AIR PERMIT APPLICATION

Pinnacle Renewable Energy Inc. > Newton, Mississippi

Wood Pellet Production Facility

TRINITY CONSULTANTS
1 Perimeter Park S
Suite 100N
Birmingham, AL 35243
(205) 970-6035

August 2019
Revised November 2019
Revised January 2020

Project 190101.0031

EHS solutions delivered uncommonly well

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

Pinnacle Renewable Energy Inc. (Pinnacle) is requesting air permit(s) from the Mississippi Department of Environmental quality (MDEQ) for construction and operation of a greenfield wood pellet production facility in Newton, Newton County, Mississippi (Newton facility).

The proposed Newton facility operations will include a wood chips, sawdust, bark, and shavings receiving, processing, and storage area, one (1) dryer, nine (9) wood pellet production and cooling lines, wood pellets storage, and a truck loadout area. The raw materials will be delivered to the facility via trucks. Pinnacle may process whole logs in the future, but to start the facility will only process received green sawdust, shavings, bark and wood chips. Potential emissions from future debarking and cutting operations associated with processing whole logs are included in this application. Pinnacle proposes to limit potential facility-wide emissions of volatile organic compounds (VOC) of the Newton facility to 250 tons per year (tpy) to ensure the facility is classified as a synthetic minor source with respect to the federal Prevention of Significant Deterioration (PSD) program.

The Newton facility will be a major source with respect to the Title V permitting program as potential emissions of VOC from point sources will potentially exceed the applicable major source threshold of 100 tpy. The facility will be a minor source of hazardous air pollutants (HAP) as potential emissions of each individual HAP are less than the applicable major source threshold of 10 tpy while total HAP are less than the 25 tpy major source threshold.

The federal New Source Review (NSR) program is applicable to new major sources and major modifications at existing major sources. The Newton facility is located in Newton County, which has been classified as in attainment with the National Ambient Air Quality Standards (NAAQS) or unclassified for all regulated pollutants.[1] Therefore, the Newton facility is not subject to nonattainment NSR (NNSR) permitting requirements for any criteria pollutants. The proposed facility is potentially subject to PSD permitting requirements, but will be a minor source with respect to PSD permitting due to potential PSD-regulated pollutant emissions less than the respective major source thresholds at the requested production throughput limit of 440,000 tpy.

The following information is included as part of this Air Permit application submittal package:

- Section 2 provides a description of the proposed greenfield facility operations;
- Section 3 discusses the emissions calculation methodologies and presents the facility-wide potential emissions;
- Section 4 details the regulatory applicability analysis;
- Appendix A includes the area map, process flow diagram, and proposed plot plan;
- Appendix B presents the detailed emissions calculations;
- Appendix C includes the required MDEQ air permit application forms; and
- Appendix D includes additional documentation for the VOC emission factors relied upon for this application.

---

[1] 40 CFR 81.311.

The Newton facility will be located in Newton County, Newton, Mississippi. Newton County has been designated as an "attainment area" or "unclassified" for all criteria pollutants.

2.1. SITE DESCRIPTION

Pinnacle is proposing to construct and operate a greenfield wood pellet production facility in Newton, Mississippi. The operations are categorized under Standard Industrial Classification (SIC) code 2499*, Wood Products – Not Elsewhere Classified*. The Newton facility will process wood chips, sawdust, and other wood materials into fuel pellets, to produce a source of alternative renewable fuel for solid fuel combustion sources.

2.2. PROCESS DESCRIPTION

The proposed Newton facility operations will include a wood chips receiving and processing area, bark/shavings receiving and storage, one (1) dryer, nine (9) wood pellet production and cooling lines, wood pellets storage, and a truck loadout area. Future operations may include a debarker and a chipper for the purpose of processing whole logs. For the purposes of estimating potential emissions, the Newton facility is assumed to operate continuously [8,760 hours per year (hr/yr)].

2.2.1. Raw Material Receiving and Storage Area

Green sawdust, shavings, bark and wood chips are delivered to the Newton facility via trucks. The trucks will travel on paved roadways to the green raw materials receiving area. The trucks are unloaded and a front end loader moves the sawdust and wood chips to the green raw material storage pile. Front-end loaders (FEL) distribute the material throughout the storage area. Additionally, Pinnacle will have the ability to process up to 100,000 ton per year of received dry wood shavings (also via trucks), which will be stored in a separate enclosed storage tent.

Future operations include the processing of whole logs. Tree length logs will be delivered by truck on paved roadways. Logs will be fed to the debarker and the chipper. The resulting sawdust, shavings, bark and wood chips will be moved to the green raw material storage pile to be processed with the received raw material.

Fugitive emissions are reduced due to the inherent moisture content (approximately 50%) of the wet raw materials. Fugitive emissions from dry shavings are reduced by utilization of enclosed (i.e., tent) storage.

2.2.2. Green Raw Material Drying and Material Storage

The FEL will transfer the green sawdust and wood chips from the green raw material storage area to a feed bin, which will be connected to a conveyor. The green sawdust, shavings, bark, and wood chips from the infeed bin will be fed directly to the rotary dryer or will be diverted to the burner fuel bin. The dryer processes the material from an in-feed moisture content of approximately 50% to a 5-10% final moisture content. The inlet dryer air will dry the green raw material that passes through the dryer drum. The reduction in moisture content in the dryers decreases the hot gas temperature to approximately 240° F at the drum outlet. The dryer step grate furnace burner (170 MMBtu/hr heat input capacity) will combust biomass (wood materials).

The moisture rich exhaust gases mixed with fine particulate will be routed to the wet electrostatic precipitator (WESP) to separate the fine particulate from the exhaust gas stream. The dried wood materials in the gaseous stream are collected from the WESP for later use in the rotary dryer combustion system or fiber infeed system for pellet production. Dried material will be passed through the dryer into the post-dryer operations.

Exhaust gases from the dryer will contain VOCs released during the drying process of green raw materials due to increased temperature. After the WESP, the exhaust stream from the dryer is controlled by the regenerative thermal oxidizer (RTO1) for reduction of VOC and organic HAP emissions from the dryer system. The RTO1 unit includes one (1) burner (maximum heat input capacity of 10.0 MMBtu/hr) that combusts natural gas to oxidize VOC and organic HAP in the exhaust gases to form carbon dioxide (CO_2) and water at approximately 1,500° F. Controlled exhaust gases will be released to the atmosphere through the exhaust stack.

After the drying process, the material will be conveyed to the one (1) dried fiber storage tent or directly into the pellet production process. Any emissions from this source will be considered fugitive emissions.

There are two (2) separate abort stacks, the furnace abort stack and the dryer abort stack. The furnace abort stack may be used during cold start-ups, planned shutdowns, and malfunctions. Routine abort stack usage occurs at minimal firing rates (approximately 10% of capacity), and there are no process emissions during furnace abort stack usage. The only emissions from routine furnace abort stack usage are from wood residue combustion. Pinnacle included emissions from routine furnace abort stack usage as part of the facility-wide potential emissions in addition to assuming continuous operation (8,760 hr/yr) for the dryer.

Venting at full capacity out of the furnace abort stack only occurs in the event of a malfunction. Additionally, the dryer abort stack is only used in the event of a malfunction, specifically spark detect. Malfunctions are infrequent, unpredictable, and minimized to the maximum extent possible. These emissions are conservatively included as part of the facility-wide potential emissions.

2.2.3. Fuel Preparation System

Bark fuel will be delivered to the proposed facility via truck, and will be delivered to the fuel bin. The material from the fuel bin is conveyed to the step grate burner in front of the dryer. The step grate burner will have a potential maximum heat input capacity of 170 MMBtu/hr, and provides the heat for the dryer.

2.2.4. Wood Pelletizing Lines

The dried wood material is transferred via conveyor into one of the four (4) dry hammermills that process the dried material to desired size. The four hammermills exhaust is controlled by a single baghouse.

In the pelletizing area there are nine (9) pellet mills which receive dried materials from the four (4) dry hammermills. In each pellet mill, rollers push the material through the holes of a die plate. Knives on the exterior of the die plate cut the wood pellets from the plate once the pellets achieve the required length. An exhaust system at the discharge of the pellet mills removes any excess moisture and dust generated during the pelletizing process and is conveyed to the pellet line baghouse and the pelletizing regenerative thermal oxidizer (RTO2).

Wood pellets from each pelletizing line are discharged into a pellet cooler, one pellet cooler for each of the pelletizing lines. Wood pellets enter the cooling chamber and flow countercurrent to a stream of ambient air introduced in the cooler. The air flow reduces the temperature of the wood pellets at the point of pellet discharge. The captured exhaust is controlled first by a baghouse for PM emissions control. Subsequently, the exhaust will be controlled by RTO2 for reduction of VOC and organic HAP emissions from the pelletizing lines. The RTO2 unit includes one (1) burner (maximum heat input capacity of 10.0 MMBtu/hr) that combusts natural gas to oxidize VOC and organic HAP in the exhaust gases to form carbon dioxide (CO_2) and water at approximately 1,500° F. Controlled exhaust gases will be released to the atmosphere through the exhaust stack.

2.2.5. Screening Process

There will be two (2) parts of the facility where there are screening operations. There will be a scalping roll before the dryer system, and there will be a pellet screening vibratory conveyor coming out of the pellet machines. Screening operations result in fugitive PM emissions.

2.2.6. Pellet Storage and Loadout

Cooled pellets will be stored in an atmospheric weather-tight storage silo (PSS1). The pellet storage silo will vent directly to the atmosphere. Wood pellets will be conveyed to be loaded onto a truck for final shipment to the Pinnacle mill in Demopolis, AL. PM emissions from the truck loadout are not controlled.

2.2.7. Emission Unit Summary

Included below is a summary of the proposed emission units and air pollution control devices (APCD) at the Newton facility and the associated identification numbers used throughout this application.

Table 2-1. Proposed Emission Units and Control Devices

EP ID	APCD ID	Emission Sources
RD	WESP/RTO1	Biomass Rotary Dryer
HM1 - HM4	BAG1	Dry Hammermill #1 - #4
PL1 - PL9	BAG2/RTO2	Pellet Line No. 1 - 9
PSS1	N/A	Pellet Storage Silo
TLS	N/A	Truck Loadout System
ENG1	N/A	500 kW Emergency Generator
ENG2	N/A	300 kW Emergency Generator
ENG3	N/A	150 kW Emergency Generator
ENG4	N/A	25 kW Emergency Generator
ENG5	N/A	25 kW Emergency Generator
FWP1	N/A	127 kW Fire Pump Engine
Fugitive Sources		
F-DB	N/A	Log Debarker
F-CH	N/A	Chipper
F-STP1	N/A	Greenwood Storage Pile
F-MT	N/A	Material Transfer
FDCS	N/A	Fugitive Dry Chip Storage
F-SC1	N/A	Wet Infeed Screening
F-SC2	N/A	Pellet Screening

This section presents the methodology used to quantify pollutant emissions from the Newton facility. Pollutants emitted from the facility include VOC, PM, PM_{10}, $PM_{2.5}$, NO_X, CO, sulfur dioxide (SO_2), greenhouse gases (GHG) in the form of carbon dioxide equivalent (CO_2e), and HAPs.

3.1. DRYER

As detailed in Section 2.2.3 of the permit application, exhaust gases from the dryer are exhausted through a WESP, and then RTO1 (control devices operating in series). The Newton facility has the capability of burning biomass in the step grate burner. As such, potential emissions are conservatively calculated based on the maximum potential emissions from combusting wood fuel in the dryer burner on an annual basis (8,760 hr/yr).

The potential criteria pollutant emissions estimated for the dryer utilized:

- Vendor guaranteed emission rates for CO, NO_X, Total PM, and VOC. Previous compliance testing results by a similar facility owned by Pinnacle (Pinnacle Aliceville, formerly known as Westervelt Aliceville) supports lower emission rates for CO, NO_X, Total PM, and VOC (with an included 25% safety factor);
  - Please see Appendix D for additional information.
- AP-42 Section 1.6 wood residue combustion emission factors for SO_2, lead, and Greenhouse Gases (GHG);
- Georgia Environmental Protection Division (GA EPD) Recommended Emission Factors for Wood Pellet Manufacturing for Acetaldehyde, Formaldehyde, Hydrogen Chloride (HCl), and Methanol; and
- GA EPD guidance for WESP HCl emissions control efficiency.

As the Pinnacle Aliceville facility has a rotary dryer of comparable size and can process more green wood per hour, Pinnacle believes with the applied 25% safety factor, the emissions units are similar and conservative for use in estimating emissions at the Newton facility. With the use of the WESP and RTO1 (both of which operated during the referenced compliance testing by Westervelt Aliceville), Pinnacle feels the compliance testing results are an accurate conservative estimation of the identified criteria pollutant emissions in Appendix B. Table 3-1 is a comparison of the dryers at Pinnacle's Aliceville facility and the dryer to be installed at the Newton facility.

Table 3-1. Comparison of Biomass Rotary Dryers at Pinnacle Facilities

Operating Parameter	Proposed Newton Dryer	Existing Aliceville Dryer
Fuels Combusted	Biomass	Biomass
Burner Size (MMBtu/hr)	170	151
Max Process Throughput (tpy)	440,000	512,570
RTO Aux. Burner Size (MMBtu/hr)	10	14
RTO Aux. Combustion Fuel	Natural Gas	Natural Gas

The Aliceville testing information is provided to demonstrate the inherent conservatism of the vendor guaranteed emission rates used for this application. Table 3-2 is a comparison of the emissions calculated based on Aliceville testing results (with an included 25% safety factor for VOC) and the vendor guaranteed emissions used for this application.

Table 3-2. Comparison of Dryer Potential Emissions

Pollutants	Potential Emissions from Aliceville Testing Results (lb/hr)	Potential Emissions Guaranteed by Vendor (lb/hr)
CO	11.07	35.97
NO_X	13.13	22.84
VOC	7.51	10.96
Total PM	2.39	3.44

Potential emissions from RTO1 natural gas combustion are estimated using uncontrolled emission factors for natural gas combustion and the natural gas heating value average from AP-42, Section 1.4- Natural Gas Combustion and the maximum burner rating of 10 MMBtu/hr. Emissions from the burner are controlled by RTO1 itself. A conservative control efficiency of 95% was used for VOC and HAP emissions based on a guaranteed destruction rate from the vendor.

3.1.1. Dryer and Furnace Abort Stacks

Potential emissions of criteria pollutants, HAP, and GHG from furnace abort stack usage are calculated using emission factors from AP-42, Section 1.6- Wood Residue Combustion in Boilers. Emissions during malfunction events are based on the full capacity of the furnace (170 MMBtu/hr) and 50 hours per year. Emissions during periods of idling are based on 10% of the full capacity (17 MMBtu/hr) and 500 hours per year.

Potential emissions of criteria pollutants, HAP, and GHG from dryer abort stack usage during malfunction events are based on the full capacity (170 MMBtu/hr) and 50 hours per year. Potential emissions of CO and NO_X are calculated using the vendor guaranteed concentrations at the RTO1 inlet. Potential emissions of VOC and PM are based on the uncontrolled hourly emission rates guaranteed by the vendor. Potential emissions of SO_2, lead, and GHG are calculated using emission factors from AP-42, Section 1.6- Wood Residue Combustion in Boilers. Potential HAP emissions are calculated using uncontrolled emission factors from GA EPD Recommended Emission Factors for Wood Pellet Manufacturing.

3.2. DRY HAMMERMILLS, PELLET MILLS, AND PELLET COOLER

Potential PM emissions are calculated using an exit grain loading rate methodology for the hammermill baghouse. This method uses the conservative estimated mass concentration, 0.01 gr/dscf for the dry hammermill baghouse. The pellet mills and pellet coolers are controlled by a baghouse. Similarly, Pinnacle assumes the same exit grain loading rate methodology for calculating emissions from the pellet lines. Potential PM emission rates from the pellet coolers are vendor guaranteed. Potential annual PM emissions are calculated using the potential cubic flow rate per minute and multiplying by 60 minutes and then 8,760 hr/yr. Since PM emissions from the operations consist of primarily fines, it is assumed that all of the PM is less than 2.5 microns.

Potential VOC emissions from the dry hammermills are determined by utilizing internal testing results obtained at the Aliceville facility for an identical process. Potential emissions of individual organic HAP (specifically, acetaldehyde, formaldehyde, and methanol) from the dry hammermills are estimated using the potential process throughput and uncontrolled acetaldehyde, formaldehyde, and methanol emission factors derived from the Georgia Environmental Protection Division Recommended Emission Factors for Wood Pellet Manufacturing.

Potential VOC emissions from the pellet coolers are based on a vendor guaranteed emission rate. Additionally, Pinnacle has internal test results obtained at the Pinnacle Aliceville facility for an identical process that support a lower emission rate. Potential emissions of individual organic HAP (specifically, acetaldehyde, formaldehyde, and methanol) from the pellet lines routed to RTO2 are determined by using the potential process throughput, acetaldehyde, formaldehyde, and methanol emission factors derived from GA EPD Recommended Emission Factors for Wood Pellet Manufacturing, and a control efficiency of 95% based on a guaranteed destruction rate from the vendor.

Potential emissions from RTO2 natural gas combustion are estimated using a maximum burner rating of 10 MMBtu/hr and uncontrolled emission factors for natural gas combustion and the natural gas heating value average from AP-42, Section 1.4- Natural Gas Combustion. Emissions from the burner are controlled by RTO2 itself. A control efficiency of 95% was used for VOC and HAP emissions was based on a guaranteed destruction rate from the vendor.

3.3. WOOD MATERIALS AND PELLETS HANDLING PROCESSES

The green raw materials, green wood handling, dry shavings handling and preparation system are sources of PM emissions and organic HAP emissions. Partial or complete enclosures of fugitive emissions sources (where practicable) are utilized to minimize fugitive PM emissions.

3.3.1. Raw Material Receiving and Storage

The green raw material storage pile contributes to fugitive PM and VOC emissions. Potential PM, PM_{10}, and $PM_{2.5}$ emissions from the storage pile are estimated using the potential green material throughput and emission factors from EPA Region 10 Memorandum titled "Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country". The green material throughput to be received at the Newton facility is assumed to be twice the weight of the dried material throughput due to moisture content. Pinnacle conservatively used emission factors for dry material, as some of the material received at the Newton facility may be dry material. Potential VOC emissions are estimated using the potential green material throughput and a VOC emission factor for stockpiles a chip pile size of 0.25 acres from a Texas Natural Resource Conservation Commission (TNRCC) document for emissions from industrial wood processing.

Material transfer results in fugitive PM emissions. Pinnacle conservatively assumes three (3) material transfer points. Potential PM, PM_{10}, and $PM_{2.5}$ emissions from material transfer are estimated using the potential green material throughput, the number of transfer points, and emission factors from EPA Region 10 Memorandum titled "Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country".

3.3.2. Whole Log Processing

Potential PM emissions from debarking and chipping operations are uncontrolled and considered fugitive. Uncontrolled PM emissions are based on the lumber throughput. The lumber throughput is conservatively estimated by applying a factor of 1.25 to the raw green material throughput.

The Filterable PM and PM_{10} emission factors for debarking and chipping are from the Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fourth Edition with Supplements A, B, and C, AP-42. , per the EPA Factor Information Retrieval (WebFIRE) database, updated 9/7/2016 for SCC Code

3-07-008-01, Log Debarking. The total $PM_{2.5}$ emission factor was based on information presented at the 2015 NCASI Southern Regional Meeting. Pinnacle believes that the factors for debarking may result in an inaccurate overestimate of actual emissions from the chipper. However, Pinnacle is using these factors to estimate emissions from the chipper as no other factors are readily available and because these factors should result in a conservative estimation of emissions.

3.3.3. Screening Process

The Newton facility screening operations are a source of fugitive PM emissions. Potential PM emissions are based on the Texas Commission on Environmental Quality (TCEQ) guidance and the potential throughput. The potential throughput for screening operations prior to the dryer is based on the green material throughput. The potential throughputs for screening operations prior to pellet storage and loadout are based on the facility's production capacity. Wet screening factors are utilized for wet infeed screening, and dry screening factors are utilized for all other screening operations. The emissions calculations methodology for screening operations accounts for emissions from all screening at the two specified points in the process.

3.3.4. Pellet Storage and Loadout

Emissions from dry chip storage are considered fugitive emissions. Emissions from the pellet storage silo and the truck loadout system are point source emissions. PM emissions from storage and truck loadout are estimated using potential throughput and PM emission factors from AP-42 Section 9.9.1, Table 9.9.1-1: Particulate Emission Factors for Grain Elevators. VOC emissions from storage and truck loadout are based on a VOC emission factor from a Texas Natural Resource Conservation Commission (TNRCC) document for VOC emissions from industrial wood processing. Potential emissions of individual organic HAP (specifically, acetaldehyde, formaldehyde, and methanol) from storage and truck loadout are estimated using the potential process throughput and uncontrolled emission factors derived from the Georgia Environmental Protection Division Recommended Emission Factors for Wood Pellet Manufacturing.

3.4. EMERGENCY GENERATOR

The proposed fire pump engine and five (5) emergency generator engines all fire diesel fuel. Emissions from the emergency engines are emitted directly to the atmosphere with units ranging in size from 49 horsepower to 757 horsepower. The units emit combustion pollutants, including PM, NO_X, CO, VOC, SO_2, CO_2e, and organic HAP. PM, CO, and NO_X emissions from diesel combustion in the engines are calculated using the applicable emission standards of NSPS Subpart IIII. SO_2 emissions are limited by the sulfur content of the fuel as required by NSPS Subpart IIII. For all other pollutants, emission factors from US EPA's AP-42, Fifth Edition, Volume I, Chapter 3, Section 3.3, *Gasoline and Diesel Industrial Engines* were used to calculate emissions. Potential hourly emissions are calculated using respective engine horsepower ratings of each engine and the lb/hp-hr or g/hp-hr emission factor. Potential annual emissions are calculated based on a potential annual usage of 500 hr/yr allowed for emergency engines including the RICE MACT allowed maintenance and readiness testing operation.

3.5. FACILITY-WIDE EMISSIONS

Table 3-3 includes the facility-wide controlled criteria pollutant and HAP emissions following the proposed greenfield facility operations at the Newton facility. Detailed potential emissions calculations are included as Appendix B of the permit application. The potential emissions calculations in Table 3-3 include point source emissions only and exclude fugitive emissions. The fugitive emissions are excluded because the wood pellet production operation is not on the PSD List of 28 categories with a lower major source threshold (100 tpy), which requires subject source categories to include fugitive emissions for permitting applicability determinations.

Table 3-3. Facility-Wide Potential Point Source Emissions

Pollutant	Potential Facility-Wide Point Source Emissions (tpy)	Title V Major Source Threshold (tpy)	Title V Major? (Yes/No)	PSD Major Source Threshold (tpy)	PSD Major? (Yes/No)
Filterable PM	83.74	100	No	250	No
Total PM_{10}	67.77	100	No	250	No
Total $PM_{2.5}$	60.73	100	No	250	No
NO_X	110.4	100	Yes	250	No
CO	170.6	100	Yes	250	No
VOC	234.7	100	Yes	250	No
SO_2	18.99	100	No	250	No
Total HAP	14.02	25	No	N/A	No
Max Individual HAP[1]	4.27	10	No	N/A	No

1. The maximum inidividual HAP is Hydrogen Chloride.

Potentially applicable federal and state air regulations are identified for the Newton facility in the following section.

4.1. NEW SOURCE REVIEW

NSR requires that federal construction permitting of new emission sources or modifications to existing emission sources be completed when significant net emission increases result. Two distinct NSR permitting programs apply depending on whether the facility is located in an attainment or nonattainment area for a particular pollutant. NNSR permitting applies to new construction or modifications that result in emission increases of a particular pollutant for which the area in which the facility is located is classified as "nonattainment" for that pollutant. The PSD program applies to project increases of those pollutants for which the area the facility is located in is classified as "attainment" or "unclassifiable".

The federal NSR program is listed in 40 CFR 51-52. The Newton facility is located in Newton County, which has been classified as in attainment with the NAAQS or unclassified for all regulated pollutants. Therefore, the Newton facility is not subject to NNSR permitting requirements for any criteria pollutants. The proposed facility is potentially subject to PSD permitting requirements.

Under PSD permitting rules, the major source threshold is 250 tpy unless the facility is listed specifically in 40 CFR §52.21 as having a lower major source threshold (100 tpy). Wood pellet production is not on the List of 28 categories detailed in 40 CFR §52.21 with a lower major source threshold for non-GHG PSD pollutants. Also, the Newton facility will not operate fossil-fuel fired boilers with more than 250 MMBtu/hr heat input, which is also identified on the List of 28 categories. The Newton facility is a minor source for the purposes of PSD permitting requirements as potential non-GHG PSD pollutant emissions are less than 250 tpy as identified in Table 3-3. Therefore, PSD permitting is not triggered for the Newton facility. Fugitive emissions are excluded from the PSD applicability determination because the wood pellet production operation is not on the List of 28 categories, which requires subject source categories to include fugitive emissions for non-GHG PSD permitting applicability determinations.

Pinnacle requests as a replacement for the process weight rule and fuel burning equipment allowable PM emission rates, the potential emissions included in Appendix B represent the PM emission limits for each emission unit concerning PSD applicability.[2]

4.2. NEW SOURCE PERFORMANCE STANDARDS

MDEQ has received delegation from EPA to regulate facilities subject to New Source Performance Standards (NSPS). Regulatory requirements for facilities subject to NSPS are incorporated by reference in 11 Mississippi Administrative Code (11 Miss. Admin. Code) Pt. 2, Ch. 1, Rule 1.6 and promulgated in 40 CFR Part 60. NSPS require new, modified, or reconstructed sources to control emissions to the level achievable by the best-demonstrated technology as specified in the applicable provisions. Moreover, any source subject to an NSPS is also subject to the general provisions of NSPS Subpart A, unless specifically excluded.

Pinnacle has determined that an NSPS is potentially applicable to the wood pellet production operations at the Newton facility.

[2] Process Weight Rule per 11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.3.F.(1), Manufacturing Processes.

4.2.1. 40 CFR 60 Subpart A – General Provisions

All affected sources are subject to the general provisions of NSPS Subpart A unless specifically excluded by the source-specific NSPS. Subpart A requires initial notification and performance testing, recordkeeping, monitoring, provides reference methods, and mandates general control device requirements for all other subparts as applicable. Subpart A will be applicable as Subpart IIII will be applicable and does not specifically exclude Subpart A.

4.2.2. 40 CFR 60 Subpart D – Fossil Fuel-Fired Steam Generators

NSPS Subpart D, *Standards of Performance for Fossil Fuel-Fired Steam Generators for which Construction is Commenced after August 17, 1971*, applies to steam generating units with a heat input capacity of 250 MMBtu/hr or greater from fossil fuel combustion for which construction is commenced after August 17, 1971. Pinnacle is not proposing installation of any steam generating units. Therefore, the facility will not be subject to NSPS Subpart D.

4.2.3. 40 CFR 60 Subpart Db – Industrial, Commercial, and Institutional Steam Generating Units

NSPS Subpart Db, *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units*, applies to industrial, commercial, and institutional steam generating units with a heat input greater than 100 MMBtu/hr that began construction, modification, or reconstruction after June 19, 1984. Pinnacle is not proposing installation of any steam generating units.

The suspension burner in the dryer includes one (1) 170 MMBtu/hr burner firing biomass (wood materials) to provide heat for the dryer. The burner will be utilized to generate heat for drying of green raw wood materials only, and no heat from the burner will be utilized to generate steam for the pelletizing process at the Newton facility.

Dryers associated with a bark burner system at an oriented strand board (OSB) facility in Thomasville, Alabama were not identified as process heaters and thereby exempt from NSPS Subpart Db.[3] EPA determined that the combination bark burner/rotary dryer/thermal oil heater system (bark burner system) at the OSB facility is subject to Subpart Db, stating that the bark burner system as a whole meets the definition of a “steam generating unit” in Subpart Db, and it is not a process heater. EPA further determined that since the bark burner system consists of two burner units, each with a heat input capacity greater than 100 MMBtu/hr, that each burner would be a separate affected facility under Subpart Db.

The dryer at the Newton facility is similar to the OSB facility’s bark burner system with the main difference that the Newton facility system is utilized for drying only rather than steam generation as well, like the previously described OSB facility. Based on the EPA determination for the OSB facility, Subpart Db requirements are not applicable for the Newton facility dryer since the units are not defined as steam generating units. Therefore, the facility will not be subject to NSPS Subpart Db.

4.2.4. 40 CFR 60 Subpart Dc – Small Steam Generating Units

NSPS Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*, applies to steam generating units with a maximum heat input capacity of 100 MMBtu/hr or less, but greater than

[3] EPA Applicability Determination Index (ADI) summary for Louisiana-Pacific Corporation from Mr. Ken Gigliello, Acting Director of the Compliance Assessment and Media Programs Division, October 2, 2008, ADI Control Number 0800089.

or equal to 10 MMBtu/hr. The applicability date for Subpart Dc is June 9, 1989. Pinnacle is not proposing installation of any steam generating units. The suspension grate burner is rated at 170 MMBtu/hr which is greater than the applicability. Therefore, the facility will not be subject to NSPS Subpart Dc.

