBE ANY AUXILIARY MATER	IALS INTRODUCED INTO THE CONTROL
50-100			SYSTEM	
>100			NOAH	
	ΤΟΤΑ	L = 100	-	
DESCRIBE ANY MONITORI			TTACHMENTS: PLC	
COMMENTS:				
	GRAM OF THE TOP VIE		DIMENSIONS (include at a minimum the	plate spacing and wire spacing
				plato opaoling and thro opaoling

CONTROL DEVICE (THERMAL OR CATALYTIC)

REVISED 09/22/16 NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate									C3	
AS REQUIRED BY 15A NCAC 2Q .0112, THIS FORM	MUST BE S	EALED BY	A PROFESSIONAL	ENGINEE	R (P.E.) LIC	ENSEL		RTH C	AROLINA.	
CONTROL DEVICE ID NO: CD-RT0-1			NS FROM WHICH	EMISSION	SOURCE I	D NO(S	: ES-DR	YER-1,	ES-GHM-1	
EMISSION POINT (STACK) ID NO(S): EP-1			OF CONTROLS		NO.	3	OF	3	UNITS	
MANUFACTURER: TBD	<u> </u>	MODEL NO:				<u> </u>	_ 0		_ 00	
OPERATING SCENARIO:		MODEL NO.	IDD							
OF1										
TYPE AFTERBURNER V REGENERATIVE T	HERMAL O	XIDATION		VF THERM				I YTIC	OXIDATION	
EXPECTED LIFE OF CATALYST (YRS): TBD	1		DF DETECTING WHEN CATALYST NEEDS REPLACMENT: TBD							
	OGEN	,	_		ROUS COM	IPOUNE) _ [_ HEA	VY METAL	
			OTHER (SPEC					NOI	NE	
TYPE OF CATALYST: TBD CATALYST V	'OL (FT ³): TI	BD	VELOCITY THRO	UGH CATA	ALYST (FPS): TBD				
SCFM THROUGH CATALYST: TBD DESCRIBE CONTROL SYSTEM, INCLUDING RELATION										
POLLUTANT(S) COLLECTED:	VOC									
BEFORE CONTROL EMISSION RATE (LB/HR):						_				
CAPTURE EFFICIENCY:		%		%		%			%	
CONTROL DEVICE EFFICIENCY:	97.5	%		%		%			%	
CORRESPONDING OVERALL EFFICIENCY:		%		%		%			%	
EFFICIENCY DETERMINATION CODE:						_				
TOTAL AFTER CONTROL EMISSION RATE (LB/HR) :	See Emiss	ion Calculat	ions in Appendix C			-			_	
PRESSURE DROP (IN. H ₂ C MIN MAX TBI)	OUTL	ET TEMPERATUR	E (°F): _ <u>TB</u>	DMIN		TBD	MAX	<	
INLET TEMPERATURE (°F) MIN MAX TBI)	RESID	ENCE TIME (SEC	ONDS): TB	D					
INLET AIR FLOW RATE (ACFM): TBD (SCFM): TBD	1	COME	USTION TEMPER	ATURE (°F)): TBD					
COMBUSTION CHAMBER VOLUME (FT ³): TBD		INLET	MOISTURE CONT	ENT (%): T	'BD					
% EXCESS AIR: TBD		CONC	ENTRATION (ppm	v) <u> </u>	<u>rbd</u> inlet	-	<u> </u>	00	TLET	
AUXILIARY FUEL USED: Natural Gas		ΤΟΤΑ	L MAXIMUM FIRIN	G RATE (M	ILLION BTU	J/HR): 3	2			
DESCRIBE MAINTENANCE PROCEDURES: TBD										
DESCRIBE ANY AUXILIARY MATERIALS INTRODUCED N/A	INTO THE (CONTROL S	YSTEM:							
COMMENTS:										

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

	O/Division of		Application	tor Air Borm	it to Constru	ot/Operate		, B	
REVISED 09/22/1 NCDE EMISSION SOURCE DESCRIPTION:	Q/DIVISION OI	f Air Quality -	Application	1		-		D	
EMISSION SOURCE DESCRIPTION: Green Wood Direct-Fired Dryer System	(Dryor #1 By	mass				NO: ES-DRYER	BYP-1		
					DEVICE ID N	() ;			
OPERATING SCENARIO1	OF				POINT (STAC	CK) ID NO(S):	EP-2		
DESCRIBE IN DETAILTHE EMISSION		•		•					
Green wood is conveyed to a rotary dry			-			•			
emissions will be controlled utilizing a									
controlled by a regenerative thermal or will be used to exhaust hot gases during				he dryer (ES-	DRYERBYP-1	I) and furnace	e (ES-FURNA)	EBAD-1)	
will be used to exhaust not gases during	; startup, snu	tuown, anu m	anunctions.						
TYPE OF EMISSION SOUR	CE (CHECK /		TE APPROF	RIATE FOR	M B1-B9 ON	THE FOLLOV	VING PAGES	5):	
Coal,wood,oil, gas, other burner (Fo	•		orking (Form E			. of chemicals		-	
Int.combustion engine/generator (Fo	,	_	finishing/print	,		ration (Form B	0		
Liquid storage tanks (Form B3)	1111 DZ)		silos/bins (Fo			(Form B9)	0)		
START CONSTRUCTION DATE:				JFACTURED:		(1011120)			
TBD			TBD		•				
MANUFACTURER / MODEL NO.:									
TBD			EXPECTED	OP SCHEDI	IIE [.] 2.4 ⊢	HR/DAY <u>7</u>	DAY/WK	52 WK/YE	
	S THIS SOURCE SUBJECT 🔲 NSPS (SUBPARTS?):				AP (SUBPA				
PERCENTAGE ANNUAL THROUGHPU		,	MAR-MAY	25% JUN	,	SEP-NOV 2	25%		
CRITERIA AI	()						-		
	NT OLLOT								
SOURCE O				D ACTUAL		POTENTIAL			
		EMISSION	(AFTER CONT	,		TROLS / LIMITS)	(AFTER CONTROLS / LIMIT		
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
PARTICULATE MATTER (PM)		See Emission	n Calculations	s in Appendix	κ C				
PARTICULATE MATTER<10 MICRONS (107								
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})									
SULFUR DIOXIDE (SO2)									
NITROGEN OXIDES (NOx)									
CARBON MONOXIDE (CO)									
VOLATILE ORGANIC COMPOUNDS (V	OC)								
LEAD									
OTHER									
HAZARDOUS	AIR POLLI	JTANT EM	ISSIONS I	NFORMAT	TION FOR	THIS SOUL	RCE	- -	
	Ī	SOURCE OF	EXPECTE	D ACTUAL	POTENTIAL EMISSIONS				
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	AFTER CONTROLS / LIMITS)	
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
			n Calculations	,		(01.10, y)		to:::o,;j:	
	ł	2000 2000000		,					
	<u> </u>								
	<u> </u>								
	╂─────	╂─────							
	┢────								
	<u> </u>								
							-		
TOXIC AIR	POLLUTA	NIEMISS	IONS INFO	ORMATION	NFOR THI	S SOURCE			
		OF	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	ROLS / LIMI	TATIONS	
		EMISSION			1				
TOXIC AIR POLLUTANT	CAS NO.	FACTOR		/hr		′day	lb	/yr	
		See Emission	n Calculations	s in Appendix	κ C				
Attachments: (1) emissions calculations and s	upporting docur	nentation: (2) in	dicate all reque	sted state and	federal enforce	able permit limits	s (e.a. hours of	operation.	
emission rates) and describe how these are m									

EMISSION S	SOURCE (WOOD, COAL, OIL, GA	AS, OTHER FUEL-FIRED BURNER)
)9/22/16	NCDEQ/Division of Air Quality - Application for	r Air Permit to Construct/Operate	B1
SOURCE DESCRIPTION			

Т

	CDEQ/Division of Air Quality	y - Application for Air Po	ermit to Construct/Ope	erate B1						
EMISSION SOURCE DESCRIPTION: Green Wood Direct-Fired Dryer System	n (Druor #1 Rumaca)	EMISS	EMISSION SOURCE ID NO: ES-DRYERBYP-1							
Green wood Direct-rired Dryer Syste	n (Dryer #1 Dypass)	CONT	ROL DEVICE ID NO(S):	N/A						
OPERATING SCENARIO: <u>1</u>	OF	_ EMISS	ION POINT (STACK) IE	0 NO(S): EP-2						
DESCRIBE USE: PROCESS H	EAT SPACE H	IEAT	ELECTRICAL GENER	ATION						
	IS USE STAND E	BY/EMERGENCY	OTHER (DESCRIBE):							
HEATING MECHANISM:	INDIRECT	✓ DIRECT								
MAX. FIRING RATE (MMBTU/HOUR):	153									
	WO	OD-FIRED BURNER	2							
WOOD TYPE: DARK	WOOD/BARK 🗹 WE	T WOOD D	RY WOOD	OTHER (DESCRIBE):						
PERCENT MOISTURE OF FUEL:	<u>~50%</u>									
	CONTROLLED WITH	FLYASH REINJECTION	CONT	ROLLED W/O REINJECTION						
FUEL FEED METHOD: N/A	HEAT TR	ANSFER MEDIA:	STEAM 🗹 AIR 🗌 C	OTHER (DESCRIBE)						
	CO	AL-FIRED BURNER	2							
TYPE OF BOILER	IF OTHER DESCRIBE:									
		SPREADER	STOKER F	LUIDIZED BED						
				CIRCULATING						
		FLYASH REI	ASH REINJECTION							
			REINJECTION							
	OIL/GAS-FIRED BURNER									
				TUTIONAL						
TYPE OF FIRING:				OW NOX BURNER						
	OTHER	FUEL-FIRED BUR	NER							
TYPE(S) OF FUEL:		_								
TYPE OF BOILER:				TUTIONAL						
TYPE OF FIRING:	_ TYPE(S) OF CONTRO									
	FUEL USAGE (INC	MAXIMUM DESIG		REQUESTED CAPACITY						
FUEL TYPE	UNITS			LIMITATION (UNIT/HR)						
FUELTIPE	UNITS	CAPACITY (UNIT/H								
FUE			HAT ARE APPLIC	ABLE)						
		SPECIFIC	SULFUR CONTENT	ASH CONTENT						
FUEL TYPE		BTU CONTENT	(% BY WEIGHT)	(% BY WEIGHT)						
Bark/Wet Wood		ninal 4,200 BTU/lb	0.011	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						
Dark/ wet woou	NOI	ai 7,200 D I U/IU	0.011							
COMMENTS:	I		1	1						
	• • • • ···	ional Shoots As N								

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/1 NCDE	Q/Division of	Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		, B
EMISSION SOURCE DESCRIPTION:				-		O: ES-FURNA	CERVP.1	
Green Wood Direct-Fired Dryer System	(Furnace #1	Bypass)					CEDIF-1	
OPERATING SCENARIO 1	OF	1				K) ID NO(S): I	FD-3	
DESCRIBE IN DETAILTHE EMISSION S						N) ID NO(3). I	LF-3	
Green wood is conveyed to a rotary dry emissions will be controlled utilizing a controlled by a regenerative thermal ox be used to exhaust hot gases during star	er system. Di wet electrost idizer (RTO) rtup, shutdov	rect contact l atic precipita . Bypass stack vn, and malfu	neat is provid tor (WESP) fo ts following t nctions.	ed to the systor particulate he dryer (ES-	removal. VO DRYERBYP-1	C and organic) and furnace	-HAP emissio (ES-FURNAC	ons will be EBYP-1) will
	•							-
Coal,wood,oil, gas, other burner (For			orking (Form E	,		. of chemicals	0	s (Form B7)
Int.combustion engine/generator (For	rm B2)		finishing/print			ration (Form B	8)	
Liquid storage tanks (Form B3)		Storage	silos/bins (Fo	,		(Form B9)		
START CONSTRUCTION DATE: TBD		DATE MANU TBD	JFACTURED:					
MANUFACTURER / MODEL NO.: TBD		EXPECTED	OP. SCHEDI	JLE: <u>24</u> H	R/DAY <u>7</u>	_DAY/WK _	<u>52</u> WK/YR	
IS THIS SOURCE SUBJECT	PS (SUBPAR	:TS?):		NESH	AP (SUBPAR	RTS?):		
PERCENTAGE ANNUAL THROUGHPUT	Г (%): DEC-F	EB 25%	MAR-MAY	25% JUN-	AUG 25%	SEP-NOV 2	5%	
CRITERIA AI	R POLLUT	ANT EMIS	SIONS IN	FORMATIC	ON FOR TH	IS SOURC	E	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION		ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)		ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	n Calculations	,	C C	,		· · · ·
PARTICULATE MATTER<10 MICRONS (P	M ₁₀)							
PARTICULATE MATTER<2.5 MICRONS (F	PM _{2.5})							
SULFUR DIOXIDE (SO2)	2.07							
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (VO	C)							
LEAD)							
OTHER								
HAZARDOUS	AIR POLL	JTANT EM	ISSIONS I	NFORMAT	TON FOR	THIS SOUP	RCE	
		SOURCE OF	-	TED ACTUAL POTENTIAL EMISSIONS				
		EMISSION						ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/vr	lb/hr	tons/yr	lb/hr	tons/yr
			n Calculation			toriory	10,111	(0110/ J1
TOXIC AIR	POLLUTA	NT EMISS	IONS INFO	ORMATION	FOR THI	S SOURCE		
		SOURCE				AFTER CONT		TATIONS
		OF						
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/	day	lb	/yr
		See Emission	n Calculation	s in Appendix	C			
Attachments: (1) emissions calculations and su emission rates) and describe how these are mo								

REVISED 09/22/16	NCDEQ/Division of A	ir Quality - A	pplication for A	Air Pe	ermit to Constru	ct/Ope	rate	B1
EMISSION SOURCE DESCRIPT Green Wood Direct-Fired Dryer	-		E	MISSI	ON SOURCE ID	NO: E	S-FURNACEBYP-1	
dreen wood Direct-rired Diyer	System (Furnace #1 Dypa	133)	C	ONTR	OL DEVICE ID N	10(S):	N/A	
OPERATING SCENARIO:	OF	1	E	MISSI	ON POINT (STA	CK) ID	NO(S): EP-3	
DESCRIBE USE: PROC	ESS HEAT	SPACE HEAT	-		ELECTRICAL G	ENER	ATION	
	INUOUS USE	STAND BY/E	MERGENCY		OTHER (DESCF	RIBE): _		
HEATING MECHANISM:	INDIRECT	\checkmark] DIRECT					
MAX. FIRING RATE (MMBTU/H	OUR): 153							
		WOOD-	FIRED BUR	NER				
WOOD TYPE: BARK	WOOD/BARK	✓ WET WC			RY WOOD		OTHER (DESCRIB	E):
PERCENT MOISTURE OF FUEL								
		D WITH FLYA	ASH REINJECT	ION	\checkmark	CONT	ROLLED W/O REINJ	IECTION
FUEL FEED METHOD: N/A		HEAT TRANSF			STEAM 🗹 AIR	<u> </u>	THER (DESCRIBE)	
		COAL-F	FIRED BUR	NER				
TYPE OF BOILER	IF OTHER DESCR	RIBE:						
	_				STOKER	_	LUIDIZED BED	
							CIRCULATING	
		D			NJECTION		RECIRCULATING	
				-	REINJECTION	_		
			-FIRED BUI					
TYPE OF BOILER:		STRIAL ENTIAL					IUTIONAL	
			EL-FIRED E			NO LC	W NOX BORNER	
TYPE(S) OF FUEL:								
		STRIAL		RCIAL		INSTI	TUTIONAL	
		CONTROL(S)						
				P/BA	CKUP FUEL	.S)		
			MAXIMUM D	ESIGN	N		REQUESTED CA	APACITY
FUEL TYPE	UNITS		CAPACITY (UI	NIT/HI	R)		LIMITATION (UI	NIT/HR)
Bark/Wet Wood	ODT/hr		0.0					
	UEL CHARACTERI	STICS (CO	MPLETE AL	L TH	HAT ARE AP	PLIC	ABLE)	
			PECIFIC		SULFUR CON	ENT	ASH CO	NTENT
FUEL TY	PE	BTU	CONTENT		(% BY WEIG	HT)	(% BY W	EIGHT)
Bark/Wet V	Vood	Nominal	l 4,200 BTU/lb		0.011			
COMMENTS:								
	A / / I	A al al 11 a						

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCDE	Q/Division of	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	NO: ES-DRYER	-2	
Green Wood Direct-Fired Dryer System	(Dryer #2)				DEVICE ID N	O(S): CD-DC-2	. CD-WESP-2	. CD-RTO-2
OPERATING SCENARIO 1	OF	1				K) ID NO(S):		
DESCRIBE IN DETAILTHE EMISSION S	SOURCE PRO	CESS (ATTA	CH FLOW D			,		
Green wood is conveyed to a rotary dry		•			em via a 180	MMBtu/hr bu	rner system.	Air
emissions will be controlled utilizing a								
controlled by a regenerative thermal ox			-	e dryer (ES-D	ORYERBYP-2)	and furnace	(ES-FURNACI	BYP-2) will
be used to exhaust hot gases during star	_							
	•						-	
Coal,wood,oil, gas, other burner (For	,	_	rking (Form E	,		. of chemicals	-	(Form B7)
Int.combustion engine/generator (For	m B2)		0.	ing (Form B5)		ration (Form B	8)	
Liquid storage tanks (Form B3)			silos/bins (Fo	,		(Form B9)		
START CONSTRUCTION DATE:			DATE MANU TBD	JFACTURED				
TBD			IBD					
MANUFACTURER / MODEL NO.:							DAMAN	
		TOO	EXPECTED			IR/DAY <u>7</u>	_DAY/WK _	<u>52</u> WK/YF
		,			AP (SUBPA	/		
PERCENTAGE ANNUAL THROUGHPU CRITERIA AI	()					SEP-NOV 2		
	K FOLLOT					POTENTIAL		
		SOURCE OF		D ACTUAL		-		
				ROLS / LIMITS)		TROLS / LIMITS)	(AFTER CONT	
		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	i Calculation	s in Appendix				
PARTICULATE MATTER<10 MICRONS (F PARTICULATE MATTER<2.5 MICRONS (I	,							
	-IVI _{2.5})							
VOLATILE ORGANIC COMPOUNDS (VO	JC)							
OTHER HAZARDOUS								
HAZARDOUS								
		SOURCE OF		D ACTUAL		POTENTIAL		
		EMISSION	· ·	ROLS / LIMITS)		TROLS / LIMITS)	(AFTER CONT	
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	1 Calculation	s in Appendix				
<u> </u>								
TOXIC AIR								
	FULLUIA	JOURGE				SOURCE		
		OF	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	ROLS / LIMI	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	EMISSION FACTOR	lb	/hr	lb/	dav	lb	hir
	CAS NO.					day	(UI	/yr
L	1	See Emission	i calculation	s in Appendix				
	+							
Attachments: (1) emissions calculations and s		antation: (2) inc		stad state and	l fodoral onforca	able permit limit	to (o a hours -	fonoration

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.

EMISSION SOURCE (WOOD, COAL, OIL, GAS, OTHER FUEL-FIRED BURNER)

REVISED 09/22/16 NCDEQ/Division of	Air Quality - Ap	pplication for	Air Pe	ermit to Constru	ct/Ope	rate	B1
EMISSION SOURCE DESCRIPTION: Green Wood Direct-Fired Dryer System (Dryer #2)		E	EMISSI	ION SOURCE ID	NO: E	S-DRYER-2	
dieen wood Diett-rifed Diyer System (Diyer #2)		C	CONTR	ROL DEVICE ID I	VO(S):	CD-WESP-2, CD-RTO	-2
OPERATING SCENARIO: 0F	1	E	EMISSI	ION POINT (STA	CK) ID	NO(S): EP-4	
DESCRIBE USE: PROCESS HEAT	SPACE HEAT	-		ELECTRICAL G	ENERA	TION	
	STAND BY/EN	MERGENCY		OTHER (DESCF	RIBE): _		
HEATING MECHANISM:	\checkmark	DIRECT					
MAX. FIRING RATE (MMBTU/HOUR): 180							
	WOOD-I	FIRED BUI	RNER				
WOOD TYPE: BARK WOOD/BARK	🗹 WET WC	DOD	DF	RY WOOD		OTHER (DESCRIBI	=):
PERCENT MOISTURE OF FUEL: ~50%	_						
	ED WITH FLYA	SH REINJEC	TION	<i>✓</i>	CONT	ROLLED W/O REINJ	ECTION
FUEL FEED METHOD: N/A	HEAT TRANSF	ER MEDIA:				THER (DESCRIBE) _	
	COAL-F		RNER				
TYPE OF BOILER IF OTHER DESC	RIBE:						
	O STOKER	SPRE	ADER	STOKER	F	LUIDIZED BED	
	DLLED		NTROL	LED		CIRCULATING	
DRY BED CONTROLLED CONTROLL	ED	FLYAS	H REI	NJECTION		RECIRCULATING	
		NO FL	YASH	REINJECTION			
	OIL/GAS	-FIRED BU	IRNE	R			
	JSTRIAL					UTIONAL	
TYPE OF FIRING: NORMAL TANG	GENTIAL				NO LC	W NOX BURNER	
	OTHER FU	EL-FIRED	BURN	NER			
TYPE(S) OF FUEL:		_		_			
	JSTRIAL		RCIAL	- 🗌	INSTIT	UTIONAL	
	CONTROL(S)	· ·			<u> </u>		
FUEL USA					.3)	REQUESTED CA	
FUEL TYPE UNITS		CAPACITY (L				LIMITATION (UN	
							NTT/THX)
FUEL CHARACTER	ISTICS (COI	MPLETE A		HAT ARE AP	PLIC/	ABLE)	
	1	PECIFIC		SULFUR CON		ASH CON	NTENT
FUEL TYPE	BTU	CONTENT		(% BY WEIG	HT)	(% BY WI	EIGHT)
Bark/Wet Wood	Nominal	4,200 BTU/I	b	0.011			
·							
					_		
COMMENTS:							
Attac	h Additiona	al Sheete	∆c N	ecessary			

CONTROL DEVICE (CYCLONE, MULTICYCLONE, OR OTHER MECHANICAL)

REVISED 09/22/16	NCDEQ/Divi	sion of Air Qu	ality - Appl	lication fo	or Air Pe	rmit to Constru	ct/Operate	C4
CONTROL DEVICE ID NO: CD-D	C-2	CONTROLS E	EMISSIONS	S FROM \	WHICH E	MISSION SOUF	RCE ID NO(S)	: ES-DRYER-2
EMISSION POINT (STACK) ID N	O(S): EP-4	POSITION IN	SERIES O	F CONTF	ROLS	NO.	1 OF	3 UNITS
OPERATIN	G SCENARIO:							
	OF1		P.E. SEAL	REQUIR	ED (PER	2Q .0112)?	S YES	NO
DESCRIBE CONTROL SYSTEM Three identical cyclones are equ combined into a common duct a	ipped to control the o	-	-		-			ssions from each cyclone are
POLLUTANT(S) COLLECTED:			РМ		PM ₁₀	PM _{2.5}	_	
BEFORE CONTROL EMISSION	RATE (LB/HR):							
CAPTURE EFFICIENCY:			98.5	%	98.5	% 98.	5 %	%
CONTROL DEVICE EFFICIENCY	<i>(</i> :			%		%	%	%
CORRESPONDING OVERALL E	FFICIENCY:			%		%	%	%
EFFICIENCY DETERMINATION	CODE:						_	
TOTAL AFTER CONTROL EMIS	SION RATE (LB/HR):		See Emiss	ion Calcu	lations ir	n Appe <mark>ndix C</mark>	_	
PRESSURE DROP (IN. H ₂ 0):	MIN	<u>TBD</u> N	MAX					
INLET TEMPERATURE (°F):	MIN	<u>_TBD</u> MAX		OUTLET	TEMPER	RATURE (°F):	MIN	_ <u>TBD</u> _MAX
INLET AIR FLOW RATE (ACFM)	: TBD			BULK PA	ARTICLE	DENSITY (LB/F	T ³): TBD	
POLLUTANT LOADING RATE (G	R/FT ³): TBD							
SETTLING CHAMBER			CYCLONE			_		MULTICYCLONE
LENGTH (INCHES):	INLET VELOCITY (F	T/SEC): TBD					NO. TUBES	S:
WIDTH (INCHES):	DIMENSIONS (INC	CHES) See inst	tructions	IF W	ET SPRA	Y UTILIZED	DIAMETER	OF TUBES:
HEIGHT (INCHES):	H:	Dd:		LIQUID (SPIRATION SYSTEM?
VELOCITY (FT/SEC.):	W:	Lb: TBD			ATE (GP		☐ YES	L NO
NO. TRAYS:	De: TBD	Lc: TBD		MAKE U	P RATE (GPM):	LOUVERS?	
NO. BAFFLES:	D: TBD	S:					VES	∐ NO
DESCRIBE MAINTENANCE PRO	TYPE OF CYCLONE		TIONAL	LΗ	IGH EFF	ICIENCY		
Periodic inspection of mechanic		ant outages as	specified b	y the		SIZE		
manufacturer.						(MICRONS)	WEIGHT OF TOTA	
DESCRIBE INCOMING AIR STR						0-1		Unknown
The flue gas from the dryer will routed to the WESP and RTO. Af						1-10		
duct and directed to the WESP in	ilet point.	-			Ŭ.	10-25		
						25-50		
						50-100		
						>100		
								TOTAL = 100
DESCRIBE ANY MONITORING E N/A ON A SEPARATE PAGE, ATTAC				HE CONT	ROL DE\		IISSION SOU	RCE(S):
		ttach Add						

CONTROL DEVICE (Electrostatic Precipitator)

REVISED 09/22/16 NCD	EQ/Division of Air Quality - Appli	cation for Air Permit to Construct/C	Operate	C2
CONTROL DEVICE ID NO: CD-WESP-2		CONTROLS EMISSIONS FROM WHICH	EMISSION SOURCE ID NO	S): ES-DRYER-2
EMISSION POINT (STACK) ID NO(S): EP-	4	POSITION IN SERIES OF CONTRO	DL NO. 2 OF 3	UNITS
MANUFACTURER: TBD		MODEL NO. TBD		
OPERATING SC	ENARIO:			
OPERATING SCENARIO:	1OF1	P.E. SEAL REQUIRED (PER 2Q .0'	112)? 🗸 YES 🗸	NO
DESCRIBE CONTROL SYSTEM: Emissions from the Dryer and dryer doubl removal.	e duct burners will be controlled t	by the WESP through a common duct	for additional PM, metalli	c HAP, and HCl
EQUIPMENT SPECIFICATIONS		GAS DISTRIBUTION GRIDS:	V YES	NO
TYPE: VET		SINGLE-STAGE		-
TOTAL COLLECTION PLATE AREA (FT ²):			ECTOR PLATES PER FIE	
COLLECTOR PLATE SIZE (FT): LENGTH		SPACING BETWEEN COLLECTOR		
TOTAL DISCHARGE ELECTRODE LENGT		GAS VISCOSITY (POISE): TBD		
NUMBER OF DISCHARGE ELECTRODES:	. ,	NUMBER OF COLLECTING ELECT	RODE RAPPERS: TBD	
MAXIMUM INLET AIR FLOW RATE (ACFM		PARTICLE MIGRATION VELOCITY		
MINIMUM GAS TREATMENT TIME (SEC):	,	BULK PARTICLE DENSITY (LB/FT	, ,	
FIELD STRENGTH (VOLTS) CHARGING:	COLLECTING: TBD	CORONA POWER (WATTS/1000 C		
ELECTRICAL USAGE (KW/HOUR): TBD		•		
	APPING DLATE VIB		OTHER	
OPERATING PARAMETERS	RESSURE DROP (IN. H20): MIN	MAX WARNING	ALARM? YES	NO
RESISTIVITY OF POLLUTANT (OHM-CM):	TBD		O TYPE OF AGENT (IF Y	'ES):
INLET GAS TEMPERATURE (°F): TBD		OUTLET GAS TEMPERATURE (°F	F): TBD	
VOLUME OF GAS HANDLED (ACFM): TB	D	INLET MOISTURE PERCENT: T	BIMIN TBD MAX	
POWER REQUIREMENTS	AN ENERGY MANAGEMENT SY	STEM USED? YES	NO	
FIELD NO. NO. OF S	SETS CHARGING	EACH TRANSFORMER (kVA)	EACH RECTIFIER Kv	Ave/Peak Ma Dc
I				
POLLUTANT(S) COLLECTED:	РМ	PM ₁₀ PM _{2.5}		
BEFORE CONTROL EMISSION RATE (LB/	/HR):			
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	%	%	%	%
CORRESPONDING OVERALL EFFICIENC	Y:%	%	%	%
EFFICIENCY DETERMINATION CODE:			_	
TOTAL AFTER CONTROL EMISSION RAT	E (LB/HR) See Emission Calculatio	ns in Appendix C		
PARTICLE SIZE DIS	TRIBUTION	DESCRIBE STARTUP PROCEDUR	RES: TBD	
SIZE WEIGH	T % CUMULATIVE			
(MICRONS) OF TOT	AL %			
0-1		DESCRIBE MAINTENANCE PROC	EDURES: TBD	
1-10				
10-25				
25-50		DESCRIBE ANY AUXILIARY MATE	RIALS INTRODUCED INT	O THE CONTROL
50-100		SYSTEM		
>100]		
	TOTAL = 100			
DESCRIBE ANY MONITORING DEVICES,	GAUGES, OR TEST PORTS AS A	TTACHMENTS: PLC		
COMMENTS:				
ATTACH A DIAGRAM OF THE	TOP VIEW OF THE ESP WITH D	IMENSIONS (include at a minimum th	ne plate spacing and wire s	pacing
and indicate the electrod	le type), AND THE RELATIONSHIP	OF THE CONTROL DEVICE TO ITS	S EMISSION SOURCE(S):	