4.2.5. 40 CFR 60 Subpart E – Incinerators

NSPS Subpart E, *Standards of Performance for Incinerators*, applies to incinerators with a charging rate of 50 tons/day for which construction or modification commenced after August 17, 1971. An incinerator is defined in §60.51(a) as any furnace used in the process of burning solid waste for the purpose of reducing the volume of the waste by removing combustible matter. Solid waste is defined in the rule as "refuse, more than 50 percent of which is municipal type waste consisting of a mixture of paper, wood, yard wastes, food wastes, plastics, leather, rubber, and other combustibles, and noncombustible materials such as glass and rock."[4] The dryer system burner at the Newton facility will not combust solid waste for the purpose of reducing the volume of the waste. Therefore, NSPS Subpart E is not applicable.

4.2.6. 40 CFR 60 Subpart IIII – Compression Ignition Internal Combustion Engines

NSPS Subpart IIII applies to new compression ignition (CI) internal combustion engines (ICE). Fire pumps are subject to the rule if they were manufactured after July 1, 2006. The Newton facility is proposing to operate up to five (5) CI ICE emergency generators and one (1) fire pumps; therefore, the facility is subject to this regulation and Pinnacle will comply with the rule accordingly. The facility shall comply with the following requirements:

- Using only ultra-low sulfur diesel;
- Operate, maintain, install, and configure the engines per the manufacturer's instructions;
- Maintain a copy of the US EPA certificate for the engine;
- Ensure the engine is equipped with a non-resettable hour meter and that run logs noting the reason for operation are maintained.

Operations of the emergency engine are restricted to 100 hours per year for maintenance and readiness testing and other authorized non-emergency uses. The engines at the Newton facility will be in compliance with the requirements of Subpart IIII prior to the commencement of Pinnacle operations.

4.2.7. 40 CFR 60 Subpart JJJJ – Spark Ignition Internal Combustion Engines

NSPS Subpart JJJJ applies to new and modified spark ignition (SI) ICE units. Per 40 CFR 60.4230(a)(4), stationary SI ICE for which construction commenced after June 12, 2005 and which are emergency engines with maximum power outputs greater than 25 hp are subject to Subpart JJJJ if they were manufactured on or after January 1, 2009. The Newton facility is not proposing to operate an emergency SI ICE. Therefore, NSPS Subpart JJJJ is not applicable.

4.3. NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

National Emission Standards for Hazardous Air Pollutants (NESHAP) are emission standards for HAP and are applicable to major and area sources of HAP. A HAP major source is defined as a facility with potential emissions in excess of 25 tpy for total HAP or potential emissions in excess of 10 tpy for any individual HAP. An area source is a stationary source that is not a major source. Part 63 NESHAP allowable emission limits are established on the basis of a Maximum Achievable Control Technology (MACT) determination for a particular source category.

---

[4] 40 CFR 60.51(b).

NESHAP apply to sources in specifically regulated industrial source categories [CAA Section 112(d)] or on a case-by-case basis [Section 112(g)] for facilities not regulated as a specific industrial source type. As identified in Table 3-3, the Newton facility is a minor source (area source) of HAP emissions since maximum individual HAP emissions are less than 10 tpy and total HAP emissions are less than 25 tpy.

Similar to NSPS, any source subject to a NESHAP is also subject to the general provision of NESHAP Subpart A, unless specifically excluded. Regulatory requirements for facilities subject to Part 61 and Part 63 NESHAP are incorporated by reference in 11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.8.

4.3.1. 40 CFR 63 Subpart A – General Provisions

All affected sources are subject to the general provisions of Part 63 NESHAP Subpart A unless specifically excluded by the source-specific NESHAP. Subpart A requires initial notification and performance testing, recordkeeping, monitoring, provides reference methods, and mandates general control device requirements for all other subparts as applicable.

4.3.2. 40 CFR 63 Subpart DDDD – Plywood and Composite Wood Products

NESHAP Subpart DDDD, *NESHAP for Plywood and Composite Wood Products*, applies to major sources of HAP that manufacture plywood or composite wood products by bonding wood materials (fibers, particles, strands, veneers, etc.) or agricultural fiber, generally with resin under heat and pressure, to form a structural panel or engineered wood product. The Newton facility will not use any form of resin or manufacture structural panels or any similar type of wood product (i.e., veneer, particleboard, fiberboard, kiln-dried lumber). Furthermore, the facility is an area source of HAP; therefore, NESHAP Subpart DDDD is not applicable.

4.3.3. 40 CFR 63 Subpart ZZZZ – Reciprocating Internal Combustion Engines

NESHAP Subpart ZZZZ regulates HAP emissions from reciprocating internal combustion engines (RICE) at both major and area sources of HAP. The Newton facility will operate six (6) diesel-fired emergency generators that are subject to NESHAP Subpart ZZZZ. As the units are emergency CI ICE that have a maximum power output greater than 25 hp and which was manufactured before January 1, 2009, the generators and fire pump engine are considered a new unit under the rule. New units will demonstrate compliance with the RICE MACT by demonstrating compliance with the applicable NSPS. Pinnacle will comply with the appropriate engine NSPS as applicable.

4.3.4. 40 CFR 63 Subpart DDDDD – Industrial, Commercial, and Institutional Boilers and Process Heaters

The revised NESHAP Subpart DDDDD, *NESHAP for Industrial, Commercial, and Institutional Boilers and Process Heaters* regulates HAP emissions from solid, liquid, and gaseous-fired boilers and steam generating units at major sources of HAP emissions. The Newton facility is a minor source of HAP emissions; and there are no proposed boilers or process heaters, therefore, the facility is not subject to Subpart DDDDD.

4.3.5. 40 CFR 63 Subpart JJJJJJ – Area Sources: Industrial, Commercial, and Institutional Boilers

NESHAP Subpart JJJJJJ, *NESHAP for Area Sources: Industrial, Commercial, and Institutional Boilers,* regulates HAP emissions from boilers and steam generating units at facilities that are area sources of HAP emissions. There are no boilers being installed at the facility. The step grate burner for the wood dryer provides direct heat to the dryers and does not generate steam. As such, the unit is not considered a boiler and is not subject to Subpart JJJJJJ.

4.3.6. 40 CFR 63 Subpart QQQQQQ - Wood Preserving (Area Sources)

NESHAP Subpart QQQQQQ, *NESHAP for Wood Preserving Area Sources*, applies to area sources of HAP that conduct wood preserving operations. A wood preserving operation is defined by Subpart QQQQQQ as a pressure treatment process with use of a wood preservative containing chromium, arsenic, dioxins, or methylene chloride, where the preservative is applied to the wood product inside a retort or similarly closed vessel. The Newton facility will not use any wood preservatives in the production of wood pellets. Therefore, NESHAP Subpart QQQQQQ is not applicable.

4.4. TITLE V OPERATING PERMIT PROGRAM

40 CFR 70 establishes the federal Title V operating permit program. MDEQ has incorporated the provisions of the federal program in 11 Miss. Admin. Code Pt. 2, Ch. 6 *Air Emissions Operating Permit Regulations for Purposes of Title V of the Federal Clean Air Act*. The major source thresholds with respect to the Mississippi Title V operating permit program for sources in attainment areas are 10 tpy for an individual HAP, 25 tpy for total HAP emissions, or 100 tpy of an individual criteria pollutant

As identified previously in Table 3-3, the potential criteria pollutant emissions from point sources will exceed 100 tpy for at least one criteria pollutant, making the facility a Title V major source. Facility-wide emissions of individual and total HAP are below 25 tpy and 10 tpy, respectively. As required by MDEQ regulation, a Title V operating permit application will be submitted in accordance with the due date identified in the air construction permit.

4.5. COMPLIANCE ASSURANCE MONITORING

Under 40 CFR 64, the Compliance Assurance Monitoring (CAM) regulations, facilities are required to prepare and submit monitoring plans for certain emissions units with the initial or renewal Title V operating permit application. The CAM Plans are intended to provide an on-going and reasonable assurance of compliance with emission limits. Under the general applicability criteria, this regulation only applies to emission units that use a control device to achieve compliance with an emission limit and whose pre-controlled emission levels exceed the major source thresholds under the Title V operating permit program. For a subject unit whose post-controlled emissions also exceed the major source threshold, a CAM plan is required to be submitted with the initial Title V operating permit application. For a subject unit whose post-control emissions are less than the major source threshold, a CAM plan does not have to be submitted until the first renewal application.

CAM applicability is triggered for RTO1 on the rotary dryer and the RTO2 on the pellet lines as the facility is limiting potential throughput to ensure that the facility is a PSD minor source, the pre-control emission levels of the rotary dryer and pellet lines exceed the major source threshold and the post-control emission levels are less than the major source threshold. As this application is for the purpose of the initial construction permits, no CAM plan was included as part of the application and a CAM plan will be included with the first Title V renewal application.

4.6. MDEQ AIR REGULATIONS

The Newton facility will also be subject to 11 Miss. Admin. Code Pt. 2: Air Regulations. The facility will potentially be subject to a number of standards under these regulations. Applicability to state regulations is discussed in the following subsections.

4.6.1. 11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.3.A - Smoke

This regulation limits opacity from smoke emitting from a point source to not exceed 40%. Startup opacity levels greater than 40% are limited to no more than 15 minutes per startup in one hour, and no more than three startups in any twenty-four hour period. This regulation will apply to the point sources of emissions at the Newton facility.

4.6.2. 11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.3.B - Equivalent Opacity

11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.3.B restricts visible emissions from stationary sources to less than 40 percent opacity, not including uncombined water droplets. This regulation will apply to all manufacturing operations at the Newton facility.

4.6.3. 11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.3.C - General Nuisances

This regulation pertains to general nuisances from PM emissions. Precautions are to be taken to reduce unnecessary emissions from handling, transport, or storage of materials. If PM emissions cause a nuisance on adjacent property or violate a regulation, control measures may be imposed by MDEQ.

4.6.4. 11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.3.D - Fuel Burning

This regulation limits PM emissions from fossil fuel burning sources. The dryer burner will combust biomass fuel but will not be used for the purposes of indirect heating. Therefore, the dryer burner will not be subject to this rule and the associated opacity and PM limits specified by the rule. Pinnacle will not operate any equipment at the proposed Newton facility that will be subject to this standard.

4.6.5. 11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.3.F - Manufacturing Processes, General

11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.3.F.(1) limits PM process emissions based on the following equation, commonly known as the process weight rule:

$$E = 4.1 \times p^{0.67}$$

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

This regulation is expected to apply to the biomass rotary dryer, the hammermills, and the pellets processing and handling systems.

Table 4-1 includes the PWR allowable PM emissions for the subject sources at the Newton facility. The subject emission sources are less than the PWR allowable limits. Therefore, Pinnacle requests that the potential controlled emissions presented in Appendix B (and the MDEQ forms) represent the potential PM emissions for each applicable emission source in the issued Air Permits, not the PWR allowable limits.

Table 4-1. PWR Allowable Emission Limits for Subject Emission Units

Emission Point ID	Emission Unit	Potential PM Emissions (tpy)	Potential PM Emissions (lb/hr)	Throughput (tpy)	Throughput (tph)	PWR Allowable PM Emissions (lb/hr)
RD	Biomass Rotary Dryer	15.07	3.44	440,000	50.23	56.55
HM1 - HM4	Dry Hammermill #1 - #4	18.77	4.29	440,000	50.23	56.55
PL1 - PL9	Pellet Line No. 1 - 9	18.77	4.29	440,000	50.23	56.55
PSS1	Pellet Storage Silo	5.50	1.26	440,000	50.23	56.55
TLS	Truck Loadout System	18.92	4.32	440,000	50.23	56.55

4.6.6. 11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.3.G - Open Burning

This regulation prohibits the open burning of residential, commercial, institutional, or industrial solid waste. This regulation will apply to the Newton facility.

4.6.7. 11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.3.H - Incineration

This regulation limits PM emissions from incinerators. An incinerator is defined as a combustion device specifically designed for the destruction by high temperature burning of solid, semi-solid, liquid, or gaseous combustible wastes and from which the solid residues contain little or no combustibles.[5] RTO1 for the dryer and RTO2 for the pellet lines only directly burn natural gas fuel and does not meet the definition of an incinerator because the gaseous stream being destructed is not considered a waste.

4.6.8. 11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.4.A - SO_2 Emissions from Fuel Burning

11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.4.A limits SO_2 emissions from fuel burning operations to 4.8 lb/MMBtu heat input. This rule specifically regulates the SO_2 emissions from emission units producing heat or power by indirect heat transfer. Since Pinnacle combusts fuel in the dryer, this unit is subject to the emission limitation. Pinnacle will demonstrate compliance with the emissions limitation for the dryers by firing biomass (wood) only.

4.6.9. 11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.4.B - SO_2 Emissions from Processes

11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.4.B.(1) prohibits emissions of SO_2 in excess of 500 ppmv from process equipment constructed after January 25, 1972. 11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.4.B.(2) prohibits emissions of hydrogen sulfide in excess of one grain per 100 standard cubic feet from any gas stream. These regulations will apply to all process equipment at the Newton facility. This regulation is not applicable to any fuel burning equipment.[6]

4.6.10. 11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.5.B - Miscellaneous Chemical Emissions

This regulation restricts the emission of toxic, noxious, or deleterious substances into the ambient air in concentrations sufficient to affect human health and well-being, or unreasonably interfere with the enjoyment of

---

[5] 11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.2.M.

[6] Mr. Rick Sumrall (MDEQ) indicated that previously named Mississippi Regulation APC-S-1, Subsection 4-2 (now 11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.4.B) is not applicable to any fuel burning equipment during a phone conversation with Ms. Jessica Quinn (Trinity Consultants) on July 24, 2008.

property or unreasonably and adversely affect plant or animal life beyond the boundaries of the property. This regulation will be generally applicable to the Newton facility.

4.6.11. 11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.10 – Provisions for Upsets, Startups, and Shutdowns

This regulation contains requirements related to upsets, startups, shutdowns, and maintenance. The Newton facility will be subject to this regulation and will submit notifications as required.

4.6.12. 11 Miss. Admin. Code Pt. 2, Ch. 4 – Mississippi Ambient Air Quality Standards

11 Miss. Admin. Code Pt. 2, Ch. 4 has adopted the federal primary and secondary ambient air quality standards, promulgated in 40 CFR 50, by reference. In addition, this regulation contains ambient air quality standards for odor. In compliance with the regulation, the Newton facility will not emit odorous substances in the ambient air in concentrations sufficient to adversely and unreasonably affect human health and well-being, interfere with the use or enjoyment of property, or affect plant or animal life.

4.6.13. New Sources of Air Toxics

Per discussion with MDEQ during the pre-application meeting, MDEQ has reserved the right to require a Toxic Impact Analysis.[7] However, as the facility is a minor source of HAP and the site location is in a rural area and there are no sensitive populations nearby, Pinnacle believes that a state toxic assessment should not be required.

4.6.14. Incorporation of Federal Regulations by Reference

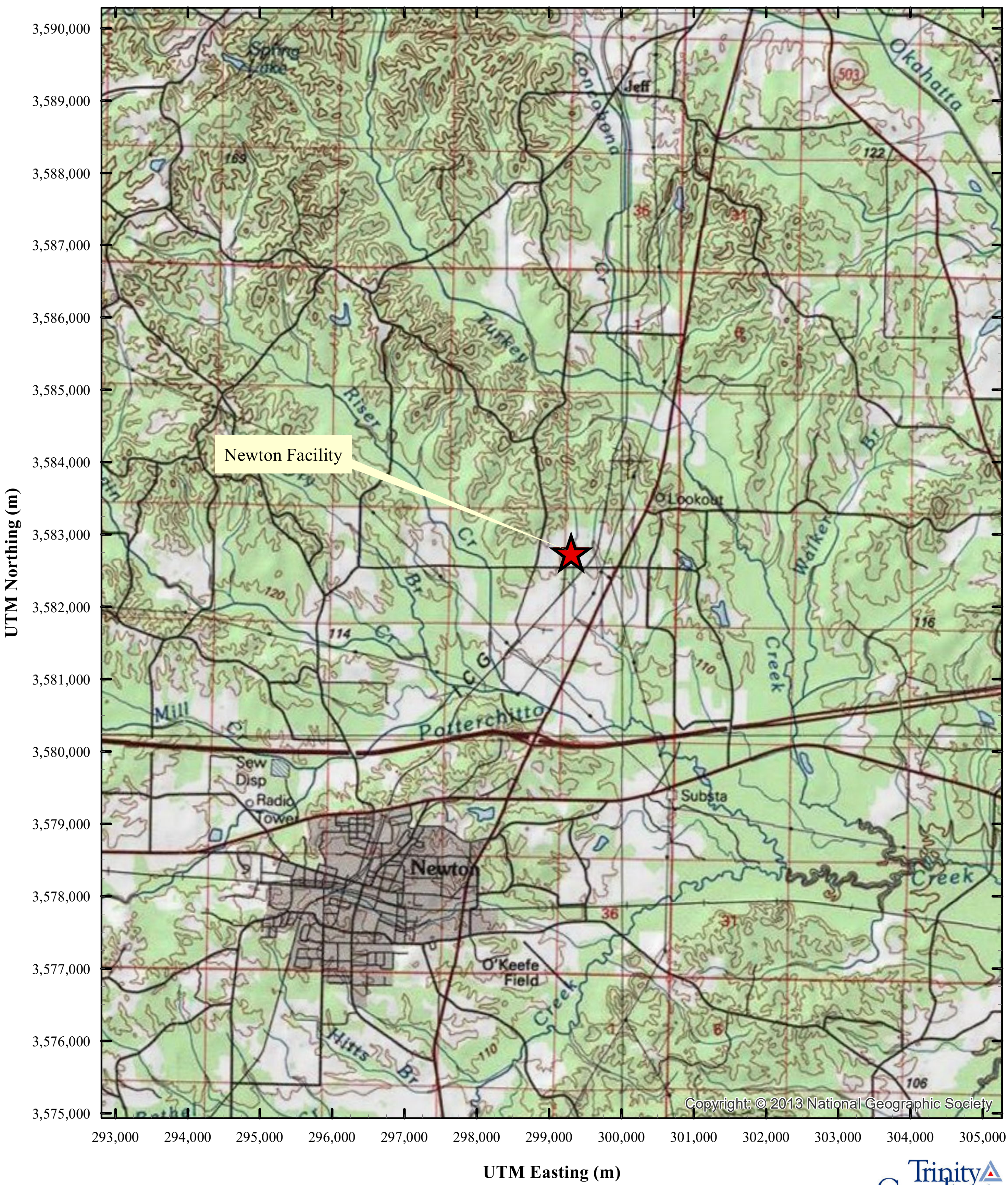
The following federal regulations are incorporated in the Mississippi Administrative Code by reference and were addressed previously in this application:

- 11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.6 – NSPS
- 11 Miss. Admin. Code Pt. 2, Ch. 1, Rule 1.8 – NESHAP
- 11 Miss. Admin. Code Pt. 2, Ch. 5 – PSD
- 11 Miss. Admin. Code Pt. 2, Ch. 6 – Title V Operating Permits

[7] Per pre-application call between Mr. Jeremiah Redman (Trinity Consultants), Ms. Maya Rao (Trinity Consultants), Ms. Krystal Rudolph (MDEQ), Ms. Kayra Johnson (MDEQ), and Paul Pawlowski (Pinnacle) on July 26, 2019.

APPENDIX A: FACILITY FIGURES

Figure A-1. Area Map
Pinnacle Renewable Energy - Newton, Newton County, Mississippi



Coordinates reflect UTM projection Zone 16, NAD83.

Trinity Consultants

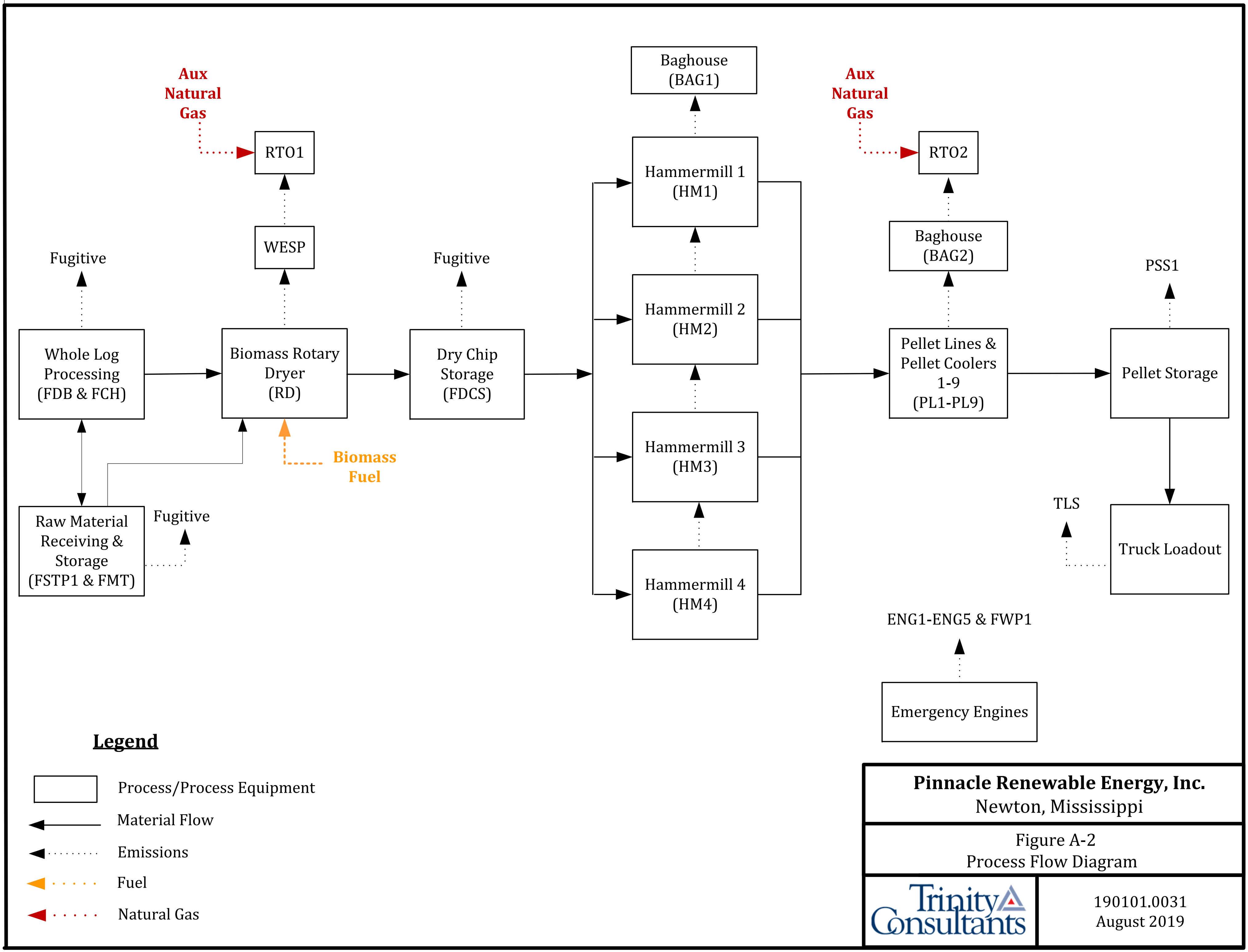
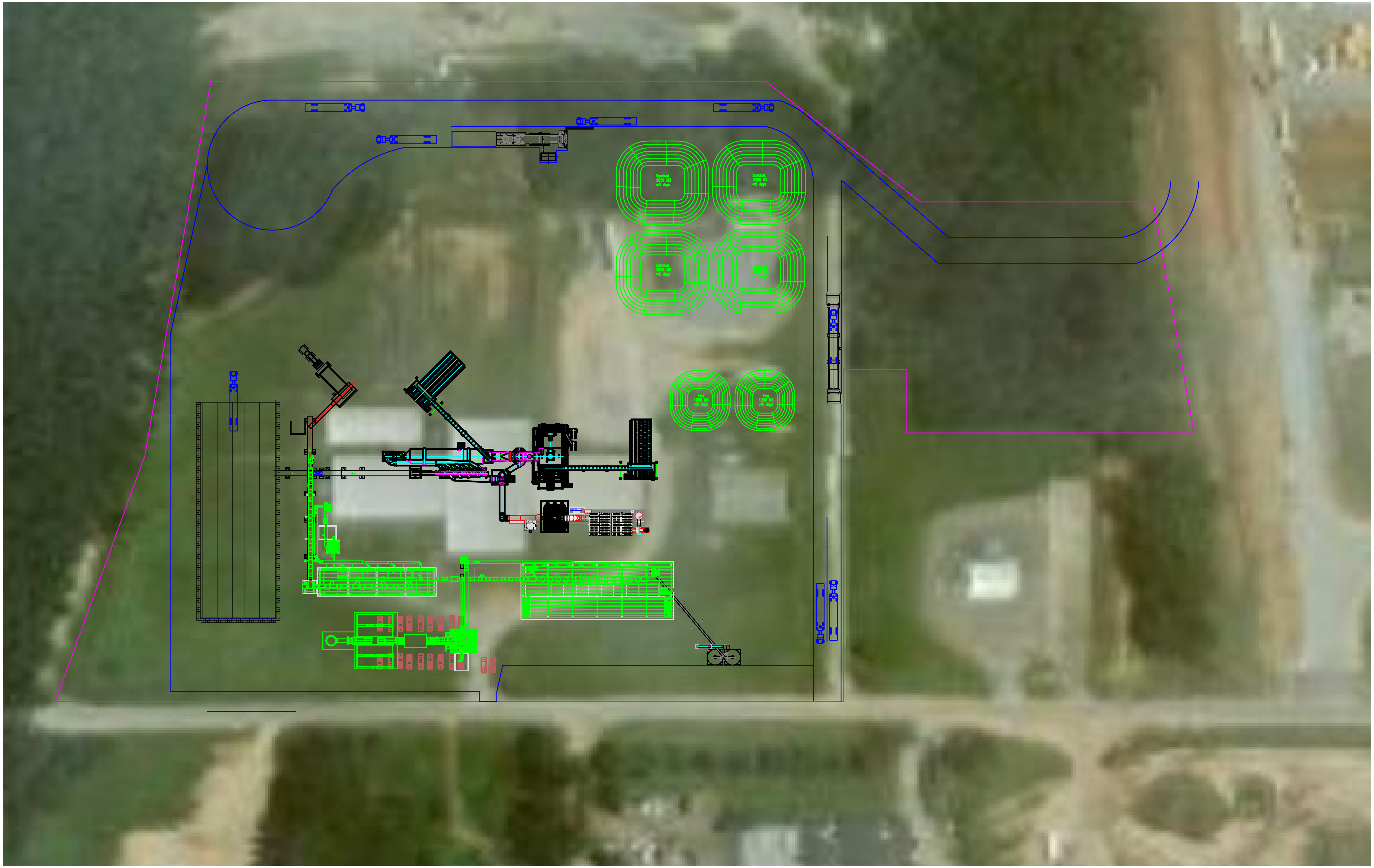

Aux Natural Gas
RTO1
WESP
Fugitive
Whole Log Processing (FDB & FCH)
Biomass Rotary Dryer (RD)
Biomass Fuel
Raw Material Receiving & Storage (FSTP1 & FMT)
Fugitive
Fugitive
Dry Chip Storage (FDCS)
Baghouse (BAG1)
Hammermill 1 (HM1)
Hammermill 2 (HM2)
Hammermill 3 (HM3)
Hammermill 4 (HM4)
Aux Natural Gas
RTO2
Baghouse (BAG2)
Pellet Lines & Pellet Coolers 1-9 (PL1-PL9)
PSS1
Pellet Storage
TLS
Truck Loadout
ENG1-ENG5 & FWP1
Emergency Engines
Legend
Process/Process Equipment
Material Flow
Emissions
Fuel
Natural Gas
Pinnacle Renewable Energy, Inc.
Newton, Mississippi
Figure A-2
Process Flow Diagram
Trinity Consultants
190101.0031
August 2019

Figure A-3. Facility Plot Plan



APPENDIX B: POTENTIAL EMISSIONS CALCULATIONS

Table B-1. Facility-Wide Potential Emissions Summary

		Facility-Wide Potential Emissions (tpy)												
EP ID	**Emission Sources**	**VOC**	**Filterable PM**	**Total PM**	**Total PM_{10}**	**Total $PM_{2.5}$**	**NO_X**	**SO_2**	**CO**	**Acetaldehyde**	**Formaldehyde**	**Hydrogen Chloride (HCl)**	**Methanol**	**Total HAP**
RD	Biomass Rotary Dryer	48.00	15.07	15.07	15.07	15.07	100.06	18.62	157.53	1.21	1.54	4.24	1.21	8.20
HM1 - HM4	Dry Hammermill #1 - #4	135.24	18.77	18.77	18.77	18.77	-	-	-	0.88	1.76	-	0.88	3.52
PL1 - PL9	Pellet Line No. 1 - 9	32.54	18.77	18.77	18.77	18.77	-	-	-	0.01	0.02	-	0.01	0.04
PSS1	Pellet Storage Silo	6.10	5.50	5.50	1.39	0.24	-	-	-	0.22	0.44	-	0.22	0.88
TLS	Truck Loadout System	6.10	18.92	18.92	6.38	1.08	-	-	-	0.22	0.44	-	0.22	0.88
ENG1	500 kW Emergency Generator	0.47	0.06	0.42	0.42	0.42	1.99	2.06E-03	1.09	1.02E-03	1.56E-03	-	-	5.13E-03
ENG2	300 kW Emergency Generator	0.28	0.04	0.25	0.25	0.25	0.74	1.22E-03	0.65	6.03E-04	9.27E-04	-	-	3.04E-03
ENG3	150 kW Emergency Generator	0.14	0.02	0.13	0.13	0.13	0.38	6.28E-04	0.33	3.10E-04	4.77E-04	-	-	1.57E-03
ENG4	25 kW Emergency Generator	0.03	0.01	0.03	0.03	0.03	0.09	1.33E-04	0.10	6.58E-05	1.01E-04	-	-	3.32E-04
ENG5	25 kW Emergency Generator	0.03	0.01	0.03	0.03	0.03	0.09	1.33E-04	0.10	6.58E-05	1.01E-04	-	-	3.32E-04
FWP1	127 kW Fire Pump Engine	0.12	0.02	0.11	0.11	0.11	0.32	5.22E-04	0.28	2.58E-04	3.96E-04	-	-	1.30E-03
RTO1[1]	Dryer RTO No. 1 *(Natural Gas Combustion)*	-	-	-	-	-	-	0.03	-	-	1.61E-04	-	-	4.06E-03
RTO2[2]	Pelletizing RTO No. 2 *(Natural Gas Combustion)*	-	0.08	0.33	0.33	0.33	4.29	0.03	3.61	-	1.61E-04	-	-	4.06E-03
FAS1[3]	Furnace Abort Stack - Idling	0.07	2.38	2.45	2.20	1.90	0.94	0.11	2.55	-	-	-	-	-
FAS2[3]	Furnace Abort Stack - Full Capacity	0.07	2.38	2.45	2.20	1.90	0.94	0.11	2.55	-	-	-	-	-
DAS	Dryer Abort Stack	5.48	1.72	1.72	1.72	1.72	0.57	0.11	1.80	0.14	0.18	0.02	0.14	0.48
Fugitive Sources (Not Included in PSD Applicability)														
F-DB	Log Debarker	-	11.00	11.00	6.05	0.03	-	-	-	-	-	-	-	-
F-CH	Chipper	-	11.00	11.00	6.05	0.03	-	-	-	-	-	-	-	-
F-STP1	Greenwood Storage Pile	9.24	34.68	34.68	17.34	8.67	-	-	-	-	-	-	-	-
F-MT	Material Transfer	-	1.98	1.98	0.92	0.13	-	-	-	-	-	-	-	-
FDCS	Fugitive Dry Chip Storage	6.10	5.50	5.50	1.39	0.24	-	-	-	0.22	0.44	-	0.22	0.88
F-SC1	Wet Infeed Screening	-	0.78	0.78	0.37	0.08	-	-	-	-	-	-	-	-
F-SC2	Pellet Screening	-	6.93	6.93	3.30	0.69	-	-	-	-	-	-	-	-
Total Fugitive Source Emissions (Non-PSD Regulated)		**15.34**	**71.86**	**71.86**	**35.42**	**9.86**	**--**	**--**	**--**	**0.22**	**0.44**	**--**	**0.22**	**0.88**
Total Point Source Emissions (PSD Regulated)		**234.7**	**83.74**	**84.93**	**67.77**	**60.73**	**110.4**	**18.99**	**170.6**	**2.68**	**4.38**	**4.27**	**2.68**	**14.02**
Total Emissions (including fugitives)		**250.0**	**155.6**	**156.8**	**103.2**	**70.59**	**110.4**	**18.99**	**170.6**	**2.90**	**4.82**	**4.27**	**2.90**	**14.90**
PSD Threshold (tpy)[3]		**250**	**250**	**250**	**250**	**250**	**250**	**250**	**250**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
PSD Threshold Exceeded (Yes/No)		**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

1. Emissions of CO, NO_X, VOC, and PM from RTO1 are included in Dryer calculations.
2. VOC emissions from RTO2 are included in Pellet Line calculations.
3. Please note that FAS1 and FAS2 are the same emission point with different operating parameters. FAS1 is the furnace abort stack with operations at idling mode. FAS2 is the furnace abort stack with operations at full capacity.
4. As the Newton facility is a PSD synthetic minor source and wood pellet manufacturing is not on the list of 28 source categories with more stringent standards, fugitive emissions are not evaluated for purposes of PSD applicability (point sources only).