CONTROL DEVICE (THERMAL OR CATALYTIC)

REVISED 09/22/16	NCDEQ/Division	of Air Quality	- Applic	ation for Air Pern	nit to C	onstruct/Opera	te		С	3
AS REQUIRED BY 15A NCAC 2Q .011	2, THIS FORM M	IUST BE SEAL	ED BY	A PROFESSIONA	L ENGI	INEER (P.E.) LI	CENSED	IN NORT	TH CARO	LINA.
CONTROL DEVICE ID NO: CD-RTO-2		CONTROLS E	MISSIO	NS FROM WHICH	EMISS	SION SOURCE I	D NO(S)	: ES-DRYI	ER-2	
EMISSION POINT (STACK) ID NO(S): EP	-4	POSITION IN	SERIES	OF CONTROLS		NO	3	OF3	UN	IITS
MANUFACTURER: TBD		MOD	DEL NO:	TBD						
OPERATING SCENA	ARIO:									
1OF1	L									
TYPE AFTERBURNER 🗸 REG	GENERATIVE TH	IERMAL OXIDA	ATION		IVE TH	ERMAL OXIDAT	ION 🗌	CATALY	TIC OXII	DATION
EXPECTED LIFE OF CATALYST (YRS):	TBD	METHOD OF I	DETECT	ING WHEN CATA						
CATALYST MASKING AGENT IN AIR ST		OGEN] SILIC			PHOROUS COM	IPOUND		HEAVY I	METAL
		R COMPOUND		OTHER (SPEC	$CIFY)_{}$	<u>TBD</u>			NONE	
TYPE OF CATALYST: TBD	CATALYST VC	DL (FT ³): TBD		VELOCITY THRO	DUGH (CATALYST (FPS	S): TBD			
SCFM THROUGH CATALYST: TBD DESCRIBE CONTROL SYSTEM, INCLUD										
Emissions leaving the WESP will enter th										
POLLUTANT(S) COLLECTED:		VOC								
BEFORE CONTROL EMISSION RATE (LI	B/HR):		_							
CAPTURE EFFICIENCY:			%		%		%		%	
CONTROL DEVICE EFFICIENCY:		97.5	%		%		%		%	
CORRESPONDING OVERALL EFFICIEN	CY:		%		%		%		%	
EFFICIENCY DETERMINATION CODE:	-		-							
TOTAL AFTER CONTROL EMISSION RA	TE (LB/HR) :	See Emission (Calculati	ions in Appendix (2					
PRESSURE DROP (IN. H ₂ MIN	MAX TBD		OUTLE	ET TEMPERATUR	E (°F):	_TBDMIN		TBD	MAX	
INLET TEMPERATURE (°F MIN	MAX TBD			ENCE TIME (SEC					100 0 0	
INLET AIR FLOW RATE (ACFM): TBD	(SCFM): TBD		1							
COMBUSTION CHAMBER VOLUME (FT ³			1	MOISTURE CON						
% EXCESS AIR: TBD). IDD			ENTRATION (ppm		<u>TBD</u> INLET	-	TBD	OUTLET	r
AUXILIARY FUEL USED: Natural Gas									COTEET	
DESCRIBE MAINTENANCE PROCEDURI TBD	ES:							-		
DESCRIBE ANY AUXILIARY MATERIALS N/A	INTRODUCED I	NTO THE CON	ITROL S	SYSTEM:						
COMMENTS:										

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/1 NCD	EQ/Division of	Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION:				FMISSION S		NO: ES-DRYER	RYP-2	
Green Wood Direct-Fired Dryer Syste	m (Dryer #2 By	/pass)						
OPERATING SCENARIO	L OF	- 1				CK) ID NO(S): 1	EP-5	
DESCRIBE IN DETAILTHE EMISSION								
Green wood is conveyed to a rotary dr emissions will be controlled utilizing	ryer system. Di a wet electrosta	irect contact l atic precipita	heat is provid tor (WESP) fo	led to the sys or particulate	e removal. VO	, OC and organic	-HAP emissi	ons will be
controlled by a regenerative thermal will be used to exhaust hot gases duri	. ,		0	he dryer (ES	-DRYERBYP-2	2) and furnace	e (ES-FURNA)	CEBYP-2)
TYPE OF EMISSION SOU	RCE (CHECK /		ETE APPROF	PRIATE FOR	M B1-B9 ON	THE FOLLOV	VING PAGES	S):
Coal,wood,oil, gas, other burner (F	orm B1)	Woodwc	orking (Form E	34)	Manuf	. of chemicals	/coatings/ink	s (Form B7)
Int.combustion engine/generator (F	Form B2)	Coating/	finishing/print	ing (Form B5) 🗌 Incine	ration (Form B	8)	
Liquid storage tanks (Form B3)		Storage	silos/bins (Fo	rm B6)	Other	(Form B9)		
START CONSTRUCTION DATE: TBD			DATE MANU TBD	JFACTURED	:			
MANUFACTURER / MODEL NO.:								
TBD			EXPECTED	OP. SCHEDI	JLE: <u>24</u> ⊦	IR/DAY <u>7</u>	DAY/WK	<u>52</u> WK/YF
	ISPS (SUBPAR	(TS?):			HAP (SUBPA			
PERCENTAGE ANNUAL THROUGHP	·	,	MAR-MAY			SEP-NOV 2	25%	
	AIR POLLUT			-	-		-	
		SOURCE OF		D ACTUAL		POTENTIAL		
		EMISSION	-	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)		, Rols / Limits)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	Ib/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)			n Calculation:			toris/yi	ID/TII	10115/ yi
PARTICULATE MATTER (1 M)	(PM)	See Emission						
PARTICULATE MATTER<2.5 MICRONS	10,							
SULFUR DIOXIDE (SO2)	5 (F 1V12.5)	 						
NITROGEN OXIDES (NOx)		 						
CARBON MONOXIDE (CO)		 						
	(100)							
VOLATILE ORGANIC COMPOUNDS (LEAD	<u>vuc</u>)	 						
OTHER								
HAZARDOUS		ITANT FM	USSIONS I	NFORMAT		THIS SOUL	RCF	I
		SOURCE OF		D ACTUAL		POTENTIAL		1
		EMISSION		ROLS / LIMITS)		TROLS / LIMITS)		ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	Ib/hr	tons/yr	lb/hr	tons/yr
HAZARDOUS AIR FOLLUTANT			n Calculation	,		toris/yi	ID/TII	toris/yr
		See Emission						
		1						
		1						
		1						
		1						
	+	<u> </u>						
		1						
	R POLLUTA					SSOURCE		
	TOLLOTA	BOORDE				3 300ACL		
		OF EMISSION	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	ROLS / LIMI	ITATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/	′day	lb	/yr
		See Emission	n Calculation	s in Appendix	K C			
Attachments: (1) emissions calculations and	supporting docur	nentation; (2) in	dicate all reque	sted state and	federal enforce	able permit limits	s (e.q. hours of	operation,
emission rates) and describe how these are	monitored and with	th what frequen	cy; and (3) des	cribe any monit	oring devices, g	gauges, or test p	orts for this so	urce.

REVISED 09/2	22/16	NCDEQ/Divi	sion of Air Quality - A	pplication for Air P	ermit to Construct/C	perate	B1
	DURCE DESCRIPT Direct-Fired Dryer		2 Bynass)	EMISS	SION SOURCE ID NO	: ES-DRYERBYP-2	
Green wood I	Sheet-Filed Diyer	System (Diyer #	z bypassj	CONT	ROL DEVICE ID NO(5): N/A	
OPERATING	SCENARIO:	<u>1</u> 0	F <u>1</u>	EMISS	SION POINT (STACK)	ID NO(S): EP-5	
DESCRIBE U	SE: ✓PROC	ESS HEAT	SPACE HEA	г 🗌	ELECTRICAL GENE	RATION	
		NUOUS USE	STAND BY/E	MERGENCY	OTHER (DESCRIBE):	
HEATING ME	CHANISM:		т	DIRECT			
MAX. FIRING	RATE (MMBTU/H	OUR): 180					
			WOOD	FIRED BURNE	२		
WOOD TYP	PE: 🗌 BARK	WOOD/	BARK 🗹 WET W		RY WOOD	OTHER (DESCRIB	E):
PERCENT MC	DISTURE OF FUEL	.: <u>~50%</u>					
	UNCONTROLLED		ITROLLED WITH FLY	ASH REINJECTION	CO	NTROLLED W/O REINJ	IECTION
FUEL FEED N	IETHOD: N/A		HEAT TRANS	FER MEDIA:	STEAM 🗹 AIR 🗌	OTHER (DESCRIBE)	
			COAL-	FIRED BURNER	2		
TYPE OF BOI	ILER	IF OTHEI	R DESCRIBE:				
PULVERIZED	OVERFEED STO	DKER UND	ERFEED STOKER	SPREADER	STOKER	FLUIDIZED BED	
U WET BED			ONTROLLED	UNCONTRO	LLED [
🗌 DRY BED			ITROLLED	FLYASH RE	INJECTION [RECIRCULATING	
				NO FLYASH	REINJECTION		
			OIL/GAS	S-FIRED BURNE	R		
TYPE OF BOI	LER:	UTILITY	INDUSTRIAL		L 🗌 INS	TITUTIONAL	
TYPE OF FIR	ING:	NORMAL				LOW NOX BURNER	
			OTHER FU	EL-FIRED BUR	NER		
TYPE(S) OF F	FUEL:				_		
TYPE OF BOI	LER:	UTILITY	INDUSTRIAL			TITUTIONAL	
TYPE OF FIR	ING:		E(S) OF CONTROL(S)				
		FUEL	USAGE (INCLU				
				MAXIMUM DESIG		REQUESTED CA	
FUE	EL TYPE	UNITS		CAPACITY (UNIT/H	IR)	LIMITATION (UI	NIT/HR)
		UEL CHARA	CTERISTICS (CC		1		
				PECIFIC	SULFUR CONTEN		
	FUEL TY	PE		CONTENT	(% BY WEIGHT)	(% BY W	EIGHT)
	Bark/Wet V	Vood	Nomina	ll 4,200 BTU/lb	0.011		
			I				
001015175							
COMMENTS:							
			Attach Addition	al Chasta As			

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/1 NCDE	EQ/Division of	Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		B
EMISSION SOURCE DESCRIPTION:				EMISSION S		O: ES-FURNA	ACEBYP-2	
Green Wood Direct-Fired Dryer System	n (Furnace #2	Bypass)						
OPERATING SCENARIO	OF	1				K) ID NO(S):	FP-6	
DESCRIBE IN DETAILTHE EMISSION						I() ID I(0(0).		
Green wood is conveyed to a rotary dr emissions will be controlled utilizing a controlled by a regenerative thermal o will be used to exhaust hot gases durin	yer system. D 1 wet electrost 1 xidizer (RTO)	irect contact l atic precipita . Bypass stac	heat is provid itor (WESP) f ks following f	led to the sys or particulate	e removal. VO	C and organi	c-HAP emissi	ions will be
								2).
TYPE OF EMISSION SOUR Coal,wood,oil, gas, other burner (Fo Int.combustion engine/generator (Fo Liquid storage tanks (Form B3) START CONSTRUCTION DATE:	orm B1)	Woodwo	orking (Form E finishing/printi silos/bins (Fo	34) ing (Form B5)	Manuf.	of chemicals ation (Form B (Form B9)	/coatings/inks	
TBD			TBD					
MANUFACTURER / MODEL NO.: TBD			EXPECTED				DAY/WK	<u>52</u> WK/YR
		/			ALLO 250	,		
				25% JUN		SEP-NOV		
CRITERIA A	IR POLLUI		1					
		SOURCE OF		D ACTUAL		POTENTIAL		
		EMISSION	`	ROLS / LIMITS)	`	TROLS / LIMITS)		ROLS / LIMITS)
		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	n Calculation	s in Appendix	к С			
PARTICULATE MATTER<10 MICRONS	,							
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 POLLU	JTANT EM	ISSIONS I	NFORMAT	TION FOR	THIS SOUI	RCE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	n Calculation	s in Appendix	k C			
TOXIC AIR	R POLLUTA	NT EMISS	IONS INFO	ORMATION	N FOR THIS	S SOURCE		
		OF EMISSION				AFTER CONT		
TOXIC AIR POLLUTANT	CAS NO.	FACTOR		/hr		day	lb	/yr
		See Emission	n Calculation	s in Appendix	« C			
	-							

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.

EMISSION SOURCE (WOOD, COAL, OIL, GAS, OTHER FUEL-FIRED BURNER)

REVISED 09/22/16	NCDEQ/Division of A	ir Quality - Application f	or Air Po	ermit to Construct	/Operate	B1			
EMISSION SOURCE DESCRIPTION: Green Wood Direct-Fired Dryer System (Furnace #2 Bypass)				EMISSION SOURCE ID NO: ES-FURNACEBYP-2					
Green wood Direct-rifed Dryer System (rui nace #2 Bypass)				CONTROL DEVICE ID NO(S): N/A					
OPERATING SCENARIO:	EMISS	ION POINT (STACI	K) ID NO(S): EP-6						
DESCRIBE USE: PROCESS HEAT SPACE HEAT				ELECTRICAL GEN	NERATION				
	DUS USE	STAND BY/EMERGENCY	, 🗌	OTHER (DESCRIE	BE):				
HEATING MECHANISM:		✓ DIRECT							
MAX. FIRING RATE (MMBTU/HOUR	e): 180								
		WOOD-FIRED BU	JRNEF	र					
WOOD TYPE: DARK	WOOD/BARK	WET WOOD		RY WOOD	OTHER (DESCRI	IBE):			
PERCENT MOISTURE OF FUEL:	<u>~50%</u>								
UNCONTROLLED CONTROLLED WITH FLYASH REINJECTION									
FUEL FEED METHOD: N/A		HEAT TRANSFER MEDIA		STEAM 🗹 AIR	OTHER (DESCRIBE	.)			
		COAL-FIRED BU	IRNER						
TYPE OF BOILER	IF OTHER DESCR	RIBE:							
PULVERIZED OVERFEED STOKE	R UNDERFEED	STOKER SPR	EADER	STOKER	FLUIDIZED BED				
			ONTRO	LLED					
		D FLYA	D FLYASH REINJECTION RECIRCUL						
			FLYASH REINJECTION						
		OIL/GAS-FIRED B	URNE	R					
			IERCIA		ISTITUTIONAL				
			NOX BU		O LOW NOX BURNER				
		OTHER FUEL-FIRED) BURI	NER					
TYPE(S) OF FUEL:				_					
TYPE OF BOILER: UTILITY INDUSTRIAL COMMERCIAL INSTITUTIONAL									
TYPE OF FIRING:		CONTROL(S) (IF ANY): _							
	FUEL USAG	E (INCLUDE STAR							
	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)			REQUESTED CAPACITY LIMITATION (UNIT/HR)				
FUEL TYPE	CAPACITY	(UNIT/H	IR)	LIMITATION (I	UNIT/HR)				
EUE			ALL T						
FUE		STICS (COMPLETE SPECIFIC		SULFUR CONTE		ONTENT			
		BTU CONTENT		(% BY WEIGHT		WEIGHT)			
FUEL TYPE				0.011					
Bark/Wet Wood		Nominal 4,200 BTU	Nominal 4,200 BTU/lb						
COMMENTS:				1	1				
		Additional Shoot							

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCDE	Q/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		B	
EMISSION SOURCE DESCRIPTION:					SOURCE ID N	-	through IFS.	DDB-8	
Double Duct Burners					000-0				
OPERATING SCENARIO 1	OF	1	EMISSION POINT (STACK) ID NO(5				N/A		
DESCRIBE IN DETAILTHE EMISSION SO		ESS (ATTAC	H FLOW DIA			1,10,10,100,00,1	•/11		
Each dryer system will include double duc double duct burners will heat the duct wo	ts which will	l be heated by	four double	duct burners	•	0	,	5.	
duct burners will reduce condensation bu					•	0	,		
rated at 1 MMBtu/hr each. The double du	-		, 0						
	•								
Coal,wood,oil, gas, other burner (Form		_	orking (Form E	,	_	of chemicals	0	(Form B7)	
Int.combustion engine/generator (Form	B2)		finishing/print			ation (Form B	8)		
Liquid storage tanks (Form B3)		Storage	silos/bins (Fo	IFACTURED:		(Form B9)			
START CONSTRUCTION DATE:			DATE MANU	FACTURED:					
MANUFACTURER / MODEL NO.:			EXPECTED	OP. SCHEDL	JLE: <u>24</u> H	R/DAY 7	DAY/WK	52 WK/YR	
IS THIS SOURCE SUBJECT TC	PS (SUBPAF	RTS?):			AP (SUBPAF				
PERCENTAGE ANNUAL THROUGHPUT ((,	MAR-MAY 2	-		EP-NOV 25%	6		
CRITERIA AIR						S SOURC	E		
		SOURCE OF		D ACTUAL			EMISSIONS		
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	ROLS / LIMITS)	(AFTER CONTROLS / LIMITS)		
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
PARTICULATE MATTER (PM)		See Emission	n Calculations		α C			,	
PARTICULATE MATTER<10 MICRONS (PM1	0)								
PARTICULATE MATTER<2.5 MICRONS (PM	2.5)								
SULFUR DIOXIDE (SO2)									
NITROGEN OXIDES (NOx)									
CARBON MONOXIDE (CO)									
VOLATILE ORGANIC COMPOUNDS (VOC)								
LEAD									
OTHER									
HAZARDOUS A	IR POLLU	TANT EMI	SSIONS IN	FORMATI	ON FOR T	HIS SOUR	CE		
		SOURCE OF	EXPECTE	D ACTUAL	POTENTIAL EMISSIONS				
				ROLS / LIMITS)	(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)		
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
		See Emission	n Calculations	s in Appendix	C				
TOXIC AIR F	POLLUTAI	NT EMISSI	ONS INFO	RMATION	FOR THIS	SOURCE			
		OF	EXPECT		EMISSIONS	AFTER CONT			
		EMISSION	EXTENT						
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/	day	lb/yr		
		See Emission	n Calculation	s in Appendix	C C				
Attachments: (1) emissions calculations and supp	orting docume	ntation; (2) indica	ate all requested	d state and fede	eral enforceable	permit limits (e.	q. hours of ope	ration,	

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.

EMISSION SOURCE (WOOD, COAL, OIL, GAS, OTHER FUEL-FIRED BURNER)

REVISED 09/22/16		ir Quality - Application	for Air Pe	ermit to Construct	t/Opera	ate B1			
EMISSION SOURCE DESCRIPTION: Double Duct Burners				EMISSION SOURCE ID NO: IES-DDB-1 through IES-DDB-8					
				CONTROL DEVICE ID NO(S): N/A					
OPERATING SCENARIO:	EMISS	EMISSION POINT (STACK) ID NO(S): N/A							
DESCRIBE USE: PROCESS HEAT SPACE HEAT				ELECTRICAL GE	NERAT	ION			
	NUOUS USE	STAND BY/EMERGENC	Y 🗌	OTHER (DESCRI	BE):				
HEATING MECHANISM:		✓ DIRECT	-						
MAX. FIRING RATE (MMBTU/HC	OUR): 1								
		WOOD-FIRED B	URNEF	8					
WOOD TYPE: BARK	WOOD/BARK	WET WOOD		RY WOOD		OTHER (DESCRIBE):			
PERCENT MOISTURE OF FUEL									
		D WITH FLYASH REINJ	ECTION		ONTR	OLLED W/O REINJECTION			
FUEL FEED METHOD:		HEAT TRANSFER MEDIA		STEAM 🗌 AIR [ОТ	HER (DESCRIBE)			
		COAL-FIRED B	JRNER						
TYPE OF BOILER	IF OTHER DESCR	RIBE:							
PULVERIZED OVERFEED STO				STOKER					
	_		ONTRO			RCULATING			
				REINJECTION					
		OIL/GAS-FIRED	BURNE	<u>R</u>					
TYPE OF BOILER: UTILITY INDUSTRIAL COMMERCIAL INSTITUTIONAL									
TYPE OF FIRING:		ENTIAL UOW				V NOX BURNER			
TYPE(S) OF FUEL: <u>Natural G</u>									
TYPE OF BOILER: UTILITY INDUSTRIAL COMMERCIAL INSTITUTIONAL TYPE OF FIRING: <u>Direct</u> TYPE(S) OF CONTROL(S) (IF ANY): <u>None</u>									
TYPE OF FIRING: <u>Direct</u>		E (INCLUDE STAR			5)				
		MAXIMUI			- /	REQUESTED CAPACITY			
FUEL TYPE	CAPACITY (UNIT/HR)			LIMITATION (UNIT/HR)					
Natural Gas or Propane	1.0			1.0					
Natural Gas or Propane MMBtu									
F	UEL CHARACTERI	STICS (COMPLETE	ALL T	HAT ARE APP	LICA	BLE)			
	SPECIFIC		SULFUR CONTENT		ASH CONTENT				
FUEL TYPE		BTU CONTENT		(% BY WEIGHT)		(% BY WEIGHT)			
Natural Ga	1,020 Btu/scf								
Propane	91,500 Btu/gal		0.54 grains/100 ft ³						
COMMENTS:									
	A++	Additional Shoot	- ^ - `						

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCI	DEQ/Division of	Air Quality -	Application	for Air Perm	it to Constru	uct/Operate		В		
EMISSION SOURCE DESCRIPTION:		EMISSION S								
Dried Wood Handling				CONTROL DEVICE ID NO(S): CD-DWH-BF						
OPERATING SCENARIO1	OF _	1		_ EMISSION POINT (STACK) ID NO(S): EP-7						
DESCRIBE IN DETAILTHE EMISSION Dried Wood Handling (ES-DWH) will in Hammermills and Pellet Mills.		•		,	ryer and Dry	Hammermills	s and the Dr	y		
TYPE OF EMISSION SOU Coal,wood,oil, gas, other burner (Fo Int.combustion engine/generator (Fo Liquid storage tanks (Form B3) START CONSTRUCTION DATE:	orm B1)	Woodwo	rking (Form inishing/print silos/bins (Fo	B4) ting (Form B5)	Manut) Incine	THE FOLLOW f. of chemicals, ration (Form B (Form B9)	/coatings/ink			
MANUFACTURER / MODEL NO.: Bliss, Model 44-60			EXPECTED	OP. SCHED	JLE: <u>24</u> H	HR/DAY <u>7</u>	DAY/WK	<u>52</u> WK/Y		
IS THIS SOURCE SUBJECT T	NSPS (SUBPAR	TS?):		_ 🗌 NESH	HAP (SUBPA	RTS?):				
PERCENTAGE ANNUAL THROUGHP				25% JUN-A			-			
CRITERIA A	AIR POLLUT			ORMATIO	N FOR TH	HIS SOURC	E			
		SOURCE OF				POTENTIAL	EMISSIONS			
		EMISSION	(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS			
AIR POLLUTANT EMITTED		FACTOR	lb/hr tons/yr		lb/hr tons/yr		lb/hr	tons/yr		
PARTICULATE MATTER (PM)		See Emission	n Calculation	s in Appendix	K C					
PARTICULATE MATTER<10 MICRONS										
PARTICULATE MATTER<2.5 MICRONS	(PM _{2.5})									
SULFUR DIOXIDE (SO2)										
NITROGEN OXIDES (NOx)										
CARBON MONOXIDE (CO)										
VOLATILE ORGANIC COMPOUNDS (VOC)									
LEAD										
OTHER										
HAZARDOUS	S AIR POLLU	TANT EMI	SSIONS II	NFORMAT	ION FOR	THIS SOUR	CE			
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	6		
		EMISSION	(AFTER CONT	FROLS / LIMITS)	(BEFORE CON	ITROLS / LIMITS)	(AFTER CON	TROLS / LIMITS)		
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr		
		See Emission	n Calculation	is in Appendiz	x C					
TOXIC AI	R POLLUTAI	NT EMISSI	ons info	ORMATION	FOR THIS	S SOURCE				
	OF EMISSION				EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS					
TOXIC AIR POLLUTANT	CAS NO.			o/hr		/day	lb/yr			
		See Emissior	1 Calculation	is in Appendix	x C					
					ļ					
					 					

REVISED 09/22/16	NCDEQ/Div	vision of Air Quality -	Application f	or Air Permit to Construct/Op	perate	B9
EMISSION SOURCE DESCRIF		•		EMISSION SOURCE ID NO: E		
Dried Wood Handling				CONTROL DEVICE ID NO(S)		
OPERATING SCENARIO:	1	_ OF <u>1</u>		EMISSION POINT (STACK) IE	D NO(S): EP-7	
DESCRIBE IN DETAIL THE PF Dried Wood Handling (ES-DW Hammermills and Pellet Mills.	H) will include			petween the Dryer and Dry Ha	mmermills and the b	Dry
MATERIALS ENTERIN			CESS	MAX. DESIGN	REQUESTED	
	TYPE	- CONTINUOUS FRO	UNITS	CAPACITY (UNIT/HR)	LIMITATION	
Dried Wood			ODT/hr	142	LIMITATION	
			001/11	142		
					DEOLIEOTER	
	TYPE	S - BATCH OPERAT	UNITS	MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTEE LIMITATION (U	
			UNITS	CAPACITI (UNIT/BATCH)	LIVITATION (O	NIT/BATCH)
			 			
MAXIMUM DESIGN (BATCHES	,					
REQUESTED LIMITATION (BA	ATCHES / HOL	JR):	(BATCHES/	YR):		
FUEL USED: N/A			TOTAL MAX	IMUM FIRING RATE (MILLION	BTU/HR): N/A	
MAX. CAPACITY HOURLY FU	EL USE: N/A		REQUESTE	D CAPACITY ANNUAL FUEL U	JSE: N/A	
COMMENTS:						

FORM C1 CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 NCDEQ/Divis	ion of Air Quality -	Applicatio	n for Air Permit	to Construct/Oper	ate		C1
CONTROL DEVICE ID NO: CD-DWH-BF	CONTROLS EMIS	SIONS FRO	OM WHICH EMIS	SION SOURCE ID	NO(S): ES-D	WH	
EMISSION POINT (STACK) ID NO(S): EP-7	POSITION IN SER	IES OF CC	NTROLS	NO	. 1 OF	1 UNITS	
OPERATING SCENARIO:							
1OF1		P.E. SEAL	REQUIRED (PE	R 2q .0112)? 🗸	YES	NO NO	
DESCRIBE CONTROL SYSTEM: A bag filter will be utilized for emission control on D	ried Wood Handling	g operation	15.				
POLLUTANTS COLLECTED:		РМ	PM ₁₀	PM _{2.5}			
BEFORE CONTROL EMISSION RATE (LB/HR):							
CAPTURE EFFICIENCY:		~99.9	% ~99.9	% ~99.9	%	%	
CONTROL DEVICE EFFICIENCY:			%	_%	%	%	
CORRESPONDING OVERALL EFFICIENCY:			%	_%	_%	%	
EFFICIENCY DETERMINATION CODE:							
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):		See Emiss	ion Calculations	in Appendix C			
PRESSURE DROP (IN H ₂ 0): MIN: MAX: TBL	GAUGE?	✓ YES	NO				
BULK PARTICLE DENSITY (LB/FT ³): TBD		INLET TEI	MPERATURE (°F): MIN	MAX TBD		
POLLUTANT LOADING RATE: 0.004 🗌 LB/HR	GR/FT ³	OUTLET 1	TEMPERATURE	(°FMIN	MAX TBD		
INLET AIR FLOW RATE (ACFM): 1,500		FILTER O	PERATING TEM	P (°F): N/A			
NO. OF COMPARTMENTS: TBD NO. OF BAGS	PER COMPARTM	ENT: TBD		LENGTH OF BA	G (IN.): TBD		
NO. OF CARTRIDGES: TBD FILTER SURF	ACE AREA PER CA	ARTRIDGE	(FT ²): TBD	DIAMETER OF I	BAG (IN.): TB	D	
TOTAL FILTER SURFACE AREA (FT ²): TBD	AIR TO CLOTH RA	ATIO: TBD					
DRAFT TYPE: 🗹 INDUCED/NEGATIVE 🗹	FORCED/POSITIV	Έ	FILTER N	MATERIAL:] WOVEN	✓ FELTED	
DESCRIBE CLEANING PROCEDURES				PAR	TICLE SIZE D	ISTRIBUTION	
✓ AIR PULSE	SONIC			SIZE	WEIGHT	% CUMUL	ATIVE
REVERSE FLOW	SIMPLE BAG COL	LAPSE		(MICRONS)	OF TOT	AL %	
	RING BAG COLLA	PSF		0-1		Unknown	
				1-10			
DESCRIBE INCOMING AIR STREAM:				10-25			
The air stream will contain wood dust particles.				25-50			
				50-100			
				>100			
						TOTAL = 100	
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHO	WING THE RELATION	ONSHIP OF	THE CONTROL	DEVICE TO ITS E	MISSION SO	URCE(S):	
COMMENTS:							

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCD	EQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	IO: ES-PS-1 ar	nd ES-PS-2	
Prescreeners				CONTROL [DEVICE ID NO	D(S): CD-PS-B	F	
OPERATING SCENARIO 1	OF	1		EMISSION F	POINT (STAC	K) ID NO(S):	EP-8	
DESCRIBE IN DETAILTHE EMISSION So Presecreeners will screen chips: large ch Feed Silo. Emissions from the prescreen	ips will be sen	t to the Dry Ha	ammermills f	or further re		ll chips will b	e sent to the	Pellet Mill
TYPE OF EMISSION SOUR	CE (CHECK A		TE APPROPF	RIATE FORM	B1-B9 ON T	HE FOLLOW	ING PAGES):	
Coal,wood,oil, gas, other burner (Form	n B1)	Woodwo	rking (Form E	34)	Manuf.	of chemicals	/coatings/inks	(Form B7)
Int.combustion engine/generator (Form	n B2)		inishing/printi	• • •		ation (Form B	88)	
Liquid storage tanks (Form B3)		Storage s	silos/bins (Fo			(Form B9)		
START CONSTRUCTION DATE:			DATE MANU	JFACTURED				
MANUFACTURER / MODEL NO.:			EXPECTED	OP. SCHEDI	JLE: <u>24</u> H	R/DAY <u>7</u>	_DAY/WK _	_ <u>52_</u> WK/YR
IS THIS SOURCE SUBJECT TC	SPS (SUBPAR	RTS?):		NESH	HAP (SUBPAF	RTS?):		
PERCENTAGE ANNUAL THROUGHPUT	(%): DEC-FE	B 25% N	MAR-MAY 2	5% JUN-AU	IG 25% S	EP-NOV 25%	6	
CRITERIA AI	R POLLUT	ANT EMISS	SIONS INF	ORMATIO	N FOR TH	IS SOURC	E	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	n Calculations	s in Appendix	с С			
PARTICULATE MATTER<10 MICRONS (PM	И ₁₀)							
PARTICULATE MATTER<2.5 MICRONS (PI	M _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (VO	C)							
LEAD								
OTHER								
HAZARDOUS	AIR POLLU	TANT EMIS	SSIONS IN	IFORMAT	ION FOR T	HIS SOUR	RCE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	. EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	Calculations	s in Appendix	с С			
	1							
TOXIC AIR	POLLUTAI	NT EMISSIO	ONS INFO	RMATION	FOR THIS	SOURCE		
		OF	EVDECT			AFTER CON		
		EMISSION	EXFECT	ED ACTUAL	EIVIISSIONS	AFTERCON		TATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/	day	lb	/yr
		See Emission	Calculations	s in Appendix	C C			
Attachments: (1) emissions calculations and su	poorting docume	ntation: (2) indic	ate all request	ed state and fe	deral enforceab	le nermit limits		neration

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.

MPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOUR Attach Additional Sheets As Necessary

REVISED 09/22/16 NCDEQ/Division of Air Quality -	Application f	or Air Permit to Construct/O	perate	B9
EMISSION SOURCE DESCRIPTION:		EMISSION SOURCE ID NO:	ES-PS-1 and ES-PS-2	
Prescreeners		CONTROL DEVICE ID NO(S): CD-PS-BF	
OPERATING SCENARIO: OF		EMISSION POINT (STACK) I	D NO(S): EP-8	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM Presecreeners will screen chips: large chips will be sent to the Dry Feed Silo. Emissions from the prescreeners will route to a baghou	Hammermil		l chips will be sent t	o the Pellet Mill
MATERIALS ENTERING PROCESS - CONTINUOUS PRO	CE88	MAX. DESIGN	PEOLIESTE	D CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION	
Wood Pellets			N/A	
	ODT/yr	781,255	N/A	
MATERIALS ENTERING PROCESS - BATCH OPERAT	1	MAX. DESIGN	REQUESTE	
ТҮРЕ	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (L	INIT/BATCH)
MAXIMUM DESIGN (BATCHES / HOUR):				
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/	/R):		
FUEL USED: N/A	TOTAL MAX	IMUM FIRING RATE (MILLIO	N BTU/HR): N/A	
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTE	D CAPACITY ANNUAL FUEL	USE: N/A	
COMMENTS:	<u>.</u>			

FORM C1 CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 NCDEQ/Divis	ion of Air Quality -	Applicatio	n for Air Peri	mit to Cons	truct/Operation	ate			C1
CONTROL DEVICE ID NO: CD-PS-BF	CONTROLS EMIS	SIONS FRO	OM WHICH E	MISSION S	OURCE ID	NO(S): ES	S-PS-1 and	ES-PS-2	-
EMISSION POINT (STACK) ID NO(S): EP-8	POSITION IN SER	IES OF CC	NTROLS		NO.	1 OF	- 1	UNITS	
OPERATING SCENARIO:									
OF		P.E. SEAL	REQUIRED	(PER 2q .0	112)? 🗸	YES] NO	
DESCRIBE CONTROL SYSTEM: A baghouse collects dust from the presecreeners bef	ore the dry hammer	mills.							
POLLUTANTS COLLECTED:		РМ	РМ	М ₁₀	PM _{2.5}				
BEFORE CONTROL EMISSION RATE (LB/HR):			<u> </u>						
CAPTURE EFFICIENCY:		~99.9	<u>%</u> ~9	9.9_%	~99.9	%		%	
CONTROL DEVICE EFFICIENCY:			%	%		%		%	
CORRESPONDING OVERALL EFFICIENCY:			%	%		%		%	
EFFICIENCY DETERMINATION CODE:									
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	,	_	ion Calculatio		ndix C		<u> </u>		
PRESSURE DROP (IN H ₂ 0): MIN: MAX: TBI	GAUGE?	YES							
BULK PARTICLE DENSITY (LB/FT ³): TBD			MPERATURE			MAX TBI			
POLLUTANT LOADING RATE: 0.004 LB/HR	GR/FT ³		EMPERATU			MAX TBI	D		
INLET AIR FLOW RATE (ACFM): 17,100			PERATING T		-	- ///			
	PER COMPARTM		·2		STH OF BA				
	ACE AREA PER CA		(F1²): TBD	DIAM	ETER OF E	3AG (IN.):	TBD		
	AIR TO CLOTH RA								
	FORCED/POSITIV	'E	FILI	ER MATERI		WOVEN		FELTED	
						1			
	SONIC				SIZE	WEIG		CUMUL	
REVERSE FLOW	SIMPLE BAG COL			(M)	ICRONS)	OF I	OTAL	%	
	RING BAG COLLA	PSE			0-1		Unkn	iown	
DESCRIBE INCOMING AIR STREAM:					1-10				
					10-25 25-50				
					20-00 50-100				
					>100				
						1	TOTAL	= 100	
							TOTAL	= 100	
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHO	WING THE RELATION		THE CONT			MISSION	SOURCE	(S):	
COMMENTS:							0001102	(0).	

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NC	DEQ/Division o	f Air Quality -	Application	for Air Permi	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S		NO: IES-DLH		
Dry Line Hopper				CONTROL D	DEVICE ID N	O(S): CD-HM-I	BF-3, CD-RCO	-1
OPERATING SCENARIO 1	OF	1				K) ID NO(S): I		
DESCRIBE IN DETAILTHE EMISSION Dried wood materials are transferred t		•		GRAM):				
TYPE OF EMISSION SOU	RCE (CHECK A			RIATE FORM	B1-B9 ON T	HE FOLLOWI	NG PAGES):	
Coal,wood,oil, gas, other burner (For	rm B1)	Woodwo	rking (Form E	34)	Manuf	. of chemicals/	/coatings/inks	(Form B7)
Int.combustion engine/generator (Fo	rm B2)	Coating/f	inishing/printi	ng (Form B5)	Incine	ration (Form B	8)	
Liquid storage tanks (Form B3)		✓ Storage s	silos/bins (Fo	m B6)	√Other	(Form B9)		
START CONSTRUCTION DATE: 2014			DATE MANU 2014	IFACTURED:				
MANUFACTURER / MODEL NO.:								
Enviva Built			EXPECTED	OP. SCHEDL	JLE: <u>24</u> ⊦	IR/DAY <u>7</u>	_ DAY/WK _	<u>52</u> WK/YR
IS THIS SOURCE SUBJECT T(NSPS (SUBPAR	TS?):		NESH	IAP (SUBPA	RTS?):		
PERCENTAGE ANNUAL THROUGHPU	T (%): DEC-FE	B 25% N	AR-MAY 2	5% JUN-AU	G 25% S	EP-NOV 25%	6	
CRITERIA A	IR POLLUT	ANT EMISS	SIONS INF	ORMATIO	N FOR TH	IIS SOURC	E	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	Calculation	in Appendix	C			
PARTICULATE MATTER<10 MICRONS (F	PM ₁₀)							
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (V	OC)							
LEAD	,							
OTHER								
HAZARDOUS	AIR POLLU	TANT EMIS	SSIONS IN	IFORMATI	ON FOR 1	THIS SOUR	CE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION		ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	Calculation	, ,	C	,		
				TT · ·	- -			
TOXIC AIF	R POLLUTAI		ONS INFO	RMATION	FOR THIS	SOURCE		
		OF EMISSION	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	rols / Limi	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb	/day	lb	/yr
		See Emission				,		-
Attachments: (1) emissions calculations and s	supporting docume	entation: (2) indic	ate all request	ed state and fee	deral enforceat	ole permit limits (e.a. hours of o	peration.

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.

MPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOUR Attach Additional Sheets As Necessary

REVISED 09/22/16 NCDEQ/Division of Air Quality -	Application f	or Air Permit to Construct/O	perate B9
EMISSION SOURCE DESCRIPTION:		EMISSION SOURCE ID NO:	IES-DLH
Dry Line Hopper		CONTROL DEVICE ID NO(S): CD-HM-BF-3, CD-RCO-1
OPERATING SCENARIO: OF		EMISSION POINT (STACK) I	D NO(S): EP-9
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM			
Dried wood materials are transferred to Dry Line Conveyor (ES-D	LC-1).		
MATERIALS ENTERING PROCESS - CONTINUOUS PRO	CESS	MAX. DESIGN	REQUESTED CAPACITY
ТҮРЕ	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Dried Wood Materials	ODT/yr	781,255	N/A
MATERIALS ENTERING PROCESS - BATCH OPERAT	ION	MAX. DESIGN	REQUESTED CAPACITY
ТҮРЕ	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH)
MAXIMUM DESIGN (BATCHES / HOUR): REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/	√D).	
		,	
FUEL USED: N/A MAX. CAPACITY HOURLY FUEL USE: N/A		IMUM FIRING RATE (MILLIOI D CAPACITY ANNUAL FUEL	
COMMENTS:	REQUESTE	D CAFACITT ANNOAL FOEL	USE. N/A

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCD	EQ/Division of	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		B
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	O: ES-HM-1 t	hrough ES-H	M-8
Eight (8) Dry Wood Hammermills					DEVICE ID NO		5	
					M-BF-1 throu	. ,	-	
OPERATING SCENARIO	OF _	1		EMISSION F	POINT (STAC	K) ID NO(S):	EP-9	
DESCRIBE IN DETAILTHE EMISSION S	SOURCE PRO	CESS (ATTA	CH FLOW DI	AGRAM):	•	, , ,		
Dried materials are reduced to appropr		•		•	od hammerm	ills.		
TYPE OF EMISSION SOUR	CE (CHECK A				B1-B9 ON T	HE FOLLOW	ING PAGES	:
Coal,wood,oil, gas, other burner (For	•		orking (Form B			of chemicals		
Int.combustion engine/generator (Fo	,	_	finishing/print	,		ation (Form B	-	· · ·
Liquid storage tanks (Form B3)	,		silos/bins (Fo		, , , , Other (•	,	
START CONSTRUCTION DATE:				JFACTURED				
2012			2012					
MANUFACTURER / MODEL NO.:								
Bliss, Model 44-60			EXPECTED	OP. SCHEDI	JLE: <u>24</u> H	R/DAY <u>7</u>	DAY/WK	<u>52_</u> WK/YF
IS THIS SOURCE SUBJECT T	ISPS (SUBPAF	RTS?):		NESH	HAP (SUBPAF	RTS?):		
PERCENTAGE ANNUAL THROUGHPU	T (%): DEC-FE	B 25%	MAR-MAY 2	25% JUN-A	UG 25%	SEP-NOV 25	%	
CRITERIA A	IR POLLUT	ANT EMIS	SIONS INF	ORMATIO	N FOR TH	IS SOURC	E	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CONT	ROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)			1 Calculation	,				
PARTICULATE MATTER<10 MICRONS (F	PM10)							1
PARTICULATE MATTER<2.5 MICRONS (16,							(
SULFUR DIOXIDE (SO2)	2.37							
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (VO	OC)							
LEAD)							
OTHER								
HAZARDOUS	AIR POLLU		SSIONS IN	IFORMAT	ION FOR T	HIS SOUR	CE	
	1	SOURCE OF	T	D ACTUAL		POTENTIAL		
		EMISSION		ROLS / LIMITS)	(BEFORE CONT	-		ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
	CAC NO.		1 Calculation			torio/yi	10/111	torio/yi
		See Linission		in Appendiz				
	-							l
	POLLUTA		ONS INFO	RMATION	FOR THIS	SOURCE		
	FOLLOTA				FOR THIS	SUUNCE		
		OF	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	ROLS / LIMI	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	EMISSION FACTOR	lb	/hr	lb/	hav	lb	har
	GAG NU.		n Calculation			day	a	/yr
	+	See Emission		s in Appendix				
	-							
	+	<u> </u>						
	+	+						

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.

MPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOUR Attach Additional Sheets As Necessary

REVISED 09/22/16 NCDEQ/Division of Air Quality -	Application f	or Air Permit to Construct/O	perate	B9
EMISSION SOURCE DESCRIPTION:		EMISSION SOURCE ID NO:	ES-HM-1 through ES	-HM-8
Eight (8) Dry Wood Hammermills		CONTROL DEVICE ID NO(S 8, CD-HM-BF-1 through CD-H		ugh CD-HM-CYC
OPERATING SCENARIO:1 OF1		EMISSION POINT (STACK) I	D NO(S): EP-9	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRA Dried materials are reduced to appropriate size needed for pellet		ght (8) dry wood hammermill	s.	
MATERIALS ENTERING PROCESS - CONTINUOUS PRO	CESS	MAX. DESIGN	REQUESTE	D CAPACITY
ТҮРЕ	UNITS	CAPACITY (UNIT/HR)	LIMITATION	(UNIT/HR)
Dried Wood	ODT/hr	62	N/A	
MATERIALS ENTERING PROCESS - BATCH OPERAT	TION	MAX. DESIGN	REQUESTE	O CAPACITY
ТҮРЕ	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (U	INIT/BATCH)
MAXIMUM DESIGN (BATCHES / HOUR):				
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/	/R):		
FUEL USED: N/A		IMUM FIRING RATE (MILLIO	N BTU/HR): N/A	
MAX. CAPACITY HOURLY FUEL USE: N/A		D CAPACITY ANNUAL FUEL	, ,	
COMMENTS:			,	

FORM C4

CONTROL DEVICE (CYCLONE, MULTICYCLONE, OR OTHER MECHANICAL)

REVISED 09/22/16	NCDEQ/Divi	sion of Air Quality - Ap	plication for Air Pe	ermit to Construc	ct/Operate	C4
CONTROL DEVICE ID NO: CD- HM-CYC-8	HM-CYC-1 through CD-		NS FROM WHICH E	EMISSION SOUR	CE ID NO(S): ES-	HM-1 through ES-HM-8
EMISSION POINT (STACK) ID N	NO(S): EP-9	POSITION IN SERIES	OF CONTROLS	NO.	1 OF	4 UNITS (ES-HM-1 to 8)
· · ·	NG SCENARIO:					
1	_OF1	P.E. SE/	L REQUIRED (PE	R 2Q .0112)?	✓ YES	
DESCRIBE CONTROL SYSTEM One cyclone is equipped for eac				· · · · · · · · · · · · · · · · · · ·		d to one of three bagfilters.
**Dry Hammermills ES-HM-1 th the control device forms associ	-		•	(CD-RCO-1) afte	r leaving the bag	filter (CD-HM-BF-1). Refer to
POLLUTANT(S) COLLECTED:		РМ	PM ₁₀	PM _{2.5}		
BEFORE CONTROL EMISSION	I RATE (LB/HR):			<u> </u>	<u> </u>	
CAPTURE EFFICIENCY:		9	8 % 98	% 98	_%	%
CONTROL DEVICE EFFICIENC	CY:		%	%	%	%
CORRESPONDING OVERALL	EFFICIENCY:		%	%	%	%
EFFICIENCY DETERMINATION	I CODE:			.	<u> </u>	
TOTAL AFTER CONTROL EMIS	SSION RATE (LB/HR):	See Emi	ssion Calculations i	n Appendix C	<u> </u>	
PRESSURE DROP (IN. H ₂ 0):	MIN	<u>6"</u> MAX				
INLET TEMPERATURE (°F):	MIN	_ Ambient_ MAX	OUTLET TEMPE	RATURE ([°] F):	MIN	_ Ambient _ MAX
INLET AIR FLOW RATE (ACFM): 15,000 (each)		BULK PARTICLE	DENSITY (LB/F1	Г ³): 1.43Е-03	
POLLUTANT LOADING RATE (GR/FT ³): 10 (inlet)					
SETTLING CHAMBER		CYCLON	F		N	IULTICYCLONE
			-			ICE NOT CE CINE
LENGTH (INCHES):	INLET VELOCITY (F			RECTANGLE	NO. TUBES:	
LENGTH (INCHES): WIDTH (INCHES):	`		T			
	`	T/SEC): 114.65			NO. TUBES: DIAMETER OF	
WIDTH (INCHES):	DIMENSIONS (INC	T/SEC): 114.65 CHES) See instructions	IF WET SPRA	AY UTILIZED	NO. TUBES: DIAMETER OF	TUBES:
WIDTH (INCHES): HEIGHT (INCHES):	DIMENSIONS (INC H: 60"	T/SEC): 114.65 CHES) See instructions Dd: 20 "	IF WET SPRA	ay <i>utilized</i> PM):	NO. TUBES: DIAMETER OF HOPPER ASPIR	TUBES: RATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.):	DIMENSIONS (INC H: 60" W: 32.25"	T/SEC): 114.65 CHES) See instructions Dd: 20 " Lb: 60 "	CIRCULAR	ay <i>utilized</i> PM):	NO. TUBES: DIAMETER OF HOPPER ASPIF	TUBES: RATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS:	DIMENSIONS (INC H: 60" W: 32.25" De: 45" D: 96"	T/SEC): 114.65 CHES) See instructions Dd: 20" Lb: 60" Lc: 120" S: 64.75"	CIRCULAR	AY UTILIZED PM): (GPM):	NO. TUBES: DIAMETER OF HOPPER ASPIF YES LOUVERS?	TUBES: RATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR	DIMENSIONS (INC H: 60" W: 32.25" De: 45" D: 96" TYPE OF CYCLONE OCEDURES:	T/SEC): 114.65 CHES) See instructions Dd: 20" Lb: 60" Lc: 120" S: 64.75" CONVENTIONAL	CIRCULAR	AY UTILIZED PM): (GPM): FICIENCY	NO. TUBES: DIAMETER OF HOPPER ASPIR VES LOUVERS?	TUBES: RATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES:	DIMENSIONS (INC H: 60" W: 32.25" De: 45" D: 96" TYPE OF CYCLONE OCEDURES:	T/SEC): 114.65 CHES) See instructions Dd: 20" Lb: 60" Lc: 120" S: 64.75" CONVENTIONAL	CIRCULAR	AY UTILIZED PM): (GPM): FICIENCY	NO. TUBES: DIAMETER OF HOPPER ASPIF YES LOUVERS? YES OTHER	TUBES: RATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani manufacturer. DESCRIBE INCOMING AIR STF	DIMENSIONS (INC H: 60" W: 32.25" De: 45" D: 96" TYPE OF CYCLONE OCEDURES: cal integrity during pl:	T/SEC): 114.65 CHES) See instructions Dd: 20" Lb: 60" Lc: 120" S: 64.75" CONVENTIONAL ant outages as specified	CIRCULAR IF WET SPRA LIQUID USED: FLOW RATE (GF MAKE UP RATE HIGH EFF by the	AY UTILIZED PM): (GPM): FICIENCY	NO. TUBES: DIAMETER OF HOPPER ASPIR YES LOUVERS? YES OTHER PARTICLE SIZE I WEIGHT %	TUBES: RATION SYSTEM? NO NO DISTRIBUTION CUMULATIVE
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani manufacturer. DESCRIBE INCOMING AIR STF The material will be pulled throw	DIMENSIONS (INC H: 60" W: 32.25" De: 45" D: 96" TYPE OF CYCLONE OCEDURES: cal integrity during pl: REAM: pugh the cyclone under	T/SEC): 114.65 CHES) See instructions Dd: 20" Lb: 60" Lc: 120" S: 64.75" CONVENTIONAL ant outages as specified r negative pressure. Th	CIRCULAR IF WET SPRA LIQUID USED: FLOW RATE (GF MAKE UP RATE HIGH EFF by the	AY UTILIZED PM): (GPM): FICIENCY SIZE (MICRONS)	NO. TUBES: DIAMETER OF HOPPER ASPIR YES LOUVERS? YES OTHER PARTICLE SIZE I WEIGHT %	TUBES: RATION SYSTEM? NO NO DISTRIBUTION CUMULATIVE %
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani manufacturer. DESCRIBE INCOMING AIR STF The material will be pulled thro separate the material from the prior to being discharged to the	DIMENSIONS (INC H: 60" W: 32.25" De: 45" D: 96" TYPE OF CYCLONE OCEDURES: cal integrity during pla REAM: pugh the cyclone under air stream and the air	T/SEC): 114.65 CHES) See instructions Dd: 20" Lb: 60" Lc: 120" S: 64.75" CONVENTIONAL ant outages as specified r negative pressure. Th will discharge to an ass	CIRCULAR IF WET SPRA LIQUID USED: FLOW RATE (GF MAKE UP RATE MAKE UP RATE HIGH EFF by the e cyclone will cociated bag filter	AY UTILIZED PM): (GPM): FICIENCY SIZE (MICRONS) 0-1	NO. TUBES: DIAMETER OF HOPPER ASPIR YES LOUVERS? YES OTHER PARTICLE SIZE I WEIGHT %	TUBES: RATION SYSTEM? NO NO DISTRIBUTION CUMULATIVE %
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani manufacturer. DESCRIBE INCOMING AIR STF The material will be pulled thro separate the material from the	DIMENSIONS (INC H: 60" W: 32.25" De: 45" D: 96" TYPE OF CYCLONE OCEDURES: cal integrity during pla REAM: pugh the cyclone under air stream and the air	T/SEC): 114.65 CHES) See instructions Dd: 20" Lb: 60" Lc: 120" S: 64.75" CONVENTIONAL ant outages as specified r negative pressure. Th will discharge to an ass	CIRCULAR IF WET SPRA LIQUID USED: FLOW RATE (GF MAKE UP RATE MAKE UP RATE HIGH EFF by the e cyclone will cociated bag filter	AY UTILIZED PM): (GPM): FICIENCY SIZE (MICRONS) 0-1 1-10	NO. TUBES: DIAMETER OF HOPPER ASPIR YES LOUVERS? YES OTHER PARTICLE SIZE I WEIGHT %	TUBES: RATION SYSTEM? NO NO DISTRIBUTION CUMULATIVE %
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani manufacturer. DESCRIBE INCOMING AIR STF The material will be pulled thro separate the material from the prior to being discharged to the	DIMENSIONS (INC H: 60" W: 32.25" De: 45" D: 96" TYPE OF CYCLONE OCEDURES: cal integrity during pla REAM: pugh the cyclone under air stream and the air	T/SEC): 114.65 CHES) See instructions Dd: 20" Lb: 60" Lc: 120" S: 64.75" CONVENTIONAL ant outages as specified r negative pressure. Th will discharge to an ass	CIRCULAR IF WET SPRA LIQUID USED: FLOW RATE (GF MAKE UP RATE MAKE UP RATE HIGH EFF by the e cyclone will cociated bag filter	AY UTILIZED PM): (GPM): FICIENCY SIZE (MICRONS) 0-1 1-10 10-25	NO. TUBES: DIAMETER OF HOPPER ASPIR YES LOUVERS? YES OTHER PARTICLE SIZE I WEIGHT %	TUBES: RATION SYSTEM? NO NO DISTRIBUTION CUMULATIVE %
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani manufacturer. DESCRIBE INCOMING AIR STF The material will be pulled thro separate the material from the prior to being discharged to the	DIMENSIONS (INC H: 60" W: 32.25" De: 45" D: 96" TYPE OF CYCLONE OCEDURES: cal integrity during pla REAM: pugh the cyclone under air stream and the air	T/SEC): 114.65 CHES) See instructions Dd: 20" Lb: 60" Lc: 120" S: 64.75" CONVENTIONAL ant outages as specified r negative pressure. Th will discharge to an ass	CIRCULAR IF WET SPRA LIQUID USED: FLOW RATE (GF MAKE UP RATE MAKE UP RATE HIGH EFF by the e cyclone will cociated bag filter	AY UTILIZED PM): (GPM): TCIENCY SIZE (MICRONS) 0-1 1-10 10-25 25-50 50-100	NO. TUBES: DIAMETER OF HOPPER ASPIR YES LOUVERS? YES OTHER PARTICLE SIZE I WEIGHT %	TUBES: RATION SYSTEM? NO NO DISTRIBUTION CUMULATIVE %
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani manufacturer. DESCRIBE INCOMING AIR STF The material will be pulled thro separate the material from the prior to being discharged to the	DIMENSIONS (INC H: 60" W: 32.25" De: 45" D: 96" TYPE OF CYCLONE OCEDURES: cal integrity during pla REAM: pugh the cyclone under air stream and the air	T/SEC): 114.65 CHES) See instructions Dd: 20" Lb: 60" Lc: 120" S: 64.75" CONVENTIONAL ant outages as specified r negative pressure. Th will discharge to an ass	CIRCULAR IF WET SPRA LIQUID USED: FLOW RATE (GF MAKE UP RATE MAKE UP RATE HIGH EFF by the e cyclone will cociated bag filter	AY UTILIZED PM): (GPM): FICIENCY SIZE (MICRONS) 0-1 1-10 10-25 25-50	NO. TUBES: DIAMETER OF HOPPER ASPIR YES LOUVERS? YES OTHER PARTICLE SIZE I WEIGHT %	TUBES: RATION SYSTEM? NO NO DISTRIBUTION CUMULATIVE %
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani manufacturer. DESCRIBE INCOMING AIR STF The material will be pulled thro separate the material from the prior to being discharged to the	DIMENSIONS (INC H: 60" W: 32.25" De: 45" D: 96" TYPE OF CYCLONE OCEDURES: cal integrity during pla REAM: ough the cyclone under air stream and the air e atmosphere via a disc	T/SEC): 114.65 CHES) See instructions Dd: 20" Lb: 60" Lc: 120" S: 64.75" CONVENTIONAL ant outages as specified r negative pressure. Th will discharge to an ass caharge stack common	CIRCULAR IF WET SPRA LIQUID USED: FLOW RATE (GF MAKE UP RATE MAKE UP RATE HIGH EFF by the e cyclone will cociated bag filter	AY UTILIZED PM): (GPM): TCIENCY SIZE (MICRONS) 0-1 1-10 10-25 25-50 50-100	NO. TUBES: DIAMETER OF HOPPER ASPIR YES LOUVERS? YES OTHER PARTICLE SIZE I WEIGHT %	TUBES: RATION SYSTEM? NO NO DISTRIBUTION CUMULATIVE % Unknown Unknown