Table B-2. Potential Emissions for Debarking and Chipping Operations

EP ID	Emission Source	Throughput[1] (tpy)	Annual Hours of Operation	Pollutant[2]	Emission Factor[3,4] (lb/ton, wet)	Potential Emissions[5,6] (lb/hr)	Potential Emissions[5,6] (tpy)
F-DB	Debarking	1,100,000	8,760	Filterable PM	2.00E-02	2.51	11.00
				Filterable PM_{10}	1.10E-02	1.38	6.05
				Filterable $PM_{2.5}$	4.60E-05	0.01	0.03
F-CH	Chipper	1,100,000	8,760	Filterable PM	2.00E-02	2.51	11.00
				Filterable PM_{10}	1.10E-02	1.38	6.05
				Filterable $PM_{2.5}$	4.60E-05	0.01	0.03

1. Value represents total annual log throughput. Pinnacle conservatively estimated the annual log throughput by multiplying the raw green material throughput by a factor of 1.25.
2. Condensable PM is negligible for this process; therefore, Filterable PM equals Total PM.
3. The factors for Filterable PM and PM_{10} are from Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fourth Edition with Supplements A, B, and C, AP-42. , per the EPA Factor Information Retrieval (WebFIRE) database, updated 9/7/2016 for SCC Code 3-07-008-01, Log Debarking.
4. Based on information presented at the 2015 NCASI Southern Regional Meeting. The Filterable $PM_{2.5}$ factor for drum debarkers listed is 4.6E-05 lb/ton log processed. No additional control applied in the calculation.
5. Potential Emissions (lb/hr) = Potential Annual Emissions (tpy) x 2,000 (lb/ton) ÷ Annual Hours of Operation (hr/yr)
6. Potential Emissions (tpy) = Emission factor (lb/ton) × (1 - Control Efficiency) × Potential Throughput (ton/yr) ÷ 2,000 (lb/ton)

Table B-3. Potential PM & VOC Emissions from Green Raw Material Receiving & Storage

EP ID	Emission Unit	Green Material Throughput[1] (tpy)	PM Emission Factor[2,3]	PM_{10} Emission Factor[2,3]	$PM_{2.5}$ Emission Factor[2,3]	VOC Emission Factor[4]	Emission Factor Units	Potential Emissions[5,6] PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	VOC (tpy)
F-STP1	Greenwood Storage Pile	880,000	0.38	0.19	0.10	0.10	ton/acre-day	34.7	17.3	8.7	9.2
F-MT	Material Transfer		1.50E-03	7.00E-04	1.00E-04	N/A	lb/ton (dry)	1.98	0.92	0.13	--
							Total Emissions:	**36.7**	**18.3**	**8.8**	**9.2**

1. The green material throughput to be received at the Newton Pellet Mill is assumed to be twice the weight of the dried material throughput due to moisture content.

2. PM/PM_{10}/$PM_{2.5}$ emission factors from EPA Region 10 Memorandum titled "Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country". For the material transfer, Pinnacle has conservatively used the factors for dry material, as some of the material received at the Newton Pellet Mill may be dry material. The emission factors for "material transfer" are for each material drop point. Pinnacle conservatively assumes the following number of transfer points of green material:

Number of Green Material Transfer Points = 3

3. Condensable PM is negligible for this process; therefore, Filterable PM/PM10/PM2.5 equal Total PM/PM10/PM2.5.
4. VOC emission factor for stockpiles from TNRCC document and is estimated assuming a residence time of one day and is based on the following size chip pile:

Chip Pile Size = 0.25 acre

5. Potential Emissions from Chip Pile calculated as follows: Annual Emissions (tpy) = Emission Factor (ton/acre-day) x Chip Pile Size (Acre) x 365 day/year

6. Potential Emissions from Material Transfer calculated as follows: Annual Emissions (tpy) = Emission Factor (lb/ton) x Throughput (ton/year) x No. of Transfer Points ÷ 2,000 (lb/ton)

Table B-4. Biomass Rotary Dryer Operating Parameters

Parameter	Value	Units
Number of Burners	1	burner
Unit Heat Input	170	MMBtu/hr
Max Hourly Throughput	50.2	tph
Potential Process Throughput	440,000	tpy
Annual Operation	8,760	hr/yr
Dryer Flow Rate	110,000	dscfm

Table B-5. Biomass Rotary Dryer Potential PSD Pollutants and HAP Emissions

PSD Pollutants	Emission Factors[1-3]	Emission Factor Units	Maximum Hourly Emissions (lb/hr)[4,5]	Potential Annual Emissions (tpy)[6]
CO	150.0	ppmvd	35.97	157.5
NO_X	29.00	ppmvd	22.84	100.1
VOC	10.96	lb/hr	10.96	48.0
Filterble PM	--	--	3.44	15.07
Total PM	3.44	lb/hr	3.44	15.07
Total PM_{10}	--	--	3.44	15.07
Total $PM_{2.5}$	--	--	3.44	15.07
SO_2	2.50E-02	lb/MMBtu	4.25	18.6
Lead	4.80E-05	lb/MMBtu	8.16E-03	3.57E-02
CH_4	2.10E-02	lb/MMBtu	3.57	15.6
N_2O	1.30E-02	lb/MMBtu	2.21	9.68
CO_2	195	lb/MMBtu	33,150	145,197
CO_2e[7]	199	lb/MMBtu	33,898	148,472
HAP Emissions				
Acetaldehyde	0.11	lb/ODT	0.28	1.21
Formaldehyde	0.14	lb/ODT	0.35	1.54
Hydrogen Chloride	1.90E-02	lb/MMBtu	0.97	4.24
Methanol	0.11	lb/ODT	0.28	1.21
			Total HAP	**8.20**
			Maximum Individual HAP[8]	**4.24**

1. Emission factors for CO and NO_X are vendor guaranteed concentrations at the RTO inlet. Emission factors for VOC and Total PM are vendor guaranteed hourly emission rates. PM_{10} and $PM_{2.5}$ are conservatively assumed to be equivalent to PM. Filterable PM conservatively assumed to be equivalent to total PM.

2. Emission factors for SO_2, lead, and GHGs are from AP-42 Section 1.6 (Wood Residue Combustion), Tables 1.6-2 and 1.6-3 (September 2003).

3. Emission Factors for Acetaldehyde, Formaldehyde, Hydrogen Chloride, and Methanol are uncontrolled and from GA EPD Recommended Emission Factors for Wood Pellet Manufacturing with units in lb/ODT for all but Hydrogen Chloride, which is in lb/MMBtu. See control efficiencies for HAP below:

Organic HAP Control Efficiency =	95%	Conservative estimate based on guaranteed destruction rate from vendor
HCl Control Efficiency =	70%	Per GA EPD Guidance for WESP Control

4. Emission rates for CO, NO_X, Total PM, and VOC are vendor guaranteed emission rates. Additionally, Pinnacle has data that supports lower emission rates from July 30, 2015 testing on RTO1 at the Pinnacle Aliceville, AL site (formerly Westervelt Aliceville site). The potential emission rates calculated using emission factors based on the Aliceville test results are as follows:

CO Emissions (lb/hr) = Emission Factor (lb/ODT) x Max Hourly Throughput (ton/hr) =	11.07
NO_X Emissions (lb/hr) = Emission Factor (lb/ODT) x Max Hourly Throughput (ton/hr) =	13.13
PM Emissions (lb/hr) = Emission Factor (lb/ODT) x Max Hourly Throughput (ton/hr) =	2.39
VOC Emissions (lb/hr) = Emission Factor (lb/ODT) x Max Hourly Throughput (ton/hr) x (1 + VOC Safety Factor) =	7.51

5. Short-term emissions are calculated as follows:

Emissions (lb/hr) = Emission Factor (lb/MMBtu) × Unit Heat Input (MMBtu/hr) × (1 - Control Efficiency)

Emissions (lb/hr) = Emissionf Factor (lb/ton) × Process Throughput (ton/hr) × (1 - Control Efficiency)

Emissions (lb/hr) = Emission Factor (ppmvd) × Molecular Weight (lb/lb-mol) × Dryer Flow Rate (dscfm) × 60 (min/hr) ÷ $Volume_{ideal}$ (ft^3 air/lb-mol air) ÷ 10^6 × (1 - Control Efficiency)

CO MW (lb/lb-mol) =	28.01	
NO_X MW (lb/lb-mol) =	46.01	
$Volume_{ideal}$ (ft^3 air/lb-mol air) =	385.5	
CO Control Efficiency =	50%	Conservative estimate based on guaranteed destruction rate from vendor

6. Annual emissions are calculated as follows:

Emissions (tpy) = Hourly Emissions (lb/hr) * Annual Operation (hr/yr) / 2,000 (lb/ton)

7. Global warming potential (GWP) for CH_4 is 25 and N_2O is 298 for estimating CO_2e emissions (40 CFR 98, Subpart A, Table A-1, effective January 1, 2014).

8. Maximum individual HAP is hydrogen chloride.

Table B-6. RTO1 Burner Operating Parameters

Parameter		Units
Number of Burners	1	burner
Unit Heat Input	10	MMBtu/hr
Natural Gas Heating Value[1]	1,020	MMBtu/MMscf
Annual Operation	8,760	hr/yr
Potential Annual Fuel Usage[2]	85.9	MMscf/yr

1. Natural Gas HHV is the average from the range listed in AP-42, Section 1.4.

2. Potential Annual Fuel Usage calculated as follows:
Annual Fuel Usage (MMscf/yr) = Heat Input (MMBtu/hr) / Natural Gas HHV (MMBtu/MMscf) x Annual Operation (hr/yr)

Table B-7. RTO1 Potential PSD Pollutants and HAP Emissions

Pollutant	Natural Gas Uncontrolled Emission Factor[3] (lb/MMscf)	RTO Control Efficiency[4] (%)	Maximum Hourly Emissions[5] (lb/hr)	Potential Annual Emissions[6] (tpy)
CO[1]	--	--	--	--
NO_X[1]	--	--	--	--
VOC[1]	--	--	--	--
Filterable PM[1]	--	--	--	--
Condensable PM[1]	--	--	--	--
Total PM[1]	--	--	--	--
SO_2	0.6	--	5.88E-03	2.58E-02
CH_4	2.3	--	2.25E-02	9.88E-02
N_2O	2.2	--	2.16E-02	9.45E-02
CO_2	120,000	--	1,176	5,153
CO_2e[2]	120,713	--	1,183	5,184
HAP Emissions				
Benzene	2.10E-03	95%	1.03E-06	4.51E-06
Formaldehyde	7.50E-02	95%	3.68E-05	1.61E-04
Hexane	1.80	95%	8.82E-04	3.86E-03
Naphthalene	6.10E-04	95%	2.99E-07	1.31E-06
Toluene	3.40E-03	95%	1.67E-06	7.30E-06
Total HAP	1.89	95%	9.26E-04	4.06E-03
			Total HAP	**4.06E-03**
			Maximum Individual HAP[7]	**3.86E-03**

1. Emissions for CO, NO_X, VOC, and PM from RTO1 are included in Dryer calculations.
2. Global warming potential (GWP) for CH_4 is 25 and N_2O is 298 for estimating CO_2e emissions (40 CFR 98, Subpart A, Table A-1,
3. Uncontrolled emission factors for natural gas combustion from AP-42, Section 1.4 - Natural Gas Combustion, Table 1.4-1,3 (9/03).
4. Emissions from the burner are controlled by the RTO itself. Additionally, natural gas will only be used as auxiliary fuel. The control efficiency is a conservative estimate based on guaranteed destruction rate from vendor.
5. Short-term emissions are calculated as follows:
Emissions (lb/hr) = Emission Factor (lb/MMscf) x Unit Heat Input (MMBtu/hr) ÷ Natural Gas Heating Value (MMBtu/MMscf) x Number of Burners x (1 - Control Efficiency)
6. Annual Emissions are calculated as follows:
Emissions (tpy) = Hourly Emissions (lb/hr) * Annual Operation (hr/yr) / 2,000 (lb/ton)
7. Maximum individual HAP from RTO1 is hexane.

Table B-8. RTO2 Burner Operating Parameters

Parameter	Units	
Number of Burners	1	burner
Unit Heat Input	10	MMBtu/hr
Natural Gas Heating Value[1]	1,020	MMBtu/MMscf
Annual Operation	8,760	hr/yr
Potential Annual Fuel Usage[2]	85.9	MMscf/yr

1. Natural Gas HHV is the average from the range listed in AP-42, Section 1.4.

2. Potential Annual Fuel Usage calculated as follows:

Annual Fuel Usage (MMscf/yr) = Heat Input (MMBtu/hr) / Natural Gas HHV (MMBtu/MMscf) x Annual Operation (hr/yr)

Table B-9. RTO2 Potential PSD Pollutants and HAP Emissions

Pollutant	Natural Gas Uncontrolled Emission Factor[3] (lb/MMscf)	RTO Control Efficiency[4] (%)	Maximum Hourly Emissions[5] (lb/hr)	Potential Annual Emissions[6] (tpy)
VOC[1]	--	--	--	--
CO	84.00	--	0.82	3.61
NO_X	100.0	--	0.98	4.29
Filterable PM	1.90	--	1.86E-02	8.16E-02
Condensable PM	5.70	--	5.59E-02	0.24
Total PM	7.60	--	7.45E-02	0.33
SO_2	0.6	--	5.88E-03	2.58E-02
CH_4	2.3	--	2.25E-02	9.88E-02
N_2O	2.2	--	2.16E-02	9.45E-02
CO_2	120,000	--	1,176	5,153
CO_2e[2]	120,713	--	1,183	5,184
HAP Emissions				
Benzene	2.10E-03	95%	1.03E-06	4.51E-06
Formaldehyde	7.50E-02	95%	3.68E-05	1.61E-04
Hexane	1.80	95%	8.82E-04	3.86E-03
Naphthalene	6.10E-04	95%	2.99E-07	1.31E-06
Toluene	3.40E-03	95%	1.67E-06	7.30E-06
Total HAP	1.89	95%	9.26E-04	4.06E-03
			Total HAP	**4.06E-03**
			Maximum Individual HAP[7]	**3.86E-03**

1. VOC Emissions from RTO2 are included in Pelletizing calculations.
2. Global warming potential (GWP) for CH_4 is 25 and N_2O is 298 for estimating CO_2e emissions (40 CFR 98, Subpart A, Table A-1, effective January 1, 2014).
3. Uncontrolled emission factors for natural gas combustion from AP-42, Section 1.4 - Natural Gas Combustion, Table 1.4-1,3 (9/03). All PM is assumed to be less than 1.0 mm in diameter; therefore, PM10 and PM2.5 are equivalent to PM.
4. Emissions from the burner are controlled by RTO2 itself. Additionally, natural gas will only be used as auxiliary fuel. The control efficiency is a conservative estimate based on guaranteed destruction rate from vendor.
5. Short-term emissions are calculated as follows:
   Emissions (lb/hr) = Emission Factor (lb/MMscf) x Unit Heat Input (MMBtu/hr) ÷ Natural Gas Heating Value (MMBtu/MMscf) x Number of Burners x (1 - Control Efficiency)
6. Annual Emissions are calculated as follows:
   Emissions (tpy) = Hourly Emissions (lb/hr) * Annual Operation (hr/yr) / 2,000 (lb/ton)
7. Maximum individual HAP from RTO2 is hexane.

Table B-10. Potential VOC Emissions from Dry Hammermills

EP ID	Emission Unit	Potential Annual Throughput[1] (tpy)	VOC Emission Factor[2] (lb/ODT)	Potential VOC Emissions[3] (tpy)	Acetaldehyde Emission Factor[4] (lb/ODT)	Potential Acetaldehyde Emissions[3] (tpy)	Formaldehyde Emission Factor[4] (lb/ODT)	Potential Formaldehyde Emissions[3] (tpy)	Methanol Emission Factor[4] (lb/ODT)	Potential Methanol Emissions[3] (tpy)
HM1 HM2 HM3 HM4	Dry Hammermill #1 Dry Hammermill #2 Dry Hammermill #3 Dry Hammermill #4	440,000	0.61	135.2	4.00E-03	0.88	8.00E-03	1.76	4.00E-03	0.88
			Total Emissions	**135.2**		**0.88**		**1.76**		**0.88**

1. Potential Annual Throughput (tpy) = Total Pellet Production (tpy)
Total Pellet Production = 440,000 tpy
2. VOC emission factor is the average value from 2013/2014 engineering testing performed on the Dry Classisizer units at the Pinnacle Aliceville facility (formerly Westervelt Aliceville). A safety factor has been added for conservatism.
Dry Milling VOC Testing Safety Factor = 25%
3. Potential Emissions (tpy) = Emission Factor (lb/ton) x Potential Annual Throughput (tpy)÷ 2,000 (lb/ton).
4. Uncontrolled Acetaldehyde, Formaldehyde, Methanol Emission Factors for Hammermill are derived from GA EPD Recommended Emission Factors for Wood Pellet Manufacturing.

Table B-11. Potential PM Emissions from Dry Hammermills

EP ID	Emission Unit	Control Device	Potential Operation[1] (hr/yr)	Exit Temperature (˚F)	Exhaust Flow Rate[2] (acfm)	Exhaust Flow Rate[2] (scfm)	Loading Rate (gr./dscf)	Total PM[3] (lb/hr)[4]	Total PM[3] (tpy)[5]	Total PM_{10}[3] (lb/hr)[4]	Total PM_{10}[3] (tpy)[5]	Total $PM_{2.5}$[3] (lb/hr)[4]	Total $PM_{2.5}$[3] (tpy)[5]
HM1 HM2 HM3 HM4	Dry Hammermill #1 Dry Hammermill #2 Dry Hammermill #3 Dry Hammermill #4	Baghouse	8,760	150	57,801	50,000	0.01	4.29	18.77	4.29	18.77	4.29	18.77
							Total Emissions:	**4.29**	**18.77**	**4.29**	**18.77**	**4.29**	**18.77**

1. Potential operation assumed to be continuous.
2. Exhaust flow rate (scfm) estimated for all hammermills. Exhaust flow converted to acfm assuming 150°F exhaust temperatures at 1 atm.
3. Since PM emissions from the operations consist of primarily fines, it is assumed that all of the particulate matter emitted is less than 2.5 microns. Condensable PM is negligible for this process; therefore, Filterable PM equals Total PM.
4. Potential hourly PM emissions (lb/hr) = Exhaust Grain Loading Rate (gr./dscf) x Exhaust Air Flow Rate (dscf/min) x (60 min/hr) x (lb/7,000 gr.)
5. Potential Annual Emissions (tpy) = Hourly Emissions (lb/hr) * Annual Operation (hr/yr)÷ 2,000 (lb/ton).

Table B-12. Potential VOC Emissions - Pellet Coolers

EP ID	Emission Unit	Potential Annual Pellet Throughput (tpy)	VOC[1] Maximum Hourly (lb/hr)	VOC[1] Potential Annual (tpy)	Acetaldehyde Emission Factor[2] (lb/ODT)	Acetaldehyde Maximum Hourly (lb/hr)	Acetaldehyde Potential Annual (tpy)	Formaldehyde Emission Factor[2] (lb/ODT)	Formaldehyde Maximum Hourly (lb/hr)	Formaldehyde Potential Annual (tpy)	Methanol Emission Factor[2] (lb/ODT)	Methanol Maximum Hourly (lb/hr)	Methanol Potential Annual (tpy)
PL1	Pellet Line No. 1												
PL2	Pellet Line No. 2												
PL3	Pellet Line No. 3												
PL4	Pellet Line No. 4												
PL5	Pellet Line No. 5	440,000	7.43	32.54	1.00E-03	2.51E-03	1.10E-02	2.00E-03	5.02E-03	2.20E-02	1.00E-03	2.51E-03	1.10E-02
PL6	Pellet Line No. 6												
PL7	Pellet Line No. 7												
PL8	Pellet Line No. 8												
PL9	Pellet Line No. 9												
		Total Emissions:	**7.43**	**32.54**		**2.51E-03**	**1.10E-02**		**5.02E-03**	**2.20E-02**		**2.51E-03**	**1.10E-02**

1. Emission rate for VOC is a vendor guaranteed emission rate. Additionally, Pinnacle has data that supports a lower emission rate from January 2018 engineering testing at Pinnacle Renewable Aliceville facility (previously Westervelt Aliceville) before the replacement RTO2 installation. The potential emission rate calculated using Aliceville testing results is as follows:

Emission Factor from Aliceville Testing Results (lb/ODT) = Average VOC Emissions (lb/hr) ÷ Average Pellet Production (ton/hr) = 1.52

Potential Emissions (tpy) = Emission Factor from Aliceville Testing Results (lb/ODT) x (1 + VOC Safety Factor) x (1 - RTO2 Control Efficiency) x Annual Throughput (tpy) ÷ 2,000 (lb/ton) = 20.88

2. Acetaldehyde, Formaldehyde, and Methanol Emission Factors for Pellet Coolers routed to RTO2 are derived from GA EPD Recommended Emission Factors for Wood Pellet Manufacturing.
3. Annual Emissions (tpy) = Emission Factor (lb/ton) x Annual Throughput (tpy) ÷ 2,000 (lb/ton) x (1 - Control Efficiency)
4. Hourly Emissions (lb/hr) = Annual Emissions (tpy) x 2,000 (lb/ton) ÷ Annual Operation (hr/yr)

RTO2 Control Efficiency = 95% Conservative estimate based on guaranteed destruction rate from vendor
Annual Operation = 8,760 Assumed to be continuous

Table B-13. Potential PM Emissions from Pellet Mills and Pellet Coolers

EP ID	Emission Unit	Control Device	Potential Operation[1] (hr/yr)	Exit Temperature (˚F)	Exhaust Flow Rate[2] (acfm)	Exhaust Flow Rate[2] (scfm)	Loading Rate (gr./dscf)	Total PM[3] (lb/hr)[4,6]	Total PM[3] (tpy)[5,6]	Total PM_{10}[3] (lb/hr)[4,6]	Total PM_{10}[3] (tpy)[5,6]	Total $PM_{2.5}$[3] (lb/hr)[4,6]	Total $PM_{2.5}$[3] (tpy)[5,6]
PL1	Pellet Line No. 1												
PL2	Pellet Line No. 2												
PL3	Pellet Line No. 3												
PL4	Pellet Line No. 4												
PL5	Pellet Line No. 5	Baghouse	8,760	150	57,801	50,000	0.01	4.29	18.77	4.29	18.77	4.29	18.77
PL6	Pellet Line No. 6												
PL7	Pellet Line No. 7												
PL8	Pellet Line No. 8												
PL9	Pellet Line No. 9												
							Total Emissions:	**4.29**	**18.77**	**4.29**	**18.77**	**4.29**	**18.77**

1. Potential operation assumed to be continuous.
2. Exhaust flow rate (scfm) estimated for all pelleters and pellet coolers. Exhaust flow converted to acfm assuming 150F exhaust temperatures at 1 atm.
3. Since PM emissions from the operations consist of primarily fines, it is assumed that all of the particulate matter emitted is less than 2.5 microns. Condensable PM is negligible for this process; therefore, Filterable PM/PM10/PM2.5 equal Total PM/PM10/PM2.5.
4. Potential hourly PM emissions (lb/hr) = Exhaust Grain Loading Rate (gr./dscf) x Exhaust Air Flow Rate (dscf/min) x (60 min/hr) x (lb/7,000 gr.)
5. Potential Annual Emissions (tpy) = Hourly Emissions (lb/hr) * Annual Operation (hr/yr) / 2,000 (lb/ton).
6. PM emission rates are vendor guaranteed.

Table B-14. Potential VOC Emissions from Miscellaneous Sources

EP ID	Emission Unit	Potential Annual Throughput (tpy)	VOC Emission Factor[1] (lb/ODT)	Potential Emissions VOC (tpy)	Acetaldehyde Emission Factor[2] (lb/ODT)	Acetaldehyde Potential Emissions (tpy)	Formaldehyde Emission Factor[2] (lb/ODT)	Formaldehyde Potential Emissions (tpy)	Methanol Emission Factor[2] (lb/ODT)	Methanol Potential Emissions (tpy)
FDCS	Fugitive Dry Chip Storage	440,000	2.77E-02	6.10	1.00E-03	0.22	2.00E-03	0.44	1.00E-03	0.22
PSS1	Pellet Storage Silo	440,000	2.77E-02	6.10	1.00E-03	0.22	2.00E-03	0.44	1.00E-03	0.22
TLS	Truck Loadout System	440,000	2.77E-02	6.10	1.00E-03	0.22	2.00E-03	0.44	1.00E-03	0.22

1. VOC emission factor is based on a Texas Natural Resource Conservation Commission (TNRCC) document for VOC emissions from industrial wood processing (April 1995).
2. Uncontrolled Acetaldehyde, Formaldehyde, Methanol Emission Factors for Storage/Handling are derived from GA EPD Recommended Emission Factors for Wood Pellet Manufacturing
3. Emissions (tpy) = Emission Factor (lb/ton) x Potential Annual Throughput (tpy) ÷ 2,000 (lb/ton)

Table B-15. Potential PM Emissions from Miscellaneous Sources

EP ID	Emission Unit	PM Emission Factor[1] (lb/ODT)	PM_{10} Emission Factor[1] (lb/ODT)	$PM_{2.5}$ Emission Factor[1] (lb/ODT)	Potential Emissions[2,3] PM (tpy)	Potential Emissions[2,3] PM_{10} (tpy)	Potential Emissions[2,3] $PM_{2.5}$ (tpy)
FDCS	Fugitive Dry Chip Storage	2.50E-02	6.30E-03	1.10E-03	5.50	1.39	0.24
PSS1	Pellet Storage Silo	2.50E-02	6.30E-03	1.10E-03	5.50	1.39	0.24
TLS	Truck Loadout System	8.60E-02	2.90E-02	4.90E-03	18.92	6.38	1.08

1. PM emission factors for storage and truck loadout are from AP-42 Section 9.9.1, Table 9.9.1-1.
2. Calculated as follows using the potential annual throughputs identified in Table B-14:
   Emissions (tpy) = Emission Factor (lb/ton) x Potential Annual Throughput (tpy) ÷ 2,000 (lb/ton)
3. Condensable PM is negligible for this process; therefore, Filterable PM equals Total PM.