FORM C1 CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 NCDEQ/Divisi	ion of Air Quality -	Applicatio	n for Air	Permit to	Construct/Oper	rate		C1
CONTROL DEVICE ID NO: CD-HM-BF-1 through CD- HM-BF-3	CONTROLS EMIS ES-DLC-1, ES-DSHI			CH EMISS	SION SOURCE ID	NO(S):	ES-HM-1 t	1rough ES-HM-8,
EMISSION POINT (STACK) ID NO(S): EP-9	POSITION IN SER	RIES OF CO	NTROLS	S**	NO	. 2	OF 4	UNITS (ES-HM-1 to 8)
	POSITION IN SER	RIES OF CO	NTROLS	5**	NO	. 1	OF 3	UNITS (ES-DLC-1)
OPERATING SCENARIO:								
OF		P.E. SEAL	. REQUIR	RED (PER	2q .0112)? 🗸	YES		NO
DESCRIBE CONTROL SYSTEM: Three (3) bag filters will be utilized for emission cont vent to CD-HM-BF-1, Hammermills 4 and 5 vent throu Feed Conveyor (DLC). **Dry Hammermills ES-HM-1 through ES-HM-8 and ES	gh CD-HM-BF-2, an	d emissions	s from Ha	ımmermi	lls 7 and 8 vent t	o the CI	O-MH-BF-3	along with the Dry Line
BF-1 through 3). Refer to the control device forms ass	ociated with CD-RO	CO-1 for mo	re inforn					
POLLUTANTS COLLECTED:		РМ		PM ₁₀	PM _{2.5}	_		-
BEFORE CONTROL EMISSION RATE (LB/HR):						-		-
CAPTURE EFFICIENCY:		~99.9	%	~99.9	% ~99.9	%		_%
CONTROL DEVICE EFFICIENCY:			%		_%	%		_%
CORRESPONDING OVERALL EFFICIENCY:					%	%		_%
EFFICIENCY DETERMINATION CODE:						_		-
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):		See Emiss	ion Calcu	lations in	Appendix C	_		-
PRESSURE DROP (IN H ₂ 0): MIN: MAX: 6"	GAUGE?	✓ YES		NO				
BULK PARTICLE DENSITY (LB/FT ³): 1.43E-05		INLET TE				MAX		
	✓ GR/FT ³	OUTLET T				MAX	100	
INLET AIR FLOW RATE (ACFM): 45,000		FILTER O	PERATIN	IG TEMP				
			(CT ²).		LENGTH OF BA	. ,		
	ACE AREA PER CA		(FT):		DIAMETER OF	BAG (IN	1.): 5.75	
TOTAL FILTER SURFACE AREA (FT ²): 6,250								FELTED
DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES	FORCED/POSITIV	E .	Г					
	CONIC					-		
	SONIC				SIZE		EIGHT %	CUMULATIVE
	SIMPLE BAG COL				(MICRONS)	U	TOTAL	%
	RING BAG COLLA	APSE			0-1			Unknown
DESCRIBE INCOMING AIR STREAM:					1-10	-		
The air stream contains wood dust particles. Larger p	articles are remov	ed by the u	pstream	cyclone	10-25	-		
for product recovery.					25-50			
					50-100	-		
					>100			
								OTAL = 100
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOW	ING THE RELATION	ONSHIP OF	THE CO	NTROL D	EVICE TO ITS E	MISSIO	N SOURCE	i(S):
COMMENTS:								

FORM C8 CONTROL DEVICE (WET PARTICULATE SCRUBBER)

CONTROL DEVICE ID NO: CD-RCO-1 EMISSION POINT ID NO(S): EP-9		ir Quality -	Application fo	r Air	Permit to	Const	ruct/C	Operate	C8
MISSION POINT ID NO(S) FD-0			FROM WHICH R-6, ES-DSHM-1				ID N): ES-HM	l-1 through ES-HM-8, ES-DLC-1,
	POSITION IN	SERIES OI	CONTROLS:		NO. S	B OF	4	UNITS	(ES-HM-1 through 8)
	POSITION IN	SERIES O	CONTROLS:		NO. 2	OF	3	UNITS	(ES-DLC-1)
	POSITION IN	SERIES OI	CONTROLS:*	*	NO. 2	2 OF	3	UNITS	(ES-CLR-1 through 6)
OPERATING SCENARI	IO:								
1OF1	_	P.E. SEAL	NEEDED (PE	R 2Q	.0112)?	√ Y	ΈS		NO
DESCRIBE CONTROL SYSTEM: After leaving the bag filters (CD-HM-BF-1 scrubber / RCO (CD-RCO-1).	through 3), the emis	sions from t	the Dry Hamme	ermil	ls (ES-HM	l-1 thro	ugh 8), and ES-DI	LC-1 will also be routed to the wet
** After leaving the pellet coolers (ES-CLR scrubber / RCO (CD-RCO-1). See the form						ough a v	wet so	rubber, and	l then will be routed to the wet
POLLUTANT(S) COLLECTED:		-	PM		PM ₁	0	_	PM _{2.5}	_
BEFORE CONTROL EMISSION RATE (LB	8/HR):	-							_
CAPTURE EFFICIENCY:		-	~99.9	%	~99.	9 %	<u> </u>	~99.9	_%
CONTROL DEVICE EFFICIENCY:		-		%		9	<u> </u>		_%
CORRESPONDING OVERALL EFFICIENC	CY:	-		%		%	6		_%
EFFICIENCY DETERMINATION CODE:		_							
TOTAL AFTER CONTROL EMISSION RAT	ΓΕ (LB/HR):	-							_
PRESSURE DROP (IN. H ₂ 0): <u>TBD</u>	MAX	T							
INLET TEMPERATURE (°F): <u>TBD</u>	MAX	OUTLET "	FEMPERATURI	E (°F]	TB	<u>)</u> M	N _	<u>TBD</u> N	<i>I</i> AX
INLET AIR FLOW RATE (ACFM): TBD		MOISTUR	E CONTENT :	INLE	T1	' <u>BD</u>	0	UTLET	TBD
THROAT VELOCITY (FT/SEC): TBD		THROAT			FIXED		<u>ا</u> ۱	ARIABLE	
TYPE OF SYSTEM: TBD		TYPE OF	PACKING USE	DIF	ANY: <u>TBI</u>)_			
ADDITIVE LIQUID SCRUBBING MEDIUM:	TBD	PERCEN	RECIRCULAT	ED: 1	ГBD				
MINIMUM LIQUID INJECTION RATE (GAL	/MIN): TBD								
MAKE UP RATE (GAL/MIN): TBD	FOR ADDITIVE (G	GAL/MIN): T	BD						
	ES:								
					_		-		
						IZE RONS)	-	WEIGHT %	CUMULATIVE
					(MIC	RONS)	-		
DESCRIBE MAINTENANCE PROCEDURE	GAUGES, TEST PO	RTS, ETC:			(MIC		-	WEIGHT %	CUMULATIVE
DESCRIBE MAINTENANCE PROCEDURE	GAUGES, TEST PO	RTS, ETC:			(MIC (1	RONS))-1	-	WEIGHT %	CUMULATIVE
DESCRIBE MAINTENANCE PROCEDURE	GAUGES, TEST PO	RTS, ETC:			(MIC (1 1(RONS))-1 -10	-	WEIGHT %	CUMULATIVE
DESCRIBE MAINTENANCE PROCEDURE	GAUGES, TEST PO	RTS, ETC:			(MIC (1 1(2! 50	RONS))-1 -10)-25 5-50 -100	-	WEIGHT %	CUMULATIVE
DESCRIBE MAINTENANCE PROCEDURE	GAUGES, TEST PO	RTS, ETC:			(MIC (1 1(2! 50	RONS) -1 -10 -25 5-50		WEIGHT %	CUMULATIVE %

FORM C3 CONTROL DEVICE (THERMAL OR CATALYTIC)

REVISED 09/22/16 NCDEQ/Divisio		- Application for Air Permit to Co			,		C3
AS REQUIRED BY 15A NCAC 2Q .01	12, THIS FORM	MUST BE SEALED BY A PROFES	SSIONAL ENG	INEER	(P.E.) L	ICENS	ED IN NORTH CAROLINA.
CONTROL DEVICE ID NO: CD-RC0-1	CONTROLS E	EMISSIONS FROM WHICH EMISSI Dugh ES-CLR-6, ES-DSHM-1 and ES-I	ON SOURCE		. ,		
EMISSION POINT (STACK) ID NO(S): EP-9	POSITION IN	SERIES OF CONTROLS	NO	_4	OF	4	UNITS (ES-HM-1 through 8)
	POSITION IN	SERIES OF CONTROLS	NO	3	OF	3	UNITS (ES-DLC-1)
	POSITION IN	SERIES OF CONTROLS**	NO	3	OF	3	UNITS (ES-CLR-1 through 6)
MANUFACTURER: TBD	MO	DEL NO: TBD					
OPERATING SCENARIO:							
1OF1							
TYPE 🗌 AFTERBURNER 🗍 REGENERATIVE 1		ATION 🗌 RECUPERATIVE THE	RMAL OXIDA	TION [√ CAT	ALYTIC	OXIDATION
EXPECTED LIFE OF CATALYST (YRS): TBD		DETECTING WHEN CATALYST N					
CATALYST MASKING AGENT IN AIR STRE 🛛 HA	LOGEN		HOROUS COI TBD	MPOUN			AVY METAL DNE
TYPE OF CATALYST: TBD CATALYST \	OL (FT ³): TBD	VELOCITY THROUGH C	ATALYST (FP:	S): TBD			
SCFM THROUGH CATALYST: TBD							
After leaving the bag filters (CD-HM-BF-1 through 3), the 1). ** After leaving the pellet coolers (ES-CLR-1 through 6), φ See the forms associated with the pellet coolers for more	missions from t						
POLLUTANT(S) COLLECTED:	VOC						
BEFORE CONTROL EMISSION RATE (LB/HR):				_			
	-	%		%			%
CONTROL DEVICE EFFICIENCY:	95			- %			<u> </u>
CORRESPONDING OVERALL EFFICIENCY:		%%		- % %			%
EFFICIENCY DETERMINATION CODE:		/0/0		_ /0			/0
TOTAL AFTER CONTROL EMISSION RATE (LB/HR) :	See Emission	Calculations in Appendix C		_			
PRESSURE DROP (IN. H ₂ C MIN MAX TBI)	OUTLET TEMPERATURE (°F):	TBD MIN		TBD	MA	AX
INLET TEMPERATURE (°F) MIN MAX TBI)	RESIDENCE TIME (SECONDS):	TBD				
INLET AIR FLOW RATE (ACFM): TBD (SCFM): TBD)	COMBUSTION TEMPERATURE	(°F): TBD				
COMBUSTION CHAMBER VOLUME (FT ³): TBD		INLET MOISTURE CONTENT (%	. ,				
% EXCESS AIR: TBD		CONCENTRATION (ppmv)	<u>TBD</u> INLE	т	TBI		JTLET
AUXILIARY FUEL USED: Natural Gas		TOTAL MAXIMUM FIRING RATE					
DESCRIBE ANY AUXILIARY MATERIALS INTRODUCED N/A COMMENTS:	INTO THE CON	ITROL SYSTEM:					

Attach Additional Sheets As Necessary

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCI	DEQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ict/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION	SOURCE ID I	NO: ES-DSHM-	1 and ES-DS	HM-2
Dry Shavings Hammermills								
						O(S): CD-DSH		0-1
OPERATING SCENARIO1	OF _				POINT (STAC	CK) ID NO(S):	EP-9	
DESCRIBE IN DETAILTHE EMISSION						•11		
Dry shavings are reduced to appropria	ite size needed i	or pelletizing	using two (2) dry shaving	gs hammerm	111.		
TYPE OF EMISSION SOU								
Coal,wood,oil, gas, other burner (Fo	•		orking (Form E			. of chemicals		
Int.combustion engine/generator (Fe	,		finishing/print			ration (Form B	0	
Liquid storage tanks (Form B3)	onn B2)		silos/bins (Fo	•		(Form B9)	,0)	
START CONSTRUCTION DATE:			,	JFACTURED		()		
TBD			TBD					
MANUFACTURER / MODEL NO.:								
TBD			EXPECTED			HR/DAY <u>7</u>	DAY/WK	<u>52</u> WK/YF
	NSPS (SUBPAR	,			HAP (SUBPA			
PERCENTAGE ANNUAL THROUGHPU			MAR-MAY			SEP-NOV 25	-	
CRITERIA A	AIR POLLUT				IN FOR IT			
		SOURCE OF		D ACTUAL		POTENTIAL		
		EMISSION		ROLS / LIMITS)		TROLS / LIMITS)		ROLS / LIMITS)
		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	n Calculation	s in Appendi:	x C			
PARTICULATE MATTER<10 MICRONS	10,			1				
SULFUR DIOXIDE (SO2)	(PM _{2.5})							
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (\	/OC)							
LEAD	(00)							
OTHER								
HAZARDOUS	AIR POLLU	TANT EMI	SSIONS IN	FORMAT	ION FOR 1	THIS SOUR	CE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	n Calculation	s in Appendiz	x C			
					ļ			
					ļ			
				DMATION				
	R POLLUTA	JUUNUE	UNS INFO	RIVIATION	FUR THIS	SOURCE		
		OF	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	ROLS / LIM	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	EMISSION FACTOR	lb	/hr	lb	/day	lh	/yr
	CAS NO.		n Calculation			uay	u	/yi
		See Emission		s in Appendix				
					1			
		1			1			

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.

MPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOUR Attach Additional Sheets As Necessary

REVISED 09/22/16 NCDEQ/Division of Air Quality -	Application f	or Air Permit to Construct/O	perate	B9
EMISSION SOURCE DESCRIPTION:		EMISSION SOURCE ID NO:	ES-DSHM-1 and ES-E	SHM-2
Dry Shavings Hammermill		CONTROL DEVICE ID NO(S 3, CD-RCO-1): CD-HM-BF-1 throu	ıgh CD-HM-BF-
OPERATING SCENARIO: OF		EMISSION POINT (STACK)	D NO(S): EP-9	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM Dry shavings are reduced to appropriate size needed for pelletizin		2) dry shavings hammermill		
MATERIALS ENTERING PROCESS - CONTINUOUS PRO	CESS	MAX. DESIGN	REQUESTED	CAPACITY
ТҮРЕ	UNITS	CAPACITY (UNIT/HR)	LIMITATION	UNIT/HR)
Dried Wood Shavings	ODT/hr	8	N/A	
	1			
MATERIALS ENTERING PROCESS - BATCH OPERAT	ION	MAX. DESIGN	REQUESTED	CAPACITY
ТҮРЕ	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (U	NIT/BATCH)
	1			
MAXIMUM DESIGN (BATCHES / HOUR):		•		
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/	/R):		
FUEL USED: N/A	TOTAL MAX	IMUM FIRING RATE (MILLIO	N BTU/HR): N/A	
MAX. CAPACITY HOURLY FUEL USE: N/A		D CAPACITY ANNUAL FUEL		
COMMENTS:				

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NC	DEQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ict/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID I	NO: ES-CLR-1	through ES-C	CLR-6
Pellet Coolers					DEVICE ID N	O(S): CD-CLR-	0	
OPERATING SCENARIO	LOF	1		EMISSION F	POINT (STAC	CK) ID NO(S):	EP-9	
DESCRIBE IN DETAILTHE EMISSION	N SOURCE PRO	CESS (ATTA	CH FLOW DI	AGRAM):				
Six (6) pellet coolers follow the pellet	presses to cool t	he newly forn	ned pellets d	own to an acc	eptable stor	age temperatı	ure.	
TYPE OF EMISSION SOL	•		TE APPROP			THE FOLLOW		
Int.combustion engine/generator (F	,			ing (Form B5		ration (Form E	-	5 (I UIII D7)
Liquid storage tanks (Form B3)	0111 B2)		silos/bins (Fo	0.		(Form B9)	50)	
START CONSTRUCTION DATE:				JFACTURED		(1 0111 20)		
2012			2012					
MANUFACTURER / MODEL NO.:								
Kahl Press 60-1250			EXPECTED			HR/DAY <u>7</u>	DAY/WK	<u>52</u> _WK/YI
	NSPS (SUBPAR	,		_	IAP (SUBPA	,		
PERCENTAGE ANNUAL THROUGHP	AIR POLLUT					SEP-NOV 25		
	AIK FOLLOT	SOURCE OF						
				ROLS / LIMITS)		POTENTIAL		ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	Ib/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)				s in Appendix		tonia/ yi	10/111	torio/ yi
PARTICULATE MATTER<10 MICRONS	(PM ₁₀)	bee Linission		l				-
PARTICULATE MATTER<2.5 MICRONS								
SULFUR DIOXIDE (SO2)	(2.0)							
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS ((VOC)							
LEAD								
OTHER								
HAZARDOU	S AIR POLLU	ITANT EMI	SSIONS II	NFORMAT	ION FOR T	THIS SOUR	RCE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	\$
		EMISSION		ROLS / LIMITS)	(BEFORE CON	ITROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	n Calculation	s in Appendix	к С 			
								-
TOXIC A	IR POLLUTA	NT EMISSI	ONS INFO	RMATION	FOR THIS	SOURCE		
		OF	EXPECT	ED ACTUAL	EMISSIONS	AFTER CON	TROLS / LIM	ITATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/	/day	lb	o/yr
			-	s in Appendix				<u></u>
Attachments: (1) emissions calculations and	supporting docume	entation; (2) indic	cate all request	ed state and fe	deral enforceab	ole permit limits (e.g. hours of o	peration,

tions and supporting documentati ion; (2) indi :(1)6 equ 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.

MPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOUR **Attach Additional Sheets As Necessary**

REVISED 09/22/16 NCDEQ/Division of Air Quality	y - Application f	or Air Permit to Construct/O	perate	B9
EMISSION SOURCE DESCRIPTION:		EMISSION SOURCE ID NO:	ES-CLR-1 through ES	S-CLR-6
Pellet Coolers		CONTROL DEVICE ID NO(S CD-WS-1, CD-RCO-1		
OPERATING SCENARIO: OF		EMISSION POINT (STACK) I	D NO(S): EP-9	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGR Six (6) pellet coolers follow the pellet presses to cool the newly	,	down to an acceptable storag	e temperature.	
MATERIALS ENTERING PROCESS - CONTINUOUS PR	ROCESS	MAX. DESIGN	REQUESTED	CAPACITY
ТҮРЕ	UNITS	CAPACITY (UNIT/HR)	LIMITATION	(UNIT/HR)
Wood Pellets	ODT/hr	100	N/A	
MATERIALS ENTERING PROCESS - BATCH OPER	ATION	MAX. DESIGN	REQUESTED	CAPACITY
ТҮРЕ	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (U	NIT/BATCH)
MAXIMUM DESIGN (BATCHES / HOUR):				
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/	(R):		
FUEL USED: N/A	TOTAL MAX	IMUM FIRING RATE (MILLIOI	N BTU/HR): N/A	
MAX. CAPACITY HOURLY FUEL USE: N/A	REQUESTE	D CAPACITY ANNUAL FUEL	USE: N/A	
COMMENTS:				

FORM C4

CONTROL DEVICE (CYCLONE, MULTICYCLONE, OR OTHER MECHANICAL)

REVISED 09/22/16	NCDEQ/Div	ision of Air Qu	ality - App	lication for Air P	ermit to Cons	ruct/Operate	C
CONTROL DEVICE ID NO:		CONTROLS E	EMISSION	S FROM WHICH E	EMISSION SOU	JRCE ID NO(S): 1	ES-CLR-1 through ES-CLR-6
CD-CLR-1 through CD-CLR-6							
EMISSION POINT (STACK) ID I	NO(S): EP-9	POSITION IN	SERIES O	F CONTROLS	NO.	1 OF	4 UNITS
OPERATI	NG SCENARIO:						
1	_OF <u>1</u>		P.E. SEAI	REQUIRED (PER	R 2Q .0112)?	✓ YES	
DESCRIBE CONTROL SYSTEM Six (6) identical high efficiency		DM omissions	from cir (() pollot coolone l	Fach coolor vo	nto to ono dodico	tod gyalono. The gyalones will
operate under negative pressu		PM emissions	ITOIII SIX (b) penet coolers.	Lacii cooler ve	its to one dedica	teu cyclone. The cyclones win
POLLUTANT(S) COLLECTED:			РМ	PM ₁₀	PM _{2.}	;	
BEFORE CONTROL EMISSION	RATE (LB/HR):						
CAPTURE EFFICIENCY:			90+	% 90+	% 9	0+ %	%
CONTROL DEVICE EFFICIENC	CY:			%	%	%	%
CORRESPONDING OVERALL	EFFICIENCY:			%	%	%	%
EFFICIENCY DETERMINATION	I CODE:						
TOTAL AFTER CONTROL EMI	SSION RATE (LB/HR):		See Emiss	ion Calculations i	n Appendix C		
PRESSURE DROP (IN. H ₂ 0):	MIN	<u>6"</u> MA	Х				
INLET TEMPERATURE (°F):	MIN	_ <u>Ambient</u> _ M	AX	OUTLET TEMPE	RATURE (°F):	MIN	_ <u>Ambient</u> _ MAX
INLET AIR FLOW RATE (ACFN	l): 17,100 (each)			BULK PARTICLE	DENSITY (LB	/FT ³): 2.86E-05	
POLLUTANT LOADING RATE (GR/FT ³): 0.01 (inlet)						
SETTLING CHAMBER		(CYCLONE				MULTICYCLONE
LENGTH (INCHES):	INLET VELOCITY (F	T/SEC): 94.75				E NO. TUBES:	
LENGTH (INCHES): WIDTH (INCHES):	INLET VELOCITY (F			CIRCULAR		E NO. TUBES: DIAMETER C	OF TUBES:
WIDTH (INCHES):						DIAMETER (DF TUBES: PIRATION SYSTEM?
	DIMENSIONS (IN	CHES) See inst		IF WET SPRA	AY UTILIZED	DIAMETER (
WIDTH (INCHES): HEIGHT (INCHES):	DIMENSIONS (IN H: 38"	CHES) See inst Dd: 22"		IF WET SPRA	ay <i>utilized</i> PM):	DIAMETER O	PIRATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.):	DIMENSIONS (IN H: 38" W: 25"	CHES) See inst Dd: 22" Lb: 74.25"		IF WET SPR/ LIQUID USED: FLOW RATE (GF	ay <i>utilized</i> PM):	DIAMETER (HOPPER AS	PIRATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES:	DIMENSIONS (IN H: 38" W: 25" De: 32" D: 54" TYPE OF CYCLONE	CHES) See inst Dd: 22" Lb: 74.25" Lc: 84.5" S: 44.38"	tructions	IF WET SPR/ LIQUID USED: FLOW RATE (GF	AY UTILIZED PM): (GPM):	DIAMETER (HOPPER AS YES LOUVERS?	PIRATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR	DIMENSIONS (IN H: 38" W: 25" De: 32" D: 54" TYPE OF CYCLONE OCEDURES:	CHES) See inst Dd: 22" Lb: 74.25" Lc: 84.5" S: 44.38" CONVEN	TIONAL	IF WET SPR/ LIQUID USED: FLOW RATE (GF MAKE UP RATE	AY UTILIZED PM): (GPM): FICIENCY	DIAMETER C HOPPER AS VES LOUVERS? VES OTHEF PARTICLE SI	
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES:	DIMENSIONS (IN H: 38" W: 25" De: 32" D: 54" TYPE OF CYCLONE OCEDURES:	CHES) See inst Dd: 22" Lb: 74.25" Lc: 84.5" S: 44.38" CONVEN	TIONAL	IF WET SPR/ LIQUID USED: FLOW RATE (GF MAKE UP RATE	AY UTILIZED PM): (GPM): FICIENCY SIZE	DIAMETER C HOPPER AS VES LOUVERS? VES OTHER PARTICLE SI	PIRATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani manufacturer.	DIMENSIONS (IN H: 38" W: 25" De: 32" D: 54" TYPE OF CYCLONE OCEDURES: ical integrity during pl	CHES) See inst Dd: 22" Lb: 74.25" Lc: 84.5" S: 44.38" CONVEN	TIONAL	IF WET SPR/ LIQUID USED: FLOW RATE (GF MAKE UP RATE	AY UTILIZED PM): (GPM): FICIENCY SIZE (MICRONS	DIAMETER C HOPPER AS VES LOUVERS? VES OTHER PARTICLE SI	PIRATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani manufacturer. DESCRIBE INCOMING AIR STF The material will be pulled throw	DIMENSIONS (IN H: 38" W: 25" De: 32" D: 54" TYPE OF CYCLONE OCEDURES: ccal integrity during pl REAM: ough the cyclone unde	CHES) See inst Dd: 22" Lb: 74.25" Lc: 84.5" S: 44.38" CONVEN ant outages as	TIONAL specified l	IF WET SPR/ LIQUID USED: FLOW RATE (GF MAKE UP RATE MAKE UP RATE HIGH EFF by the cyclone will	AY UTILIZED PM): (GPM): FICIENCY SIZE	DIAMETER C HOPPER AS VES LOUVERS? VES OTHER PARTICLE SI	PIRATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani manufacturer. DESCRIBE INCOMING AIR STF The material will be pulled throw	DIMENSIONS (IN H: 38" W: 25" De: 32" D: 54" TYPE OF CYCLONE OCEDURES: ccal integrity during pl REAM: ough the cyclone unde	CHES) See inst Dd: 22" Lb: 74.25" Lc: 84.5" S: 44.38" CONVEN ant outages as	TIONAL specified l	IF WET SPR/ LIQUID USED: FLOW RATE (GF MAKE UP RATE MAKE UP RATE HIGH EFF by the cyclone will	AY UTILIZED PM): (GPM): FICIENCY SIZE (MICRONS 0-1 1-10	DIAMETER C HOPPER AS VES LOUVERS? VES OTHER PARTICLE SI	PIRATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani manufacturer. DESCRIBE INCOMING AIR STF The material will be pulled throw	DIMENSIONS (IN H: 38" W: 25" De: 32" D: 54" TYPE OF CYCLONE OCEDURES: ccal integrity during pl REAM: ough the cyclone unde	CHES) See inst Dd: 22" Lb: 74.25" Lc: 84.5" S: 44.38" CONVEN ant outages as	TIONAL specified l	IF WET SPR/ LIQUID USED: FLOW RATE (GF MAKE UP RATE MAKE UP RATE HIGH EFF by the cyclone will	AY UTILIZED PM): (GPM): TICIENCY SIZE (MICRONS 0-1 1-10 10-25	DIAMETER C HOPPER AS VES LOUVERS? VES DTHEF PARTICLE SL WEIGHT %	PIRATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani manufacturer. DESCRIBE INCOMING AIR STF The material will be pulled throw	DIMENSIONS (IN H: 38" W: 25" De: 32" D: 54" TYPE OF CYCLONE OCEDURES: ccal integrity during pl REAM: ough the cyclone unde	CHES) See inst Dd: 22" Lb: 74.25" Lc: 84.5" S: 44.38" CONVEN ant outages as	TIONAL specified l	IF WET SPR/ LIQUID USED: FLOW RATE (GF MAKE UP RATE MAKE UP RATE HIGH EFF by the cyclone will	AY UTILIZED PM): (GPM): FICIENCY SIZE (MICRONS 0-1 1-10	DIAMETER C HOPPER AS VES LOUVERS? VES DTHEF PARTICLE SL WEIGHT %	PIRATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani manufacturer. DESCRIBE INCOMING AIR STF The material will be pulled throw	DIMENSIONS (IN H: 38" W: 25" De: 32" D: 54" TYPE OF CYCLONE OCEDURES: ccal integrity during pl REAM: ough the cyclone unde	CHES) See inst Dd: 22" Lb: 74.25" Lc: 84.5" S: 44.38" CONVEN ant outages as	TIONAL specified l	IF WET SPR/ LIQUID USED: FLOW RATE (GF MAKE UP RATE MAKE UP RATE HIGH EFF by the cyclone will	AY UTILIZED PM): (GPM): ICIENCY SIZE (MICRONS 0-1 1-10 10-25 25-50 50-100	DIAMETER C HOPPER AS VES LOUVERS? VES DTHEF PARTICLE SL WEIGHT %	PIRATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani manufacturer. DESCRIBE INCOMING AIR STF The material will be pulled throw	DIMENSIONS (IN H: 38" W: 25" De: 32" D: 54" TYPE OF CYCLONE OCEDURES: ccal integrity during pl REAM: ough the cyclone unde	CHES) See inst Dd: 22" Lb: 74.25" Lc: 84.5" S: 44.38" CONVEN ant outages as	TIONAL specified l	IF WET SPR/ LIQUID USED: FLOW RATE (GF MAKE UP RATE MAKE UP RATE HIGH EFF by the cyclone will	AY UTILIZED PM): (GPM): ICIENCY SIZE (MICRONS 0-1 1-10 10-25 25-50	DIAMETER C HOPPER AS VES LOUVERS? VES DTHEF PARTICLE SL WEIGHT %	PIRATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani manufacturer. DESCRIBE INCOMING AIR STF The material will be pulled thro separate the material from the	DIMENSIONS (IN H: 38" W: 25" De: 32" D: 54" TYPE OF CYCLONE OCEDURES: ical integrity during pl REAM: ough the cyclone unde air stream and the air	CHES) See inst Dd: 22" Lb: 74.25" Lc: 84.5" S: 44.38" CONVEN ant outages as r negative press will discharge	TIONAL specified I ssure. The to CD-RCC	IF WET SPR/ LIQUID USED: FLOW RATE (GF MAKE UP RATE MAKE UP RATE HIGH EFF by the cyclone will	AY UTILIZED PM): (GPM): ICIENCY SIZE (MICRONS 0-1 1-10 10-25 25-50 50-100	DIAMETER C HOPPER AS VES LOUVERS? VES DTHEF PARTICLE SL WEIGHT %	PIRATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani	DIMENSIONS (IN H: 38" W: 25" De: 32" D: 54" TYPE OF CYCLONE OCEDURES: ical integrity during pl REAM: ough the cyclone unde air stream and the air	CHES) See inst Dd: 22" Lb: 74.25" Lc: 84.5" S: 44.38" CONVEN ant outages as r negative press will discharge	TIONAL specified I ssure. The to CD-RCC	IF WET SPR/ LIQUID USED: FLOW RATE (GF MAKE UP RATE MAKE UP RATE HIGH EFF by the cyclone will	AY UTILIZED PM): (GPM): ICIENCY SIZE (MICRONS 0-1 1-10 10-25 25-50 50-100	DIAMETER C HOPPER AS VES LOUVERS? VES DTHEF PARTICLE SL WEIGHT %	PIRATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani manufacturer. DESCRIBE INCOMING AIR STF The material will be pulled thro separate the material from the DESCRIBE ANY MONITORING	DIMENSIONS (IN H: 38" W: 25" De: 32" D: 54" TYPE OF CYCLONE OCEDURES: ical integrity during pl REAM: ough the cyclone unde air stream and the air	CHES) See inst Dd: 22" Lb: 74.25" Lc: 84.5" S: 44.38" CONVEN ant outages as r negative press will discharge	TIONAL specified I ssure. The to CD-RCC	IF WET SPR/ LIQUID USED: FLOW RATE (GF MAKE UP RATE MAKE UP RATE HIGH EFF by the cyclone will	AY UTILIZED PM): (GPM): ICIENCY SIZE (MICRONS 0-1 1-10 10-25 25-50 50-100	DIAMETER C HOPPER AS VES LOUVERS? VES DTHEF PARTICLE SL WEIGHT %	PIRATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani manufacturer. DESCRIBE INCOMING AIR STF The material will be pulled thro separate the material from the DESCRIBE ANY MONITORING	DIMENSIONS (IN H: 38" W: 25" De: 32" D: 54" TYPE OF CYCLONE OCEDURES: ical integrity during pl REAM: ough the cyclone unde air stream and the air	CHES) See inst Dd: 22" Lb: 74.25" Lc: 84.5" S: 44.38" CONVEN ant outages as r negative press will discharge	TIONAL specified I ssure. The to CD-RCC	IF WET SPR/ LIQUID USED: FLOW RATE (GF MAKE UP RATE MAKE UP RATE HIGH EFF by the cyclone will	AY UTILIZED PM): (GPM): ICIENCY SIZE (MICRONS 0-1 1-10 10-25 25-50 50-100	DIAMETER C HOPPER AS VES LOUVERS? VES DTHEF PARTICLE SL WEIGHT %	PIRATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani manufacturer. DESCRIBE INCOMING AIR STF The material will be pulled thro separate the material from the	DIMENSIONS (IN H: 38" W: 25" De: 32" D: 54" TYPE OF CYCLONE OCEDURES: ical integrity during pl REAM: ough the cyclone unde air stream and the air	CHES) See inst Dd: 22" Lb: 74.25" Lc: 84.5" S: 44.38" CONVEN ant outages as r negative press will discharge	TIONAL specified I ssure. The to CD-RCC	IF WET SPR/ LIQUID USED: FLOW RATE (GF MAKE UP RATE MAKE UP RATE HIGH EFF by the cyclone will	AY UTILIZED PM): (GPM): ICIENCY SIZE (MICRONS 0-1 1-10 10-25 25-50 50-100	DIAMETER C HOPPER AS VES LOUVERS? VES DTHEF PARTICLE SL WEIGHT %	PIRATION SYSTEM?
WIDTH (INCHES): HEIGHT (INCHES): VELOCITY (FT/SEC.): NO. TRAYS: NO. BAFFLES: DESCRIBE MAINTENANCE PR Periodic inspection of mechani manufacturer. DESCRIBE INCOMING AIR STF The material will be pulled thro separate the material from the DESCRIBE ANY MONITORING	DIMENSIONS (IN H: 38" W: 25" De: 32" D: 54" TYPE OF CYCLONE OCEDURES: ical integrity during pl REAM: ough the cyclone unde air stream and the air	CHES) See inst Dd: 22" Lb: 74.25" Lc: 84.5" S: 44.38" CONVEN ant outages as r negative press will discharge	TIONAL specified I ssure. The to CD-RCC	IF WET SPR/ LIQUID USED: FLOW RATE (GF MAKE UP RATE MAKE UP RATE HIGH EFF by the cyclone will	AY UTILIZED PM): (GPM): ICIENCY SIZE (MICRONS 0-1 1-10 10-25 25-50 50-100	DIAMETER C HOPPER AS VES LOUVERS? VES DTHEF PARTICLE SL WEIGHT %	PIRATION SYSTEM?