Table B-16. Emergency Generator Engines Operating Parameters

Parameter	ENG1	ENG2	ENG3	ENG4	ENG5	Units
Fuel	Diesel	Diesel	Diesel	Diesel	Diesel	--
Maximum Power Output[1]	564	335	172	37	37	kW, output
	757	449	231	49	49	bhp, output
Potential Operation[2]	500	500	500	500	500	hr/yr
Heating Value of Diesel[3]	19,300	19,300	19,300	19,300	19,300	Btu/lb
Power Conversion[3]	7,000	7,000	7,000	7,000	7,000	Btu/hp-hr

1. Manufacturer specified parameters.
2. Emergency engines operate a maximum of 500 hours per year.
3. Conversion factor and heating value for diesel fuel as noted in AP-42, Section 3.3, Table 3.3-1 footnotes.

Table B-17. Emergency Generator Engines Emission Factors

Pollutant	ENG1 NSPS Subpart IIII Emission Standards[1,2] (g/kW-hr)	ENG2 Subpart IIII Emission Standards[1,2] (g/kW-hr)	ENG3 NSPS Subpart IIII Emission Standards[1,2] (g/kW-hr)	ENG4 and ENG5 NSPS Subpart IIII Emission Standards[1,2] (g/kW-hr)	AP-42 Engine Emission Factor[4] (lb/hp-hr)	(lb/MMBtu)	40 CFR Part 98 Emission Factor[5,6] (lb/MMBtu)	(kg/MMBtu)
CO	3.50	3.50	3.50	5.00	--	--	--	--
NO_X	6.40	4.00	4.00	4.70	--	--	--	--
Filterable PM	0.20	0.20	0.20	0.40	--	--	--	--
Total PM[3]	--	--	--	--	2.20E-03			
Total PM_{10}[3]	--	--	--	--	2.20E-03	--	--	--
Total $PM_{2.5}$[3]	--	--	--	--	2.20E-03	--	--	--
SO_2	1.09E-05 lb/hp-hr				--	--	--	--
VOC	--	--	--	--	2.47E-03	--	--	--
CO_2	--	--	--	--	--	--	163.05	73.96
CH_4	--	--	--	--	--	--	6.61E-03	3.00E-03
N_2O	--	--	--	--	--	--	1.32E-03	6.00E-04
CO_2e	--	--	--	--	--	--	163.61	74.21
Total HAP	--	--	--	--	--	3.79E-03	--	--
Benzene	--	--	--	--	--	9.33E-04	--	--
Toluene	--	--	--	--	--	4.09E-04	--	--
Xylenes	--	--	--	--	--	2.85E-04	--	--
1,3-Butadiene	--	--	--	--	--	3.91E-05	--	--
Formaldehyde	--	--	--	--	--	1.18E-03	--	--
Acetaldehyde	--	--	--	--	--	7.67E-04	--	--
Acrolein	--	--	--	--	--	9.25E-05	--	--
Naphthalene	--	--	--	--	--	8.48E-05	--	--

1. Emission factors from NSPS Subpart IIII emission standards for specific engine. It is conservatively assumed that emission standards for NMHC+NOx as NOx emission rate.
2. Sulfur content (15 ppmv) in accordance with 40 CFR 60.4207(b) as required by NSPS Subpart IIII.
3. All PM is assumed to have a diameter of less than one micron. Additionally, there is no CPM factor available; thus, PM = PM_{10} = $PM_{2.5}$. These emission factors are from AP-42 Table 3.3-1.
4. HAP emission factors from AP-42, Table 3.3-2.
5. Based on EPA default factors in 40 CFR Part 98 Subpart C Tables C-1 and C-2, effective January 1, 2014, for Distillate Fuel Oil No. 2 (Petroleum Products).
6. Emissions for Greenhouse Gases (GHGs) are denoted as CO_2 equivalent (CO_2e), which is the sumproduct of each GHG and its respective global warming potentials (GWP) for a

CO_2	1
CH_4	25
N_2O	298

Table B-18. Emergency Generator Engines Criteria Pollutant & GHG Potential Emissions[1,2]

Pollutant	ENG1 Emissions (lb/hr)	(tpy)	ENG2 Emissions (lb/hr)	(tpy)	ENG3 Emissions (lb/hr)	(tpy)	ENG4 Emissions (lb/hr)	(tpy)	ENG5 Emissions (lb/hr)	(tpy)
CO	4.36	1.09	2.58	0.65	1.33	0.33	0.40	0.10	0.40	0.10
NO_X	7.96	1.99	2.95	0.74	1.52	0.38	0.38	9.47E-02	0.38	9.47E-02
N_2O	7.01E-03	1.75E-03	4.16E-03	1.04E-03	2.14E-03	5.35E-04	4.54E-04	1.13E-04	4.54E-04	1.13E-04
Filterable PM	0.25	6.22E-02	0.15	3.69E-02	7.60E-02	1.90E-02	3.22E-02	8.06E-03	3.22E-02	8.06E-03
Total PM	1.67	0.42	0.99	0.25	0.51	0.13	0.11	2.70E-02	0.11	2.70E-02
Total PM_{10}	1.67	0.42	0.99	0.25	0.51	0.13	0.11	2.70E-02	0.11	2.70E-02
Total $PM_{2.5}$	1.67	0.42	0.99	0.25	0.51	0.13	0.11	2.70E-02	0.11	2.70E-02
SO_2[3]	8.24E-03	2.06E-03	4.89E-03	1.22E-03	2.51E-03	6.28E-04	5.33E-04	1.33E-04	5.33E-04	1.33E-04
VOC	1.87	0.47	1.11	0.28	0.57	0.14	0.12	3.03E-02	0.12	3.03E-02
CO_2	864.0	216.0	512.5	128.1	263.7	65.91	55.93	13.98	55.93	13.98
CH_4	3.50E-02	8.76E-03	2.08E-02	5.20E-03	1.07E-02	2.67E-03	2.27E-03	5.67E-04	2.27E-03	5.67E-04
CO_2e	867.0	216.7	514.2	128.6	264.6	66.14	56.12	14.03	56.12	14.03

1. Emissions calculated as follows:
   Potential Emissions (tpy) = Emission Factor (g/kW-hr) x Rated Capacity (kW) / Conversion (453.6 g/lb) x Annual Operation (hr/yr) / 2,000 (lb/ton)
   Potential Emissions (tpy) = Emission Factor (g/hp-hr) x Rated Capacity (hp) / Conversion (453.6 g/lb) x Annual Operation (hr/yr) / 2,000 (lb/ton)
   Potential Emissions (tpy) = Emission Factor (lb/hp-hr) x Rated Capacity (hp) x Annual Operation (hr/yr) / 2,000 (lb/ton)
   Potential Emissions (tpy) = Emission Factor (lb/MMBtu) x Rated Capacity (hp) x Fuel Factor (MMBtu/hp-hr) x Annual Operation (hr/yr) / 2,000 (lb/ton)
   Fuel Factor (MMBtu/hp-hr) = 0.007 Per AP-42 Table 3.3-1 Footnote a.
2. Potential Emissions (lb/hr) = Potential Emissions (tpy) x 2,000 lb/ton / Annual Operation (hr/yr)
3. SO_2 emissions are calculated as follows:
Emissions (lb/hr) = Emission Factor (lb/hp-hr) * Engine Capacity (hp)
Annual Emissions (tpy) = Hourly Emissions (lb/hr) * Annual Operation (hr/yr) / 2,000 (lb/ton).

Table B-19. Emergency Generator Engines Potential HAP Emissions[2,3]

Pollutant	Emission Factor[1] (lb/hp-hr)	Emission Factor[1] (lb/MMBtu)	ENG1 Potential (lb/hr)	ENG1 Potential (tpy)	ENG2 Potential (lb/hr)	ENG2 Potential (tpy)	ENG3 Potential (lb/hr)	ENG3 Potential (tpy)	ENG4 Potential (lb/hr)	ENG4 Potential (tpy)	ENG5 Potential (lb/hr)	ENG5 Potential (tpy)
Acetaldehyde	5.37E-06	7.67E-04	4.06E-03	1.02E-03	2.41E-03	6.03E-04	1.24E-03	3.10E-04	2.63E-04	6.58E-05	2.63E-04	6.58E-05
Acrolein	6.48E-07	9.25E-05	4.90E-04	1.23E-04	2.91E-04	7.27E-05	1.50E-04	3.74E-05	3.17E-05	7.93E-06	3.17E-05	7.93E-06
Benzene	6.53E-06	9.33E-04	4.94E-03	1.24E-03	2.93E-03	7.33E-04	1.51E-03	3.77E-04	3.20E-04	8.00E-05	3.20E-04	8.00E-05
Formaldehyde	8.26E-06	1.18E-03	6.25E-03	1.56E-03	3.71E-03	9.27E-04	1.91E-03	4.77E-04	4.05E-04	1.01E-04	4.05E-04	1.01E-04
Toluene	2.86E-06	4.09E-04	2.17E-03	5.42E-04	1.29E-03	3.21E-04	6.61E-04	1.65E-04	1.40E-04	3.51E-05	1.40E-04	3.51E-05
Xylenes	2.00E-06	2.85E-04	1.51E-03	3.78E-04	8.96E-04	2.24E-04	4.61E-04	1.15E-04	9.78E-05	2.44E-05	9.78E-05	2.44E-05
1,3 Butadiene	2.74E-07	3.91E-05	2.07E-04	5.18E-05	1.23E-04	3.07E-05	6.32E-05	1.58E-05	1.34E-05	3.35E-06	1.34E-05	3.35E-06
Total PAH	1.18E-06	1.68E-04	8.90E-04	2.23E-04	5.28E-04	1.32E-04	2.72E-04	6.79E-05	5.76E-05	1.44E-05	5.76E-05	1.44E-05
Naphthalene	5.94E-07	8.48E-05	4.49E-04	1.12E-04	2.67E-04	6.66E-05	1.37E-04	3.43E-05	2.91E-05	7.27E-06	2.91E-05	7.27E-06
Acenaphthylene	3.54E-08	5.06E-06	2.68E-05	6.70E-06	1.59E-05	3.98E-06	8.18E-06	2.05E-06	1.74E-06	4.34E-07	1.74E-06	4.34E-07
Acenaphthene	9.94E-09	1.42E-06	7.52E-06	1.88E-06	4.46E-06	1.12E-06	2.30E-06	5.74E-07	4.87E-07	1.22E-07	4.87E-07	1.22E-07
Fluorene	2.04E-07	2.92E-05	1.55E-04	3.87E-05	9.18E-05	2.29E-05	4.72E-05	1.18E-05	1.00E-05	2.50E-06	1.00E-05	2.50E-06
Phenanthrene	2.06E-07	2.94E-05	1.56E-04	3.89E-05	9.24E-05	2.31E-05	4.75E-05	1.19E-05	1.01E-05	2.52E-06	1.01E-05	2.52E-06
Anthracene	1.31E-08	1.87E-06	9.91E-06	2.48E-06	5.88E-06	1.47E-06	3.02E-06	7.56E-07	6.41E-07	1.60E-07	6.41E-07	1.60E-07
Fluoranthene	5.33E-08	7.61E-06	4.03E-05	1.01E-05	2.39E-05	5.98E-06	1.23E-05	3.08E-06	2.61E-06	6.53E-07	2.61E-06	6.53E-07
Pyrene	3.35E-08	4.78E-06	2.53E-05	6.33E-06	1.50E-05	3.76E-06	7.73E-06	1.93E-06	1.64E-06	4.10E-07	1.64E-06	4.10E-07
Benzo(a)anthracene	1.18E-08	1.68E-06	8.90E-06	2.23E-06	5.28E-06	1.32E-06	2.72E-06	6.79E-07	5.76E-07	1.44E-07	5.76E-07	1.44E-07
Chrysene	2.47E-09	3.53E-07	1.87E-06	4.68E-07	1.11E-06	2.77E-07	5.71E-07	1.43E-07	1.21E-07	3.03E-08	1.21E-07	3.03E-08
Benzo(b)fluoranthene	6.94E-10	9.91E-08	5.25E-07	1.31E-07	3.11E-07	7.79E-08	1.60E-07	4.01E-08	3.40E-08	8.50E-09	3.40E-08	8.50E-09
Benzo(k)fluoranthene	1.09E-09	1.55E-07	8.21E-07	2.05E-07	4.87E-07	1.22E-07	2.51E-07	6.27E-08	5.32E-08	1.33E-08	5.32E-08	1.33E-08
Benzo(a)pyrene	1.32E-09	1.88E-07	9.96E-07	2.49E-07	5.91E-07	1.48E-07	3.04E-07	7.60E-08	6.45E-08	1.61E-08	6.45E-08	1.61E-08
Indeno(1,2,3-cd)pyrene	2.63E-09	3.75E-07	1.99E-06	4.97E-07	1.18E-06	2.95E-07	6.06E-07	1.52E-07	1.29E-07	3.22E-08	1.29E-07	3.22E-08
Dibenz(a,h)anthracene	4.08E-09	5.83E-07	3.09E-06	7.72E-07	1.83E-06	4.58E-07	9.43E-07	2.36E-07	2.00E-07	5.00E-08	2.00E-07	5.00E-08
Benzo(g,h,l)perylene	3.42E-09	4.89E-07	2.59E-06	6.48E-07	1.54E-06	3.84E-07	7.91E-07	1.98E-07	1.68E-07	4.19E-08	1.68E-07	4.19E-08
		Total HAP	**2.05E-02**	**5.13E-03**	**1.22E-02**	**3.04E-03**	**6.26E-03**	**1.57E-03**	**1.33E-03**	**3.32E-04**	**1.33E-03**	**3.32E-04**
		Max Individual HAP[4]	**6.25E-03**	**1.56E-03**	**3.71E-03**	**9.27E-04**	**1.91E-03**	**4.77E-04**	**4.05E-04**	**1.01E-04**	**4.05E-04**	**1.01E-04**

1. Emission factors from AP-42 Section 3.3 (Gasoline and Diesel Industrial Engines), Table 3.3-2 (10/96). Emission factors in lb/MMBtu were converted to lb/hp-hr by multiplying the power conversion factor of 7,000 Btu/hp-hr and 1 MMBtu/1,000,000 Btu.
2. Short-term emissions are calculated as follows:
Emissions (lb/hr) = Emission Factor (lb/hp-hr) * Engine Capacity (hp).
3. Annual emissions are calculated as follows:
Annual Emissions (tpy) = Hourly Emissions (lb/hr) * Annual Operation (hr/yr) / 2,000 (lb/ton).
4. Maximum individual HAP is formaldehyde.

Table B-20. Fire Pump Operating Parameters

Parameter	FWP1	Units
Fuel	Diesel	
Maximum Power Output[1]	192	bhp
Potential Operation[2]	500	hr/yr
Heating Value of Diesel[3]	19,300	Btu/lb
Power Conversion[3]	7,000	Btu/hp-hr

1. Manufacturer specified parameters.
2. Engine will operate a maximum of 500 hrs/yr, per EPA guidance.
3. Conversion factor for diesel fuel as noted in AP-42, Section 3.3, Table 3.3-1 footnote.

Table B-21. Fire Pump Criteria Pollutant & GHG Potential Emissions

Pollutant	Emission Factor[6] (lb/hp-hr)	Emission Factor[6] (lb/MMBtu)	FWP1 Potential Emissions[7,8] (lb/hr)	FWP1 Potential Emissions[7,8] (tpy)
NO_X[1]	6.58E-03	--	1.26	0.32
VOC	2.47E-03	--	0.47	0.12
CO[1]	5.76E-03	--	1.11	0.28
Filterable PM[1]	3.29E-04	--	6.32E-02	1.58E-02
Total PM[2]	2.20E-03	--	0.42	0.11
Total PM_{10}[2]	2.20E-03	--	0.42	0.11
Total $PM_{2.5}$[2]	2.20E-03	--	0.42	0.11
SO_2[3]	1.09E-05	--	2.09E-03	5.22E-04
CO_2	1.15	--	220.8	55.20
CH_4[4]	4.63E-05	6.61E-03	8.89E-03	2.22E-03
N_2O[4]	9.26E-06	1.32E-03	1.78E-03	4.44E-04
CO_2e[5]	1.15	--	221.6	55.39

1. Fire pump PM, CO, NO_X emissions factors are based on NSPS IIII emission limit.

NSPS IIII Emission Limit		
NO_X =	4	g/kW-hr
NMHC =		g/kW-hr
CO =	3.5	g/kW-hr
Filterable PM =	0.2	g/kW-hr

Emission factors were converted to lb/hp-hr by dividing 608 per AP-42, Section 3.3, Table 3.3-1 footnote.
2. All PM is assumed to have a diameter of less than one micron. Additionally, there is no CPM factor available; thus, Total PM = Total PM_{10} = Total $PM_{2.5}$.
3. Sulfur content (15 ppmv) in accordance with 40 CFR 60.4207(b) as required by NSPS Subpart IIII.
4. CH_4 and N_2O factors are from 40 CFR Part 98, Table C-2 for petroleum fuels. Factors were converted from kg/MMBtu to lb/MMBtu.

CH_4 =	0.003	kg/MMBtu
N_2O =	0.0006	kg/MMBtu

5. CO_2e is calculated using Global Warming Potentials (GWPs) from 40 CFR Part 98, Subpart A, Table A-1 effective

CO_2	1
CH_4	25
N_2O	298

6. Otherwise emission factors from AP-42 Section 3.3 (Gasoline and Diesel Industrial Engines), Table 3.3-1 (10/96). Emission factors in lb/MMBtu were converted to lb/hp-hr by multiplying the power conversion factor of 7,000 Btu/hp-hr and 1MMBtu/1,000,000 Btu.
7. Short-term emissions are calculated as follows:
Emissions (lb/hr) = Emission Factor (lb/hp-hr) * Engine Capacity (hp).
8. Annual emissions are calculated as follows:
Annual Emissions (tpy) = Hourly Emissions (lb/hr) * Annual Operation (hr/yr) / 2,000 (lb/ton).

Table B-22. Fire Pump Potential HAP Emissions

Pollutant	Emission Factor[1] (lb/hp-hr)	Emission Factor[1] (lb/MMBtu)	FWP1 Potential Emissions[2,3] (lb/hr)	FWP1 Potential Emissions[2,3] (tpy)
Acetaldehyde	5.37E-06	7.67E-04	1.03E-03	2.58E-04
Acrolein	6.48E-07	9.25E-05	1.24E-04	3.11E-05
Benzene	6.53E-06	9.33E-04	1.25E-03	3.13E-04
Formaldehyde	8.26E-06	1.18E-03	1.59E-03	3.96E-04
Toluene	2.86E-06	4.09E-04	5.50E-04	1.37E-04
Xylenes	2.00E-06	2.85E-04	3.83E-04	9.58E-05
1,3 Butadiene	2.74E-07	3.91E-05	5.26E-05	1.31E-05
Naphthalene	5.94E-07	8.48E-05	1.14E-04	2.85E-05
Acenaphthylene	3.54E-08	5.06E-06	6.80E-06	1.70E-06
Acenaphthene	9.94E-09	1.42E-06	1.91E-06	4.77E-07
Fluorene	2.04E-07	2.92E-05	3.92E-05	9.81E-06
Phenanthrene	2.06E-07	2.94E-05	3.95E-05	9.88E-06
Anthracene	1.31E-08	1.87E-06	2.51E-06	6.28E-07
Fluoranthene	5.33E-08	7.61E-06	1.02E-05	2.56E-06
Pyrene	3.35E-08	4.78E-06	6.42E-06	1.61E-06
Benzo(a)anthracene	1.18E-08	1.68E-06	2.26E-06	5.64E-07
Chrysene	2.47E-09	3.53E-07	4.74E-07	1.19E-07
Benzo(b)fluoranthene	6.94E-10	9.91E-08	1.33E-07	3.33E-08
Benzo(k)fluoranthene	1.09E-09	1.55E-07	2.08E-07	5.21E-08
Benzo(a)pyrene	1.32E-09	1.88E-07	2.53E-07	6.32E-08
Indeno(1,2,3-cd)pyrene	2.63E-09	3.75E-07	5.04E-07	1.26E-07
Dibenz(a,h)anthracene	4.08E-09	5.83E-07	7.84E-07	1.96E-07
Benzo(g,h,l)perylene	3.42E-09	4.89E-07	6.57E-07	1.64E-07
		Total HAP	**5.21E-03**	**1.30E-03**
		Max Individual HAP[4]	**1.59E-03**	**3.96E-04**

1. Emission factors from AP-42 Section 3.3 (Gasoline and Diesel Industrial Engines), Table 3.3-2 (10/96). Emission factors in lb/MMBtu were converted to lb/hp-hr by multiplying the power conversion factor of 7,000 Btu/hp-hr and 1MMBtu/1,000,000 Btu.
2. Short-term emissions are calculated as follows:
Emissions (lb/hr) = Emission Factor (lb/hp-hr) * Engine Capacity (hp).
3. Annual emissions are calculated as follows:
Annual Emissions (tpy) = Hourly Emissions (lb/hr) * Annual Operation (hr/yr) / 2,000 (lb/ton).
4. Maximum individual HAP is formaldehyde.

Table B-23. Potential PM Emissions from Screening

EP ID	Emission Unit	Potential Throughput[1] (tpy)	Emission Factors[2] (lb/ton) PM	PM_{10}	$PM_{2.5}$	Potential Emissions[3] PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
F-SC1	Wet Infeed Screening	880,000	1.76E-03	8.40E-04	1.76E-04	7.76E-01	3.70E-01	7.76E-02
F-SC2	Pellet Screening	440,000	3.15E-02	1.50E-02	3.15E-03	6.93	3.30	0.69

1. The potential throughput for wet infeed screening is based on the green material throughput. The potential throughput for pellet screening is based on the facility's production capacity.

2. Emission factors from the "Rock Crushing Plants," Table 6, published by TCEQ (February 2002). Wet screening factors were used for wet infeed screening. Dry screening factors were used for pellet screening. $PM_{2.5}$ conservatively assumed 10% of PM.

3. Potential Emissions from screening are calculated as follows: Potential Emissions (tpy) = Emission Factor (lb/ton) x Throughput (ton/year) ÷ 2,000

Table B-24. Operating Parameters for Dryer Abort[1]

Parameter	Value	Units
Number of Burners	1	burner
Unit Heat Input	170	MMBtu/hr
Max Hourly Throughput	50.2	tph
Annual Operation	50	hr/yr
Dryer Flow Rate	110,000	dscfm

1. The dryer abort stack is only used in the event of a malfunction, specifically spark detect. Malfunctions are infrequent, unpredictable, and minimized to the maximum extent possible. Pinnacle conservatively included emissions from dryer abort stack usage assuming 50 hr/yr.

Table B-25. Potential PSD Pollutants and HAP Emissions from Dryer Abort

PSD Pollutants	Emission Factors[1-4]	Emission Factor Units	Maximum Hourly Emissions (lb/hr)[5]	Potential Annual Emissions (tpy)[6]
CO	150.0	ppmvd	71.93	1.80
NO_X	29.00	ppmvd	22.84	0.57
VOC	219.2	lb/hr	219.2	5.48
Filterble PM	--	--	68.80	1.72
Total PM	68.80	lb/hr	68.80	1.72
Total PM_{10}	--	--	68.80	1.72
Total $PM_{2.5}$	--	--	68.80	1.72
SO_2	2.50E-02	lb/MMBtu	4.25	0.11
Lead	4.80E-05	lb/MMBtu	8.16E-03	2.04E-04
CH_4	2.10E-02	lb/MMBtu	3.57	8.93E-02
N_2O	1.30E-02	lb/MMBtu	2.21	5.53E-02
CO_2	195.0	lb/MMBtu	33,150	828.8
CO_2e[7]	199.4	lb/MMBtu	33,898	847.4
HAP Emissions				
Acetaldehyde	0.11	lb/ton	5.53	0.14
Formaldehyde	0.14	lb/ton	7.03	0.18
Hydrogen Chloride	1.90E-02	lb/MMBtu	0.95	2.39E-02
Methanol	0.11	lb/ton	5.53	0.14
			Total HAP	**0.48**
			Maximum Individual HAP[8]	**0.18**

1. Emission factors for CO and NO_X are vendor guaranteed concentrations at the RTO inlet.
2. Emission factors for VOC and Total PM were back calculated using the vendor guaranteed hourly emission rate and a 95% control efficiency. PM_{10} and $PM_{2.5}$ are conservatively assumed to be equivalent to PM. Filterable PM conservatively assumed equivalent to total PM.
3. Emission factors for SO_2, lead, and GHGs are from AP-42 Section 1.6 (Wood Residue Combustion), Tables 1.6-2 and 1.6-3 (September 2003).
4. Emission Factors for Acetaldehyde, Formaldehyde, Hydrogen Chloride, and Methanol are uncontrolled and from GA EPD Recommended Emission Factors for Wood Pellet Manufacturing with units in lb/ODT for all but Hydrogen Chloride, which is in lb/MMBtu. During dryer bypass emissions are not controled by the WESP and RTO1.
5. Short-term emissions are calculated as follows:

Emissions (lb/hr) = Emission Factor (lb/MMBtu) × Unit Heat Input (MMBtu/hr)

Emissions (lb/hr) = Emissionf Factor (lb/ton) × Process Throughput (ton/hr)

(ft^3 air/lb-mol air) ÷ 10^6

CO MW (lb/lb-mol) = 28.01

NO_X MW (lb/lb-mol) = 46.01

$Volume_{ideal}$ (ft^3 air/lb-mol air) = 385.5

6. Annual emissions are calculated as follows:

Emissions (tpy) = Hourly Emissions (lb/hr) × Annual Operation (hr/yr) / 2,000 (lb/ton)

7. Global warming potential (GWP) for CH_4 is 25 and N_2O is 298 for estimating CO_2e emissions (40 CFR 98, Subpart A, Table A-1, effective January 1, 2014).
8. Maximum individual HAP is formaldehyde.

Table B-26. Operating Parameters for Furnace Abort - Idle Mode

Parameter	Value	Units
Number of Burners	1	burner
Unit Heat Input[1]	17	MMBtu/hr
Annual Operation	500	hr/yr

1. During idle mode, the maximum heat input capacity is estimated to be 10% of the potential heat input capacity during normal operation.

Table B-27. Potential PSD Pollutants Emissions from Furnace Abort - Idle Mode

PSD Pollutants	Emission Factors[1] (lb/MMBtu)	Maximum Hourly Emissions (lb/hr)[2]	Potential Annual Emissions (tpy)[3]
CO	0.60	10.20	2.55
NO_X	0.22	3.74	0.94
VOC	1.70E-02	0.29	7.23E-02
Filterble PM	0.56	9.52	2.38
Condensible PM	1.70E-02	0.29	7.23E-02
Total PM	0.58	9.81	2.45
Total PM_{10}	0.52	8.79	2.20
Total $PM_{2.5}$	0.45	7.60	1.90
SO_2	2.50E-02	0.43	0.11
Lead	4.80E-05	8.16E-04	2.04E-04
CH_4	2.10E-02	0.36	8.93E-02
N_2O	1.30E-02	0.22	5.53E-02
CO_2	195.0	3,315	828.8
CO_2e[4]	199.4	3,390	847.4

1. Emission factors from AP-42 Section 1.6 (Wood Residue Combustion), Tables 1.6-1 through 1.6-4 (September 2003).

2. Potential Emissions (lb/hr) = Emission Factor (lb/MMBtu) × Unit Heat Input (MMBtu/hr)

3. Potential Emissions (tpy) = Hourly Emissions (lb/hr) × Annual Operation (hr/yr) / 2,000 (lb/ton)

4. Global warming potential (GWP) for CH_4 is 25 and N_2O is 298 for estimating CO_2e emissions (40 CFR 98, Subpart A, Table A-1, effective January 1, 2014).

Table B-28. Operating Parameters for Furnace Abort at Full Capacity

Parameter	Value	Units
Number of Burners	1	burner
Unit Heat Input	170	MMBtu/hr
Annual Operation	50	hr/yr

Table B-29. Potential PSD Pollutants Emissions from Furnace Abort at Full Capacity

PSD Pollutants	Emission Factors[1] (lb/MMBtu)	Maximum Hourly Emissions (lb/hr)[2]	Potential Annual Emissions (tpy)[3]
CO	0.60	102.0	2.55
NO_X	0.22	37.40	0.94
VOC	1.70E-02	2.89	7.23E-02
Filterble PM	0.56	95.20	2.38
Condensible PM	1.70E-02	2.89	7.23E-02
Total PM	0.58	98.09	2.45
Total PM_{10}	0.52	87.89	2.20
Total $PM_{2.5}$	0.45	75.99	1.90
SO_2	2.50E-02	4.25	0.11
Lead	4.80E-05	8.16E-03	2.04E-04
CH_4	2.10E-02	3.57	8.93E-02
N_2O	1.30E-02	2.21	5.53E-02
CO_2	195.0	33,150	828.8
CO_2e[4]	199.4	33,898	847.4

1. Emission factors from AP-42 Section 1.6 (Wood Residue Combustion), Tables 1.6-1 through 1.6-4 (September 2003).
2. Potential Emissions (lb/hr) = Emission Factor (lb/MMBtu) × Unit Heat Input (MMBtu/hr)
3. Potential Emissions (tpy) = Hourly Emissions (lb/hr) × Annual Operation (hr/yr) / 2,000 (lb/ton)
4. Global warming potential (GWP) for CH_4 is 25 and N_2O is 298 for estimating CO_2e emissions (40 CFR 98, Subpart A, Table A-1, effective January 1, 2014).

APPENDIX C: MDEQ AIR PERMIT APPLICATION FORMS

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Facility (Agency Interest) Information — **Section A**

1. Name, Address, and Location of Facility

A. Owner/Company Name: Pinnacle Renewable Energy Inc.

B. Facility Name (if different than A. above): Newton, MS Facility

C. Facility Air Permit No. (if known): ____________

D. Agency Interest No. (if known): ____________

E. Physical Address
1. Street Address: 615 Coliseum Dr
2. City: Newton 3. State: MS
4. County: Newton 5. Zip Code: 39345
6. Telephone No. TBD 7. Fax No. TBD

F. Mailing Address *(if different from physical address)*
1. Street Address or P.O. Box: ____________
2. City: ____________
3. State: ____________ 4. Zip Code: ____________

G. Latitude/Longitude Data
1. Collection Point *(check one)*
[ ] Plant Entrance [x] Other: Facility Site
2. Method of Collection *(check one)*
[ ] GPS Specify coordinate system (NAD 83, etc.) ____________
[ ] Map Interpolation (Google Earth etc.) [ ] Other: ____________
3. Latitude (degrees/minutes/seconds): 32 degrees 21 minutes 38.90 seconds
4. Longitude (degrees/minutes/seconds): 89 degrees 8 minutes 2.88 seconds
5. Elevation: 388 feet

H. SIC/NAICS Codes *(primary code listed first)*
SIC: 2499
NAICS: 321999
(NAICS Code should correspond with the SIC Code directly above.)

2. Name and Address of Facility Contact

A. Name: Paul Pawlowski Title: Director - Energy & Environment

B. Mailing Address
1. Street Address or P.O. Box: 3600 Lysander Lane, Suite 350
2. City: Richmond 3. State: British Columbia
4. Zip Code: V7B 1C3 5. Email: paul.pawlowski@pinnaclepellet.com
6. Telephone No. 1 (604) 270-9613 Ext. 2022 7. Fax No. ____________

3.	**Name and Address of Air Contact** *(if different from Facility Contact)*

A. Name Paul Pawlowski Title: Director - Energy & Environment

B. Mailing Address
1. Street Address: 3600 Lysander Lane, Suite 350
2. City: Richmond
3. State: British Columbia
4. County:
5. Zip Code: V7B 1C3
6. Telephone No. 1 (604) 270-9613 Ext. 2022
7. Fax No.

4.	**Name and Address of the Responsible Official for the Facility**

The Responsible Official is defined as one of the following:

a. For a corporation, a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and the facilities employ more than 250 persons or have gross annual sales or expenditures exceeding $ 25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated in accordance with corporate procedures.

b. For a partnership or sole proprietorship: a general partner or the proprietor, respectively.

c. For a municipality, state, federal, or other public agency: either a principal executive officer or ranking elected official. For purposes of these regulations, a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of EPA). A principal executive officer of a military facility includes the facility commander, chief executive officer, or any other similar person who performs similar policy or decision-making functions for the institution.

A. Name Paul Pawlowski Title : Director - Energy & Environment

B. Mailing Address
1. Street Address 3600 Lysander Lane, Suite 350
2. City : Richmond
3. State: British Columbia
4. Zip Code: V7B 1C3
5. Email paul.pawlowski@pinnaclepellet.com
6. Telephone No. 1 (604) 270-9613 Ext. 2022
7. Fax No.

C. Is the person above a duly authorized representative? ☐ Yes ☐ No

If yes, has written notification of such authorization been submitted to MDEQ?
☐ Yes ☒ No ☐ Request for authorization is attached

5.	Type of Permit Application *(Check all that apply)*

State Permit to Construct (i.e., non-PSD or PSD avoidance)

[X] Initial Application [ ] Modification

New Source Review (NSR) Permit to Construct (includes both Prevention of Significant Deterioration (PSD) and Nonattainment)

[ ] Initial Application [ ] Modification

Title V Operating Permit

[ ] Initial Application

[ ] Re-issuance: Are any modification to the permit/facility being requested? [ ] Yes [ ] No

If yes, provide a separate sheet identifying the modification(s) and resulting change to emissions.

[ ] Modification (*Specify type*): [ ] Significant [ ] Minor [ ] Administrative

Synthetic Minor Operating Permit *(Appendix B must be completed and attached.)*

[ ] Initial Application

[ ] Re-issuance: Are any modification to the permit/facility being requested? [ ] Yes [ ] No

[ ] Modification

State Permit to Operate a Significant Minor Source *(defined in APC-S-2, Section I.C.25)*

[ ] Initial Application

[ ] Re-issuance: Are any modification to the permit/facility being requested? [ ] Yes [ ] No

[ ] Modification

True Minor Determination

[ ] Uncontrolled potential to emit air pollutants is below the Title V thresholds

6.	Process/Product Details

A. List Significant Raw Materials (*if applicable*):
Green sawdust, shavings, bark and wood chips

B. List All Products (*if applicable*):
Fuel pellets

C. Brief Description of Principal Process(es):
Pinnacle is proposing to construct and operate a greenfield wood pellet facility. The Newton Facility will process wood chips, sawdust, and other wood materials into fuel pellets to produce a source of alternative renewable fuel for solid fuel combustion sources. Operations will include a wood chips receiving and processing area, bark/shavings receiving and storage, one (1) dryer, four (4) hammermills, nine (9) wood pellet production and cooling lines, wood pellets storage, and a truck loadout area. Future operations may include a debarker and a chipper for the purpose of processing whole logs. Potential emissions from future debarking and cutting operations associated with processing whole logs are included in this application.

6. Process/Product Details (continued)

D. Maximum Throughput for Raw Material(s) (*if applicable*):

Raw Materials	Throughput	Units
Green sawdust, shavings, bark and wood chips	880,000	tpy

E. Maximum Throughput for Principal Product(s) (*if applicable*):

Product	Throughput	Units
Fuel pellets	440,000	tpy

7. Facility Operating Information

A. Number of employees at the facility: ________

	Average Actual	Maximum Potential
B. Hours per day the facility will operate:	24	24
C. Days per week the facility will operate:	7	7
D. Weeks per year the facility will operate:	52	52
E. Months the facility will operate:	12	12

8. Maps

A. Attach a topographical map of the area extending to at least 1/2 mile beyond the property boundaries. The map must show the outline of the property boundaries.

B. Attach a site map/diagram showing the outline of the property, and outline of all buildings and roadways on the site, and the location of each significant air emission source.

9.	Zoning

A. Is the facility (either existing or proposed) located in accordance with any applicable city and/or county zoning ordinances? If no, please explain.
Yes

B. Is the facility (either existing or proposed) required to obtain any zoning variance to locate/ expand the facility at this site? If yes, please explain.
No

10.	Risk management Plan

A. Is the facility required to develop and register a risk management plan pursuant to Section 112(r), regulated under 40 CFR Part 68? [ ] Yes [X] No

B. If yes, to whom was the plan submitted? ______

11.	***Is confidential information being submitted with this application?*** [ ] Yes [X] No

If so, please follow the procedures outlined in the Mississippi Code Ann. Sections 49-17-39 and 17-17-27(6), as outlined in MCEQ-2-"Regulation regarding the review and reproduction of public records".

12.	MS Secretary of State Registration / Certificate of Good Standing

No permit will be issued to a company that is not authorized to conduct business in Mississippi. If the company applying for the permit is a corporation, limited liability company, a partnership or a business trust, the application package should include proof of registration with the Mississippi Secretary of State and/or a copy of the company's Certificate of Good Standing. The name listed on the permit will include the company name as it is registered with the Mississippi Secretary of State.

It should be noted that for an application submitted in accordance with 11 Miss. Admin. Code Pt. 2, R. 2.8.B. to renew a State Permit to Operate or in accordance with 11 Miss. Admin. Code Pt. 2, R. 6.2.A(1)(c). to renew a Title V Permit to be considered timely and complete, the applicant shall be registered and in good standing with the Mississippi Secretary of State to conduct business in Mississippi.

13.	**Certification**

Note: If approved by the MDEQ, a duly authorized representative (DAR) may sign the air permit application. The DAR must be listed in Section 4 of this application.

I certify to the best of knowledge and belief formed after reasonable inquiry; the statements and information in this application are true, complete, and accurate, and that as a responsible official, my signature shall constitute an agreement that the applicant assumes the responsibility for any alteration, additions, or changes in operation that may be necessary to achieve and maintain compliance with all applicable Rules and Regulations. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

P. Pawlowski
Signature of Responsible Official/DAR

Jan 23 2020
Date

Paul Pawlowski
Printed Name

Director - Energy & Environment
Title

14. Required Sections

For the sections below, indicate the number that have been completed for each section as part of the application.

Section A	1	Section L1	2	Section M5	
Section B	5	Section L2		Section M6	
Section C	1	Section L3		Section M7	
Section D	6	Section L4	2	Section M8	
Section E	7	Section L5		Section M9	
Section F		Section L6	1	Section M10	
Section G		Section L7		Section N	1
Section H		Section M1		Appendix A	
Section I		Section M2		Appendix B	
Section J		Section M3		Appendix C	
Section K		Section M4			

The following permit applications must contain the specified sections, at a minimum, to be considered administratively complete.

Permit Type	Section				Appendix		
	A	B	M	N	A	B	C
State Permit to Construct	X	X		X			
New Source Review Permit							
Title V Operating Permit							
Synthetic Minor Operating Permit							
State Permit to Operate							
True Minor Determination							

Section B.1: Maximum Uncontrolled Emissions (under normal operating conditions)

Maximum Uncontrolled Emissions are the emissions at maximum capacity and prior to (in the absence of) pollution control, emission-reducing process equipment, or any other emission reduction. Calculate the hourly emissions using the worst case hourly emissions for each pollutant. For each pollutant, calculate the annual emissions as if the facility were operating at maximum plant capacity without pollution controls for 8760 hours per year, unless otherwise approved by the Department. List Hazardous Air Pollutants (HAP) in Section B.3 and GHGs in Section B.4. Emission Point numbering must be consistent throughout the application package and, for existing emission points, should match any MDEQ ID's in the current permit. Fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Emissions > 0.01 TPY must be included. Please do not change the column widths on this table.

Emission Point ID	TSP[1] (PM)		PM-10[1]		PM-2.5[1]		SO_2		NOx		CO		VOC		TRS[2]		Lead		Total HAPs	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
RD	68.80	301.3	68.80	301.3	68.80	301.3	4.25	18.62	22.84	100.1	35.97	157.5	219.2	960	--	--	4.25	18.62	21.31	93.35
HM1-HM4	85.71	375.4	85.71	375.4	85.71	375.4	--	--	--	--	--	--	30.88	135.2	--	--	--	--	0.80	3.52
PL1 - PL9	85.71	375.4	85.71	375.4	85.71	375.4	--	--	--	--	--	--	148.6	650.9	--	--	--	--	0.20	0.88
PSS1	1.26	5.50	0.32	1.39	5.53E-02	0.24	--	--	--	--	--	--	1.39	6.10	--	--	--	--	0.20	0.88
TLS	4.32	18.92	1.46	6.38	0.25	1.08	--	--	--	--	--	--	1.39	6.10	--	--	--	--	0.20	0.88
ENG1	0.25	6.22E-02	1.67	0.42	1.67	0.42	8.24E-03	2.06E-03	7.96	1.99	4.36	1.09	1.87	0.47	--	--	--	--	2.05E-02	5.13E-03
ENG2	0.15	3.69E-02	0.99	0.25	0.99	0.25	4.89E-03	1.22E-03	2.95	0.74	2.58	0.65	1.11	0.28	--	--	--	--	1.22E-02	3.04E-03
ENG3	7.60E-02	1.90E-02	0.51	0.13	0.51	0.13	2.51E-03	6.28E-04	1.52	0.38	1.33	0.33	0.57	0.14	--	--	--	--	6.26E-03	1.57E-03
ENG4	3.22E-02	8.06E-03	0.11	2.70E-02	0.11	2.70E-02	5.33E-04	1.33E-04	0.38	9.47E-02	0.40	0.10	0.12	3.03E-02	--	--	--	--	1.33E-03	3.32E-04
ENG5	3.22E-02	8.06E-03	0.11	2.70E-02	0.12	3.03E-02	5.33E-04	1.33E-04	0.38	9.47E-02	0.40	0.10	0.12	3.03E-02	--	--	--	--	1.33E-03	3.32E-04
FWP1	6.32E-02	1.58E-02	0.42	0.11	0.42	0.11	2.09E-03	5.22E-04	1.26	0.32	1.11	0.28	0.47	0.12	--	--	--	--	5.21E-03	1.30E-03
RTO1	--	--	--	--	--	--	5.88E-03	2.58E-02	--	--	--	--	--	--	--	--	--	--	1.85E-02	8.12E-02
RTO2	1.86E-02	8.16E-02	7.45E-02	0.33	7.45E-02	0.33	5.88E-03	2.58E-02	0.98	4.29	0.82	3.61	--	--	--	--	--	--	1.85E-02	8.12E-02
FAS1	9.52	2.38	8.79	2.20	7.60	1.90	0.43	0.11	3.74	0.94	10.20	2.55	0.29	7.23E-02	--	--	8.16E-04	2.04E-04	--	--
FAS2	95.20	2.38	87.89	2.20	75.99	1.90	4.25	0.11	37.40	0.94	102.0	2.55	2.89	7.23E-02	--	--	8.16E-03	2.04E-04	--	--
DAS	68.80	1.72	68.80	1.72	68.80	1.72	4.25	0.11	22.84	0.57	71.93	1.80	219.2	5.48	--	--	8.16E-03	2.04E-04	19.04	0.48
F-DB	2.51	11.00	1.38	6.05	5.78E-03	0.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
F-CH	2.51	11.00	1.38	6.05	5.78E-03	0.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
F-STP1	7.92	34.68	3.96	17.34	1.98	8.67	--	--	--	--	--	--	2.11	9.24	--	--	--	--	--	--
F-MT	0.45	1.98	0.21	0.92	3.01E-02	0.13	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FDCS	1.26	5.50	0.32	1.39	5.53E-02	0.24	--	--	--	--	--	--	1.39	6.10	--	--	--	--	0.20	0.88
F-SC1	0.18	0.78	8.44E-02	0.37	1.77E-02	7.76E-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--
F-SC2	1.58	6.93	0.75	3.30	0.16	0.69	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Totals	**436.3**	**1,155**	**419.4**	**1,103**	**399.1**	**1,070**	**13.21**	**18.99**	**102.3**	**110.4**	**231.1**	**170.6**	**631.6**	**1,780**	**--**	**--**	**4.27**	**18.62**	**42.04**	**101.0**

[1] **Condensables:** Include condensable particulate matter emissions in particulate matter calculations for PM-10 and PM-2.5, but not for TSP (PM).

[2] **TRS:** Total reduced sulfur (TRS) is the sum of the sulfur compounds hydrogen sulfide (H_2S), methyl mercaptan (CH_4S), dimethyl sulfide (C_2H_6S), and dimethyl disulfide ($C_2H_6S_2$).

[3] **Emissions for CO, NO_X, VOC, and PM from RTO1 are included in Dryer calculations.**

[4] **VOC emissions from RTO2 are included in Pellet Line calculations.**

[5]**Please note that FAS1 and FAS2 are the same emission point with different operating parameters. FAS1 is the furnace abort stack with operations at idling mode. FAS2 is the furnace abort stack with operations at full capacity.**

Section B.2: Proposed Allowable Emissions

Proposed Allowable Emissions (Potential to Emit) are those emissions the facility is currently permitted to emit as limited by a specific permit requirement or federal/state standard (e.g., a MACT standard); or the emission rate at which the facility proposes to emit considering emissions control devices, restrictions to operating rates/hours, or other requested permit limits that reduce the maximum emission rates. Emission Point numbering must be consistent throughout the application package and, for existing emission points, should match any MDEQ ID's in the current permit. Fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Additional columns may be added if there are regulated pollutants (other than HAPs and GHGs) emitted at the facility.

Emission Point ID	TSP[1]		PM10[1]		PM2.5[1]		SO_2		NOx		CO		VOC		TRS		Lead		Total HAPs	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
RD	3.44	15.07	3.44	15.07	3.44	15.07	4.25	18.62	22.84	100.06	35.97	157.53	10.96	48.00	--	--	8.16E-03	3.57E-02	1.87	8.20
HM1-HM4	4.29	18.77	4.29	18.77	4.29	18.77	--	--	--	--	--	--	30.88	135.2	--	--	--	--	0.80	3.52
PL1 - PL9	4.29	18.77	4.29	18.77	4.29	18.77	--	--	--	--	--	--	7.43	32.54	--	--	--	--	1.00E-02	4.40E-02
PSS1	1.26	5.50	0.32	1.39	5.53E-02	0.24	--	--	--	--	--	--	1.39	6.10	--	--	--	--	0.20	0.88
TLS	4.32	18.92	1.46	6.38	0.25	1.08	--	--	--	--	--	--	1.39	6.10	--	--	--	--	0.20	0.88
ENG1	0.25	6.22E-02	1.67	0.42	1.67	0.42	8.24E-03	2.06E-03	7.96	1.99	4.36	1.09	1.87	0.47	--	--	--	--	2.05E-02	5.13E-03
ENG2	0.15	3.69E-02	0.99	0.25	0.99	0.25	4.89E-03	1.22E-03	2.95	0.74	2.58	0.65	1.11	0.28	--	--	--	--	1.22E-02	3.04E-03
ENG3	7.60E-02	1.90E-02	0.51	0.13	0.51	0.13	2.51E-03	6.28E-04	1.52	0.38	1.33	0.33	0.57	0.14	--	--	--	--	6.26E-03	1.57E-03
ENG4	3.22E-02	8.06E-03	0.11	2.70E-02	0.11	2.70E-02	5.33E-04	1.33E-04	0.38	9.47E-02	0.40	0.10	0.12	3.03E-02	--	--	--	--	1.33E-03	3.32E-04
ENG5	3.22E-02	8.06E-03	0.11	2.70E-02	0.12	3.03E-02	5.33E-04	1.33E-04	0.38	9.47E-02	0.40	0.10	0.12	3.03E-02	--	--	--	--	1.33E-03	3.32E-04
FWP1	6.32E-02	1.58E-02	0.42	0.11	0.42	0.11	2.09E-03	5.22E-04	1.26	0.32	1.11	0.28	0.47	0.12	--	--	--	--	5.21E-03	1.30E-03
RTO1	--	--	--	--	--	--	5.88E-03	2.58E-02	--	--	--	--	--	--	--	--	--	--	9.26E-04	4.06E-03
RTO2	1.86E-02	8.16E-02	7.45E-02	0.33	7.45E-02	0.33	5.88E-03	2.58E-02	0.98	4.29	0.82	3.61	--	--	--	--	--	--	9.26E-04	4.06E-03
FAS1	9.52	2.38	8.79	2.20	7.60	1.90	0.43	0.11	3.74	0.94	10.20	2.55	0.29	7.23E-02	--	--	8.16E-04	2.04E-04	--	--
FAS2	95.20	2.38	87.89	2.20	75.99	1.90	4.25	0.11	37.40	0.94	102.0	2.55	2.89	7.23E-02	--	--	8.16E-03	2.04E-04	--	--
DAS	68.80	1.72	68.80	1.72	68.80	1.72	4.25	0.11	22.84	0.57	71.93	1.80	219.2	5.48	--	--	8.16E-03	2.04E-04	19.04	0.48
F-DB	2.51	11.00	1.38	6.05	5.78E-03	0.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
F-CH	2.51	11.00	1.38	6.05	5.78E-03	0.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
F-STP1	7.92	34.68	3.96	17.34	1.98	8.67	--	--	--	--	--	--	2.11	9.24	--	--	--	--	--	--
F-MT	0.45	1.98	0.21	0.92	3.01E-02	0.13	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FDCS	1.26	5.50	0.32	1.39	5.53E-02	0.24	--	--	--	--	--	--	1.39	6.10	--	--	--	--	0.20	0.88
F-SC1	0.18	0.78	8.44E-02	0.37	1.77E-02	7.76E-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--
F-SC2	1.58	6.93	0.75	3.30	0.16	0.69	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Totals	**208.1**	**155.6**	**191.2**	**103.2**	**170.8**	**70.59**	**13.21**	**18.99**	**102.3**	**110.4**	**231.1**	**170.6**	**282.2**	**250.0**	**--**	**--**	**2.53E-02**	**3.64E-02**	**22.37**	**14.90**

[1] **Condensables:** Include condensable particulate matter emissions in particulate matter calculations for PM-10 and PM-2.5, but not for TSP (PM).

[2] **TRS:** Total reduced sulfur (TRS) is the sum of the sulfur compounds hydrogen sulfide (H_2S), methyl mercaptan (CH_4S), dimethyl sulfide (C_2H_6S), and dimethyl disulfide ($C_2H_6S_2$).

[3] **Emissions for CO, NO_X, VOC, and PM from RTO1 are included in Dryer calculations.**

[4] **VOC emissions from RTO2 are included in Pellet Line calculations.**

[5] **Please note that FAS1 and FAS2 are the same emission point with different operating parameters. FAS1 is the furnace abort stack with operations at idling mode. FAS2 is the furnace abort stack with operations at full capacity.**

Section B.3: Proposed Allowable Hazardous Air Pollutants (HAPs)

In the table below, report the Proposed Allowable Emissions (Potential to Emit) for each HAP from each regulated emission unit if the HAP > 0.0001 tpy. Each facility-wide Individual HAP total and the facility-wide Total HAPs shall be the sum of all HAP sources. Use the HAP nomenclature as it appears in the Instructions. Emission Point numbering must be consistent throughout the application package and, for existing emission points, should match any MDEQ ID's in the current permit. For each HAP listed, fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected or the pollutant is emitted in a quantity less than the threshold amounts described above. Additional columns may be added as necessary to address each HAP.

Emission Point ID	Total HAPs		Acetaldehyde		Benzene		Formaldehyde		Hexane		Hydrogen Chloride		Methanol	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
RD	**1.87**	**8.20**	0.28	1.21	--	--	0.35	1.54	--	--	0.97	4.24	0.97	1.21
HM1-HM4	**0.80**	**3.52**	0.20	0.88	--	--	0.40	1.76	--	--	--	--	0.20	0.88
PL1 - PL9	**1.00E-02**	**4.40E-02**	2.51E-03	1.10E-02	--	--	5.02E-03	2.20E-02	--	--	--	--	2.51E-03	1.10E-02
PSS1	**0.20**	**0.88**	5.02E-02	0.22	--	--	0.10	0.44	--	--	--	--	5.02E-02	0.22
TLS	**0.20**	**0.88**	5.02E-02	0.22	--	--	0.10	0.44	--	--	--	--	5.02E-02	0.22
ENG1	**1.17E-03**	**5.13E-03**	4.06E-03	1.02E-03	4.94E-03	1.24E-03	6.25E-03	1.56E-03	--	--	--	--	--	--
ENG2	**6.95E-04**	**3.04E-03**	2.41E-03	6.03E-04	2.93E-03	7.33E-04	3.71E-03	9.27E-04	--	--	--	--	--	--
ENG3	**3.58E-04**	**1.57E-03**	1.24E-03	3.10E-04	1.51E-03	3.77E-04	1.91E-03	4.77E-04	--	--	--	--	--	--
ENG4	**--**	**3.32E-04**	2.63E-04	--	3.20E-04	--	4.05E-04	1.01E-04	--	--	--	--	--	--
ENG5	**--**	**3.32E-04**	2.63E-04	--	3.20E-04	--	4.05E-04	1.01E-04	--	--	--	--	--	--
FWP1	**2.97E-04**	**1.30E-03**	1.03E-03	2.58E-04	1.25E-03	3.13E-04	1.59E-03	3.96E-04	--	--	--	--	--	--
RTO1	**9.26E-04**	**4.06E-03**	--	--	--	--	3.68E-04	1.61E-04	8.82E-04	3.86E-03	--	--	--	--
RTO2	**9.26E-04**	**4.06E-03**	--	--	--	--	3.68E-04	1.61E-04	8.82E-04	3.86E-03	--	--	--	--
FAS1	**--**	**--**	--	--	--	--	--	--	--	--	--	--	--	--
FAS2	**--**	**--**	--	--	--	--	--	--	--	--	--	--	--	--
DAS	**19.04**	**0.48**	5.53	0.14	--	--	7.03	0.18	--	--	0.95	2.39E-02	5.53	0.14
F-DB	**--**	**--**	--	--	--	--	--	--	--	--	--	--	--	--
F-CH	**--**	**--**	--	--	--	--	--	--	--	--	--	--	--	--
F-STP1	**--**	**--**	--	--	--	--	--	--	--	--	--	--	--	--
F-MT	**--**	**--**	--	--	--	--	--	--	--	--	--	--	--	--
FDCS	**0.20**	**0.88**	--	--	--	--	0.10	0.44	--	--	--	--	--	--
F-SC1	**--**	**--**	--	--	--	--	--	--	--	--	--	--	--	--
F-SC2	**--**	**--**	--	--	--	--	--	--	--	--	--	--	--	--
Totals:	**22.33**	**14.90**	**6.16**	**2.90**	**1.13E-02**	**2.83E-03**	**8.11**	**4.82**	**1.76E-03**	**7.73E-03**	**1.92**	**4.27**	**6.85**	**2.90**

Emission Point ID	Napthalene		Toluene		Acrolein		Xylenes							
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
RD	--	--	--	--	--	--	--	--						
HM1-HM4	--	--	--	--	--	--	--	--						
PL1 - PL9	--	--	--	--	--	--	--	--						
PSS1	--	--	--	--	--	--	--	--						
BLS	--	--	--	--	--	--	--	--						
ENG1	4.49E-04	1.12E-04	2.17E-03	5.42E-04	4.90E-04	1.23E-04	1.51E-03	3.78E-04						
ENG2	2.67E-04	--	1.29E-03	3.21E-04	2.91E-04	--	8.96E-04	2.24E-04						
ENG3	1.37E-04	--	6.61E-04	1.65E-04	1.50E-04	--	4.61E-04	1.15E-04						
ENG4	--	--	1.40E-04	--	--	--	--	--						
ENG5	--	--	1.40E-04	--	--	--	--	--						
FWP1	1.14E-04	--	5.50E-04	1.37E-04	1.24E-04	--	3.83E-04	--						
RTO1	--	--	--	--	--	--	--	--						
RTO2	--	--	--	--	--	--	--	--						
FAS1	--	--	--	--	--	--	--	--						
FAS2	--	--	--	--	--	--	--	--						
DAS	--	--	--	--	--	--	--	--						
F-DB	--	--	--	--	--	--	--	--						
F-CH	--	--	--	--	--	--	--	--						
F-STP1	--	--	--	--	--	--	--	--						
F-MT	--	--	--	--	--	--	--	--						
FDCS	--	--	--	--	--	--	--	--						
F-SC1	--	--	--	--	--	--	--	--						
F-SC2	--	--	--	--	--	--	--	--						
Totals:	**1.03E-03**	**2.59E-04**	**4.95E-03**	**1.25E-03**	**1.12E-03**	**2.80E-04**	**3.45E-03**	**8.61E-04**	**--**	**--**	**--**	**--**	**--**	**--**

Section B.4: Greenhouse Gas Emissions

Applicants must report potential emission rates in SHORT TONS per year, as opposed to metric tons required by Part 98. Emission Point numbering must be consistent throughout the application package and, for existing emission points, should match any MDEQ ID's in the current permit.

		CO_2 (non-biogenic) ton/yr	CO_2 (biogenic)[2] ton/yr	N_2O ton/yr	CH_4 ton/yr	SF_6 ton/yr	PFC/HFC[3] ton/yr					Total GHG Mass Basis ton/yr[5]	Total CO_2e ton/yr[6]
Emission Point ID	GWPs [1]	1	1	298	25	22,800	footnote 4						
RD	mass GHG	145,197		9.68	15.64							145,222	148,472
	CO_2e	145,197		2,885	390.9								
ENG1	mass GHG	216.0		1.75E-03	8.76E-03							216.0	216.7
	CO_2e	216.0		0.52	0.22								
ENG2	mass GHG	128.1		1.04E-03	5.20E-03							128.1	128.6
	CO_2e	128.1		0.31	0.13								
ENG3	mass GHG	65.91		5.35E-04	2.67E-03							65.92	66.14
	CO_2e	65.91		0.16	6.68E-02								
ENG4	mass GHG	13.98		1.13E-04	5.67E-04							13.98	14.03
	CO_2e	13.98		3.38E-02	1.42E-02								
ENG5	mass GHG	13.98		1.13E-04	5.67E-04							13.98	14.03
	CO_2e	13.98		3.38E-02	1.42E-02								
FWP1	mass GHG	55.20		4.44E-04	2.22E-03							55.20	55.39
	CO_2e	55.20		0.13	5.56E-02								
RTO1	mass GHG	5,153		9.45E-02	9.88E-02							5,153	5,184
	CO_2e	5,153		28.15	2.47								
RTO2	mass GHG	5,153		9.45E-02	9.88E-02							5,153	5,184
	CO_2e	5,153		28.15	2.47								
FAS1	mass GHG	828.8		5.53E-02	8.93E-02							828.9	847.4
	CO_2e	828.8		16.46	2.23								
FAS2	mass GHG	828.8		5.53E-02	8.93E-02							828.9	847.4
	CO_2e	828.8		16.46	2.23								
DAS	mass GHG	828.8		5.53E-02	8.93E-02							828.9	847.4
	CO_2e	828.8		16.46	2.23								
FACILITY TOTAL	mass GHG	**155,996**		**9.87**	**15.83**							**158,508**	**161,877**
	CO_2e	**155,996**		**2,941**	**395.9**								

[1] **GWP** (Global Warming Potential): Applicants must use the most current GWPs codified in Table A-1 of 40 CFR part 98. GWPs are subject to change, therefore, applicants need to check 40 CFR 98 to confirm GWP values.