Attach Additional Sheets As Necessary

FORM C8 CONTROL DEVICE (WET PARTICULATE SCRUBBER)

REVISED 09/22/16 NCDE	Q/Division of A	ir Quality	- Application	for Air	Permit to (Construc	ct/Operate		C8
CONTROL DEVICE ID NO: CD-WS-1	CONTROLS E	MISSION	S FROM WHI	CH FM	SSION SO) NO(S) [.] ES-CI	.R-1 thro	igh FS-CLR-6
EMISSION POINT ID NO(S): EP-9	POSITION IN				NO. 2		4 UNITS		
OPERATING SCENARIO:	I CONTONUN			.0.	110. 2	01	4 01110		
1OF1		P.E. SEA	L NEEDED (F	PFR 20	.0112)?	√ YES	3	NO	
DESCRIBE CONTROL SYSTEM:									
Exhaust from six (6) identical high efficiency cy	clones will be c	ontrolled	by a wet scru	bber (C	D-WS-1).				
** Emissions from CD-WS-1 will continue to the device will be referenced in conjunction with C						area (CD	-RCO-1). Thr	oughout t	he forms and text, the control
POLLUTANT(S) COLLECTED:			РМ		PM ₁₀		PM _{2.5}		
BEFORE CONTROL EMISSION RATE (LB/HR):									
CAPTURE EFFICIENCY:			~99.9	%	~99.9	%	~99.9	%	
CONTROL DEVICE EFFICIENCY:				%		%		%	
CORRESPONDING OVERALL EFFICIENCY:				%		%		%	
EFFICIENCY DETERMINATION CODE:									
TOTAL AFTER CONTROL EMISSION RATE (LE	3/HR):								
PRESSURE DROP (IN. H ₂ 0): <u>TBD</u>	MAX								
INLET TEMPERATURE (°F): <u>TBD</u>	MAX	OUTLET	TEMPERATU	JRE (°F	TBD	MIN	TBD	MAX	
INLET AIR FLOW RATE (ACFM): TBD		MOISTU	RE CONTEN	T: INLE	TTB	<u>D</u>	OUTLET	TBD	
THROAT VELOCITY (FT/SEC): TBD		THROAT	TYPE:		FIXED		VARIABLE		
TYPE OF SYSTEM: TBD		TYPE OF	F PACKING U	SED IF	ANY: <u>TBD</u> _	-			
ADDITIVE LIQUID SCRUBBING MEDIUM: TBD		PERCEN	IT RECIRCUL	ATED:	TBD				
MINIMUM LIQUID INJECTION RATE (GAL/MIN)	: TBD								
MAKE UP RATE (GAL/MIN): TBD FO	R ADDITIVE (G	AL/MIN):	TBD						
DESCRIBE MAINTENANCE PROCEDURES:							PARTICLE	SIZE DIS	TRIBUTION
					SIZ		WEIGHT %		CUMULATIVE
					(MICR	ONS)	OF TOTAL	-	%
DESCRIBE ANY MONITORING DEVICES, GAU	CES TEST DO				0- ⁻ 1-1				
DESCRIBE ANT MONITORING DEVICES, GAO	GES, TEST FO	RIS, EIC	•		1-1			_	
					25-				
					50-1				
					>1(00			
							TOTAL = 10	00	
ATTACH A DIAGRAM OF THE RELATIONSHIP				MISSIO		(5):			

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCDE	Q/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S		O: IES-DRYSI	HAVE, IES-DR	YSHAVE-1
Dry Shavings Handling					DEVICE ID NO		,	
OPERATING SCENARIO 1	OF	1				K) ID NO(S): 1	N/A	
DESCRIBE IN DETAILTHE EMISSION SO		CESS (ATTAC			- (/ - (- /	,	
For IES-DRYSHAVE, purchased dry shavir		•		•	eds material	via enclosed	conveyors to	a bucket
elevator that ultimately fills a silo. For IE	S-DRYSHAVE-	1, purchased	dry shavings	will be unloa	ded from tru	cks into a Dry	Shavings Sil	o (IES-DSS)
for storage. From there, the dry shavings					-		-	ansfer
points associated with dry shavings stora	ge and handli	ing will be par	rt of the Dry S	havings emis	ssion source l	D (IES-DRYSH	IAVE).	
	CE (CHECK A	ND COMPLE	TE APPROPF	RIATE FORM	B1-B9 ON T	HE FOLLOW	NG PAGES)	:
Coal,wood,oil, gas, other burner (Form	ו B1)	U Woodwo	orking (Form E	34)	Manuf	. of chemicals	coatings/ink	s (Form B7)
Int.combustion engine/generator (Forr	n B2)	Coating/	finishing/printi	ng (Form B5) 🗌 Incinei	ration (Form B	8)	
Liquid storage tanks (Form B3)		Storage	silos/bins (Fo	rm B6)	√ Other	(Form B9)		
START CONSTRUCTION DATE:			DATE MANU	JFACTURED				
2014			2014					
MANUFACTURER / MODEL NO.:							D 4 3 7 4 4 1 4	
			EXPECTED			IR/DAY <u>7</u>	DAY/WK	<u>52</u> WK/YF
		,			AP (SUBPA	,		
PERCENTAGE ANNUAL THROUGHPUT CRITERIA AII			MAR-MAY 2			SEP-NOV 25		
	VFOLLO							
					(DEE00E 0.0)	POTENTIAL		
		EMISSION	(AFTER CONT		`	TROLS / LIMITS)	(AFTER CONT	
		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	A \	See Emission	n Calculations	s in Appendix				
PARTICULATE MATTER <10 MICRONS (PM	107							
PARTICULATE MATTER<2.5 MICRONS (PI	M _{2.5})							
SULFUR DIOXIDE (SO2)								
	<u></u>							
VOLATILE ORGANIC COMPOUNDS (VO	C)							
LEAD								
OTHER							05	
HAZARDOUS A	AIR POLLU				ON FOR I			
					(DEE00E 0.0)	POTENTIAL		
	CAS NO.	EMISSION FACTOR	(AFTER CONT	,		TROLS / LIMITS)	(AFTER CONT	
HAZARDOUS AIR POLLUTANT	CAS NO.			tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
			n Calculations					
TOXIC AIR			ONS INFO	RMATION		SOURCE		
		JUUNUE				SOURCE		
		OF	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	ROLS / LIMI	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	EMISSION FACTOR	lb	/hr	lb/	dov	lb	hir
	CAS NU.		n Calculations			day	di	/yr
		See Emission	a carcuidtions	s in Appendix				
	1	<u> </u>						

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.

OMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOUR Attach Additional Sheets As Necessary

REVISED 09/22/16 NCDEQ/Division of Air Quality	y - Application f	or Air Permit to Construct/O	perate	B9
EMISSION SOURCE DESCRIPTION:		EMISSION SOURCE ID NO:	IES-DRYSHAVE, IES-	DRYSHAVE-1
Dry Shavings Handling		CONTROL DEVICE ID NO(S)		
OPERATING SCENARIO: OF		EMISSION POINT (STACK) I	D NO(S): N/A	
DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGR For IES-DRYSHAVE, purchased dry shavings will be unloaded fr elevator that ultimately fills a silo. For IES-DRYSHAVE-1, purcha for storage. From there, the dry shavings will be transferred to points associated with dry shavings storage and handling will b	om trucks into a ased dry shaving the Dry Shaving	gs will be unloaded from truck gs Hammermills (ES-DSHM-1	ks into a Dry Shaving and ES-DSHM-2). T	gs Silo (IES-DSS)
MATERIALS ENTERING PROCESS - CONTINUOUS PR	ROCESS	MAX. DESIGN	REQUESTE	D CAPACITY
ТҮРЕ	UNITS	CAPACITY (UNIT/HR)	LIMITATION	(UNIT/HR)
Dried Wood Materials	ODT/yr	781,255	N/A	
MATERIALS ENTERING PROCESS - BATCH OPER	ATION	MAX. DESIGN	REQUESTE	
TYPE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (L	
	ontro			
MAXIMUM DESIGN (BATCHES / HOUR):				
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/	YR):		
FUEL USED: N/A	TOTAL MAX	IMUM FIRING RATE (MILLION	N BTU/HR): N/A	
MAX. CAPACITY HOURLY FUEL USE: N/A		D CAPACITY ANNUAL FUEL		
COMMENTS:				

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/1 NCDE	Q/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	O: IES-DSS		
Dry Shavings Silo				CONTROL D	DEVICE ID NO	D(S): CD-DSS-	BF	
OPERATING SCENARIO1	OF	1		EMISSION F	OINT (STAC	K) ID NO(S): I	EP-10	
DESCRIBE IN DETAILTHE EMISSION S Stores dry shavings used in pellet produ		•		,	avings Bagho	ouse (CD-DSS-	BF).	
TYPE OF EMISSION SOUR	CE (CHECK	AND COMPLE	TE APPROF	RIATE FOR	M B1-B9 ON	THE FOLLOW	VING PAGES):
Coal,wood,oil, gas, other burner (For	m B1)	Woodwoo	rking (Form E	84)	Manuf	. of chemicals/	coatings/inks	(Form B7)
Int.combustion engine/generator (Fo	rm B2)	Coating/f	inishing/printi	ng (Form B5)	Inciner	ation (Form B	8)	
Liquid storage tanks (Form B3)		Storage s	silos/bins (For	rm B6)	Other	(Form B9)		
START CONSTRUCTION DATE: TBD			DATE MANU TBD	JFACTURED:				
MANUFACTURER / MODEL NO.: TBD					IIE· 24 ⊔			
	PS (SUBPAR		EXPECTED		IAP (SUBPAF	R/DAY <u>7</u> RTS?):	_DAT/WK _	<u>_52</u> WRVTR
PERCENTAGE ANNUAL THROUGHPU			MAR-MAY	25% JUN-/		SEP-NOV 2	5%	
CRITERIA AI	()						-	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	Calculations	s in Appendix	C			
PARTICULATE MATTER<10 MICRONS (F	PM ₁₀)							
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})							
SULFUR DIOXIDE (SO2)								
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (V	OC)							[
LEAD	· ·							
OTHER								
HAZARDOUS	AIR POLLU	JTANT EM	ISSIONS I	NFORMAT	TION FOR	THIS SOU	RCE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	Calculations	s in Appendix	C			
TOXIC AIR	POLLUTA	NT EMISS	IONS INFO	ORMATION	FOR THI	S SOURCE		
		OF EMISSION	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	FROLS / LIMI	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/	day	lb	/yr
		See Emission	Calculations	s in Appendix				
	1							
	1				1			
	1							
	1				1			
Attachments: (1) emissions calculations and s	upporting docu	mentation: (2) in	dicate all requi	ested state and	federal enforce	able permit limi	its (e.a. hours c	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.

MPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOUN Attach Additional Sheets As Necessary

FORM B6 EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16	NCDEQ/Divisio	n of Air Quality - App	licatio	n for Ai	r Permit to Co	onstruct/Oper	ate	B6
EMISSION SOURCE DESCR	IPTION:				EMISSION SC	URCE ID NO	: IES-DSS	
Dry Shavings Silo					CONTROL DE	VICE ID NO(S): CD-DSS-BF	
OPERATING SCENARIO:	1	OF1		_	EMISSION PC	NINT(STACK)	ID NO(S): EP-10	
DESCRIBE IN DETAIL THE P Stores dry shavings used in p			ontrolle	ed by th	e Dry Shaving	s Baghouse (C	CD-DSS-BF).	
MATERIAL STORED: Dry Sha	avinos			DENSI	TY OF MATER	RIAL (LB/FT3)	· TBD	
	CUBIC FEET:			TONS:				
	HEIGHT:	DIAMETER: TBD	(OR)	LENG		WIDTH:	HEIGHT:	
ANNUAL PRODUCT THRC		ACTUAL:	, ,		MAXIMUM DE			
PNEUMATICALLY FI		MECHANIC	ALLY F				FILLED FROM	
BLOWER		SCREW CONVEYO	R				CAR	
COMPRESSOR	1	BELT CONVEYOR					к	
OTHER: TBD		BUCKET ELEVATO	R			STOR	AGE PILE	
		OTHER:				✓ OTHE	R: Conveyor	
NO. FILL TUBES:								
MAXIMUM ACFM:								
MATERIAL IS UNLOADED TO	D:							
BY WHAT METHOD IS MATE								
MAXIMUM DESIGN UNLOAD	ING RATE OF MAT	ERIAL (TONS/HR): T	BD					
COMMENTS:								

FORM C1 CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 NCDEQ	Division of Air Quality	- Applicatio	on for A	Air Permit te	o Cons	truct/Oper	ate		C 1	1
CONTROL DEVICE ID NO: CD-DSS-BF	CONTROLS EM	SSIONS FR	OM WI	HICH EMIS	SION S	OURCE ID	NO(S)	: IES-DSS		
EMISSION POINT (STACK) ID NO(S): EP-10	POSITION IN SE	RIES OF CO	ONTRO	DLS		NO	. 1	OF 1	UNITS	
OPERATING SCENARIO):									
OF		P.E. SEA	L REQI	UIRED (PEF	R 2q .01	12)? 🗸	YES	[NO	
DESCRIBE CONTROL SYSTEM:										
The silo baghouse will control emissions from the silo baghouse will control emissions from the second se	ie dry shavings silo (IE	S-DSS).								
POLLUTANTS COLLECTED:		PM	_	PM ₁₀	_	PM _{2.5}	_		-	
BEFORE CONTROL EMISSION RATE (LB/HR):			-		-		-		-	
CAPTURE EFFICIENCY:		~99.9	%	~99.9	%	~99.9	%		%	
			_		_		-		-	
CONTROL DEVICE EFFICIENCY:			%		%		%		%	
			_		_		_		-	
CORRESPONDING OVERALL EFFICIENCY:			%		%		%		_%	
EFFICIENCY DETERMINATION CODE:			-		-		-		-	
TOTAL AFTER CONTROL EMISSION RATE (LB	/HR):	See Emiss	sion Cal	lculations in	n Appei	ıdix C				
			-				-	-	-	
PRESSURE DROP (IN H ₂ 0): MIN: MAX BULK PARTICLE DENSITY (LB/FT ³): TBD	: TBD GAUGE?	VES	MDED	∐ NO ATURE (°F)	• NAINI		MAX	FDD		
POLLUTANT LOADING RATE: 0.004 LB/HR	GR/FT ³			ERATURE (MAX			
				TING TEMP		/ 4	IVIAA			
INLET AIR FLOW RATE (ACFM): 3,600 NO. OF COMPARTMENTS: TBD NO. OF I	BAGS PER COMPART		FERA			TH OF BA		TDD		
NO. OF COMPARTMENTS. IBD NO. OF	BAGS FER CONFART				LEING	TH OF BA	G (IN.).	IBD		
			(ET ²).	TDD						
			: (FT ²):	TBD	DIAM	ETER OF I	BAG (IN	l.): TBD		
TOTAL FILTER SURFACE AREA (FT ²): TBD	AIR TO CLOTH	RATIO: TBD	: (FT ²):			_			EEL TED	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE		RATIO: TBD	: (FT ²):	TBD FILTER N		AL:	WOVE	EN 🗸	FELTED	_
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES	AIR TO CLOTH	RATIO: TBD	(FT ²):		IATERI	AL:		EN 🗸	BUTION	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE	AIR TO CLOTH	RATIO: TBD	(FT ²):		IATERI.	AL: PART	WOVE	EN 📝 SIZE DISTRI	BUTION CUMULATIVE	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW	AIR TO CLOTH	RATIO: TBD IVE DLLAPSE	(FT ²):		IATERI.	AL: PART SIZE CRONS)	WOVE	EN SIZE DISTRI EIGHT % F TOTAL	BUTION CUMULATIVE %	Ē
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER	AIR TO CLOTH	RATIO: TBD IVE DLLAPSE	: (FT ²):		IATERI.	AL: PART SIZE CRONS) 0-1	WOVE	EN SIZE DISTRI EIGHT % F TOTAL	BUTION CUMULATIVE	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER OTHER:	AIR TO CLOTH	RATIO: TBD IVE DLLAPSE	: (FT ²):		(MI	AL: PART SIZE CRONS) 0-1 1-10	WOVE	EN SIZE DISTRI EIGHT % F TOTAL	BUTION CUMULATIVE %	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER	AIR TO CLOTH	RATIO: TBD IVE DLLAPSE	: (FT ²):		(MI	AL: PART SIZE CRONS) 0-1 1-10 10-25	WOVE	EN SIZE DISTRI EIGHT % F TOTAL	BUTION CUMULATIVE %	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER OTHER: DESCRIBE INCOMING AIR STREAM:	AIR TO CLOTH	RATIO: TBD IVE DLLAPSE	: (FT ²):		(MI	AL: PAR SIZE CRONS) 0-1 1-10 10-25 25-50	WOVE	EN SIZE DISTRI EIGHT % F TOTAL	BUTION CUMULATIVE %	=
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER OTHER: DESCRIBE INCOMING AIR STREAM:	AIR TO CLOTH	RATIO: TBD IVE DLLAPSE	: (FT ²):		(MI	AL: PART SIZE CRONS) 0-1 1-10 10-25 25-50 50-100	WOVE	EN SIZE DISTRI EIGHT % F TOTAL	BUTION CUMULATIVE %	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER OTHER: DESCRIBE INCOMING AIR STREAM:	AIR TO CLOTH	RATIO: TBD IVE DLLAPSE	: (FT ²):		(MI	AL: PAR SIZE CRONS) 0-1 1-10 10-25 25-50	WOVE	EN SIZE DISTRI EIGHT % TOTAL Unk	BUTION CUMULATIVE % nown	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER OTHER: DESCRIBE INCOMING AIR STREAM:	AIR TO CLOTH	RATIO: TBD IVE DLLAPSE	(FT ²):		(MI	AL: PART SIZE CRONS) 0-1 1-10 10-25 25-50 50-100	WOVE	EN SIZE DISTRI EIGHT % TOTAL Unk	BUTION CUMULATIVE %	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER OTHER: DESCRIBE INCOMING AIR STREAM:	AIR TO CLOTH	RATIO: TBD IVE DLLAPSE	(FT ²):		(MI	AL: PART SIZE CRONS) 0-1 1-10 10-25 25-50 50-100	WOVE	EN SIZE DISTRI EIGHT % TOTAL Unk	BUTION CUMULATIVE % nown	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER OTHER: DESCRIBE INCOMING AIR STREAM:	AIR TO CLOTH	RATIO: TBD IVE DLLAPSE			(MI	AL: PART SIZE CRONS) 0-1 1-10 10-25 25-50 50-100	WOVE	EN SIZE DISTRI EIGHT % TOTAL Unk	BUTION CUMULATIVE % nown	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER OTHER: DESCRIBE INCOMING AIR STREAM:	AIR TO CLOTH	RATIO: TBD IVE DLLAPSE	: (FT ²):		(MI	AL: PART SIZE CRONS) 0-1 1-10 10-25 25-50 50-100	WOVE	EN SIZE DISTRI EIGHT % TOTAL Unk	BUTION CUMULATIVE % nown	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER OTHER: DESCRIBE INCOMING AIR STREAM: The air stream will contain wood dust particles.	AIR TO CLOTH	RATIO: TBD		FILTER M		AL: PART SIZE CRONS) 0-1 1-10 10-25 25-50 50-100 >100		EN J SIZE DISTRI EIGHT % TOTAL Unk TOTA	BUTION CUMULATIVE % nown L = 100	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER OTHER: DESCRIBE INCOMING AIR STREAM: The air stream will contain wood dust particles. ON A SEPARATE PAGE, ATTACH A DIAGRAM	AIR TO CLOTH	RATIO: TBD		FILTER M		AL: PART SIZE CRONS) 0-1 1-10 10-25 25-50 50-100 >100		EN J SIZE DISTRI EIGHT % TOTAL Unk TOTA	BUTION CUMULATIVE % nown L = 100	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER OTHER: DESCRIBE INCOMING AIR STREAM: The air stream will contain wood dust particles.	AIR TO CLOTH	RATIO: TBD		FILTER M		AL: PART SIZE CRONS) 0-1 1-10 10-25 25-50 50-100 >100		EN J SIZE DISTRI EIGHT % TOTAL Unk TOTA	BUTION CUMULATIVE % nown L = 100	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER OTHER: DESCRIBE INCOMING AIR STREAM: The air stream will contain wood dust particles. ON A SEPARATE PAGE, ATTACH A DIAGRAM	AIR TO CLOTH	RATIO: TBD		FILTER M		AL: PART SIZE CRONS) 0-1 1-10 10-25 25-50 50-100 >100		EN J SIZE DISTRI EIGHT % TOTAL Unk TOTA	BUTION CUMULATIVE % nown L = 100	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER OTHER: DESCRIBE INCOMING AIR STREAM: The air stream will contain wood dust particles. ON A SEPARATE PAGE, ATTACH A DIAGRAM	AIR TO CLOTH	RATIO: TBD		FILTER M		AL: PART SIZE CRONS) 0-1 1-10 10-25 25-50 50-100 >100		EN J SIZE DISTRI EIGHT % TOTAL Unk TOTA	BUTION CUMULATIVE % nown L = 100	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER OTHER: DESCRIBE INCOMING AIR STREAM: The air stream will contain wood dust particles. ON A SEPARATE PAGE, ATTACH A DIAGRAM	AIR TO CLOTH	RATIO: TBD		FILTER M		AL: PART SIZE CRONS) 0-1 1-10 10-25 25-50 50-100 >100		EN J SIZE DISTRI EIGHT % TOTAL Unk TOTA	BUTION CUMULATIVE % nown L = 100	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER OTHER: DESCRIBE INCOMING AIR STREAM: The air stream will contain wood dust particles. ON A SEPARATE PAGE, ATTACH A DIAGRAM	AIR TO CLOTH	RATIO: TBD		FILTER M		AL: PART SIZE CRONS) 0-1 1-10 10-25 25-50 50-100 >100		EN J SIZE DISTRI EIGHT % TOTAL Unk TOTA	BUTION CUMULATIVE % nown L = 100	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER OTHER: DESCRIBE INCOMING AIR STREAM: The air stream will contain wood dust particles. ON A SEPARATE PAGE, ATTACH A DIAGRAM	AIR TO CLOTH	RATIO: TBD		FILTER M		AL: PART SIZE CRONS) 0-1 1-10 10-25 25-50 50-100 >100		EN J SIZE DISTRI EIGHT % TOTAL Unk TOTA	BUTION CUMULATIVE % nown L = 100	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER OTHER: DESCRIBE INCOMING AIR STREAM: The air stream will contain wood dust particles. ON A SEPARATE PAGE, ATTACH A DIAGRAM	AIR TO CLOTH	RATIO: TBD		FILTER M		AL: PART SIZE CRONS) 0-1 1-10 10-25 25-50 50-100 >100		EN J SIZE DISTRI EIGHT % TOTAL Unk TOTA	BUTION CUMULATIVE % nown L = 100	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER OTHER: DESCRIBE INCOMING AIR STREAM: The air stream will contain wood dust particles. ON A SEPARATE PAGE, ATTACH A DIAGRAM	AIR TO CLOTH	RATIO: TBD		FILTER M		AL: PART SIZE CRONS) 0-1 1-10 10-25 25-50 50-100 >100		EN J SIZE DISTRI EIGHT % TOTAL Unk TOTA	BUTION CUMULATIVE % nown L = 100	
TOTAL FILTER SURFACE AREA (FT ²): TBD DRAFT TYPE: INDUCED/NEGATIVE DESCRIBE CLEANING PROCEDURES AIR PULSE REVERSE FLOW MECHANICAL/SHAKER OTHER: DESCRIBE INCOMING AIR STREAM: The air stream will contain wood dust particles.	AIR TO CLOTH	RATIO: TBD		FILTER M		AL: PART SIZE CRONS) 0-1 1-10 10-25 25-50 50-100 >100		EN J SIZE DISTRI EIGHT % TOTAL Unk TOTA	BUTION CUMULATIVE % nown L = 100	

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NC	DEQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В		
EMISSION SOURCE DESCRIPTION:				EMISSION S		O: ES-PMFS		-		
Pellet Mill Feed Silo				CONTROL	DEVICE ID NO	O(S): CD-PMFS	S-BV			
OPERATING SCENARIO1	OF	1		EMISSION F	POINT (STAC	K) ID NO(S): I	EP-11			
DESCRIBE IN DETAILTHE EMISSION	SOURCE PRO	CESS (ATTAC	H FLOW DI		,	, , ,				
A pellet press silo stores dried ground		•								
TYPE OF EMISSION SOU	IRCE (CHECK A		TE APPROP		B1-B9 ON T	HE FOLLOW	ING PAGES	:		
Coal,wood,oil, gas, other burner (Fo	•		rking (Form I			. of chemicals/				
Int.combustion engine/generator (Fe		\equiv	0 (ing (Form B5)		ration (Form B	-	, (i oini bi)		
Liquid storage tanks (Form B3)	onn BZ)		silos/bins (Fc	• • •		(Form B9)	0)			
START CONSTRUCTION DATE:		t eteraget		UFACTURED:		(
2013										
MANUFACTURER / MODEL NO.:										
Laidig 533			EXPECTED	OP. SCHEDU	JLE: 24 H	IR/DAY <u>7</u>	DAY/WK	52 WK/YR		
	NSPS (SUBPAR	TS?):			IAP (SUBPAR					
PERCENTAGE ANNUAL THROUGHPU		,	MAR-MAY	25% JUN-AU		SEP-NOV 259	26			
	AIR POLLUT						-			
		SOURCE OF		ED ACTUAL		POTENTIAL				
		EMISSION		ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)		ROLS / LIMITS)		
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr		
PARTICULATE MATTER (PM)				s in Appendix		10113/ yi	10/11	toris/yi		
PARTICULATE MATTER (1 M)	(DM)	See Emission						+		
PARTICULATE MATTER<2.5 MICRONS	10,							+		
				+				łł		
VOLATILE ORGANIC COMPOUNDS (VOC)			-				ł		
LEAD				-				ł		
OTHER										
HAZARDOUS	S AIR POLLU		ANT EMISSIONS INFORMATION FOR THIS SOU							
		SOURCE OF			POTENTIAL EMISSIONS					
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)		
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr		
		N/A								
TOXIC AI	R POLLUTA	NT EMISSI	ONS INFO	RMATION	FOR THIS	S SOURCE				
		OF	EXDEC			AFTER CONT				
		EMISSION		IED ACTUAL	LINISSIONS	AI TER CONT		TATIONS		
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lk	o/hr	lb/	/day	lb	o/yr		
		N/A								
					1					
Attachments: (1) emissions calculations and	supporting docum	entation: (2) indi	cate all reques	sted state and fe	ederal enforcea	ble 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.

MPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOUR Attach Additional Sheets As Necessary

FORM B6 EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16	NCDEQ/Divisior	n of Air Quality - App	olicatio	n for Air Permit to C	construct/Opera	ate	B6
EMISSION SOURCE DESCR	IPTION:			EMISSION S	OURCE ID NO:	ES-PMFS	
Pellet Mill Feed Silo					EVICE ID NO(S): CD-PMFS-BV	
OPERATING SCENARIO:	1	OF <u>1</u>		_ EMISSION P	OINT(STACK) II	D NO(S): EP-11	
DESCRIBE IN DETAIL THE P A pellet press silo stores drie			pellet p	resses.			
MATERIAL STORED: Pellet N	Mill Feed Material			DENSITY OF MATE	RIAL (LB/FT3):	40	
	CUBIC FEET:			TONS:		10	
	HEIGHT:	DIAMETER:	(OR)	LENGTH:	WIDTH:	HEIGHT:	
ANNUAL PRODUCT THRO		ACTUAL:			ESIGN CAPACI		
PNEUMATICALLY FI		MECHANIC	ALLY F			FILLED FROM	
BLOWER COMPRESSOR OTHER: NO. FILL TUBES: MAXIMUM ACFM:		SCREW CONVEYO BELT CONVEYOR BUCKET ELEVATO OTHER:					
MATERIAL IS UNLOADED TO		ROM SILO?					
MAXIMUM DESIGN FILLING	RATE OF MATERIA	L (TONS/HR): 105					
MAXIMUM DESIGN UNLOAD	ING RATE OF MAT	ERIAL (TONS/HR): 1	05				
COMMENTS:							

FORM C1 CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16	NCDEQ/Divis	ion of Air Quality -	Applicatio	n for A	ir Permit to	Const	truct/Oper	ate			C1
CONTROL DEVICE ID NO: CD-PMFS-BV		CONTROLS EMIS	SIONS FRO	N WF	HICH EMISS	SION S	OURCE ID	NO(S)	ES-PMFS		
EMISSION POINT (STACK) ID NO(S):	EP-11	POSITION IN SER	IES OF CC	NTRO	LS		NO.	1	OF 1	UNITS	
OPERATING SC	ENARIO:										
OF	1		P.E. SEAL	REQL	JIRED (PER	2q .01	12)? 🗸	YES	[NO	
DESCRIBE CONTROL SYSTEM: A bin vent filter is used to create a slight The bin vent is sized to offset the air disp					e bin vent c	ollects	dust from	the air	volume pre	sent in the s	silo.
POLLUTANTS COLLECTED:			РМ	_	PM ₁₀	_	PM _{2.5}				
BEFORE CONTROL EMISSION RATE (L	_B/HR):			-		-					
CAPTURE EFFICIENCY:			~99.9	%	~99.9	%	~99.9	%		%	
CONTROL DEVICE EFFICIENCY:				%		%		%		%	
CORRESPONDING OVERALL EFFICIEN	ICY:			%		%		%		%	
EFFICIENCY DETERMINATION CODE:				-		_					
TOTAL AFTER CONTROL EMISSION RA	ATE (LB/HR):		_	ion Cal	culations in	Apper	ndix C			-	
PRESSURE DROP (IN H ₂ 0): MIN:	MAX: 4"	GAUGE?	✓ YES		NO						
BULK PARTICLE DENSITY (LB/FT ³): 1.4					ATURE (°F):				Ambient		
POLLUTANT LOADING RATE: 0.004	LB/HR	✓ GR/FT ³			RATURE (°			MAX A	Ambient		
INLET AIR FLOW RATE (ACFM): 2,500				PERAT	ING TEMP	· · ·					
		PER COMPARTM					TH OF BA				
		ACE AREA PER CA		(FT ²):		DIAM	ETER OF E	BAG (IN	l.): 5.875		
TOTAL FILTER SURFACE AREA (FT ²): 3		AIR TO CLOTH RA									
DRAFT TYPE: INDUCED/NEGA	ATIVE 🔽	FORCED/POSITIV	Έ		FILTER M	ATERI		WOVE		FELTED	
DESCRIBE CLEANING PROCEDURES							PART		SIZE DISTRI	BUTION	
		SONIC					SIZE	WE	EIGHT %	CUMULA	ATIVE
REVERSE FLOW		SIMPLE BAG COL	LAPSE			(MI	CRONS)	OF	TOTAL	%	
MECHANICAL/SHAKER		RING BAG COLLA	PSE				0-1		Unk	nown	
OTHER:							1-10				
DESCRIBE INCOMING AIR STREAM: The air stream will contain wood dust pa	anticloc						10-25				
The an scream win contain wood dust pa	ai ticles.					:	25-50				
						5	60-100				
							>100				
									ΤΟΤΑ	L = 100	
ON A SEPARATE PAGE, ATTACH A DIA	GRAM SHOW	VING THE RELATION	ONSHIP OF	THE		DEVICE	E TO ITS E	MISSIC	ON SOURCE	E(S):	
COMMENTS:											

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/1 NCDE	Q/Division of	f Air Quality -	Application	for Air Permi	it to Constru	ct/Operate		В	
EMISSION SOURCE DESCRIPTION:				EMISSION S	SOURCE ID N	O: ES-PCHP			
Pellet Cooler HP Fines Relay System				CONTROL D	DEVICE ID NO	D(S): CD-PCHI	P-BF		
OPERATING SCENARIO	OF	1		EMISSION F	OINT (STAC	K) ID NO(S): I	EP-12		
DESCRIBE IN DETAILTHE EMISSION S Fine pellet material from the hammerm relay system which is controlled by a ba	ill pollution o ghouse.	control system	n and screeni	ng operation		-			
TYPE OF EMISSION SOUR Coal,wood,oil, gas, other burner (For Int.combustion engine/generator (For Liquid storage tanks (Form B3) START CONSTRUCTION DATE:	m B1)	Woodwo	rking (Form E finishing/printi silos/bins (Fo	34) ng (Form B5)	Manuf.	THE FOLLOW of chemicals/ ation (Form B (Form B9)	coatings/inks/		
MANUFACTURER / MODEL NO.: Aircon IS THIS SOURCE SUBJECT SIBJECT SI PERCENTAGE ANNUAL THROUGHPU CRITERIA AI	()	EB 25%	MAR-MAY	NESH 25% JUN-/	IAP (SUBPAF AUG 25%	SEP-NOV 2	5%	<u>52</u> WK/YR	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS		
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)	
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
PARTICULATE MATTER (PM)		See Emission	n Calculations	s in Appendix	C				
PARTICULATE MATTER<10 MICRONS (P	νM ₁₀)								
PARTICULATE MATTER<2.5 MICRONS (F	RTICULATE MATTER<2.5 MICRONS (PM _{2.5})								
SULFUR DIOXIDE (SO2)									
NITROGEN OXIDES (NOx)									
CARBON MONOXIDE (CO)									
VOLATILE ORGANIC COMPOUNDS (VO									
LEAD	50)								
OTHER									
-	AIR POLLU	JTANT EM	IISSIONS INFORMATION FOR THIS SOURCE						
		SOURCE OF	OF EXPECTED ACTUAL POTENTIAL EMISSIO						
	EMISSION (AFTER CONTROLS / LIMITS) (BEFORE CONTROLS / LIMITS)					FROLS / LIMITS)	S) (AFTER CONTROLS / LIMITS)		
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
		N/A		,		,			
		,							
								<u> </u>	
TOXIC AIR						S SOURCE			
	FULLUIA	NI ENIISS				S SOURCE	-		
		OF EMISSION	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	FROLS / LIMI	TATIONS	
TOXIC AIR POLLUTANT	CAS NO.	FACTOR N/A	lb	/hr	lb/	day	lb	/yr	
		1							
		1							
Attachments: (1) emissions calculations and s	upportina docu	mentation: (2) ir	ndicate all reque	ested state and	federal enforce	able permit limi	its (e.g. hours o	f 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.

MPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOUN Attach Additional Sheets As Necessary

FORM B6 EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16	NCDEQ/Division	of Air Quality - App	licatio	n for Air Permit to C	onstruct/Operate		B6
EMISSION SOURCE DESCR	IPTION:			EMISSION S	OURCE ID NO: ES-P	СНР	
Pellet Cooler HP Fines Relay S	System			CONTROL D	EVICE ID NO(S): CD	-PCHP-BF	
OPERATING SCENARIO:	1	OF1_		_ EMISSION P	OINT(STACK) ID NO	D(S): EP-12	
DESCRIBE IN DETAIL THE P Fine pellet material from the relay system which is control	hammermill polluti		ıd scree	ening operation is co	llected in the pellet	cooler high pressi	ıre fines
MATERIAL STORED: Fine Pe	llat Matarial						
				DENSITY OF MATE	RIAL (LB/F13): 40		
	CUBIC FEET: 2,200 HEIGHT:	DIAMETER: 12	(OR)	TONS: LENGTH:	WIDTH: HE	EIGHT:	
ANNUAL PRODUCT THRO		ACTUAL:	(01)		ESIGN CAPACITY: (
PNEUMATICALLY FI	· · · · ·	MECHANIC	ALLY F		1		
BLOWER		SCREW CONVEYO					
		BELT CONVEYOR					
OTHER:		BUCKET ELEVATO	२			PILE	
		OTHER:			OTHER: C		
NO. FILL TUBES:						5	
MAXIMUM ACFM:							
MATERIAL IS UNLOADED TO		ROM SILO?					
MAXIMUM DESIGN FILLING	RATE OF MATERIA	L (TONS/HR): TBD					
MAXIMUM DESIGN UNLOAD	ING RATE OF MATE	ERIAL (TONS/HR): T	BD				
COMMENTS:							

FORM C1 CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 NCDEQ/Divi	sion of Air Quality -	Applicatio	n for Ai	r Permit to	Construct/O	oerate		C1
CONTROL DEVICE ID NO: CD-PCHP-BF	CONTROLS EMIS	SIONS FRO	DM WH	ICH EMISS	SION SOURCE	ID NO	(S): ES-PCHP	•
EMISSION POINT (STACK) ID NO(S): EP-12	POSITION IN SER	IES OF CC	NTROL	S	١	10.	1 OF 1	UNITS
OPERATING SCENARIO:								
OF		P.E. SEAL	. REQUI	IRED (PER	2q .0112)?	√ YE	s	NO
DESCRIBE CONTROL SYSTEM:		•						
A baghouse is used to create a slight negative pressu in the silo. The baghouse is sized to offset the air dis					ie baghouse co	llects d	lust from the a	ir volume present
				DM	DM			
POLLUTANTS COLLECTED:		PM	- ·	PM ₁₀	PM ₂	5		-
BEFORE CONTROL EMISSION RATE (LB/HR):								-
CAPTURE EFFICIENCY:		~99.9	%	~99.9	% ~99.	9_%		%
CONTROL DEVICE EFFICIENCY:			%		%	%		%
CORRESPONDING OVERALL EFFICIENCY:			%		%	%		%
EFFICIENCY DETERMINATION CODE:								-
TOTAL AFTER CONTROL EMISSION RATE (LB/HR)		_	ion Calc		Appendix C			-
PRESSURE DROP (IN H ₂ 0): MIN: MAX: TB	D GAUGE?	✓ YES	L					
BULK PARTICLE DENSITY (LB/FT ³): TBD				TURE (°F):			X TBD	
POLLUTANT LOADING RATE: 0.004 LB/HR	GR/FT ³			RATURE (°		MA	X TBD	
INLET AIR FLOW RATE (ACFM): 3,600			PERATI	ING TEMP				
	S PER COMPARTM		<u>,</u>		LENGTH OF			
	FACE AREA PER CA		(FT ²): 1	ГBD	DIAMETER C	F BAG	(IN.): TBD	
TOTAL FILTER SURFACE AREA (FT ²): TBD	AIR TO CLOTH RA							
DRAFT TYPE: 🔄 INDUCED/NEGATIVE	J FORCED/POSITIV	/E		FILTER M		<u> </u>		FELTED
DESCRIBE CLEANING PROCEDURES					P/	RTICL	E SIZE DISTRI	BUTION
	SONIC				SIZE		WEIGHT %	CUMULATIVE
	SIMPLE BAG COL	LAPSE			(MICRONS)	OF TOTAL	%
MECHANICAL/SHAKER	RING BAG COLLA	PSE			0-1		Unk	nown
✓ OTHER:					1-10			
DESCRIBE INCOMING AIR STREAM: The air stream will contain wood dust particles. Lai	rger narticles will be	removed b	w the u	nstream	10-25			
cyclone.	ger pår deles mil se		, y une u	potroum	25-50			
					50-100			
					>100			
							TOTA	L = 100
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHC	WING THE RELATION	ONSHIP OF	THE C	ONTROL	DEVICE TO IT:	SEMIS	SION SOURCE	E(S):
COMMENTS:		5.						. /

SPECIFIC EMISSIC	ON SOUR		RMATIO	- N (REQU		R ALL S	OURCE	S)		
	EQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В		
EMISSION SOURCE DESCRIPTION: Finished Product Handling, Pellet Load	out Bins, Pelle	et Loadout		EMISSION SOURCE ID NO: ES-FPH, ES-PB-1 through ES-PB-12, ES-PL-1, ES-PL-2						
	05					D(S): CD-FPH-				
OPERATING SCENARIO <u>1</u>					POINT (STAC	K) ID NO(S): I	EP-13			
DESCRIBE IN DETAILTHE EMISSION Pelletizing product is conveyed to pellet					(FS.PI.1 and	FS-PI-2) Fn	nissions fron	s the Pellet		
Loadout Bins are controlled by a bagfilt covered shoot that automatically teleso	ter (CD-FPH-B copes upward	F). Pellet Load during the loa	dout is accom idout process	plished by gr s to maintain	avity feed of constant con	the pellets in tact with the p	to trucks thre product as it i	ough a is loaded to		
prevent PM emissions. Although emiss been removed in the pellet coolers, a sl		-		0						
negative pressure is produced via an ir	0 0 1				0	1		0		
press silo. Trucks are also covered im				ie sugniter til			, our round	or the perior		
TYPE OF EMISSION SOUR	CE (CHECK A	AND COMPLE	TE APPROP	RIATE FORM	1 B1-B9 ON 1	HE FOLLOW	ING PAGES):		
Coal,wood,oil, gas, other burner (Fo	rm B1)	Woodwo	orking (Form I	B4)	Manuf	. of chemicals	/coatings/inks	s (Form B7)		
Int.combustion engine/generator (Fo	rm B2)	Coating/	finishing/print	ing (Form B5)	Incine	ration (Form B	88)			
Liquid storage tanks (Form B3)		Storage	silos/bins (Fo	-	Ŷ	(Form B9)				
START CONSTRUCTION DATE: 2013			DATE MANU	JFACTURED:						
MANUFACTURER / MODEL NO.:										
Agra 1200 Pellet Storage			EXPECTED			R/DAY <u>7</u>	DAY/WK _	<u>52</u> WK/YF		
	SPS (SUBPAF	,			AP (SUBPAR	· ·				
PERCENTAGE ANNUAL THROUGHPU	、 <i>)</i>		MAR-MAY	-	AUG 25%	SEP-NOV 2				
CRITERIA A	IR POLLUI		-							
		SOURCE OF	-	D ACTUAL		POTENTIAL				
	EMISSION		ROLS / LIMITS)		ROLS / LIMITS)	(AFTER CONTI				
		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr		
PARTICULATE MATTER (PM)		See Emission	n Calculation	s in Appendix	с Г					
PARTICULATE MATTER <10 MICRONS (,									
PARTICULATE MATTER<2.5 MICRONS	(PM _{2.5})									
CARBON MONOXIDE (CO)										
VOLATILE ORGANIC COMPOUNDS (V	00)									
OTHER										
HAZARDOUS										
HAZARDOUS										
		SOURCE OF	-			POTENTIAL				
HAZARDOUS AIR POLLUTANT	CAS NO.	EMISSION FACTOR	(AFTER CONT	ROLS / LIMITS)		ROLS / LIMITS)	(AFTER CONTI	,		
HAZARDOUS AIR FOLLUTANT	CAS NO.		ID/TII	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr		
	-	N/A								
	-									
	-									
TOXIC AIR		NT EMISSI	IONS INFO	RMATION	FOR THIS	S SOURCE				
		T SCOUCE	I							
		OF EMISSION	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	ROLS / LIMI	TATIONS		
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/	day	lb	/yr		
		N/A				,		,		
Attachments: (1) emissions calculations and s	upporting docum	entation; (2) indi	cate all reques	ted state and fe	deral enforceab	le permit limits ((e.g. hours of o	peration,		
emission rates) and describe how these are m										

FORM R

MPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOUR Attach Additional Sheets As Necessary

REVISED 09/22/16	NCDEQ/Divi	ision of Air C	Quality - Application	for Air Permit to Construct/O	perate	B9
EMISSION SOURCE DESCRIP				EMISSION SOURCE ID NO:		
Finished Product Handling				CONTROL DEVICE ID NO(S		
OPERATING SCENARIO:	1	OF	1	EMISSION POINT (STACK)	D NO(S): EP-13	
DESCRIBE IN DETAIL THE PR Collection of transfer points, po						
MATERIALS ENTERING	G PROCESS .		US PROCESS	MAX. DESIGN	REQUESTE	
	TYPE	CONTINUO		CAPACITY	LIMITATION	
Wood Pellets			ODT/yr	781,255	N/A	
wood i chets			001/91	701,233	МЛА	
MATERIALS ENTERI	NG PROCESS	6 - BATCH (PERATION	MAX. DESIGN	REQUESTE	O CAPACITY
1	TYPE		UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (L	INIT/BATCH)
MAXIMUM DESIGN (BATCHES	3 / HOUR):					
REQUESTED LIMITATION (BA	TCHES / HOU	IR):	(BATCHES/	YR):		
FUEL USED: N/A			TOTAL MAX	(IMUM FIRING RATE (MILLIO	N BTU/HR): N/A	
MAX. CAPACITY HOURLY FUE	EL USE: N/A		REQUESTE	D CAPACITY ANNUAL FUEL	USE: N/A	
COMMENTS:						

FORM B6 EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16 NCDEQ/D	vivision of Air Quality - App	olication fo	r Air Permit to Co	onstruct/Operate	B6
EMISSION SOURCE DESCRIPTION:			EMISSION SC	OURCE ID NO: ES-PB-1 through	ES-PB-12
Pellet Loadout Bins			CONTROL DE	EVICE ID NO(S): CD-FPH-BF	
OPERATING SCENARIO:	_1OF1		EMISSION PO	DINT(STACK) ID NO(S): EP-13	
DESCRIBE IN DETAIL THE PROCESS (AT Pellet Loadout Bins are used to store pelle areas.		then loade	d from the bins in	to trucks/trains in one of two p	ellet loadout
MATERIAL STORED: Pellet Product		DE	NSITY OF MATER	RIAL (LB/FT3): 40	
CAPACITY CUBIC FEET	: 2,200	то	NS:		
DIMENSIONS (FEET) HEIGHT:	DIAMETER: 12	(OR) _{LE}	NGTH:	WIDTH: HEIGHT:	
ANNUAL PRODUCT THROUGHPUT (TO	ACTUAL:		MAXIMUM DE	SIGN CAPACIT' 781255 ODT/y	/r
PNEUMATICALLY FILLED	MECHANICA	ALLY FILL	ED	FILLED FROM	l
BLOWER		R			
	BELT CONVEYOR				
OTHER:		R			
	OTHER:			✓ OTHER: Conveyor	
NO. FILL TUBES:					
MAXIMUM ACFM: 750 each					
MATERIAL IS UNLOADED TO:					
BY WHAT METHOD IS MATERIAL UNLOA	DED FROM SILO?				
MAXIMUM DESIGN FILLING RATE OF MA	TERIAL (TONS/HR): 105				
MAXIMUM DESIGN UNLOADING RATE O	F MATERIAL (TONS/HR): 1	05			
COMMENTS:					

REVISED 09/22/16	NCDEQ/[Division of Air	Quality - Ap	plication f	or Air Permit to Construct/O	perate	B9
EMISSION SOURCE DESCRI					EMISSION SOURCE ID NO:		
Pellet Loadout 1 and 2					CONTROL DEVICE ID NO(S		
OPERATING SCENARIO:	1	OF	1		EMISSION POINT (STACK) I	D NO(S): EP-13	
DESCRIBE IN DETAIL THE PF Final product is loaded into tr							
MATERIALS ENTERIN	G PROCES	S - CONTINU		SS	MAX. DESIGN	REQUESTED	CAPACITY
	TYPE			UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Wood Pellets				ODT/yr	781,255	N/A	
MATERIALS ENTER	ING PROCE	SS - BATCH	OPERATION	1	MAX. DESIGN	REQUESTED	CAPACITY
	TYPE			UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (U	NIT/BATCH)
MAXIMUM DESIGN (BATCHE			(5	ATOUE0 1			
REQUESTED LIMITATION (BA	ATCHES / H	OUR):		ATCHES/\			
FUEL USED: N/A					IMUM FIRING RATE (MILLION		
MAX. CAPACITY HOURLY FU COMMENTS:	EL USE: N/	A	R	QUESTE	D CAPACITY ANNUAL FUEL	USE: N/A	

FORM C1 CONTROL DEVICE (FABRIC FILTER)