[2] Biogenic CO2 is defined as carbon dioxide emissions resulting from the combustion or decomposition of non-fossilized and biodegradable organic material originating from plants, animals, or micro-organisms.

[3] For **HFCs** or **PFCs** describe the specific HFC or PFC compound and use a separate column for each individual compound.

[4] For each new compound, enter the appropriate GWP for each HFC or PFC compound from Table A-1 in 40 CFR 98.

[5] Greenhouse gas emissions on a **mass basis** is the ton per year greenhouse gas emission before adjustment with its GWP. Do not include biogenic CO_2 in this total.

[6] **CO_2e** means Carbon Dioxide Equivalent and is calculated by multiplying the TPY mass emissions of the greenhouse gas by its GWP. Do not include biogenic CO_2e in this total.

Section B.5: Stack Parameters and Exit Conditions [1]

Emission Point numbering must be consistent throughout the application package and, for existing emission points, should match any MDEQ ID's in the current permit.

Emission Point ID	Orientation (H-Horizontal V=Vertical)	Rain Caps (Yes or No)	Height Above Ground (ft)	Base Elevation (ft)	Exit Temp. (°F)	Inside Diameter or Dimensions (ft)	Velocity (ft/sec)	Moisture by Volume (%)	Geographic Position (degrees/minutes/seconds)	
									Latitude	Longitude
[1] The facility will submit the stack parameters to MDEQ after the completion of the final design of the facility.										
RD	TBD	TBD	TBD	TBD	250.0	TBD	TBD	TBD	TBD	TBD
HM1	TBD	TBD	TBD	TBD	150.0	TBD	TBD	TBD	TBD	TBD
HM2	TBD	TBD	TBD	TBD	150.0	TBD	TBD	TBD	TBD	TBD
HM3	TBD	TBD	TBD	TBD	150.0	TBD	TBD	TBD	TBD	TBD
HM4	TBD	TBD	TBD	TBD	150.0	TBD	TBD	TBD	TBD	TBD
PL1	TBD	TBD	TBD	TBD	150.0	TBD	TBD	TBD	TBD	TBD
PL2	TBD	TBD	TBD	TBD	150.0	TBD	TBD	TBD	TBD	TBD
PL3	TBD	TBD	TBD	TBD	150.0	TBD	TBD	TBD	TBD	TBD
PL4	TBD	TBD	TBD	TBD	150.0	TBD	TBD	TBD	TBD	TBD
PL5	TBD	TBD	TBD	TBD	150.0	TBD	TBD	TBD	TBD	TBD
PL6	TBD	TBD	TBD	TBD	150.0	TBD	TBD	TBD	TBD	TBD
PL7	TBD	TBD	TBD	TBD	150.0	TBD	TBD	TBD	TBD	TBD
PL8	TBD	TBD	TBD	TBD	150.0	TBD	TBD	TBD	TBD	TBD
PL9	TBD	TBD	TBD	TBD	150.0	TBD	TBD	TBD	TBD	TBD
PSS1	TBD	TBD	TBD	TBD	Ambient	TBD	TBD	TBD	TBD	TBD
TLS	TBD	TBD	TBD	TBD	Ambient	TBD	TBD	TBD	TBD	TBD
FAS1	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
FAS2	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
DAS	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

[1] A WAAS-capable GPS receiver should be used and in the WGS84 or NAD83 coordinate system.

[2] Please note that FAS1 and FAS2 are the same emission point with different operating parameters.

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Fuel Burning Equipment - External Combustion Sources — **Section C**

1. Emission Point Description

A. Emission Point Designation (Ref. No.): RD

B. Equipment Description: Rotary dryer

C. Manufacturer: TBD

D. Model Yr and No.: |TBD

E. Maximum Heat Input: (higher heating value): 170.00 MMBtu/hr

F. Nominal Heat Input Capacity 170.00 MMBtu/hr

G. For units subject to NSPS Db, is the heat release rate > 70,000 Btu/hr-ft^3? ☐ Yes ☐ No

H. Use: ☐ Electrical Generation ☐ Steam ☒ Process Heat

☐ Space Heat ☐ Standby/Emergency ☐ Other (describe): ____

I. Heat Mechanism: ☒ Direct ☐ Indirect

J. Burner Type (e.g., pulverized coal, forced draft, atomizing oil, low-NO_x, etc.): step grate furnace burner

K. Additional Design Controls (e.g., FGR, etc.): ____

L. Status: ☐ Operating ☒ Proposed ☐ Under Construction

M. Date of construction, or most recent modification (for existing sources) or date of anticipated construction: 2019

2. Fuel Type

Complete the following table, identifying each type of fuel and the amount used. Specify the units for heat content, hourly usage, and yearly usage

FUEL TYPE[1]	HEAT CONTENT	% SULFUR	% ASH	MAXIMUM HOURLY USAGE	MAXIMUM YEARLY USAGE
Biomass	4,500 - 8,000 BTU/lb	N/A	N/A	18.89 tons	165,467 tons

Please list any fuel components that are hazardous air pollutants and the percentage in the fuel:

1. Boilers burning solid waste may considered " solid waste incinerators" for purposes of complying with federal regulations. However, you are only required to complete Section C, not I, of this application as long as the wastes combusted are indicated in the table above.

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Fuel Burning Equipment - Internal Combustion Sources **Section D**

1. Emission Point Description

A. Emission Point Designation (Ref. No.): ENG1

B. Equipment Description: diesel-fired emergency generator engine

C. Manufacturer: TBD D. Model Yr and No.: 2019 and TBD

E. Maximum Heat Input (higher heating value): 5.30 MMBtu/hr

F. Rated Power: 757 hp 564 kW

G. Use: ☐ Non-Emergency ☒ Emergency

H. Displacement per cylinder: ______ Liters

I. Engine Ignition Type: ☐ Spark Ignition ☒ Compression Ignition

J. Engine Burn Type: ☐ 4-stroke ☐ 2-stroke ☐ Rich Burn ☒ Lean Burn
(check all that apply)

K. Design Controls (e.g., catalytic converter, diesel particulate, etc.): No Controls

L. Status: ☐ Operating ☒ Proposed ☐ Under Construction

M. Engine Manufactured Date: 2019 N. Engine Order Date: 2019

N. Date of construction, or most recent modification (for existing sources) or date of anticipated construction: 2019

2. Fuel Type

FUEL TYPE	HEAT CONTENT	% SULFUR	% ASH	MAXIMUM HOURLY USAGE	MAXIMUM YEARLY USAGE
Diesel Fuel	140 MMBtu/Mgal	0.0015	N/A	0.04 Mgal/hr	18.93 Mgal/yr

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Fuel Burning Equipment - Internal Combustion Sources | **Section D**

1. Emission Point Description

A. Emission Point Designation (Ref. No.): ENG2

B. Equipment Description: diesel-fired emergency generator engine

C. Manufacturer: TBD

D. Model Yr and No.: 2019 and TBD

E. Maximum Heat Input (higher heating value): 3.14 MMBtu/hr

F. Rated Power: 449 hp 335 kW

G. Use: [ ] Non-Emergency [X] Emergency

H. Displacement per cylinder: ______ Liters

I. Engine Ignition Type: [ ] Spark Ignition [X] Compression Ignition

J. Engine Burn Type: [ ] 4-stroke [ ] 2-stroke [ ] Rich Burn [X] Lean Burn
(check all that apply)

K. Design Controls (e.g., catalytic converter, diesel particulate, etc.): No Controls

L. Status: [ ] Operating [X] Proposed [ ] Under Construction

M. Engine Manufactured Date: 2019

N. Engine Order Date: 2019

N. Date of construction, or most recent modification (for existing sources) or date of anticipated construction: 2019

2. Fuel Type

FUEL TYPE	HEAT CONTENT	% SULFUR	% ASH	MAXIMUM HOURLY USAGE	MAXIMUM YEARLY USAGE
Diesel Fuel	140 MMBtu/Mgal	0.0015	N/A	0.02 Mgal/hr	11.23 Mgal/yr

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Fuel Burning Equipment - Internal Combustion Sources **Section D**

1. Emission Point Description

A. Emission Point Designation (Ref. No.): ENG3

B. Equipment Description: diesel-fired emergency generator engine

C. Manufacturer: TBD

D. Model Yr and No.: 2019 and TBD

E. Maximum Heat Input (higher heating value): 1.62 MMBtu/hr

F. Rated Power: 231 hp 172 kW

G. Use: ☐ Non-Emergency ☒ Emergency

H. Displacement per cylinder: ______ Liters

I. Engine Ignition Type: ☐ Spark Ignition ☒ Compression Ignition

J. Engine Burn Type: *(check all that apply)* ☐ 4-stroke ☐ 2-stroke ☐ Rich Burn ☒ Lean Burn

K. Design Controls (e.g., catalytic converter, diesel particulate, etc.): No Controls

L. Status: ☐ Operating ☒ Proposed ☐ Under Construction

M. Engine Manufactured Date: 2019

N. Engine Order Date: 2019

N. Date of construction, or most recent modification (for existing sources) or date of anticipated construction: 2019

2. Fuel Type

FUEL TYPE	HEAT CONTENT	% SULFUR	% ASH	MAXIMUM HOURLY USAGE	MAXIMUM YEARLY USAGE
Diesel Fuel	140 MMBtu/Mgal	0.0015	N/A	0.01 Mgal/hr	5.78 Mgal/yr

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Fuel Burning Equipment - Internal Combustion Sources | **Section D**

1. Emission Point Description

A. Emission Point Designation (Ref. No.): ENG4

B. Equipment Description: diesel-fired emergency generator engine

C. Manufacturer: TBD   D. Model Yr and No.: 2019 and TBD

E. Maximum Heat Input (higher heating value): 0.34 MMBtu/hr

F. Rated Power: 49 hp   37 kW

G. Use: [ ] Non-Emergency   [X] Emergency

H. Displacement per cylinder: ______ Liters

I. Engine Ignition Type: [ ] Spark Ignition   [X] Compression Ignition

J. Engine Burn Type: [ ] 4-stroke   [ ] 2-stroke   [ ] Rich Burn   [X] Lean Burn
(check all that apply)

K. Design Controls (e.g., catalytic converter, diesel particulate, etc.): No Controls

L. Status: [ ] Operating   [X] Proposed   [ ] Under Construction

M. Engine Manufactured Date: 2019   N. Engine Order Date: 2019

N. Date of construction, or most recent modification (for existing sources) or date of anticipated construction: 2019

2. Fuel Type

FUEL TYPE	HEAT CONTENT	% SULFUR	% ASH	MAXIMUM HOURLY USAGE	MAXIMUM YEARLY USAGE
Diesel Fuel	140 MMBtu/Mgal	0.0015	N/A	0.002 Mgal/hr	1.23 Mgal/yr

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Fuel Burning Equipment - Internal Combustion Sources **Section D**

1. Emission Point Description

A. Emission Point Designation (Ref. No.): ENG5

B. Equipment Description: diesel-fired emergency generator engine

C. Manufacturer: TBD D. Model Yr and No.: 2019 and TBD

E. Maximum Heat Input (higher heating value): 0.34 MMBtu/hr

F. Rated Power: 49 hp 37 kW

G. Use: [ ] Non-Emergency [X] Emergency

H. Displacement per cylinder: ______ Liters

I. Engine Ignition Type: [ ] Spark Ignition [X] Compression Ignition

J. Engine Burn Type: [ ] 4-stroke [ ] 2-stroke [ ] Rich Burn [X] Lean Burn
(check all that apply)

K. Design Controls (e.g., catalytic converter, diesel particulate, etc.): No Controls

L. Status: [ ] Operating [X] Proposed [ ] Under Construction

M. Engine Manufactured Date: 2019 N. Engine Order Date: 2019

N. Date of construction, or most recent modification (for existing sources) or date of anticipated construction: 2019

2. Fuel Type

FUEL TYPE	HEAT CONTENT	% SULFUR	% ASH	MAXIMUM HOURLY USAGE	MAXIMUM YEARLY USAGE
Diesel Fuel	140 MMBtu/Mgal	0.0015	N/A	0.002 Mgal/hr	1.23 Mgal/yr

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Fuel Burning Equipment - Internal Combustion Sources — **Section D**

1. Emission Point Description

A. Emission Point Designation (Ref. No.): FWP1

B. Equipment Description: diesel fired emergency fire pump engine

C. Manufacturer: TBD

D. Model Yr and No.: 2019 and TBD

E. Maximum Heat Input (higher heating value): 1.34 MMBtu/hr

F. Rated Power: 192 hp 143 kW

G. Use: [ ] Non-Emergency [X] Emergency

H. Displacement per cylinder: ______ Liters

I. Engine Ignition Type: [ ] Spark Ignition [X] Compression Ignition

J. Engine Burn Type: [ ] 4-stroke [ ] 2-stroke [ ] Rich Burn [X] Lean Burn
(check all that apply)

K. Design Controls (e.g., catalytic converter, diesel particulate, etc.): No Controls

L. Status: [ ] Operating [X] Proposed [ ] Under Construction

M. Engine Manufactured Date: 2019

N. Engine Order Date: 2019

N. Date of construction, or most recent modification (for existing sources) or date of anticipated construction: 2019

2. Fuel Type

FUEL TYPE	HEAT CONTENT	% SULFUR	% ASH	MAXIMUM HOURLY USAGE	MAXIMUM YEARLY USAGE
Diesel Fuel	140 MMBtu/Mgal	0.0015	N/A	0.01 Mgal/hr	4.80 Mgal/yr

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Manufacturing Processes | **Section E**

1. Emission Point Description

A. Emission Point Designation (Ref. No.): F-DB and F-CH (debarking and chipping operations)

B. Process Description: Log preparation includes debarking and chipping. The resulting bark and wood chips will be moved to the green raw material storage pile to be processed with the received raw material.

C. Manufacturer: N/A D. Model: N/A

E. Max. Design Capacity (specify units): 1,100,000 tpy
Equivalent to: 125.57 tons/hr

F. Status: ☐ Operating ☒ Proposed ☐ Under Construction

G. Operating Schedule (Actual): 24 hrs/day 7 days/week 52 weeks/yr

H. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction.
2019

2. Raw Material Input

MATERIAL	QUANTITY/HR AVERAGE	QUANTITY/HR MAXIMUM	QUANTITY/YEAR MAXIMUM
Logs	251,142 lb/hr	251,142 lb/hr	1,100,000 tpy

3. Product Output

MATERIAL	QUANTITY/HR AVERAGE	QUANTITY/HR MAXIMUM	QUANTITY/YEAR MAXIMUM
Wood Chips	188,356 lb/hr	188,356 lb/hr	825,000 tpy
Bark	62,785 lb/hr	62,785 lb/hr	275,000 tpy

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Manufacturing Processes — **Section E**

1. Emission Point Description

A. Emission Point Designation (Ref. No.): F-STP1 and F-MT (storage pile and material transfer)

B. Process Description: Raw material, mostly green sawdust, shavings, bark and wood chips, will be received via truck at the Newton facility and will be stored in a chip pile before being processed.

C. Manufacturer: N/A D. Model: N/A

E. Max. Design Capacity (specify units): 880,000 tpy
Equivalent to: 100.46 tons/hr

F. Status: [ ] Operating [X] Proposed [ ] Under Construction

G. Operating Schedule (Actual): 24 hrs/day 7 days/week 52 weeks/yr

H. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction.
2019

2. Raw Material Input

MATERIAL	QUANTITY/HR AVERAGE	QUANTITY/HR MAXIMUM	QUANTITY/YEAR MAXIMUM
Wood	200,913 lb/hr	200,913 lb/hr	880,000 tpy

3. Product Output

MATERIAL	QUANTITY/HR AVERAGE	QUANTITY/HR MAXIMUM	QUANTITY/YEAR MAXIMUM
Wood	200,913 lb/hr	200,913 lb/hr	880,000 tpy

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Manufacturing Processes — **Section E**

1. Emission Point Description

A. Emission Point Designation (Ref. No.): RD (Biomass Rotary Dryer)

B. Process Description: Green chips, sawdust, and other types of wood go into the direct-fired rotary dryer. Material is dried from ~50% moisture to ~5% moisture.

C. Manufacturer: TBD

D. Model: TBD

E. Max. Design Capacity (specify units): 440,000 tpy
Equivalent to: 50.23 tons/hr

F. Status: ☐ Operating ☒ Proposed ☐ Under Construction

G. Operating Schedule (Actual): 24 hrs/day 7 days/week 52 weeks/yr

H. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction.
2019

2. Raw Material Input

MATERIAL	QUANTITY/HR AVERAGE	QUANTITY/HR MAXIMUM	QUANTITY/YEAR MAXIMUM
Wet Wood	200,913 lb/hr	200,913 lb/hr	880,000 tpy

3. Product Output

MATERIAL	QUANTITY/HR AVERAGE	QUANTITY/HR MAXIMUM	QUANTITY/YEAR MAXIMUM
Dry Wood	100,457 lb/hr	100,457 lb/hr	440,000 tpy

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Manufacturing Processes — **Section E**

1. Emission Point Description

A. Emission Point Designation (Ref. No.): HM1-HM4 (Dry Hammermill No. 1-4)

B. Process Description: Dry wood from the rotary dryer is sent to the 4 dry hammermills for sizing.

C. Manufacturer: TBD

D. Model: TBD

E. Max. Design Capacity (specify units): 30,000 lb/hr
Equivalent to: 15.00 tons/hr

F. Status: [ ] Operating [X] Proposed [ ] Under Construction

G. Operating Schedule (Actual): 24 hrs/day 7 days/week 52 weeks/yr

H. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction.
2019

2. Raw Material Input

MATERIAL	QUANTITY/HR AVERAGE	QUANTITY/HR MAXIMUM	QUANTITY/YEAR MAXIMUM
Dry Wood	100,457 lb/hr	100,457 lb/hr	440,000 tpy

3. Product Output

MATERIAL	QUANTITY/HR AVERAGE	QUANTITY/HR MAXIMUM	QUANTITY/YEAR MAXIMUM
Sized Wood	100,457 lb/hr	100,457 lb/hr	440,000 tpy

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Manufacturing Processes — **Section E**

1. Emission Point Description

A. Emission Point Designation (Ref. No.): PL1-9 (Pellet Line No. 1-9)

B. Process Description: Sized dry wood will go to the pelleting line. Formed pellets will be created in the pellet mills and cooled in the pellet coolers. All exhaust is controlled by a baghouse and RTO2.

C. Manufacturer: TBD

D. Model: TBD

E. Max. Design Capacity (specify units): 12,125 lb/hr
Equivalent to: 6.06 tons/hr

F. Status: ☐ Operating ☒ Proposed ☐ Under Construction

G. Operating Schedule (Actual): 24 hrs/day 7 days/week 52 weeks/yr

H. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction.
2019

2. Raw Material Input

MATERIAL	QUANTITY/HR AVERAGE	QUANTITY/HR MAXIMUM	QUANTITY/YEAR MAXIMUM
Sized Wood	100,457 lb/hr	100,457 lb/hr	440,000 tpy

3. Product Output

MATERIAL	QUANTITY/HR AVERAGE	QUANTITY/HR MAXIMUM	QUANTITY/YEAR MAXIMUM
Wood Pellets	100,457 lb/hr	100,457 lb/hr	440,000 tpy

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Manufacturing Processes **Section E**

1. Emission Point Description

A. Emission Point Designation (Ref. No.): FDCS, PSS1, and TLS (Fugitive Dry Chip Storage, Pellet Storage Silo, and Truck Loadout System)

B. Process Description: Material handling and storage process. Dried wood chips from the dryer are stored in a dried fibre storage tent. Cooled pellets are stored in an atmospheric weather-tight storage silo. Pellets are loaded into trucks for final shipments.

C. Manufacturer: N/A D. Model: N/A

E. Max. Design Capacity (specify units): 440,000 tpy
Equivalent to: 50.23 tons/hr

F. Status: ☐ Operating ☒ Proposed ☐ Under Construction

G. Operating Schedule (Actual): 24 hrs/day 7 days/week 52 weeks/yr

H. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction.
2019

2. Raw Material Input

MATERIAL	QUANTITY/HR AVERAGE	QUANTITY/HR MAXIMUM	QUANTITY/YEAR MAXIMUM
Wood Pellets	100,457 lb/hr	100,457 lb/hr	440,000 tpy
Dried Wood Chips	100,457 lb/hr	100,457 lb/hr	440,000 tpy

3. Product Output

MATERIAL	QUANTITY/HR AVERAGE	QUANTITY/HR MAXIMUM	QUANTITY/YEAR MAXIMUM
Wood Pellets	100,457 lb/hr	100,457 lb/hr	440,000 tpy
Dried Wood Chips	100,457 lb/hr	100,457 lb/hr	440,000 tpy

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Manufacturing Processes | **Section E**

1. Emission Point Description

A. Emission Point Designation (Ref. No.): F-SC1 and F-SC2 (Wet Infeed Screening and Pellet Screening Operations)

B. Process Description: Screening will occur at 2 points in the process: wet infeed screening prior to drying operations and pellet screening prior to pellet storage and loadout.

C. Manufacturer: TBD D. Model: TBD

E. Max. Design Capacity (specify units): 880,000 tpy
Equivalent to: 100.46 tons/hr

F. Status: ☐ Operating ☒ Proposed ☐ Under Construction

G. Operating Schedule (Actual): 24 hrs/day 7 days/week 52 weeks/yr

H. Date of construction, reconstruction, or most recent modification (for existing sources) or date of anticipated construction.
2019

2. Raw Material Input

MATERIAL	QUANTITY/HR AVERAGE	QUANTITY/HR MAXIMUM	QUANTITY/YEAR MAXIMUM
Wood Material	200,913 lb/hr	200,913 lb/hr	880,000 tpy
Wood Pellets	100,457 lb/hr	100,457 lb/hr	440,000 tpy

3. Product Output

MATERIAL	QUANTITY/HR AVERAGE	QUANTITY/HR MAXIMUM	QUANTITY/YEAR MAXIMUM
Wood Material	200,913 lb/hr	200,913 lb/hr	880,000 tpy
Wood Pellets	100,457 lb/hr	100,457 lb/hr	440,000 tpy

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Baghouses/Fabric Filters | **Section L1**

1. Oxidation System Equipment

A. Emission Point Designation (Ref. No.): HM1-4

B. Equipment Description (include the process(es) that adsorption controls emissions from):

Baghouse to be installed for the four (4) dry hammermills

C. Manufacturer: TBD D. Model: TBD

E. Status: ☐ Operating ☒ Proposed ☐ Under Construction

2. Baghouse Data

A. Cloth Area :________________ ft^2 B. Air to cloth ratio:__________________ ft^2

C. Type of bag: ☐ Woven ☐ Felted ☐ Membrane ☐ Other

D. Filter Material _________________________ E. Max. Filter Operating Temp. __________ ^oF

F. No. of compartment ____________ G. No. of bags per compartment: ____________

H. Bag Length _____________ ft I. Bag diameter ______________ ft

J. Pressure drop: TBD in H_2O K. Inlet air flow rate: 57,801 ACFM

L. Air temperature 150 ^oF M. Efficiency (PM): 95%

N. Is a pressure measurement device installed ☒ Yes ☐ No Warning alarm? ☒ Yes ☐ No

O. Dirty air is on ..: ☐ Inside of bag ☐ Outside of bag

P. Time between bag cleaning (specify units): ________ ☐ Automatic ☐ Timed ☐ Manual

Q. Method of cleaning ☐ Shaking ☐ Reverse air ☐ Pulse Jet ☐ Other:____________________

R. Are extra bags readily available? ☒ Yes ☐ No If yes, how many? TBD

S. Method of determining when to replace bags: ☐ Alarm ☒ Internal Inspection ☐ Visible Emissions ☐ Other: ____________________

T. How is the collected dust stored, handled, and disposed of?

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Baghouses/Fabric Filters — **Section L1**

1. Oxidation System Equipment

A. Emission Point Designation (Ref. No.): PL1-9

B. Equipment Description (include the process(es) that adsorption controls emissions from):

Baghouse to be installed for the nine (9) pellet lines

C. Manufacturer: TBD D. Model: TBD

E. Status: [ ] Operating [X] Proposed [ ] Under Construction

2. Baghouse Data

A. Cloth Area :_______________ ft^2 B. Air to cloth ratio:_________________ ft^2

C. Type of bag: [ ] Woven [ ] Felted [ ] Membrane [ ] Other

D. Filter Material ________________________ E. Max. Filter Operating Temp. : _________ ^oF

F. No. of compartments ___________ G. No. of bags per compartment: ___________

H. Bag Length ____________ ft I. Bag diameter ______________ ft

J. Pressure drop: TBD in H_20 K. Inlet air flow rate: 57,801 ACFM

L. Air temperature 150 ^oF M. Efficiency (PM): 95%

N. Is a pressure measurement device installed [X] Yes [ ] No Warning alarm? [X] Yes [ ] No

O. Dirty air is on ..: [ ] Inside of bag [ ] Outside of bag

P. Time between bag cleaning (specify units): ________ [ ] Automatic [ ] Timed [ ] Manual

Q. Method of cleaning [ ] Shaking [ ] Reverse air [ ] Pulse Jet [ ] Other:___________________

R. Are extra bags readily available? [X] Yes [ ] No If yes, how many? TBD

S. Method of determining when to replace bags: [ ] Alarm [X] Internal Inspection [ ] Visible Emissions [ ] Other: ___________________

T. How is the collected dust stored, handled, and disposed of?

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Oxidation Systems — **Section L4**

1. Oxidation System Equipment

A. Emission Point Designation (Ref. No.): RTO1

B. Equipment Description (include the process(es) that adsorption controls emissions from):

Regenerative thermal oxidizer to be installed for the rotary dryer.

C. Manufacturer: TBD D. Model: TBD

E. Status: ☐ Operating ☒ Proposed ☐ Under Construction

2. Oxidation System Data

A. Type of Oxidation Process:

☐ Afterburner ☐ Flare

☐ Recuperative Thermal Oxidizer ☐ Recuperative Catalytic Oxidizer

☒ Regenerative Thermal Oxidizer ☐ Regenerative Catalytic Oxidizer

☐ Other: ______

B. Efficiency: 95 % (estimated) Controlling the following pollutant(s): VOC
Efficiency: 95 % (estimated) Controlling the following pollutant(s): HAP

C. Inlet air flow rate: TBD acfm

D. Combustion Chamber Temperature: Minimum: 1500 °F Maximum: 1500 °F

E. Maximum burner rating: 10 MMBtu/hr F. Fuel Type: Natural gas

G. Fuel Usage Rate (specify units): ______ H. Sulfur in Fuel: -- wt %

I. Residence Time: ______ seconds J. Percent Excess Air: ______ %

K. Combustion Chamber Volume: ______ ft3

L. VOC Concentration: Inlet: ______ ppmv Outlet: ______ ppmv

2. Oxidation System Data (continued)

M. Catalyst Data (if applicable):

1. Catalyst type: ______________________

2. Catalyst volume: ____________ ft3

3. How is spent catalyst disposed of? ______________________________________

N. Flare Data (if applicable):

1. Flare Type: ☐ Non-assisted ☐ Steam-assisted ☐ Air-assisted
   ☐ Other: ____________________________________

2. Net heating value of combusted gas: ____________ Btu/scf

3. Design exit velocity: ____________ ft/sec

4. Is the presence of a flare pilot flame monitored? ☐ Yes ☐ No

   If yes, please describe the monitoring: ______________________________________

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Oxidation Systems — **Section L4**

1. Oxidation System Equipment

A. Emission Point Designation (Ref. No.): RTO2

B. Equipment Description (include the process(es) that adsorption controls emissions from):

Regenerative thermal oxidizer to be installed for the nine (9) pellet coolers.