CONTROL DEVICE ID NO: CD-FPH-BP PB-12, ES-PL-1 and ES-PL-2 PD-12, ES-PL-1,
OPERATING SCENARIO:
DESCRIBE CONTROL SYSTEM:
The bag filter will be utilized to control PM emissions from the finished product handling conveyors and screens, as well as the pellet loadout operation consisting of loading finished product from the Pellet Loadout Bins into trucks/trains. POLLUTANTS COLLECTED: PM PM_10 PM_25 SEFORE CONTROL EMISSION RATE (LB/HR):
SEFORE CONTROL EMISSION RATE (LB/HR):
CAPTURE EFFICIENCY: -99.9 % -99.9 % -99.9 % -99.9 %
CONTROL DEVICE EFFICIENCY: % % % % % CORRESPONDING OVERALL EFFICIENCY: % % % % % CORRESPONDING OVERALL EFFICIENCY: % % % % % EFFICIENCY DETERMINATION CODE:
CORRESPONDING OVERALL EFFICIENCY: % % % EFFICIENCY DETERMINATION CODE:
EFFICIENCY DETERMINATION CODE: TOTAL AFTER CONTROL EMISSION RATE (LB/HR): See Emission Calculations in Appendix C PRESSURE DROP (IN H ₂ 0): MIN: MAX: 6" GAUGE? Y ES NO BULK PARTICLE DENSITY (LB/FT ³): 1.43E-05 INLET TEMPERATURE (°F): MIN MAX 120 POLLUTANT LOADING RATE: 0.004 LB/HR GR/FT ³ OUTLET TEMPERATURE (°F): MIN MAX 100 NLET AIR FLOW RATE (ACFM): 35,500 FILTER OPERATING TEMP (°F): N/A NO NO NO. OF COMPARTMENTS: 1 NO. OF BAGS PER COMPARTMENT: 1 LENGTH OF BAG (IN.): 144 NO NO. OF CARTRIDGES: FILTER SURFACE AREA PER CARTRIDGE (FT ²): DIAMETER OF BAG (IN.): 5.75 TOTAL FILTER SURFACE AREA (FT ²): 4,842 AIR TO CLOTH RATIO: 7.30 DRAFT TYPE: INDUCED/NEGATIVE FORCED/POSITIVE FILTER MATERIAL: WOVEN FELTED DESCRIBE CLEANING PROCEDURES SONIC SIZE WEIGHT % CUMULATIVE MECHANICAL/SHAKER SIMPLE BAG COLLAPSE 0.1 WINLANDA OTHER: 0.1-10 Unknown 1-10 NO
TOTAL AFTER CONTROL EMISSION RATE (LB/HR): See Emission Calculations in Appendix C PRESSURE DROP (IN H₂0): MIN: MAX: 6" GAUGE? YES NO BULK PARTICLE DENSITY (LB/FT ³): 1.43E-05 INLET TEMPERATURE (°F): MIN MAX 120 POLLUTANT LOADING RATE: 0.004 LB/HR GR/FT ³ OUTLET TEMPERATURE (°F): MIN MAX 100 POLLUTANT LOADING RATE: 0.004 LB/HR GR/FT ³ OUTLET TEMPERATURE (°F): N/A MAX 100 NLET AIR FLOW RATE (ACFM): 35,500 FILTER OPERATING TEMP (°F): N/A MAX 100 NO. OF COMPARTMENTS: 1 NO. OF BAGS PER COMPARTMENT: 1 LENGTH OF BAG (IN.): 144 NO. OF CARTRIDGES: FILTER SURFACE AREA PER CARTRIDGE (FT ²): DIAMETER OF BAG (IN.): 5.75 TOTAL FILTER SURFACE AREA (FT ²): 4,842 AIR TO CLOTH RATIO: 7.30 DRAFT TYPE: INDUCED/NEGATIVE FORCED/POSITIVE FILTER MATERIAL: WOVEN FELTED DESCRIBE CLEANING PROCEDURES SONIC SIZE WEIGHT % CUMULATIVE AIR PULSE SONIC SIZE WEIGHT % CUMULATIVE AIR PULSE SONIC SIZE WEIGHT % CUMULATIVE MECHANICAL/SHAKER RING BAG COLLAPSE 0-1 Unknown
PRESSURE DROP (IN H₂0): MIN: MAX: 6" GAUGE? ✓ YES NO BULK PARTICLE DENSITY (LB/FT ³): 1.43E-05 INLET TEMPERATURE (°F): MIN MAX 120 POLLUTANT LOADING RATE: 0.004 LB/HR ✓ GR/FT ³ OUTLET TEMPERATURE (°FMIN MAX 100 NLET AIR FLOW RATE (ACFM): 35,500 FILTER OPERATING TEMP (°F): N/A NO. OF COMPARTMENTS: 1 NO. OF BAGS PER COMPARTMENT: 1 LENGTH OF BAG (IN.): 144 NO. OF CARTRIDGES: FILTER SURFACE AREA PER CARTRIDGE (FT ²): DIAMETER OF BAG (IN.): 5.75 TOTAL FILTER SURFACE AREA (FT ²): 4,842 AIR TO CLOTH RATIO: 7.30 DRAFT TYPE: INDUCED/NEGATIVE ✓ FORCED/POSITIVE FILTER MATERIAL: WOVEN ✓ FELTED DESCRIBE CLEANING PROCEDURES FORCED/POSITIVE FILTER MATERIAL: WOVEN ✓ FELTED AIR PULSE SONIC SIZE WEIGHT % CUMULATIVE MECHANICAL/SHAKER RING BAG COLLAPSE 0-1 UNknown
BULK PARTICLE DENSITY (LB/FT ³): 1.43E-05 INLET TEMPERATURE (°F): MIN MAX 120 POLLUTANT LOADING RATE: 0.004 LB/HR GR/FT ³ OUTLET TEMPERATURE (°F): MIN MAX 100 NLET AIR FLOW RATE (ACFM): 35,500 FILTER OPERATING TEMP (°F): N/A MAX 100 NO. OF COMPARTMENTS: 1 NO. OF BAGS PER COMPARTMENT: 1 LENGTH OF BAG (IN.): 144 NO. OF CARTRIDGES: FILTER SURFACE AREA PER CARTRIDGE (FT ²): DIAMETER OF BAG (IN.): 5.75 TOTAL FILTER SURFACE AREA (FT ²): 4,842 AIR TO CLOTH RATIO: 7.30 DIAMETER OF BAG (IN.): 5.75 DRAFT TYPE: INDUCED/NEGATIVE FORCED/POSITIVE FILTER MATERIAL: WOVEN FELTED DESCRIBE CLEANING PROCEDURES SONIC SIZE WEIGHT % CUMULATIVE (MICRONS) OF TOTAL % MECHANICAL/SHAKER RING BAG COLLAPSE 0-1 Unknown % 1-10 1-10 1
POLLUTANT LOADING RATE: 0.004 ☐ LB/HR ☑ GR/FT³ OUTLET TEMPERATURE (°FMIN MAX 100 NLET AIR FLOW RATE (ACFM): 35,500 FILTER OPERATING TEMP (°F): N/A NO. OF COMPARTMENTS: 1 NO. OF BAGS PER COMPARTMENT: 1 LENGTH OF BAG (IN.): 144 NO. OF CARTRIDGES: FILTER SURFACE AREA PER CARTRIDGE (FT²): DIAMETER OF BAG (IN.): 5.75 TOTAL FILTER SURFACE AREA (FT²): 4,842 AIR TO CLOTH RATIO: 7.30 DIAMETER OF BAG (IN.): 5.75 DRAFT TYPE: INDUCED/NEGATIVE FORCED/POSITIVE FILTER MATERIAL: WOVEN FELTED DESCRIBE CLEANING PROCEDURES SONIC SIZE WEIGHT % CUMULATIVE (MICRONS) OF TOTAL % MECHANICAL/SHAKER RING BAG COLLAPSE 0-1 Unknown %
NLET AIR FLOW RATE (ACFM): 35,500 FILTER OPERATING TEMP (°F): N/A NO. OF COMPARTMENTS: 1 NO. OF BAGS PER COMPARTMENT: 1 LENGTH OF BAG (IN.): 144 NO. OF CARTRIDGES: FILTER SURFACE AREA PER CARTRIDGE (FT ²): DIAMETER OF BAG (IN.): 5.75 TOTAL FILTER SURFACE AREA (FT ²): 4,842 AIR TO CLOTH RATIO: 7.30 DIAMETER OF BAG (IN.): 5.75 DRAFT TYPE: INDUCED/NEGATIVE FORCED/POSITIVE FILTER MATERIAL: WOVEN FELTED DESCRIBE CLEANING PROCEDURES SONIC SIZE WEIGHT % CUMULATIVE AIR PULSE SONIC SIZE WEIGHT % CUMULATIVE MECHANICAL/SHAKER RING BAG COLLAPSE 0-1 Winknown OTHER: 1-10 1-10 1-10
NO. OF COMPARTMENTS: 1 NO. OF BAGS PER COMPARTMENT: 1 LENGTH OF BAG (IN.): 144 NO. OF CARTRIDGES: FILTER SURFACE AREA PER CARTRIDGE (FT ²): DIAMETER OF BAG (IN.): 5.75 TOTAL FILTER SURFACE AREA (FT ²): 4,842 AIR TO CLOTH RATIO: 7.30 DIAMETER OF BAG (IN.): 5.75 DRAFT TYPE: INDUCED/NEGATIVE FORCED/POSITIVE FILTER MATERIAL: WOVEN ✓ FELTED DESCRIBE CLEANING PROCEDURES PARTICLE SIZE DISTRIBUTION SIZE UMULATIVE ✓ REVERSE FLOW SIMPLE BAG COLLAPSE SIZE WEIGHT % CUMULATIVE MECHANICAL/SHAKER RING BAG COLLAPSE 0-1 Unknown OTHER: I-10 III III
NO. OF CARTRIDGES: FILTER SURFACE AREA PER CARTRIDGE (FT ²): DIAMETER OF BAG (IN.): 5.75 TOTAL FILTER SURFACE AREA (FT ²): 4,842 AIR TO CLOTH RATIO: 7.30 INDUCED/NEGATIVE FILTER MATERIAL: WOVEN FELTED DRAFT TYPE: INDUCED/NEGATIVE FORCED/POSITIVE FILTER MATERIAL: WOVEN FELTED DESCRIBE CLEANING PROCEDURES SONIC SIZE WEIGHT % CUMULATIVE AIR PULSE SONIC SIZE WEIGHT % CUMULATIVE MECHANICAL/SHAKER RING BAG COLLAPSE 0-1 Unknown OTHER: 1-10 1-10 International for the formation for the f
TOTAL FILTER SURFACE AREA (FT ²): 4,842 AIR TO CLOTH RATIO: 7.30 DRAFT TYPE: INDUCED/NEGATIVE FORCED/POSITIVE FILTER MATERIAL: WOVEN FELTED DESCRIBE CLEANING PROCEDURES PARTICLE SIZE DISTRIBUTION AIR PULSE SONIC SIZE WEIGHT % CUMULATIVE REVERSE FLOW SIMPLE BAG COLLAPSE 0-1 Unknown OTHER: T-10 1-10 1-10
DRAFT TYPE: INDUCED/NEGATIVE FORCED/POSITIVE FILTER MATERIAL: WOVEN ✓ FELTED DESCRIBE CLEANING PROCEDURES AIR PULSE SONIC SIZE VEIGHT % CUMULATIVE ✓ REVERSE FLOW SIMPLE BAG COLLAPSE 0-1 WIRNown Ø OTHER: 1-10 1-10
DESCRIBE CLEANING PROCEDURES AIR PULSE SONIC REVERSE FLOW SIMPLE BAG COLLAPSE MECHANICAL/SHAKER RING BAG COLLAPSE OTHER: 1-10
AIR PULSE SONIC SIZE WEIGHT % CUMULATIVE REVERSE FLOW SIMPLE BAG COLLAPSE (MICRONS) OF TOTAL % MECHANICAL/SHAKER RING BAG COLLAPSE 0-1 Unknown OTHER: 1-10 1-10
REVERSE FLOW SIMPLE BAG COLLAPSE (MICRONS) OF TOTAL % MECHANICAL/SHAKER RING BAG COLLAPSE 0-1 Unknown OTHER: 1-10 1-10
MECHANICAL/SHAKER RING BAG COLLAPSE 0-1 Unknown OTHER: 1-10 1-10
OTHER: 1-10
DESCRIBE INCOMING AIR STREAM: 10-25
DESCRIBE INCOMING AIR STREAM: 10-25 The air stream will contain wood dust particles. 25-50
50-100
>100
TOTAL = 100
101AL = 100
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S): COMMENTS:
JOMMENTS:

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/1 NCDE	NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate							В	
EMISSION SOURCE DESCRIPTION:	IISSION SOURCE DESCRIPTION: EMISSION SOURCE ID NO: IES-ADD								
Additive Handling and Storage				CONTROL D	DEVICE ID NO	D(S): CD-ADD	-BF		
OPERATING SCENARIO1	OF	1		EMISSION F	OINT (STAC	K) ID NO(S): I	EP-14		
DESCRIBE IN DETAILTHE EMISSION	SOURCE PRO	DCESS (ATTA	CH FLOW D	IAGRAM):	,	, , ,			
Bulk additive material will be delivered		•			silo. The add	litive will the	n be conveye	d via screw	
conveyor from the storage silo to the m	illed fiber cor	veyor which	transfers mil	led wood to t	he Pellet Pres	sses. Emissio	ns from addit	tive handling	
are controlled by a baghouse.									
TYPE OF EMISSION SOUR	CE (CHECK	AND COMPLE	ETE APPROP	RIATE FORM	A B1-B9 ON	THE FOLLOW	VING PAGES):	
Coal,wood,oil, gas, other burner (For	m B1)	Woodwo	rking (Form B	34)	Manuf	of chemicals	/coatings/inks	(Form B7)	
Int.combustion engine/generator (Fo	rm B2)	Coating/f	inishina/printi	ng (Form B5)		ation (Form B	.8)	, ,	
Liquid storage tanks (Form B3)	,		silos/bins (For			(Form B9)	-,		
START CONSTRUCTION DATE:				JFACTURED:		. ,			
TBD			TBD						
MANUFACTURER / MODEL NO.:									
TBD			EXPECTED	OP. SCHEDL	JLE: <u>24</u> H	R/DAY <u>7</u>	_ DAY/WK _	<u>52</u> WK/YR	
IS THIS SOURCE SUBJECT	PS (SUBPAR	TS?):		NESH	IAP (SUBPAF	RTS?):			
PERCENTAGE ANNUAL THROUGHPU						SEP-NOV 2			
CRITERIA AI	R POLLUT	ANT EMIS	SIONS INI	FORMATIO	ON FOR TI	HIS SOUR	CE		
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS		
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)	
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
PARTICULATE MATTER (PM)		See Emission	n Calculations	s in Appendix	C				
PARTICULATE MATTER<10 MICRONS (F	PM ₁₀)								
PARTICULATE MATTER<2.5 MICRONS (PM _{2.5})								
SULFUR DIOXIDE (SO2)									
NITROGEN OXIDES (NOx)									
CARBON MONOXIDE (CO)									
VOLATILE ORGANIC COMPOUNDS (V	OC)								
LEAD									
OTHER									
HAZARDOUS	AIR POLLU	JTANT EM	ISSIONS I	NFORMAT	TION FOR	ON FOR THIS SOURCE			
		SOURCE OF				POTENTIAL EMISSIONS			
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)	
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
		See Emission	n Calculations	s in Appendix	С				
TOXIC AIR	POLLUTA	NT EMISS	IONS INFO	ORMATION	I FOR THI	S SOURCE	Ξ	-	
		OF	FYPECT		EMISSIONS	AFTER CONT			
		EMISSION		LDACIOAL				TATIONS	
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/	day	lb	/yr	
		See Emission	n Calculations	s in Appendix	C				
Attachments: (1) emissions calculations and s	upporting docu	mentation; (2) ir	ndicate all reque	ested state and	federal enforce	able permit limi	its (e.g. hours c	f 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.

MPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOUN Attach Additional Sheets As Necessary

FORM B6 EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16	NCDEQ/Divisio	on of Air Quality - App	licatio	n for Air Perm	it to Const	ruct/Operate		B6
EMISSION SOURCE DESCR	RIPTION:			EMISS	ION SOUR	CE ID NO: IES	-ADD	
Additive Handling and Stora	ge			CONT	ROL DEVIC	E ID NO(S): C	D-ADD-BF	
OPERATING SCENARIO:	1	OF1		_ EMISS	ION POINT	(STACK) ID N	O(S): EP-14	
DESCRIBE IN DETAIL THE F Bulk additive material will b conveyor from the storage si are controlled by a baghouse	e delivered by truc ilo to the milled fibe	k and pneumatically u						
MATERIAL STORED: Additiv	ve			DENSITY OF	MATERIAL	. (LB/FT3): TB	D	
CAPACITY	CUBIC FEET:			TONS:				
DIMENSIONS (FEET)	HEIGHT:	DIAMETER: TBD	(OR)	LENGTH:	WIE	DTH: H	IEIGHT:	
ANNUAL PRODUCT THRO	OUGHPUT (TONS)	ACTUAL:		MAXIN	IUM DESIG	N CAPACITY:		
PNEUMATICALLY F	ILLED	MECHANIC	ALLY F	LLED		F	ILLED FROM	
BLOWER COMPRESSOR OTHER:		SCREW CONVEYO BELT CONVEYOR BUCKET ELEVATO OTHER:				RAILCAR TRUCK STORAGE OTHER:	E PILE	
NO. FILL TUBES: MAXIMUM ACFM:								
MATERIAL IS UNLOADED T		FROM SILO?						
MAXIMUM DESIGN FILLING	RATE OF MATERI	AL (TONS/HR): TBD						
MAXIMUM DESIGN UNLOAD	DING RATE OF MA	TERIAL (TONS/HR): T	BD					
COMMENTS:								

FORM C1 CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 NCDEQ/Divis	ion of Air Quality -	Applicatio	n for Ai	r Permit to	o Const	ruct/Opera	ate			C1
CONTROL DEVICE ID NO: CD-ADD-BF	CONTROLS EMIS	SIONS FRO	OM WH	ICH EMISS	SION SC	DURCE ID	NO(S)	: IES-ADD		
EMISSION POINT (STACK) ID NO(S): EP-14	POSITION IN SER	IES OF CC	NTROL	S		NO.	1	OF 1	UNITS	
OPERATING SCENARIO:										
1OF1		P.E. SEAL	. REQUI	RED (PER	2q .01	12)? 🗸	YES	[NO	
DESCRIBE CONTROL SYSTEM: The silo baghouse will control air displaced by the loa	ded additive.									
POLLUTANTS COLLECTED:		РМ		PM ₁₀		PM _{2.5}	_		_	
BEFORE CONTROL EMISSION RATE (LB/HR):							-		-	
CAPTURE EFFICIENCY:		~99.9	%	~99.9	%	~99.9	%		%	
CONTROL DEVICE EFFICIENCY:			%		%		%		%	
CORRESPONDING OVERALL EFFICIENCY:			%		%		%		%	
EFFICIENCY DETERMINATION CODE:							-		-	
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):		See Emission Calculations in Appendix C						-		
PRESSURE DROP (IN H ₂ 0): MIN: MAX: TBD	GAUGE?	✓ YES	L							
BULK PARTICLE DENSITY (LB/FT ³): TBD		INLET TE		. ,			MAX 1			
POLLUTANT LOADING RATE: 0.004 UB/HR	✓ GR/FT ³	OUTLET 1					MAX	ГBD		
INLET AIR FLOW RATE (ACFM): 1,652		FILTER O	PERATI	NG TEMP						
	PER COMPARTM		2		-	TH OF BA				
	ACE AREA PER CA		(FT ²): 1	ſBD	DIAME	TER OF E	BAG (IN	l.): TBD		
TOTAL FILTER SURFACE AREA (FT ²): TBD	AIR TO CLOTH RA									
DRAFT TYPE: 🗸 INDUCED/NEGATIVE 🗸	FORCED/POSITIV	Έ		FILTER M	ATERIA		WOVE		FELTED	
DESCRIBE CLEANING PROCEDURES						PART	ICLE S	SIZE DISTRI	BUTION	
AIR PULSE	SONIC				5	SIZE	WE	EIGHT %	CUMUL	ATIVE
REVERSE FLOW	SIMPLE BAG COL	LAPSE			(MIC	RONS)	OF	- TOTAL	%	
MECHANICAL/SHAKER	RING BAG COLLA	PSE				0-1		Unk	nown	
OTHER:						1-10				
DESCRIBE INCOMING AIR STREAM:					1	0-25				
The air stream will contain wood dust particles.					2	5-50				
					5	0-100				
					>	>100				
								ΤΟΤΑ	L = 100	
ON A SEPARATE PAGE, ATTACH A DIAGRAM SHO	VING THE RELATION	ONSHIP OF	THE C	ONTROL I	DEVICE	TO ITS E	MISSIC	ON SOURCE	E(S):	
COMMENTS:										

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/1 NCD	EQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		B		
EMISSION SOURCE DESCRIPTION:										
Emergency Generator (350 bhp)				EMISSION SOURCE ID NO: IES-GN CONTROL DEVICE ID NO(S): N/A						
OPERATING SCENARIO 1	OF	1				CK) ID NO(S): 1	FP-15			
DESCRIBE IN DETAILTHE EMISSION Diesel-fired internal combustion engin	I SOURCE PRO	DCESS (ATTA		IAGRAM):		<u>, io ito (o)</u>				
TYPE OF EMISSION SOU	RCE (CHECK	AND COMPLE	ETE APPROF	RIATE FOR	M B1-B9 ON	THE FOLLOV	VING PAGES):		
Coal,wood,oil, gas, other burner (Fe	•		rking (Form E			. of chemicals		-		
✓ Int.combustion engine/generator (F	,		0.	ng (Form B5)		ration (Form B	•	(1 0111 D1)		
Liquid storage tanks (Form B3)	0111 82)		silos/bins (Fo	- · · ·		(Form B9)	.0)			
START CONSTRUCTION DATE:				JFACTURED:		,				
2013			2013							
MANUFACTURER / MODEL NO.: Generac SD200			EXPECTED	OP. SCHEDL	JLE: <u>24</u> H	IR/DAY <u>7</u>	_DAY/WK _	_ <u>52_</u> WK/YR		
IS THIS SOURCE SUBJECT 🛛 🗸 N	SPS (SUBPAR	TS?): <u>IIII</u>		✓ NESH	IAP (SUBPAR	RTS?): <u>ZZZZ</u>				
PERCENTAGE ANNUAL THROUGHP	UT (%): DEC-F	EB 25%	MAR-MAY	25% JUN-/	AUG 25%	SEP-NOV 2	5%			
CRITERIA A	IR POLLUT	ANT EMIS	SIONS IN	FORMATIO	ON FOR T					
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	j		
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)		
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr		
PARTICULATE MATTER (PM)		See Emission	n Calculations	s in Appendix	C C	,		,		
PARTICULATE MATTER<10 MICRONS	(PM ₁₀)									
PARTICULATE MATTER<2.5 MICRONS	(10)									
SULFUR DIOXIDE (SO2)	(****2.3)					1				
NITROGEN OXIDES (NOx)						1				
CARBON MONOXIDE (CO)										
VOLATILE ORGANIC COMPOUNDS (VOC)									
LEAD	(00)					-				
OTHER										
HAZARDOUS		JTANT EM	ISSIONS I	NFORMAT		THIS SOU	RCE			
17/12/11/2000		SOURCE OF		D ACTUAL						
		EMISSION		ROLS / LIMITS)	POTENTIAL EMISSION (BEFORE CONTROLS / LIMITS) (AFTER CONTROLS / LIMITS)					
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	Ib/hr	1	Ib/hr	1	Ib/hr	· · · ·		
HAZARDOUS AIR POLLUTANT	CAS NO.			tons/yr s in Appendix		tons/yr	ID/TII	tons/yr		
		See Emission						<u> </u>		
								<u> </u>		
		1				-		<u> </u>		
	-							 		
								├────		
<u> </u>										
								<u> </u>		
							ļ =			
	X FOLLOTA					3 SOURCE	-			
		OF EMISSION				AFTER CONT				
TOXIC AIR POLLUTANT	CAS NO.	FACTOR		/hr		/day	lb	/yr		
		See Emissior	n Calculations	s in Appendix						
		 								
		 								
Attachments: (1) emissions calculations and	supporting docu	mentation; (2) ir	ndicate all requi	ested state and	federal enforce	eable permit limi	its (e.g. hours o	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.

MPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOUN Attach Additional Sheets As Necessary

EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/TURBINES/GENERATORS)

REVISED 09/22/16	NCDEQ/Division of Air Quality	- Application for Air Per	mit to Construct/Opera	te	B2
EMISSION SOURCE DESCRIPTIO	N:		EMISSION SOURCE ID	NO: IES-GN	-
Emergency Generator (350 bhp)			CONTROL DEVICE ID	NO(S): N/A	
OPERATING SCENARIO:	OF	1	EMISSION POINT (STA		
ENGINE SERVICE	EMERGENCY	SPACE HEAT	ELECTRICAL GE		
(CHECK ALL THAT APPLY)	PEAK SHAVER	OTHER (DESCRIBE):			
GENERATOR OUTPUT (KW):	ANTICIF	ATED ACTUAL HOURS	OF OPERATION (HRS/)	′R):	
ENGINE OUTPUT (HP):					
TYPE ICE: GASOLINE ENGI	NE 🔽 DIESEL ENGINE UF	P TO 600 HP 🗌 DIESE	L ENGINE GREATER T	HAN 600 HP 🗌 DUA	AL FUEL ENGINE
OTHER (DESCRI	BE):		(complete below)		
ENGINE TYPE	RN 🔄 LEAN BURN				
EMISSION REDUCTION MODIFIC	ATIONS INJECTION TIMING	RETARD PREIG	GNITION CHAMBER CO	MBUSTION 🗌 OTH	IER
OR STATIONARY GAS TU	RBINE (complete below)	NATURAL GAS PIPELIN	E COMPRESSOR OR T	URBINE (complete be	elow)
FUEL: 🗌 NATURAL GAS		TYPE: 2-CYCLE LEA	N BURN 4-CY	CLE LEAN	RBINE
	_	4-CYCLE RIC		ER (DESCRIBE):	
			N MODIFICATIONS (DE		
		SELECTIVE CATALYTIC			REDUCTION
		AN BURN AND PRECOM		UNCONTROLLED	
	LEAN-PREMIX				
OTHER (SPECIFY):	FUEL USAGE (IN	CLUDE STARTUP/E			
				EQUESTED CAPACI	TV
FUEL TYPE	UNITS	CAPACITY (UNIT/H		IMITATION (UNIT/HF	
No. 2 Fuel Oil	gal	6.55	,	6.55	,
No. 2 Fuer on	gui	0.35		0.33	
FU	EL CHARACTERISTICS	(COMPLETE ALL T	HAT ARE APPLICA	ABLE)	
				SULFUR CONTEN	Т
FUEL TYPE	BTU/UNIT	UNITS		(% BY WEIGHT)	
No. 2 Fuel Oil	19,300	lb		< 15 ppmw	
M	ANUFACTURER'S SPEC	IFIC EMISSION FAC	CTORS (IF AVAILA	BLE)	
POLLUTANT	NOX	CO PM	PM10	VOC	OTHER
EMISSION FACTOR LB/UNIT					
UNIT					
DESCRIBE METHODS TO MINIMIZ	ZE VISIBLE EMISSIONS DURIN	G IDLING, OR LOW LOA	D OPERATIONS:		
Periodic equipment maintenance v	vill minimize opacity by followi	ng manufacturer's specif	ications or common ind	ustry practices.	
COMMENTS:					

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCDE	Q/Division o	f Air Quality -	Application	for Air Permi	it to Constru	ct/Operate		́В	
EMISSION SOURCE DESCRIPTION:		•	EMISSION SOURCE ID NO: IES-FWP						
Fire Water Pump (300 bhp)			CONTROL DEVICE ID NO(S): N/A						
OPERATING SCENARIO	OF	1				K) ID NO(S): I	EP-16		
		CESS (ATTAC				I() ID I(0(0). 1	10		
Diesel-fired internal combustion engine		•		•					
TYPE OF EMISSION SOURC	CE (CHECK A	ND COMPLE	TE APPROP	RIATE FORM	I B1-B9 ON 1	THE FOLLOW	ING PAGES)	:	
Coal,wood,oil, gas, other burner (Form	n B1)	Woodwo	rking (Form E	34)	Manuf	. of chemicals/	coatings/inks	(Form B7)	
Int.combustion engine/generator (Form	n B2)	Coating/f	inishing/printi	ng (Form B5)	Incine	ration (Form B	8)		
Liquid storage tanks (Form B3)		Storage s	silos/bins (Fo	rm B6)	Other	(Form B9)			
START CONSTRUCTION DATE:			DATE MANU	JFACTURED:					
2013									
MANUFACTURER / MODEL NO.: Clarke/John Deere PE6068L220451			EXPECTED	OP. SCHEDL			_DAY/WK _	_ <u>52</u> _WK/YR	
	PS (SUBPAR	•			•	RTS?): <u>ZZZZ</u>			
PERCENTAGE ANNUAL THROUGHPUT				25% JUN-A		SEP-NOV 25			
CRITERIA AII	R POLLUT				IN FOR TH	IIS SOURC	E		
		SOURCE OF		D ACTUAL		POTENTIAL			
		EMISSION	•	ROLS / LIMITS)		TROLS / LIMITS)	,	ROLS / LIMITS)	
		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
PARTICULATE MATTER (PM)		See Emission	Calculation	s in Appendix	: C				
PARTICULATE MATTER<10 MICRONS (PM	10,								
PARTICULATE MATTER<2.5 MICRONS (PI	M _{2.5})								
SULFUR DIOXIDE (SO2)									
CARBON MONOXIDE (CO)									
VOLATILE ORGANIC COMPOUNDS (VO	C)								
LEAD									
OTHER HAZARDOUS A								<u> </u>	
HAZARDOUS A									
		SOURCE OF		DACTUAL		-	EMISSIONS		
				ROLS / LIMITS)		TROLS / LIMITS)	1	ROLS / LIMITS)	
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
		See Emission	Calculations	s in Appendix					
	1								
	1								
TOXIC AIR	POLLUTA	NT EMISSI	ONS INFO	RMATION	FOR THIS	S SOURCE			
		JOURGE							
		OF EMISSION	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	ROLS / LIMI	TATIONS	
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb	/hr	lb/	day	lb	/yr	
		See Emission				-		-	
Attachments: (1) emissions calculations and su	oporting docum	entation: (2) indi	icate all reques	ted state and f	deral enforcea	ble permit limits	(e.g. hours of	operation	

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.

MPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOUF Attach Additional Sheets As Necessary

EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/TURBINES/GENERATORS)

REVISED 09/22/16	NCDEQ/Division of Air Quality	- Application for Air Per	mit to Construct/Opera	te	B2	
EMISSION SOURCE DESCRIPTIO	N:		EMISSION SOURCE ID NO: IES-FWP			
Fire Water Pump (300 bhp)			CONTROL DEVICE ID	NO(S): N/A		
OPERATING SCENARIO:	0F	1	EMISSION POINT (STA	CK) ID NO(S): EP-16		
ENGINE SERVICE	EMERGENCY	SPACE HEAT	ELECTRICAL GE	ENERATION		
(CHECK ALL THAT APPLY)	PEAK SHAVER	OTHER (DESCRIBE):				
GENERATOR OUTPUT (KW):	ANTICIF	PATED ACTUAL HOURS	OF OPERATION (HRS/)	′R):		
ENGINE OUTPUT (HP):						
TYPE ICE: GASOLINE ENGI	NE 🔽 DIESEL ENGINE UI	P TO 600 HP 🗌 DIESE	L ENGINE GREATER T	HAN 600 HP 🗌 DUA	L FUEL ENGINE	
	BE):		(complete below)	_		
ENGINE TYPE	RN 🔄 LEAN BURN					
EMISSION REDUCTION MODIFIC	ATIONS INJECTION TIMING	RETARD 🗌 PREIG	GNITION CHAMBER CO	MBUSTION 🗌 OTH	IER	
OR STATIONARY GAS TU	RBINE (complete below)	NATURAL GAS PIPELIN	E COMPRESSOR OR T	URBINE (complete be	low)	
FUEL: 🗌 NATURAL GAS		TYPE: 2-CYCLE LEA	N BURN 4-CY	CLE LEAN 🗌 TUR	BINE	
		4-CYCLE RIC	H BURN 🗌 OTH	ER (DESCRIBE):		
			N MODIFICATIONS (DE			
		NSELECTIVE CATALYTIC			REDUCTION	
		AN BURN AND PRECOM		UNCONTROLLED		
	LEAN-PREMIX					
OTHER (SPECIFY):		CLUDE STARTUP/B				
				EQUESTED CAPACIT	ΓV.	
FUEL TYPE	UNITS	CAPACITY (UNIT/H		IMITATION (UNIT/HR		
No. 2 Fuel Oil	gal	6.55		6.55	.,	
No. 2 Fuel On	gai	0.35		0.35		
FU	EL CHARACTERISTICS	(COMPLETE ALL T	HAT ARE APPLICA	BLE)		
				SULFUR CONTEN	Т	
FUEL TYPE	BTU/UNIT	UNITS		(% BY WEIGHT)		
No. 2 Fuel Oil	19,300	lb		< 15 ppmw		
M	ANUFACTURER'S SPEC	IFIC EMISSION FAC	CTORS (IF AVAILA	BLE)		
POLLUTANT	NOX	CO PM	PM10	VOC	OTHER	
EMISSION FACTOR LB/UNIT						
UNIT						
DESCRIBE METHODS TO MINIMIZ	ZE VISIBLE EMISSIONS DURIN	G IDLING, OR LOW LOA	D OPERATIONS:			
Periodic equipment maintenance v	will minimize opacity by followi	ing manufacturer's specif	ications or common ind	ustry practices.		
COMMENTS:						

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/1 NCE	EQ/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В
EMISSION SOURCE DESCRIPTION:				EMISSION S		O: IES-PVAP		
Propane Vaporizer				CONTROL D	DEVICE ID NO	D(S): N/A		
OPERATING SCENARIO 1	OF	1				K) ID NO(S): I	EP-17	
DESCRIBE IN DETAILTHE EMISSION Liquid propane gas-fired propane var		•		IAGRAM):		, (,		
TYPE OF EMISSION SOU	RCE (CHECK		TE APPROF	RIATE FOR	M B1-B9 ON	THE FOLLOW	VING PAGES	5):
Coal,wood,oil, gas, other burner (F	orm B1)	U Woodwo	rking (Form E	34)	Manuf	. of chemicals/	/coatings/inks	s (Form B7)
Int.combustion engine/generator (F	Form B2)	Coating/f	inishing/printi	ng (Form B5)	Incine	ration (Form B	8)	
Liquid storage tanks (Form B3)		Storage s	silos/bins (Fo	m B6)	Other	(Form B9)		
START CONSTRUCTION DATE: TBD			DATE MANU TBD	IFACTURED:				
MANUFACTURER / MODEL NO.: TBD			EXPECTED	OP. SCHEDL	JLE: <u>24</u> H	R/DAY <u>7</u>	_DAY/WK _	<u>52_</u> WK/YR
IS THIS SOURCE SUBJECT	ISPS (SUBPAR	TS?):		NESH	IAP (SUBPAR	RTS?):		
PERCENTAGE ANNUAL THROUGHP	()			25% JUN-/		SEP-NOV 2	-	
CRITERIA A	AIR POLLUT	ANT EMIS	SIONS IN	FORMATIO	ON FOR T	HIS SOUR	CE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	6
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	Calculations	in Appendix	C			
PARTICULATE MATTER<10 MICRONS	10,							
PARTICULATE MATTER<2.5 MICRONS	6 (PM _{2.5})							-
SULFUR DIOXIDE (SO2)								-
NITROGEN OXIDES (NOx)								-
CARBON MONOXIDE (CO)								-
VOLATILE ORGANIC COMPOUNDS ((VOC)							
LEAD								
OTHER								
HAZARDOUS	AIR POLL				ION FOR			
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL		
		EMISSION		ROLS / LIMITS)		TROLS / LIMITS)	1	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
	-	See Emission	Calculations	s in Appendix	C			
								<u> </u>
								┨─────
ΤΟΧΙΟ ΔΙ	R POLLUTA		IONS INFO	RMATION	I FOR THI	S SOURCE	-	L
		JOURGE					-	
		OF EMISSION	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	FROLS / LIMI	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lh	/hr	lb/	day	lh	o/yr
	0,10,1101	See Emission				uuy	12	, j .
				pp shulk	-			
							1	
							1	
Attachments: (1) emissions calculations and	supporting docu	mentation; (2) in	dicate all reque	ested state and	federal enforce	eable permit limi	its (e.a. hours d	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.

MPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOUN Attach Additional Sheets As Necessary

EMISSION SOURCE (WOOD, COAL, OIL, GAS, OTHER FUEL-FIRED BURNER)

REVISED 09/22/16	NCDEQ/Division of	Air Quality - A	oplication for Air	r Permit to Constru	ct/Oper	ate	B1
EMISSION SOURCE DESCRIPT Propane Vaporizer	TION:		EMI	SSION SOURCE ID	NO: IES	S-PVAP	
			CON	NTROL DEVICE ID I	NO(S): N	N/A	
OPERATING SCENARIO:	OF	1	EMI	SSION POINT (STA	CK) ID	NO(S): EP-17	
DESCRIBE USE: PROC	ESS HEAT	SPACE HEAT		ELECTRICAL G	ENERA	TION	
		STAND BY/E	MERGENCY		RIBE): _		
HEATING MECHANISM:	INDIRECT	\checkmark	DIRECT				
MAX. FIRING RATE (MMBTU/HO	OUR): 1						
		WOOD-	FIRED BURN	ER			
WOOD TYPE: DARK	WOOD/BARK	WET WC		DRY WOOD		OTHER (DESCRIBE	E):
PERCENT MOISTURE OF FUEL							
		ED WITH FLYA	SH REINJECTIC	N 🗌	CONTR	OLLED W/O REINJ	ECTION
FUEL FEED METHOD:		HEAT TRANSF	FER MEDIA:			THER (DESCRIBE) _	
		COAL-F		ER			
TYPE OF BOILER	IF OTHER DESC	RIBE:					
	OKER UNDERFEED	STOKER	SPREAD	ER STOKER	FL	UIDIZED BED	
		LLED		ROLLED		CIRCULATING	
		ΞD	FLYASH F	REINJECTION		RECIRCULATING	
				SH REINJECTION			
		OIL/GAS	-FIRED BURN	NER			
_		JSTRIAL				UTIONAL	
TYPE OF FIRING:		SENTIAL			NO LO	W NOX BURNER	_
		OTHER FU	EL-FIRED BU	IRNER			
	uid Propane				NOTIT		
					INSTIT	UTIONAL	
TYPE OF FIRING: <u>Direct</u>			(IF ANY):	None BACKUP FUEL	S)		
	102200/		MAXIMUM DES		,	REQUESTED CA	PACITY
FUEL TYPE	UNITS		CAPACITY (UNI	T/HR)		LIMITATION (UN	IIT/HR)
Propane	MMBtu		1.0			1.0	
			-			-	
F	UEL CHARACTER	STICS (CO	MPLETE ALL	. THAT ARE AP	PLICA	BLE)	
		SI	PECIFIC	SULFUR CON	TENT	ASH CON	ITENT
FUEL TY	PE	BTU	CONTENT	(% BY WEIG	HT)	(% BY WI	EIGHT)
Propan	e	91,5	00 Btu/gal	0.54 grains/10	00 ft ³		
COMMENTS:							
	Attacl	n Addition	al Sheets As	s Necessarv			

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCD	EQ/Division o	f Air Quality -	Application	for Air Permi	it to Constru	ct/Operate		B
EMISSION SOURCE DESCRIPTION:		-		EMISSION S		O' IES-TK-1		
Emergency Generator Fuel Storage Tank								
OPERATING SCENARIO	OF	1				K) ID NO(S): I	N / A	
DESCRIBE IN DETAILTHE EMISSION S		^				(3) ID (0)	N/A	
Diesel storage tank for distributing fuel t		•		GRAWJ.				
TYPE OF EMISSION SOUR	CE (CHECK A	ND COMPLE	TE APPROPI	RIATE FORM	B1-B9 ON T	HE FOLLOWI	NG PAGES):	
Coal,wood,oil, gas, other burner (Forn	n B1)	Woodwo	rking (Form E	34)	Manuf	. of chemicals/	coatings/inks	(Form B7)
Int.combustion engine/generator (Forr	n B2)	Coating/f	inishina/printi	ng (Form B5)		ration (Form B	•	· · · ·
↓ Liquid storage tanks (Form B3))		silos/bins (Fo	• • •		(Form B9)	-)	
START CONSTRUCTION DATE:				JFACTURED:		(/		
MANUFACTURER / MODEL NO.:			EXPECTED	OP. SCHEDL	JLE: <u>24</u> H	R/DAY <u>7</u>	_DAY/WK _	_ <u>52_</u> WK/YR
IS THIS SOURCE SUBJECT TC	SPS (SUBPAR	TS?):		NESH	IAP (SUBPAF	RTS?):		
PERCENTAGE ANNUAL THROUGHPUT				5% JUN-AU		EP-NOV 25%	-	
CRITERIA AI	R POLLUT	ANT EMISS	SIONS INF	ORMATIO	N FOR TH	IS SOURC	E	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)				s in Appendix				
PARTICULATE MATTER<10 MICRONS (PM	(La)	See Linission		,				
PARTICULATE MATTER<2.5 MICRONS (P	10,							
SULFUR DIOXIDE (SO2)	112.5/							
· · · · · · · · · · · · · · · · · · ·								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (VC	DC)							
LEAD								
OTHER								
HAZARDOUS	AIR POLLU	TANT EMIS	SSIONS IN	IFORMATI	ON FOR 1	THIS SOUR	CE	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
		See Emission	Calculation	s in Appendix	C			
TOXIC AIR			ONS INFO	PMATION		SOUPCE		
	FOLLOTAI			RIVIATION	FUR THIS	SOURCE		
		OF	EXPEC1	ED ACTUAL	EMISSIONS	AFTER CONT	ROLS / LIMI	TATIONS
		EMISSION						
TOXIC AIR POLLUTANT	CAS NO.	FACTOR		/hr		day	lb	/yr
		See Emission	1 Calculation	s in Appendix	C			
Attachments: (1) emissions calculations and su	pporting docume	entation: (2) indic	ate all request	ed state and fee	deral enforceat	le permit limits (e a hours of o	peration

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.

MPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOUR Attach Additional Sheets As Necessary

FORM B3 EMISSION SOURCE (LIQUID STORAGE TANK)

		,	,	D			
	Q/Division of Air Quality		Permit to Construct/Operate	B3			
EMISSION SOURCE DESCRIPTION:		EMI	EMISSION SOURCE ID NO: IES-TK-1				
Emergency Generator Fuel Storage Ta		CON	CONTROL DEVICE ID NO(S): None				
OPERATING SCENARIO:	OF		SSION POINT (STACK) ID NO(S): N/A				
		CH STORAGE TA	NK				
DESCRIBE IN DETAIL THE STORAGI Diesel storage tank for distributing fu							
LIQUID STORED: Diesel		LIQUID MOLECULA	R WEIGHT (LB/LB-MOLE):				
TANK CAPACITY (GAL): 2,500		VAPOR MOLECULA	AR WEIGHT (LB/LB-MOLE):				
AVERAGE LIQUID SURFACE TEMPE	RATURE (F):	VAPOR PRESSURE	AT AVE. LIQUID SURFACE TEMP (PSIA):				
	MAX. LIQUID SURFACE	TEMP (°F):	MAX. TRUE VAPOR PRESS. (PSIA):				
	BREATHER VENT SETT	INGS (PSIG)	VACUUM PRESSURE				
SHELL DIAMETER (FT): 6	SHELL CONDITION:	GOOD POOR	IS TANK HEATED: VES NO				
SHELL COLOR:	MAXIMUM THROUGHPL	JT (GAL/YR):	MAXIMUM TURNOVERS PER YEAR:				
WORKING VOLUME (GAL): 1,250	ACTUAL THROUGHPUT	GAL/YR):	ACTUAL TURNOVERS PER YEAR:				
MAX. FILLS PER DAY:	MAX. FILLING RATE (GA	AL/MIN):	MIN. DURATION OF FILL (HR/FILL):				
	VERTIC	AL FIXED ROOF	TANKS				
SHELL HEIGHT (FT):	ROOF TYP	E: CONE	DOME ROOF HEIGHT (FT):				
AVERAGE LIQUID HEIGHT (FT):	ROOF CON						
MAXIMUM LIQUID HEIGHT (FT):	ROOF COL	OR:					
	НО	RIZONTAL TAN	KS				
SHELL LENGTH (FT): 12	IS TANK UI	NDERGROUND ?:	YES NO				
	FLOA	ATING ROOF TA	NKS				
DESCRIBE PERTINENT TANK DATA			AS LEAK AND FUME DETECTION INSTRUM	IENTATION):			
COMMENTS:							

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCDE	Q/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		B
EMISSION SOURCE DESCRIPTION:		-		EMISSION S		O IES-TK-2		
Fire Pump Fuel Storage Tank								
OPERATING SCENARIO 1	OF	1				K) ID NO(S): I	N/A	
DESCRIBE IN DETAILTHE EMISSION SO								
Diesel storage tank for distributing fuel to		•		C 10 u iji				
TYPE OF EMISSION SOURC					B1-B9 ON T			
Coal,wood,oil, gas, other burner (Form	•		rking (Form E			of chemicals/		
Int.combustion engine/generator (Form	,	\equiv	9 (ng (Form B5)		ation (Form B	-	
↓ Liquid storage tanks (Form B3)	DZ)		silos/bins (Fo	• • •		(Form B9)	0)	
START CONSTRUCTION DATE:				JFACTURED:		(10111120)		
START CONSTRUCTION DATE.				NACIONED.				
MANUFACTURER / MODEL NO.:			EXPECTED	OP. SCHEDI	JLE: <u>24</u> H	R/DAY _7	DAY/WK	52_WK/YR
IS THIS SOURCE SUBJECT TC	PS (SUBPAR	TS?):		NESH	IAP (SUBPAF	RTS?):		
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FE	B 25% N	AR-MAY 2	5% JUN-AU	G 25% S	EP-NOV 25%	, 0	
CRITERIA AIR	POLLUT	ANT EMISS	SIONS INF	ORMATIO	N FOR TH	IS SOURC	E	
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS	
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)		See Emission	Calculation	s in Appendix	C	,		
PARTICULATE MATTER<10 MICRONS (PM1	₀)							
PARTICULATE MATTER<2.5 MICRONS (PM	2 5)							
SULFUR DIOXIDE (SO2)	2.07							
NITROGEN OXIDES (NOx)								
CARBON MONOXIDE (CO)								
VOLATILE ORGANIC COMPOUNDS (VOC	:)							
LEAD	')							
OTHER								
HAZARDOUS A	IR POLLU	TANT EMIS	SSIONS IN	IFORMAT	ON FOR 1	HIS SOUR	CE	
		SOURCE OF		D ACTUAL			EMISSIONS	
		EMISSION		ROLS / LIMITS)		TROLS / LIMITS)	(AFTER CONT	
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
	ono no.	See Emission				torio/yi	10/111	torio/yr
		See Linission	Carculation					
TOXIC AIR F	ΟΙΙΠΤΑΙ		ONS INFO	RMATION	FOR THIS	SOURCE		
		JOUNUE				COUNCE		
		OF	EXPECT	ED ACTUAL	EMISSIONS	AFTER CONT	ROLS / LIMI	TATIONS
TOXIC AIR POLLUTANT	CAS NO.	EMISSION FACTOR	lh	/hr	lbi	day	lh	h m
	CAS NO.					uay	u	/yr
		See EIIIISSIOI	calculations	s in Appendix				
Attachments: (1) emissions calculations and supp	<u> </u>				L		, . <i>.</i>	

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.

MPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOUR Attach Additional Sheets As Necessary

FORM B3 EMISSION SOURCE (LIQUID STORAGE TANK)

REVISED 09/22/16 NCDE	Q/Division of Air Quality - App	` lication for Air Per	mit to Construct/Operate	B3
EMISSION SOURCE DESCRIPTION:			ON SOURCE ID NO: IES-TK-2	
Fire Pump Fuel Storage Tank		CONTR	OL DEVICE ID NO(S): None	
OPERATING SCENARIO:	OF	EMISSI	ON POINT (STACK) ID NO(S): N/A	
	EACH S	TORAGE TANK		
DESCRIBE IN DETAIL THE STORAGE Diesel storage tank for distributing fu		2AM):		
LIQUID STORED: Diesel	LIQU	JID MOLECULAR V	VEIGHT (LB/LB-MOLE):	
TANK CAPACITY (GAL): 500	VAP	OR MOLECULAR \	WEIGHT (LB/LB-MOLE):	
AVERAGE LIQUID SURFACE TEMPE	RATURE (F): VAP	OR PRESSURE AT	AVE. LIQUID SURFACE TEMP (PSIA):	
	MAX. LIQUID SURFACE TEMP	P (°F):	MAX. TRUE VAPOR PRESS. (PSIA):	
	BREATHER VENT SETTINGS	(PSIG)	VACUUM PRESSURE	
SHELL DIAMETER (FT): 3	SHELL CONDITION: GO	OD POOR	IS TANK HEATED: 🗌 YES 🗌 NO	
SHELL COLOR:	MAXIMUM THROUGHPUT (GA	AL/YR):	MAXIMUM TURNOVERS PER YEAR:	
WORKING VOLUME (GAL): 250	ACTUAL THROUGHPUT (GAL	/YR):	ACTUAL TURNOVERS PER YEAR:	
MAX. FILLS PER DAY:	MAX. FILLING RATE (GAL/MIN	۷):	MIN. DURATION OF FILL (HR/FILL):	
	VERTICAL F	IXED ROOF TA	NKS	
SHELL HEIGHT (FT):	ROOF TYPE:	CONE	DOME ROOF HEIGHT (FT):	
AVERAGE LIQUID HEIGHT (FT):	ROOF CONDITIC			
MAXIMUM LIQUID HEIGHT (FT):	ROOF COLOR:			
		ONTAL TANKS		
SHELL LENGTH (FT): 10	IS TANK UNDER	GROUND ?:		
		G ROOF TANK		
DESCRIBE PERTINENT TANK DATA			⁽ @ 60 DEG F:	NTATION):
COMMENTS:				

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/16 NCDE	Q/Division o	f Air Quality -	Application	for Air Perm	it to Constru	ct/Operate		В	
EMISSION SOURCE DESCRIPTION:				EMISSION SOURCE ID NO: IES-TK-3					
Mobile Fuel Diesel Storage Tank				CONTROL DEVICE ID NO(S): None					
				EMISSION POINT (STACK) ID NO(S): N/A					
DESCRIBE IN DETAILTHE EMISSION SO Diesel storage tank for distributing fuel to	URCE PROC	•	H FLOW DIA			.,			
TYPE OF EMISSION SOURC Coal,wood,oil, gas, other burner (Form Int.combustion engine/generator (Form Liquid storage tanks (Form B3) START CONSTRUCTION DATE: TBD	B1)	Woodwood Coating/f	rking (Form E inishing/printi silos/bins (Fo	84) ng (Form B5)	Manuf Inciner	HE FOLLOWI . of chemicals/ ration (Form B (Form B9)	coatings/inks		
MANUFACTURER / MODEL NO.: TBD	EXPECTED OP. SCHEDULE: <u>24</u> HR/DAY <u>7</u> DAY/WK <u>52</u> WI								
IS THIS SOURCE SUBJECT T(PS (SUBPAR	TS?):			IAP (SUBPAF	RTS?):			
PERCENTAGE ANNUAL THROUGHPUT (,			5% JUN-AU	-	EP-NOV 25%	-		
CRITERIA AIR	R POLLUT	ANT EMISS	SIONS INF	ORMATIO	N FOR TH	IS SOURC	E		
		SOURCE OF	EXPECTE	D ACTUAL		POTENTIAL	EMISSIONS		
		EMISSION	(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)		
AIR POLLUTANT EMITTED		FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
PARTICULATE MATTER (PM)		See Emission	Calculation	s in Appendix	C	,		,	
PARTICULATE MATTER<10 MICRONS (PM	o)			II.					
PARTICULATE MATTER<2.5 MICRONS (PM	5,								
SULFUR DIOXIDE (SO2)	2.37	1							
NITROGEN OXIDES (NOx)									
CARBON MONOXIDE (CO)									
	•								
VOLATILE ORGANIC COMPOUNDS (VOC)									
LEAD									
OTHER							05		
HAZARDOUS A	IR POLLU				UN FUR I				
			EXPECTE	EXPECTED ACTUAL		POTENTIAL EMISSIONS			
		EMISSION	(AFTER CONT	ROLS / LIMITS)	(BEFORE CON	TROLS / LIMITS)	(AFTER CONT	ROLS / LIMITS)	
HAZARDOUS AIR POLLUTANT	CAS NO.	FACTOR	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	
		See Emission	Calculation	s in Appendix	C				
TOXIC AIR F	POLLUTAI	NT EMISSIO	ONS INFO	RMATION	FOR THIS	SOURCE			
	OF EMISSION					ONTROLS / LIMITATIONS			
TOXIC AIR POLLUTANT	CAS NO.	FACTOR	lb/hr		lb/day		lb	lb/yr	
		See Emission Calculations in Append		s in Appendix	C			· ·	
	1								
					1				
	1				1				
Attachments: (1) emissions calculations and supp	L dooumo	ntation: (2) india		ad atota and fa	doral onforceab	lo pormit limito	(a g boura of a	neretien	

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.

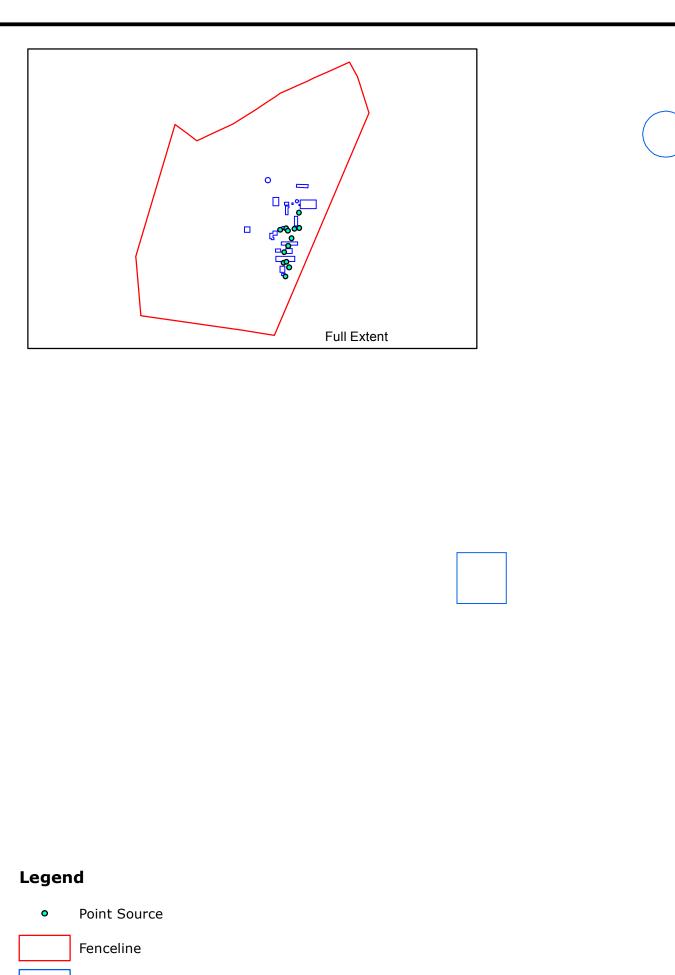
MPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOUR Attach Additional Sheets As Necessary

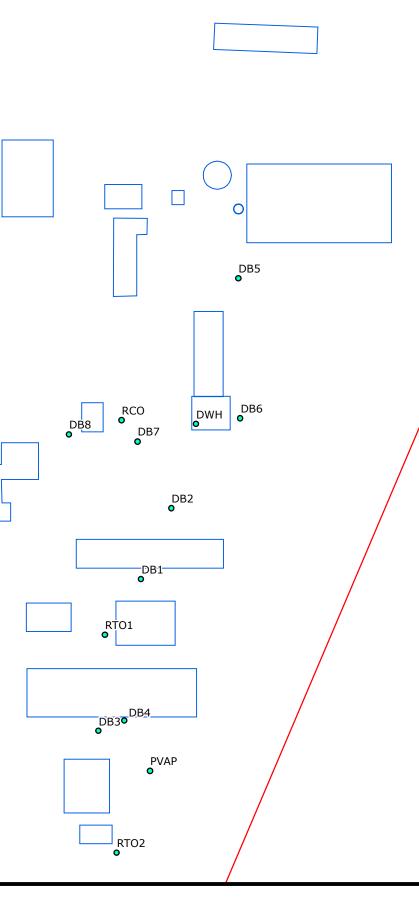
FORM B3 EMISSION SOURCE (LIQUID STORAGE TANK)

				B3				
REVISED 09/22/16 NCDE EMISSION SOURCE DESCRIPTION:	Q/DIVISION OF Air Quality -							
			EMISSION SOURCE ID NO: IES-TK-3					
Mobile Fuel Diesel Storage Tank	05		CONTROL DEVICE ID NO(S): None					
OPERATING SCENARIO: OF EMISSION POINT (STACK) ID NO(S): N/A EACH STORAGE TANK								
DESCRIBE IN DETAIL THE STORAGE			κ					
Diesel storage tank for distributing fu								
LIQUID STORED: Diesel		LIQUID MOLECULAR	ID MOLECULAR WEIGHT (LB/LB-MOLE):					
TANK CAPACITY (GAL): 5,000		VAPOR MOLECULAR	APOR MOLECULAR WEIGHT (LB/LB-MOLE):					
AVERAGE LIQUID SURFACE TEMPE	RATURE (F): TBD	VAPOR PRESSURE AT AVE. LIQUID SURFACE TEMP (PSIA):						
	MAX. LIQUID SURFACE	TEMP (°F): TBD	MAX. TRUE VAPOR PRESS. (PSIA):					
	BREATHER VENT SETTI	NGS (PSIG)	VACUUM PRESSURE					
SHELL DIAMETER (FT): 6	SHELL CONDITION:	GOOD POOR	IS TANK HEATED: 🗌 YES 🗌 NO					
SHELL COLOR:	MAXIMUM THROUGHPU	T (GAL/YR):	MAXIMUM TURNOVERS PER YEAR:					
WORKING VOLUME (GAL): 2,500	ACTUAL THROUGHPUT	(GAL/YR):	ACTUAL TURNOVERS PER YEAR:					
MAX. FILLS PER DAY:	MAX. FILLING RATE (GA		MIN. DURATION OF FILL (HR/FILL):					
	VERTICA	L FIXED ROOF T	ANKS					
SHELL HEIGHT (FT):	ROOF TYPE		DOME ROOF HEIGHT (FT):					
AVERAGE LIQUID HEIGHT (FT):	ROOF CON		GOOD POOR					
MAXIMUM LIQUID HEIGHT (FT): ROOF COLOR:								
		RIZONTAL TANKS	1					
SHELL LENGTH (FT): 23.7	IS TANK UN	IDERGROUND ?:	YES NO					
	FLOA	TING ROOF TAN	ſS					
DESCRIBE PERTINENT TANK DATA	SUCH AS DECKS, RIM-SI	EALS, LIQUID DENSIT	Y @ 60 DEG F:					
FOR ALL TANKS - DESCRIBE ANY N	IONITORING OR WARNIN	G DEVICES (SUCH AS	LEAK AND FUME DETECTION INSTRUME	NTATION):				
COMMENTS:								

APPENDIX E SUPPORTING DOCUMENTATION FOR TAP MODELING ANALYSIS Appendix E – Supporting Documentation for TAP Modeling Analysis is located on a USB drive provided with this application.

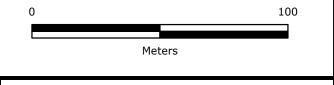
APPENDIX F MODELED SOURCE LAYOUT





Downwash Structure





Modeled Source Layout Enviva Pellets Northampton, LLC
Northampton County, NC FIGURE
1 DRAFTED BY: ARJ