C. Manufacturer: TBD D. Model: TBD

E. Status: ☐ Operating ☒ Proposed ☐ Under Construction

2. Oxidation System Data

A. Type of Oxidation Process:

☐ Afterburner ☐ Flare

☐ Recuperative Thermal Oxidizer ☐ Recuperative Catalytic Oxidizer

☒ Regenerative Thermal Oxidizer ☐ Regenerative Catalytic Oxidizer

☐ Other: ______

B. Efficiency: 95 % (estimated) Controlling the following pollutant(s): VOC
Efficiency: 95 % (estimated) Controlling the following pollutant(s): HAP

C. Inlet air flow rate: 57801.0 acfm

D. Combustion Chamber Temperature: Minimum: 1500 °F Maximum: 1500 °F

E. Maximum burner rating: 10 MMBtu/hr F. Fuel Type: Natural gas

G. Fuel Usage Rate (specify units): ______ H. Sulfur in Fuel: -- wt %

I. Residence Time: ______ seconds J. Percent Excess Air: ______ %

K. Combustion Chamber Volume: ______ ft3

L. VOC Concentration: Inlet: ______ ppmv Outlet: ______ ppmv

2. Oxidation System Data (continued)

M. Catalyst Data (if applicable):

1. Catalyst type: ______________________________

2. Catalyst volume: _______________ ft3

3. How is spent catalyst disposed of? ____

N. Flare Data (if applicable):

1. Flare Type: ☐ Non-assisted ☐ Steam-assisted ☐ Air-assisted
   ☐ Other: ____

2. Net heating value of combusted gas: _______________ Btu/scf

3. Design exit velocity: _______________ ft/sec

4. Is the presence of a flare pilot flame monitored? ☐ Yes ☐ No

   If yes, please describe the monitoring: ____

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Electrostatic Precipitators (ESP) — Section L6

1 Electrostatic Precipitator Description

A. Emission Point Designation (Ref. No.): RD

B. Equipment Description (include the process(es) that ESP controls emissions from):
To be installed for the rotary dryer.

C. Manufacturer: TBD   D. Model: TBD

E. Status: ☐ Operating   ☒ Proposed   ☐ Under Construction

2 Electrostatic Precipitator Data

A. Precipitator Type: Wet   Dry   Single-stage
Two-stage   Other: ______

B. Efficienc 95 %   Controlling the following pollutant(s): PM, PM_{10}, & $PM_{2.5}$
Efficienc 70 %   Controlling the following pollutant(s): HCl

C. Inlet air flow rate: 148,000 acfm

D. Pressure Drop: N/A in. of H_2O

E. Inlet Temperature: 250 °F

F. Total collection plate area: ______ ft^2

G. Collector Plate Size: Length: ______ ft   Width: ______ ft

H. Gas Viscosity: ______ poise

I. Pollutant Resistivity: ______ ohm-cm

J. Field   Charging: ______ volts   Collecting: ______ volts

K. No. of fields: ______

L. No. of collector plates per field: ______

2 Electrostatic Precipitator Data (continued)

M. Spacing between collector plates: ______________ in.

N. No. of compartments: ______________

O. No. of discharge electrodes:

P. Corona Power: ______________ watts/1000cfm

Q. Electrical Usage: ______________ kW/hr

R. Cleaning Method: Plate Rapping Plate Vibrating Washing

Other: ____

S. Rapper Frequency: ______________ min/cycle ☐ Automatic ☐

T. Is flue gas condition required? ☐ Yes ☐ No

U. Fan location relative to precipitator: ☐ Upstream ☐ Downstream

V. How is the collected dust stored, handled, and

W. List the electrical conditions per field:

FIELD NO.	VOLTAGE	AMPERAGE (mA)

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Applicable Requirements and Status | **Section N**

1. Summary of Applicable Requirements

Provide a list of all applicable federal standards for which your facility is or will be subject to, as well as a list of all Construction Permits establishing limits or restrictions issued to your facility. The specific emission standards and limitations applicable to each emission point shall be provided on the following pages (Parts 2 and 3).

Federal Regulations:

40 CFR Part	Subpart
60	IIII
63	ZZZZ

State Construction Permits[1]:

Permit to Construct issued:	MM/DD/YY[2]	PSD	PSD Avoidance[3]	Other
		☐	☐	☐
		☐	☐	☐
		☐	☐	☐
		☐	☐	☐
		☐	☐	☐
		☐	☐	☐

[1] Any Construction Permit containing requirements that are currently appplicable to the facility should be addressed in this section.

[2] If the permit has been modified, give the most recent modification date.

[3] Because permits are issued on a pollutant-by-pollutant basis, a PSD permit may be significant for one pollutant while also containing PSD avoidance limits for another pollutant. Therefore, you may check multiple boxes for each permit.

FORM 5	MDEQ	MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY APPLICATION FOR AIR POLLUTION CONTROL PERMIT

Applicable Requirements and Status **Section N**

3. Future Applicable Requirements

List all future applicable state and federal requirements, including emission limits, operating restrictions, etc., and the applicable test methods or monitoring used to demonstrate compliance with each applicable requirement. Clearly identify federal regulations from state requirements.

EMISSION POINT NO.	FUTURE APPLICABLE REQUIREMENT (Regulatory citation)	POLLUTANT	LIMITS/REQUIREMENTS	TEST METHOD/COMPLIANCE MONITORING	COMPLIANCE DATE[1]
40 CFR 60 SUBPART IIII					
ENG1, ENG2, ENG3, ENG4, ENG5 and FWP1	40 CFR 60.4211(a)	N/A	Operate and maintain the engine according to the manufacturer's emission-related written instructions.	N/A	
	40 CFR 60.4211(c)	N/A	Maintain a copy of the US EPA certificate for the engine.	N/A	
	40 CFR 60.4211(f)(3)	N/A	Non-emergency operation limitted to 50 hr/yr.	N/A	
	40 CFR 60.4211(f)(2)	N/A	Testing and maintenance checks limitted to 100 hr/yr.	N/A	
	40 CFR 60.4207(a)	SO_2	1.09E-05 lb/hp-hr (Sulfur content limitted to 15 ppmv)	N/A	
40 CFR 63 Subpart ZZZZ					
ENG1, ENG2, ENG3, ENG4, ENG5 and FWP1	40 CFR 63.6590	N/A	Change oil and filter 1,000 hours or annually.	N/A	
ENG1, ENG2, ENG3, ENG4, ENG5 and FWP1	40 CFR 63.6590	N/A	Inspect air cleaner 1,000 hours or annually.	N/A	
ENG1, ENG2, ENG3, ENG4, ENG5 and FWP1	40 CFR 63.6590	N/A	Inspect all hoses and belts 500 hours or annually.	N/A	

State Requirements					
All Point Sources (RD, RTO1, HM1-4, PL1-9, RCO1, PSS1, TLS, ENG1-5, and FWP1)	Mississippi Admin Code Part 2, Chapter 1- Rule 1.3.A.1	Smoke	Except for during startup and soot blowing operations, the permittee shall not cause, permit, or allow the emission of smoke from a point source into the open air from any manufacturing, industrial, commercial or waste disposal process which exceeds forty (40) percent opacity.	N/A	
All Point Sources (RD, RTO1, HM1-4, PL1-9, RCO1, PSS1, TLS, ENG1-5, and FWP1)	Mississippi Admin Code Part 2, Chapter 1- Rule 1.3.A.2	Smoke	Startup opacity levels greater than 40% are limited to no more than 15 minutes per startup in one hour and no more than three startups in any 24 hour period.	N/A	
Facility Wide	Mississippi Admin Code Part 2, Chapter 1- Rule 1.3.B	Equivalent Opacity	Maintain Opacity ≤ 40%	EPA Method 9/ Method 22	
Facility Wide	Mississippi Admin Code Part 2, Chapter 1- Rule 1.3.C	N/A	The facility will comply with this regulation.	N/A	
RD, HM1-4, PL1-9, PSS1, and TLS	Mississippi Admin Code Part 2, Chapter 1- Rule 1.3.F	PM	The subject emission sources are less than the PWR allowable limits. Operation of baghouses, WESP, and good operation will ensure that compliance is maintained with the PWR.	N/A	
Facility Wide	Mississippi Admin Code Part 2, Chapter 1- Rule 1.3.G	N/A	The facility will comply with this regulation.	N/A	
RD	Mississippi Admin Code Part 2, Chapter 1- Rule 1.4.A.1	SO_2	SO_2 Discharge ≤ 4.8 lb/MMBtu	N/A	
Facility Wide	Mississippi Admin Code Part 2, Chapter 1- Rule 1.4.B.1	SO_2	No emissions of SO_2 in excess of 500 ppmv from process equipment constructed after January 25, 1972.	N/A	
Facility Wide	Mississippi Admin Code Part 2, Chapter 1- Rule 1.4.B.	SO_2	No emissions of hydrogen sulfide in excess of one grain per 100 standard cubic feet from any gas stream.	N/A	
Facility Wide	Mississippi Admin Code Part 2, Chapter 1- Rule 1.5.B	Miscellaneous Chemical Emissions	The facility will comply with this regulation.	N/A	
Facility Wide	Mississippi Admin Code Part 2, Chapter 1- Rule 1.6	N/A	The facility will comply with this regulation.	N/A	
Facility Wide	Mississippi Admin Code Part 2, Chapter 1- Rule 1.8	N/A	The facility will comply with this regulation.	N/A	
Facility Wide	Mississippi Admin Code Part 2, Chapter 1- Rule 1.10	N/A	The facility will submit notifications as required.	N/A	
Facility Wide	Mississippi Admin Code Part 2, Chapter 4	N/A	The facility will comply with this regulation.	N/A	
Facility Wide	Mississippi Admin Code Part 2, Chapter 6	N/A	A title V operating permit application will be submitted in accordance with the due date identified in the air construction permit.	N/A	

APPENDIX D: VOC EMISSION FACTOR DOCUMENTATION

This appendix includes additional documentation pertaining to the VOC emissions factors utilized for the estimated potential emissions of the Newton facility. Specifically, this appendix includes the following documents:

- Performance testing on the dryer system at Pinnacle's Aliceville Pellet Mill in July 2015
  - As discussed in Section 3 of the narrative, the dryer at Pinnacle's Aliceville facility is very similar to the proposed dryer at Newton. The system includes as a WESP and RTO, and is similar in size and capacity.
  - The results from the testing represent controlled emission rates in units of "lb/hr"
  - The throughput during testing was 37.1 tons/hr, as listed in Page 6 of the report. Therefore, the emission factors utilized in the emissions inventory are the "lb/hr" numbers divided by 37.1 ton/hr, which provide factors in units of "lb/ton".
- Performance testing on the pellet coolers and dry hammermills baghouse at Pinnacle's Aliceville Pellet Mill in October 2018
  - This report contains emissions obtained on two (2) stacks at Aliceville, RTO2 (which is the RTO/RCO controlling VOC emissions on the pellet cooler lines) and BH1 (the baghouse controlling PM emissions on the dry hammermills at Aliceville).
  - The proposed dry hammermills and pellet coolers at Newton will be similar in controls and in capacity to the units at Aliceville.
  - The factors utilized in the potential emissions inventory for these units do not come from this test report. The factors are from engineering test runs conducted independently at the Aliceville facility as noted in the footnotes in Appendix B. Pinnacle chose to conservatively utilize more conservative emissions factors from engineering testing, which represents the worst-case VOC emissions measured on these units. Additionally, as these factors are from engineering testing, there is no test report that was submitted to the Alabama agency (ADEM). The emissions, as shown in the included October 2018 test report, are substantially lower than what is represented in Appendix B. Pinnacle submits this report as evidence that the proposed units at Newton will be able to meet the VOC emission limits.
- The GA Environmental Protection Division (EPD) recommended emission factors for pellet mills
  - These factors have been vetted and approved by EPA Region IV.
- The TNRCC document for estimating VOC from various fugitive processes
  - This has been accepted by other state agencies

TOTAL PM, CO, NOx, VOC AND VISIBLE EMISSIONS TEST

NO. 1 WET ELECTROSTATIC PRECIPITATOR AND REGENERATIVE THERMAL OXIDIZER (RD)

WESTERVELT PELLETS I, LLC

ALICEVILLE, ALABAMA PELLET PLANT

PERMIT NO. 409-0010

Aliceville, Alabama
July 30, 2015

Westervelt Pellets I, LLC
6777 Highway 17
Aliceville, Alabama 35442

Performed by:

ENVIRONMENTAL MONITORING LABORATORIES, INC.

624 Ridgewood Road
P.O. Box 655
Ridgeland, Mississippi 39158

Phone: (601)856-3092

Fax: (601)853-2151

REPORT OF
AIR EMISSIONS TEST
FOR
WESTERVELT PELLETS I, LLC
NO. 1 WET ELECTROSTATIC PRECIPITATOR
AND REGENERATIVE THERMAL OXIDIZER (RD)
(WESP/RTO)

Aliceville, Alabama
July 30, 2015

PERMIT NO. 409-0010

Westervelt Company
Post Office Box 48999
Tuscaloosa, Alabama 35404

Contact: Keith Dollar
Phone: 205/562-5475

Performed By:
Environmental Monitoring Laboratories
Ridgeland, Mississippi
⮜601/856-3092⮞

P.O. Box 655 624 Ridgewood Road
Ridgeland, Mississippi 39158
Phone: 601/856-3092
Fax 601/853-2151

EXECUTIVE SUMMARY OF AIR EMISSIONS TEST

Westervelt Pellets I, LLC - Aliceville, Alabama – (Emission Point RD)

Report date: August 31, 2015

On July 30, 2015, Environmental Monitoring Laboratories performed air emissions testing for Westervelt Pellets I, LLC in Aliceville, Alabama. Testing was performed to measure total particulate, (TPM including filterable and condensable particulate), carbon monoxide (CO), nitrogen oxides (NOx), total hydrocarbon (VOC as propane), and visible emissions (VE) from the No. 1 WESP/RTO controlling emissions from wood drying operations. This testing was done in accordance with requirements of Air Permit No. 409-0010 issued and administered by the Alabama Department of Environmental Management (ADEM.)

Measured emissions are summarized in the tables below. The results reported are the average of three 60-minute sample runs.

	lb/hr	concentration	Permit Limit
Total PM (TPM) (Method 5/202)	1.76	0.0072 grains/dscf	6.97 lb/hr
CO	8.18	65 ppm	53.65 lb/hr
NOx	9.70	47 ppm	(no permit limit)
VOC (as Propane)	4.44	23 ppm	15.00 lb/hr

Opacity	0.00% (highest 6 minute average)	0.00% (highest 1 hour average)

Mr. Lance McCray of Westervelt Company coordinated the testing project. The EML test team included Bill Norwood, Wesley Ballard, Eric Renfrow and Greg Shelnutt. Mr. Nolan Williford and Mr. Camaroun Thomas of ADEM were present to witness the test.

Following is a report of the test.

REPORT OF AIR EMISSIONS TEST
FOR WESTERVELT RENEWABLE LLC
NO. 1 WESP/RTO
ALICEVILLE, ALABAMA
JULY 30, 2015

CONTENTS

REPORT CERTIFICATION

I certify that I have examined the information submitted herein, and based upon inquires of those responsible for obtaining the data or upon my direct acquisition of data, I believe the submitted information is true, accurate and complete.

Signed ______________________

Daniel G. Russell

1.0 TEST RESULTS

The following table is a summary of the measured flow parameters and test results for emissions testing done on July 30, 2015, for the No. 1 WESP/RTO at Westervelt's wood pellet plant in Aliceville, Alabama.

Run No.		1	2	3	AVG
Date		07/30/15	07/30/15	07/30/15	-------
Time Start		0953	1130	1315	-----
Time End		1104	1250	1420	-----
TOTAL PM	lb/hr	1.58	1.72	1.99	1.76
TOTAL PM	grains/dscf	0.0063	0.0070	0.0081	0.0072
VISIBLE EMISSIONS	Highest SMA, %	0.0	0.0	0.0	0.0
CO EMISSIONS	lb/hr	7.37	8.81	8.36	8.18
CO EMISSIONS	ppm	58	71	67	65
NOx EMISSIONS	lb/hr	9.49	9.52	10.08	9.70
NOx EMISSIONS	ppm	46	47	50	47
VOC EMISSIONS (as propane)	lb/hr	4.50	4.38	4.43	4.44
VOC EMISSIONS (as propane)	ppm	23	22	23	23
VOLUMETRIC FLOW RATE	acfm	73051	72425	75000	73492
VOLUMETRIC FLOW RATE	dscfm	29045	28464	28428	28646
VELOCITY	ft./sec.	38.6	38.3	39.7	38.88
STACK TEMPERATURE	^{o}F	243	250	247	246
MOISTURE	%	47.2	47.4	49.5	48.0
SAMPLE RATE	% isokinetic	100	105	99	101

2.0 SOURCE DESCRIPTION:

Westervelt Pellets I, LLC in Aliceville, Alabama is a producer of pine wood pellets. Stored green wood flakes are conveyed to a rotary dryer that reduces moisture content from about 50% to about 8%. Dry wood is conveyed to a cyclone for separation of the flakes from the dust. Additional size classification is accomplished with series of screens and the material is stored in dry silos. Material from the dry silos is fed to pellet presses. Formed pellets are transferred to product storage silos for subsequent shipment.

Production rate during the test was 37.1 tons per hour. RTO temperature during testing was an average of 1559.91 degrees F. Operating documentation can be provided by Westervelt is in Appendix E

The Line 1 rotary dryer exhausts to a wet ESP and then to an RTO that exhausts to atmosphere. The RTO exhausts to the atmosphere by way of a 47.75-inch by 95.5-inch rectangular vertical stack. Four sample ports are provided along the longer dimension at a location that is 180 inches (2.8 diameters) below the stack exit and 180 inches (4.8 diameters) above the blower to stack.

3.0 TEST PROCEDURES:

Test procedures used are those described in the Code of Federal Regulations, Title 40, Part 60, Appendix A. All test parameters were measured simultaneously. The test consisted of triplicate 60-minute sample runs.

Sample and Velocity Traverses – EPA Method 1

Selection of sampling locations was as described in Method 1. Sample ports are installed at locations meeting requirements of the Method. Laminar airflow at sample locations was confirmed using the null Pitot technique.

Determination of Stack Gas Velocity and Volumetric Flow Rate – EPA Method 2

Stack gas velocity was measured using an S-Type Pitot tube and Method 2. Pitot tube design and its orientation with respect to the sample probe and nozzle permitted the use of a correction factor (Cp) of 0.84 as described in Method 2. Stack temperature measurements were made with a type K thermocouple and NBS calibration traceable digital thermometer.

Gas Analysis for the Determination of Dry Molecular Weight – EPA Method 3A

Oxygen and carbon dioxide content was measured by continuous monitoring with calibrated analyzers as described in Method 3A. Zero and mid level span checks were performed following each sample run. Pre test calibrations were made by introducing the gas standards at the inlet to the sample conditioner; post run zero and span checks were made through the sample system by introducing calibration gas at the inlet to the sample probe

Determination of Moisture Content in Stack Gas – EPA Method 4

Moisture content was determined from volumetric and gravimetric analysis of impinger contents of the Method 5/202 sample train.

Determination of Total Particulate Emissions – EPA Method 5 and EPA Method 202

Particulate emissions were measured as described in Method 5 in conjunction with Method 202. Method. The sample train used was identical to that described in Method 5 except modified to accommodate the collection of condensable particulate as described in the Method 202. Glass fiber filters were used for the filterable particulate; a hexane extracted Teflon filter was used in the Method 202 section. A glass probe liner and nozzle were used. Reagent grade acetone, water, and hexane were used for sample recovery. Enthalpy Analytical performed the analysis.

Determination of Nitrogen Oxides Emissions – EPA Method 7E

Nitrogen oxide was measured by continuously directing a conditioned gas sample to a TECO Model 42C chemiluminescence NOx analyzer as described in Method 7E. A sample was extracted from the source by way of a stainless steel probe, heated sample line, minimum contact moisture knockout trap, glass wool filter and vacuum sample pump. The NOx analyzer was calibrated prior to use in the appropriate range using zero, mid, and high range concentrations of NO in nitrogen. Zero and mid level span checks were performed following each sample run. Pre test calibrations were made by introducing the gas standards at the inlet to the sample conditioner; post run zero and span checks were made through the sample system by introducing calibration gas at the inlet to the sample probe. Following calibration, analyzer NO_2 converter efficiency was checked by directing a known concentration of NO_2 in air to the analyzer. For that efficiency check, a response of greater than 90% of the cylinder value indicates satisfactory converter efficiency.

Determination of Carbon Monoxide – EPA Method 10

Carbon monoxide was measured by continuously directing a conditioned gas sample to a TECO Model 48C gas filter correlation CO analyzer as described in the continuous monitoring technique described in Method 10. A sample was extracted from the source by way of a stainless steel probe, minimum contact moisture knockout trap, glass wool filter and vacuum sample pump. The CO analyzer was calibrated prior to use in the appropriate range, using zero, mid range, and span concentrations of CO in nitrogen. Zero and span checks were performed following each 60-minute sample run. Pre test calibrations were made by introducing the gas standards at the inlet to the sample conditioner; post run zero and span checks were made through the sample system by introducing calibration gas at the inlet to the sample probe.

Determination of Total Volatile Organic Compounds – EPA Method 25A

VOC (as carbon) was measured using Method 25A. A calibrated TECO Model 51 heated flame ionization detector was used to continuously monitor VOC concentration on a wet basis. A sample was directed to the analyzers by way of a Teflon sample line heated to 250^{O} F. A helium/hydrogen fuel was used to reduce oxygen synergism impact on the measurements. The instrument was calibrated with known concentrations of propane. For this testing project, results are expressed in terms of propane. Triplicate 60 minute sampling periods constituted a test. Pre test calibrations and post run zero and span checks were made through the sample system by introducing calibration gas at the inlet to the sample probe.

Preparation of Calibration Gases – EPA Method 205

Calibration gas concentrations were prepared using cylinders of EPA Protocol 1 gas mixtures and an Environics gas diluter verified by Method 205.

Data Acquisition.

Instrument data was recorded on a Fluke Hydra data logger at 5-second intervals and reduced to 60-second averages. The arithmetic average of each instrument's output was used to calculate emissions.

4.0 CALCULATIONS

Westervelt Renewable Energy - Aliceville, AL
RTO PM/CO/NOx/VOC Emissions Test - July 30, 2015

Collected Test Data:

				RUN 1	RUN 2	RUN 3
	Date	:		07/30/15	07/30/15	07/30/15
	Time start	:		0953	1130	1315
	Time end	:		1104	1250	1420
1.	As	:	sq ft	31.5017	31.5017	31.5017
2.	Dn	:	in.	0.365	0.365	0.365
3.	Cp	:	dimensionless	0.84	0.84	0.84
4.	Theta	:	minutes	60.00	60.00	60.00
5.	Y	:	dimensionless	1.002	1.002	1.002
6.	Pbar	:	in. Hg	30.04	30.04	30.04
7.	Pg	:	in. H2O	-0.14	-0.14	-0.14
8.	Vm	:	cf (dry gas)	40.791	42.728	40.073
9.	$\sqrt{(\Delta P)}$,avg	:	in.H2O^.5	0.5813	0.5750	0.5965
10.	ΔH	:	in. H2O	1.5250	1.6670	1.5229
11.	ts	:	degrees F	243.29	249.50	246.63
12.	tm	:	degrees F	82.04	88.71	91.06
13.	Vlc	:	ml	763	794.5	806
14.	CO2	:	percent	45.21	47.23	51.50
15.	O2	:	percent	10.75	9.40	10.04
16.	CO	:	percent	0.01	0.01	0.01
17.	C,CO	:	ppm	58	71	67
18.	C,NOx	:	ppm	45.63	46.70	49.51
19.	C,VOC	:	ppmw as propane	11.92	11.81	11.49
20.	M,PM	:	milligrams	6.9	6.0	10.7
21.	M,CPM back	:	milligrams (sum of Method 202 fractions)	9.6	13.0	9.8

Westervelt Renewable Energy - Aliceville, AL

RTO PM/CO/NOx/VOC Emissions Test - July 30, 2015

Calculations:

				RUN 1	RUN 2	RUN 3	AVG.
1.	Pm	:	in.Hg (ΔH/13.6)+Pbar	30.1521	30.1626	30.1520	30.1556
2.	Ps	:	in. Hg (Pg/13.6)+Pbar	30.0297	30.0297	30.0297	30.0297
3.	An	:	sq ft ((Dn/24)^2)(3.1416)	7.27E-04	7.27E-04	7.27E-04	7.27E-04
4.	Vmstd	:	dscf Vm Y(Pm/Pstd)(Tstd/Tm)	40.123	41.532	38.771	40.142
5.	Vwstd	:	scf (.04707cf/ml)(Vlc)	35.914	37.397	37.938	37.083
6.	Bws	:	dimensionless Vwstd/(Vwstd+Vmstd)	0.4723	0.4738	0.4946	0.4802
7.	Md	:	mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	35.66	35.93	36.64	36.08
8.	Ms	:	mol.wt. wet basis Md(1-Bws)+18 Bws	27.32	27.44	27.42	27.39
9.	Vs	:	ft/sec Kp Cp (√ΔP)√(Ts/(Ps Ms))	38.65	38.32	39.68	38.88
10.	Q	:	cfm Vs As(60 sec/min)	73051	72425	75000	73492
11.	Qstw	:	scfm Q(Ps/Pstd)(Tstd/Ts)	55044	54095	56246	55129
12.	Qstd	:	dscfm Qstw(1-Bws)	29045	28464	28428	28646
13.	I	:	percent [(100 Ts)(.002669 Vlc+(Vm Pm/Tm)]/(60 theta Vs Ps An)	99.84	105.46	98.57	101.29

Filterable PM

				RUN 1	RUN 2	RUN 3	AVG.
14.	E,PM	:	pounds/hr (M,PM/Vmstd)(Qstd)(60)/(453590)	0.66	0.54	1.04	0.75
15.	C,PM	:	grains/dscf (M,PM/Vmstd)(.0154 grains/mg)	0.0026	0.0022	0.0043	0.0030

Condensable PM

16.	E,PM	:	lb/hr (M,PM/Vmstd)(Qstd)(60)/(453590)	0.92	1.18	0.95	1.02
17.	C,PM	:	gr/dscf (M,PM/Vmstd)(.0154 gr//mg)	0.0037	0.0048	0.0039	0.0041

Total PM

18.	E,PM	:	lb/hr (M,PM/Vmstd)(Qstd)(60)/(453590)	1.58	1.72	1.99	1.76
19.	C,PM	:	gr/dscf (M,PM/Vmstd)(.0154 gr//mg)	0.0063	0.0070	0.0081	0.0072

Carbon Monoxide Emissions

20.	E,CO	:	pounds/hr (C,CO*7.2708e-8)(60)(Qstd)	7.37	8.81	8.36	8.18

NOx Emissions

21.	E,NOx	:	pounds/hr (C,NOx*1.194e-7)(60)(Qstd)	9.49	9.52	10.08	9.70

VOC Emissions

22.	C'VOC	:	ppm as propane dry ((C,VOC))/(1-Bws)	23	22	23	23
23.	E,VOC	:	pounds/hr (C'VOC)(3.116e-8)(Qstd)(60)	4.50	4.38	4.43	4.44

Calibration Drift and Bias Corrections:

Analyte, units	Level	Cal. Value	Pre-Test				Run No. 1			Run No. 2			Run No. 3		
			Cal. Reading	% Cal. Error	Bias Reading	% Bias	Reading	% Bias	% Drift	Reading	% Bias	% Drift	Reading	% Bias	% Drift
% CO2	Low	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mid	10.0	10.0	0.0	10.0	0.0	10.0	0.0	0.0	10.0	0.0	0.0	10.0	0.0	0.0
	High	20.0	20.0	0.0											
	SPAN =	20.0			Measured Result		45.21			47.23			51.50		
					Corrected Result		**45.21**			**47.23**			**51.50**		
% O2	Low	0.0	0.0	0.0	0.1	0.5	0.1	0.5	0.0	0.1	0.5	0.0	0.1	0.5	0.0
	Mid	10.5	10.5	0.0	10.4	0.5	10.4	0.5	0.0	10.4	0.5	0.0	10.4	0.5	0.0
	High	20.9	20.9	0.0											
	SPAN =	20.9			Measured Result		10.65			9.32			9.95		
					Corrected Result		**10.75**			**9.40**			**10.04**		
ppm CO	Low	0	1	0.3	1	0.0	1	0.0	0.0	1	0.0	0.0	0	0.0	0.3
	Mid	175	174	0.3	174	0.0	173	0.3	0.3	175	0.3	0.6	174	0.3	0.3
	High	350	351	0.3											
	SPAN =	350			Measured Result		58.29			71.15			67.51		
					Corrected Result		**58.12**			**70.96**			**67.40**		
ppm NOx	Low	0	-1	1.0	0	1.0	1	2.0	1.0	1	2.0	0.0	0	0.0	1.0
	Mid	50	50	0.0	50	0.0	49	1.0	1.0	52	2.0	3.0	52	2.0	0.0
	High	100	100	0.0											
	SPAN =	100			Measured Result		45.21			47.23			51.50		
					Corrected Result		**45.63**			**46.70**			**49.51**		

Calibration Error Allowable	< 2% of span	[((Cyl. Value - Reading) / span)* 100%]
System Bias	< 5% span	[(System Cal - Reading)/span*100%]
Drift	< 3% ......(Method 20 = 2 %)..........	[(Initial System Cal. - Final System Cal.) / Span * 100%]

5.0 NOMENCLATURE

SYMBOL	UNITS	DESCRIPTION
An	ft^2	Nozzle cross sectional area
As	ft^2	Stack cross sectional area
Bws	dimensionless	Wet gas fraction
CO_2	percent	Carbon dioxide content by volume
CO	percent	Carbon monoxide content by volume
Cp	dimensionless	Pitot correction factor
C,X	as labeled	Concentration of pollutant X
DGF	dimensionless	Dry gas fraction
Dn	inches	Nozzle diameter
ΔH (delta H)	in. H_2O	Pressure drop across meter orifice
ΔP (delta P)	in. H_2O	Stack gas velocity pressure
E,X	#/hr	Emission rate of pollutant X
E'X	#/MM Btu	Emission rate of pollutant X
F	dscf	Volume of flue gas per MM Btu
I	percent	Nozzle velocity/stack gas velocity
Kp	consistent	Pitot tube constant
M,X	milligrams	Sample weight of pollutant X
Md	#/# mole	Dry molecular weight of stack gas
Ms	#/# mole	Wet molecular weight of stack gas
N2	percent	Nitrogen content by volume, dry basis
O_2	percent	Oxygen content by volume, dry basis
Pbar	in. Hg	Barometric pressure
Pg	in. Hg	Stack static pressure
Pm	in. Hg	Total pressure at meter (Pbar+(ΔH/13.6)
Ps	in. Hg	Total stack pressure (Pbar+(Pg/13.6))
Pstd	in. Hg	Standard barometric pressure = 29.92
Q	acfm	Volumetric flow rate at stack conditions
Qstd	dscfm	Volumetric flow rate at standard conditions, dry basis
Qstdw	scfm	Volumetric flow rate at standard conditions, wet basis
θ (theta)	minutes	Sample duration
tm	^oF	Meter temperature (Tm denotes ^oR)
ts	^oF	Stack temperature (Ts denotes ^oR)
tw	^oF	Stack gas wet bulb temperature
Tstd	^oR	Standard temperature = 528^oR
Vlc	ml	volume of water collected
Vm	ft^3	Volume of dry gas sampled through meter
Vmstd	dscf	Sample volume at standard conditions
Vwstd	scf	Sample volume of water vapor
Y	dimensionless	Meter coefficient
Xsair	percent	Excess air

6.0 CALIBRATIONS

Measurement devices used by Environmental Monitoring Laboratories that are subject to changes in measurement precision are initially calibrated prior to use. Those instruments for which calibration factors are subject to change or for which calibration checks are required are calibrated following each field use or as otherwise directed and noted. Calibration procedures for specific equipment are as follows.

Dry Gas Meter:

Dry gas meters are periodically removed from the sampling consoles and cleaned and repaired. Following the overhaul of a meter, the measuring precision is checked by the Bell Prover Method and adjusted when necessary to read to within 2% of 100% accuracy. Midsouth Meter Service in Florence, Mississippi provides this service. At 6-month intervals, or following any meter repair a five point calibration is performed described in APTD-0576 using either a wet test meter, calibrated dry gas meter (used exclusively for calibrations), or a calibrated orifice set as a standard reference. Following field use, gas meter calibrations are checked at intermediate orifice settings. If a meter coefficient obtained from pre-test and post-test checks differs by more than 5%, the coefficient (Y) giving the lower sample volume is used in the calculations.

Orifice:

The orifice coefficient is initially determined and is rechecked following a major gas meter repair and calibration. The calibration is included with the Dry Gas Meter Calibration.

Nozzles:

Nozzles are checked before each field use with a precision (.001 in.) dial caliper. Three measurements on different axes are made; an average of those three readings is used in calculations. If the tolerance among measurements exceeds 0.004 inches (highest to lowest reading) the nozzle is repaired and recalibrated or discarded.

Pitot Tubes:

Pitot tubes meeting EPA geometry standards are assigned a coefficient of 0.84. Pitot tubes are visually inspected for damage before, during and after use. Those Pitot tubes not meeting the geometry standards are assigned a coefficient from the manufacturer's calibration that it retains unless damaged.

Temperature Measuring Instruments:

All temperature measurements are made with type K thermocouples and digital thermocouple thermometers that have an initial calibration traceable to NBS. Additionally, thermocouple meters are checked annually for ± 2 degree accuracy using an electronic Fluke calibrator that is calibrated annually by the manufacturer. Thermocouples are checked during a test series against a reference thermometer. Continuity and proper thermocouple contact location are checked by challenging the thermocouple with a temperature change. (EMC Alternate Method (ALT-011))

Barometer:

Aneroid field barometers are checked against and adjusted to readings from a mercury barometer or readings obtained from local weather authorities.

Differential Pressure Gauges:

Velocity head (ΔP) and orifice pressure differential (ΔH) measurements are made using water manometers of the appropriate range unless otherwise noted in the test data. Manometers do not require calibration. When Magnehelic® type gauges are used, they are calibrated against a water manometer prior to and following each use.

Analytical Balance:

Analytical balances are calibrated annually by Mettler-Toledo. Prior to each use, or daily, a quality control check is made using Class A weights of 0.5000 grams and 100.0000 grams. This check is conducted after leveling the balance and performing an internal zero and calibration.

7.0 APPENDICES

A. Field and Analytical Data and VE Record

B. Calibration Data and VE Reader Certification

C. Analyzers Data Log

D. Condensable PM Analysis (Enthalpy)

E. Operating Records

APPENDIX A

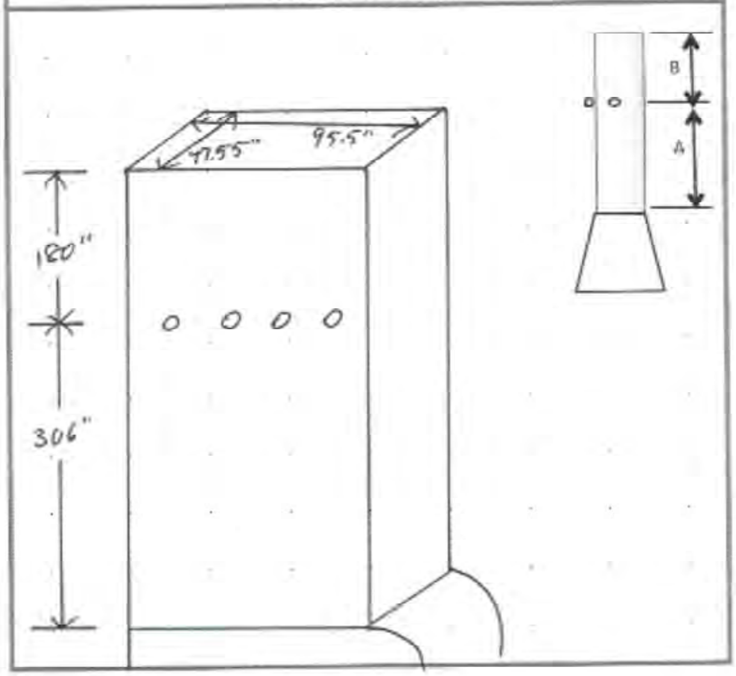
FIELD AND ANALYTICAL DATA

AND VE RECORD

STACK CONFIGURATION AND SAMPLE POINT LAYOUT (EML V-0 Effective 093013)

PLANT:	Westervelt Renewable Energy	**Date:** 7-30-15
SOURCE:	RTO 1	
TEST FOR:	PM Setup	
TEST OPERATORS:	Norwood/Renfrow/Shelnutt/Ballard	

SKETCH OF STACK



PERCENT OF DIAMETER (for circular stacks)

points on a diameter

point no.	2	4	6	8	10	12	14	16
1	14.6	6.7	4.4	3.2	2.6	2.1	1.8	1.6
2	85.4	25.0	14.6	10.5	8.2	6.7	5.7	4.9
3		75.0	29.6	19.4	14.6	11.8	9.9	8.5
4		93.3	70.4	32.3	22.6	17.7	14.6	12.5
5			85.4	67.7	34.2	25.0	20.1	16.9
6			95.6	80.6	65.8	35.6	26.9	22.0
7				89.5	77.4	64.4	36.6	28.3
8				96.8	85.4	75.0	63.4	37.5
9					91.8	82.3	73.1	62.5
10					97.4	88.2	79.9	71.7
11						93.3	85.4	78.0
12						97.9	90.1	83.1
13							94.3	87.5
14							98.2	91.5
15								95.1
16								98.4

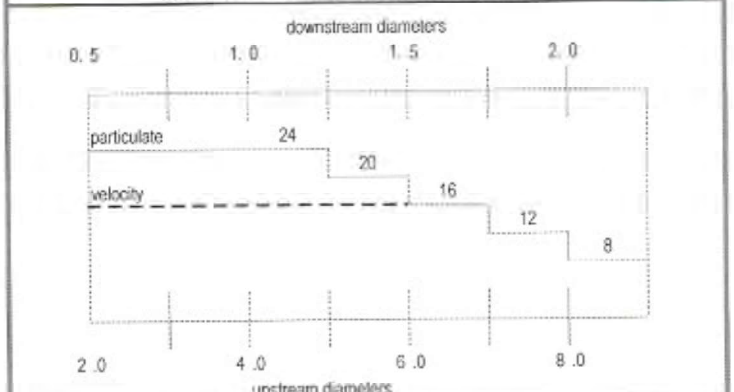
Point No.	inches from wall	velocity head
1	4.0	
2	11.9	
3	19.8	
4	27.8	
5	35.7	
6	43.7	

STACK DIAMETER: 47.55" x 95.5"	De = 63.66
Distance from ports to disturbance:	
A. to upstream disturbance	306"
B. to downstream disturbance	180"
Upstream diameters:	4.8
Downstream diameters:	2.0
Minimum No. sample points required:	24
No. sample points selected:	6 x 4
Port Length:	6.5"
Port Type:	4"
Port Access:	Platform

Pitot ID: 5' Pitot Cp: 0.84 Stack Temp: 270

Remarks:

MINIMUM NO. OF POINTS ON A DIAMETER



Plant:	Westervelt RE — Aliceville, AL
Source:	RTO 1
Test For:	PM202 - NOx - VOC - CO - VE
Test Operators:	Norwood . Ballard . Shelnutt - Renfrow

RUN NO. 1

Date 7-30-15

Time start 0953 end 1104

Meter Box	N4 Y=1.002	No. Sample Pts.	6x4	GAS ANALYSIS:	CEM
Sample Box	202-1	Minutes/Pt.	2.5	CO_2	
Probe/Pitot	5' Tef.			O_2	
Pitot Cp	0.84	K FACTOR SETUP		CO	
Nozzle Dia.	0.365	ΔH@	1.79	Time	
Filter No.	2596	Meter Temp	80		
		% H_2O	45	CONDENSATE	[illegible] 748
Amb. Temp. °F	84	Stack Temp	270	init. 100	final 103
Bar. Press. "Hg	30.04	K Factor	4.48	SILICA GEL	
Static Press. "H_2O	-0.14			init. 868	final 880

Notes: ADEM - Camaroun Thomas

Port	Point	Elapsed Time Min/sec	DGM Reading Ft^3	Velocity Head ΔP in. H_2O	Orifice ΔH in. H_2O	Stack Temp °F	Meter Temp °F in	Meter Temp °F out	Oven Temp °F	Imp Temp CF °F	Imp Temp I	VAC in. Hg
1	1	0 00	873.177	0.25	1.10	274	80	77	259	74	67	3
	2	2 30	874.7	0.39	1.75	274	80	77	268	70	66	3
	3	5 00	876.5	0.30	1.35	266	80	78	269	68	65	6
	4	7 30	878.0	0.41	1.85	237	81	78	271	65	65	8
	5	10 00	879.9	0.28	1.25	220	81	78	265	66	63	8
	6	12 30	881.5	0.25	1.10	210	81	78	265	67	65	8
2	1	15/00	882.938	0.25	1.10	267	82	79	267	71	68	4
	2	2 30	884.3	0.40	1.80	224	83	79	271	76	66	8
	3	5 00	886.2	0.32	1.45	222	83	79	266	80	65	9
	4	7 30	888.0	0.36	1.60	226	84	80	263	74	65	9
	5	10 00	889.8	0.45	2.00	239	84	80	268	74	65	9
	6	12 30	891.9	0.45	2.00	271	84	80	259	70	67	9
3	1	30/00	893.542	0.28	1.25	275	84	80	266	70	68	4
	2	2 30	895.1	0.38	1.70	247	85	81	268	70	67	8
	3	5 00	896.8	0.30	1.35	225	85	81	263	73	67	8
	4	7 30	898.6	0.41	1.85	220	85	81	259	76	66	8
	5	10 00	900.3	0.41	1.85	235	86	81	262	80	66	9
	6	12 30	902.2	0.38	1.70	255	86	82	260	82	66	9
4	1	45/00	904.010	0.38	1.70	263	86	82	262	77	68	8
	2	2 30	905.8	0.25	1.10	231	86	82	263	71	68	8
	3	5 00	907.3	0.38	1.70	223	87	82	271	68	68	7
	4	7 30	909.1	0.28	1.25	235	87	83	270	70	68	7
	5	10 00	910.7	0.25	1.10	265	87	83	260	70	68	7
	6	12 30	912.2	0.38	1.70	235	87	83	266	70	68	7
END		60/00	913.968									
			40.791	0.5813	1.5250	243.29		82.04				

COMPLETED mcr 8/6/15

Leak Checks: Sample Train 0.068 0.070 0.002 cfm @ 13 "Hg; Pitot Tubes High ✓ @ 7.4 "H_2O ‖ Low ✓ @ 6.6 "H_2O

Pretest: Sample Train ✓; Pitot Tubes ✓

[signature]

Plant: Westervelt RE Aliceville, AL		**RUN NO.**	2
Source: RTO 1		Date	7-30-15
Test For: PM-202		Time start 1130	end 1250
Test Operators: Norwood · Shelnutt · Ballard · Renfrow			

Meter Box	N4 Y=1.002	No. Sample Pts	6x4	GAS ANALYSIS: CEM			Notes:
Sample Box	2020	Minutes/Pt	2.5	CO_2			
Probe/Pitot	5' Tef	K FACTOR SETUP		O_2			
Pitot Cp	0.84	ΔH@	1.79	CO			
Nozzle Dia	0.365	Meter Temp	85	Time			
Filter No	2597	%H_2O	43	CONDENSATE			
Amb. Temp. °F	92	Stack Temp.	245	init 100	final 105		
Bar. Press. "Hg	30.04	K Factor	5.07	SILICA GEL			
Static Press. "H_2O	-0.14			init 867.5	final 880		

Port	Point	Elapsed Time Min/sec	DGM Reading Ft.³	Velocity Head ΔP in. H_2O	Orifice ΔH in. H_2O	Stack Temp °F	Meter Temp °F in	Meter Temp °F out	Oven Temp °F	Imp Temp °F CF	Imp Temp °F I	VAC in Hg
1	1	0:00	914.217	0.25	1.10	228	89	85	266	87	68	3
	2	2:30	916.4	0.41	2.10	247	89	86	263	85	68	8
	3	5:00	918.6	0.30	1.50	242	89	86	267	73	53	8
	4	7:30	920.3	0.41	2.10	225	89	86	255	70	51	8
	5	10:00	922.1	0.41	2.10	278	90	86	258	68	49	9
	6	12:30	924.1	0.25	1.10	266	90	86	267	68	51	7
2	1	15/00	925.536	0.28	1.40	223	89	86	262	71	63	4
	2	2:30	927.1	0.32	1.60	274	90	86	264	68	54	4
	3	5:00	928.9	0.41	2.10	255	90	86	263	68	54	8
	4	7:30	931.0	0.41	2.10	257	91	87	263	69	55	9
	5	10:00	933.5	0.41	2.10	279	91	87	261	71	56	9
	6	12:30	935.1	0.34	1.70	260	91	87	263	71	56	8
3	1	30/00	936.635	0.25	1.10	231	90	87	265	76	68	3
	2	2:30	938.1	0.25	1.10	250	90	87	265	76	65	3
	3	5:00	939.3	0.30	1.50	223	91	87	266	76	62	3
	4	7:30	940.9	0.32	1.60	287	91	87	268	72	59	6
	5	10:00	942.6	0.45	2.30	233	91	87	264	69	58	9
	6	12:30	944.7	0.36	1.80	258	92	87	260	65	57	9
4	1	45/00	946.591	0.21	1.10	233	91	88	261	68	62	3
	2	2:30	948.0	0.32	1.60	223	92	88	260	68	58	4
	3	5:00	949.6	0.40	2.05	278	92	88	261	72	58	8
	4	7:30	951.5	0.28	1.40	266	92	88	264	72	58	9
	5	10:00	953.3	0.40	2.05	241	92	88	262	74	58	9
	6	12:30	955.2	0.28	1.40	231	92	88	266	76	60	9
END		60/00	956.945									
			42.728	0.5750	1.6667	249.50	88.71					

COMPLETED
MCR 8-6-15

Leak Checks	Sample Train: 0.040 – 0.044 0.004 cfm @ 12 "Hg	Pitot Tubes: High ✓ @ 6.2 "H_2O Low ✓ @ 7.0 "H_2O	Pretest:	Sample Train ✓ Pitot Tubes ✓

ENVIRONMENTAL MONITORING LABORATORIES, INC. – RIDGELAND, MISSISSIPPI – 601-856-3092

Plant: Westervelt RF Aliceville, AL

Source: RTO 1

Test For: PM-202

Test Operators: Norwood; Shelnutt; Ballard; Renfrow

RUN NO. 3

Date 7-30-15

Time start 1315 end 1420

Meter Box	N4 Y=1.002
Sample Box	202-1
Probe/Pitot	5'Tef.
Pitot Cp	0.84
Nozzle Dia.	0.365
Filter No.	2598
Amb. Temp. °F	95
Bar. Press. "Hg	30.04
Static Press. "H_2O	-0.14

No. Sample Pts.	6x4
Minutes/Pt.	2.5

K FACTOR SETUP

ΔH@	1.79
Meter Temp	90
%H_2O	48
Stack Temp	250
K Factor	4.23

GAS ANALYSIS: CEM

CO_2		
O_2		
CO		
Time		

CONDENSATE: 780 init. 100 final 113

SILICA GEL init. 885 final 898

Notes:

Port	Point	Elapsed Time Min/sec	DGM Reading Ft³	Velocity Head ΔP in. H_2O	Orifice ΔH in. H_2O	Stack Temp °F	Meter Temp °F in	Meter Temp °F out	Oven Temp °F	Imp. Temp CPT °F	Imp. Temp I	VAC in. Hg
1	1	0 00	959.957	0.30	1.50	231	92	88	255	85	67	6
	2	2 30	961.7	0.25	1.05	224	92	89	258	84	68	7
	3	5 00	963.1	0.25	1.05	246	92	89	256	82	67	7
	4	7 30	965.0	0.40	1.70	278	92	89	264	79	65	9
	5	10 00	966.4	0.40	1.70	272	92	89	266	74	65	9
	6	12 30	967.9	0.35	1.50	241	92	89	265	74	65	8
2	1	15/00	969.623	0.30	1.25	263	92	89	267	72	68	5
	2	2 30	971.1	0.43	1.80	241	92	89	269	73	67	8
	3	5 00	973.0	0.33	1.40	224	92	89	260	72	67	8
	4	7 30	974.6	0.38	1.60	230	92	89	269	73	67	8
	5	10 00	976.4	0.42	1.75	255	93	89	262	75	67	8
	6	12 30	978.2	0.42	1.75	241	93	89	263	78	68	9
3	1	30/00	980.055	0.30	1.30	228	93	89	256	77	68	7
	2	2 30	981.5	0.34	1.45	256	93	89	266	78	68	8
	3	5 00	983.2	0.30	1.35	253	93	89	259	75	69	8
	4	7 30	984.8	0.48	2.05	262	93	89	261	74	69	8
	5	10 00	986.4	0.42	1.75	224	93	90	268	72	69	9
	6	12 30	988.2	0.42	1.75	251	94	90	266	72	69	9
4	1	45/00	990.069	0.31	1.30	227	93	90	264	78	69	8
	2	2 30	991.5	0.27	1.15	264	94	90	267	75	67	8
	3	5 00	993.0	0.43	1.80	279	94	90	263	74	65	9
	4	7 30	994.7	0.26	1.10	230	94	90	259	74	65	7
	5	10 00	996.3	0.43	1.80	230	94	90	270	75	67	7
	6	12 30	998.1	0.43	1.80	269	94	90	268	75	67	8
END		60/00	000.030									
			40.073	0.5965	1.5229	~~242.88~~ 246.63		91.06				

COMPLETE

mcR 8-6-15

Leak Checks: Sample Train 0.025 → 0.028 0.003 cfm @ 13 "Hg

Pitot Tubes High ✓ @ 6.2 "H_2O Low ✓ @ 5.9 "H_2O

Pretest: Sample Train ✓ Pitot Tubes ✓

PARTICULATE CATCH ANALYSIS (EML V-0 Effective 093013)

SAMPLES: Westervelt RE No. 1 RTO

DATE TAKEN: 7-29-15 DATE ANALYZED: ~~7-30-15~~ 7-31-15

DELIVERED BY: Norwood RECEIVED BY: Russell

ANALYZED BY: Russell

(Attach chain of custody if additional exchanges occur)

FILTERS:

RUN NO.	1	2	3	
FILTER NO.	2596	2597	2598	
FILTER TARE, gms.	0.2799	0.2825	0.2815	
080315 0815	0.2817	0.2841	0.2864	
080315 1510	0.2815	0.2839	0.2863	
FINAL WEIGHT, gms.	0.2815	0.2839	0.2863	
NET GAIN, gms.	0.0016	0.0014	0.0048	

PROBE WASH: Wash Solvent ________ Lot No. ________

RUN NO.	1	2	3	BLANK
CONTAINER I.D.	WV RTO1 R1	WV RTO1 R2	WV RTO1 R3	BLANK
VOLUME INTACT?	✓	✓	✓	Lot # ~~H7.6~~
VOLUME, ml	125	125	125	200
	(302)	(617)	(619)	(42)
TARE WEIGHT, gms.	107.2862	105.2083	103.6177	117.6426
080315 0830	107.2916	105.2130	103.6236	117.6424
080315 1510	107.2915	105.2129	103.6236	
FINAL WEIGHT, gms	107.2915	105.2129	103.6236	117.6424
NET GAIN, gms.	0.0053	0.0046	0.0059	
LESS BLANK, gms.	-0-	-0-	-0-	

PARTICULATE SAMPLE WEIGHT:

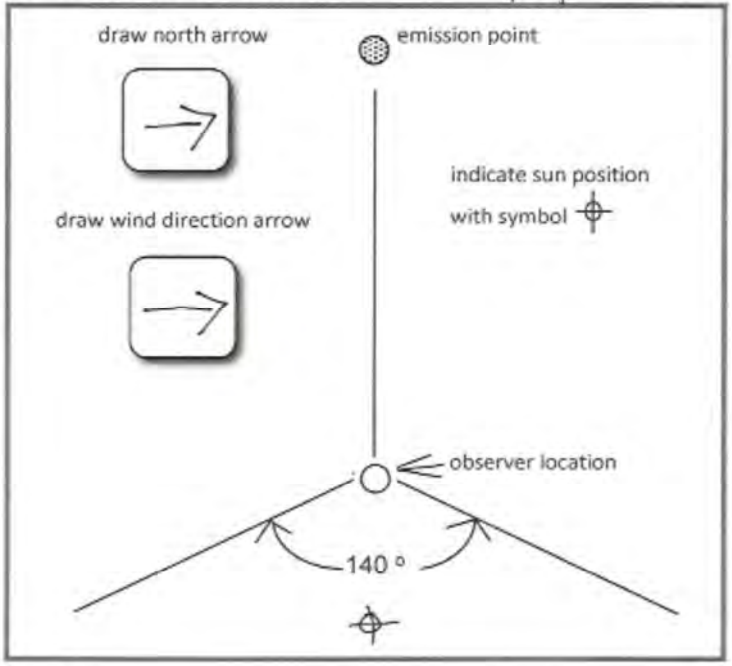
RUN NO.	1	2	3	
filter + probe, mg.	6.9	6.0	10.7	

COMPLETED MCB 08-07-15

R1

PLANT	Westervelt RE Aliceville, AL
Emission Point	RTO #1
Date	7-30-15
Stack height	40'
Distance to source	100'
Direction from source	EAST

CONDITIONS	START	STOP
Time	953	1053
Wind direction	South	NE
Wind speed	5-10	5-10
Ambient temp. °F	84	87
Sky cover	clear	clear
Plume color	N/A	N/A
Plume background	sky	sky



Condensing water vapor? Yes   Detached ☑   G.S. Attached ☒   Distance visible 90'

min	0	15	30	45	min	0	15	30	45	min	0	15	30	45	min	0	15	30	45
0	0	0	0	0	15	0	0	0	0	30	0	0	0	0	45	0	0	0	0
1	0	0	0	0	16	0	0	0	0	31	0	0	0	0	46	0	0	0	0
2	0	0	0	0	17	0	0	0	0	32	0	0	0	0	47	0	0	0	0
3	0	0	0	0	18	0	0	0	0	33	0	0	0	0	48	0	0	0	0
4	0	0	0	0	19	0	0	0	0	34	0	0	0	0	49	0	0	0	0
5	0	0	0	0	20	0	0	0	0	35	0	0	0	0	50	0	0	0	0
6	0	0	0	0	21	0	0	0	0	36	0	0	0	0	51	0	0	0	0
7	0	0	0	0	22	0	0	0	0	37	0	0	0	0	52	0	0	0	0
8	0	0	0	0	23	0	0	0	0	38	0	0	0	0	53	0	0	0	0
9	0	0	0	0	24	0	0	0	0	39	0	0	0	0	54	0	0	0	0
10	0	0	0	0	25	0	0	0	0	40	0	0	0	0	55	0	0	0	0
11	0	0	0	0	26	0	0	0	0	41	0	0	0	0	56	0	0	0	0
12	0	0	0	0	27	0	0	0	0	42	0	0	0	0	57	0	0	0	0
13	0	0	0	0	28	0	0	0	0	43	0	0	0	0	58	0	0	0	0
14	0	0	0	0	29	0	0	0	0	44	0	0	0	0	59	0	0	0	0

Remarks:

Avg. opacity for period: 0.0   Highest six minute average: 0.0

Other data reduction:

COMPLETED
MCR 8-6-15

Observer: Greg Shelnutt   date certified: 4-16-15   Signature: G. Shelnutt

VISIBLE EMISSIONS EVALUATION RECORD (EML V-0 Effective 093013) R2

PLANT Westervelt RE Aliceville, AL

Emission Point RTO #1

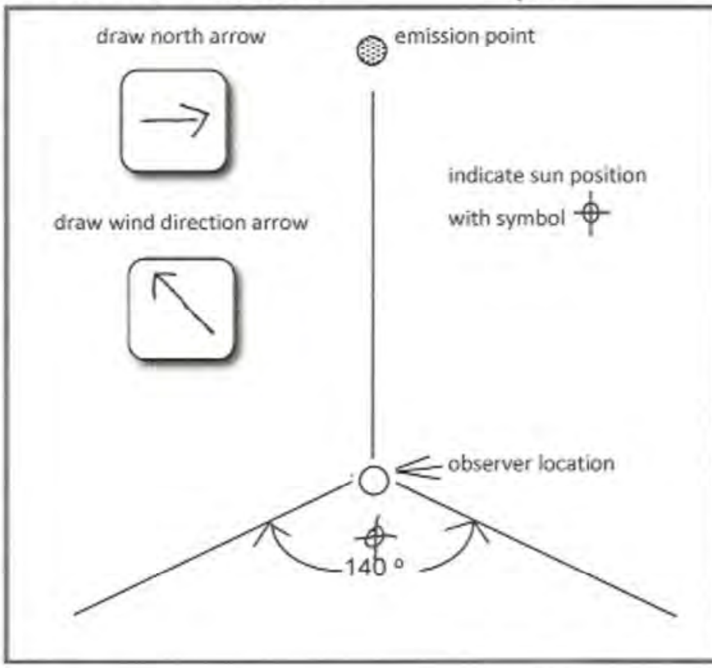
Date 7-30-15

Stack height 40'

Distance to source 100'

Direction from source EAST

CONDITIONS	START	STOP
Time	1130	1230
Wind direction	NE	NE
Wind speed	5-10	5-10
Ambient temp. °F	92	94
Sky cover	P. cloudy	P. cloudy
Plume color	N/A	N/A
Plume background	sky	sky



Condensing water vapor? yes Detached ☑ Attached ☐ Distance visible 100'

min	0	15	30	45	min	0	15	30	45	min	0	15	30	45	min	0	15	30	45
0	0	0	0	0	15	0	0	0	0	30	0	0	0	0	45	0	0	0	0
1	0	0	0	0	16	0	0	0	0	31	0	0	0	0	46	0	0	0	0
2	0	0	0	0	17	0	0	0	0	32	0	0	0	0	47	0	0	0	0
3	0	0	0	0	18	0	0	0	0	33	0	0	0	0	48	0	0	0	0
4	0	0	0	0	19	0	0	0	0	34	0	0	0	0	49	0	0	0	0
5	0	0	0	0	20	0	0	0	0	35	0	0	0	0	50	0	0	0	0
6	0	0	0	0	21	0	0	0	0	36	0	0	0	0	51	0	0	0	0
7	0	0	0	0	22	0	0	0	0	37	0	0	0	0	52	0	0	0	0
8	0	0	0	0	23	0	0	0	0	38	0	0	0	0	53	0	0	0	0
9	0	0	0	0	24	0	0	0	0	39	0	0	0	0	54	0	0	0	0
10	0	0	0	0	25	0	0	0	0	40	0	0	0	0	55	0	0	0	0
11	0	0	0	0	26	0	0	0	0	41	0	0	0	0	56	0	0	0	0
12	0	0	0	0	27	0	0	0	0	42	0	0	0	0	57	0	0	0	0
13	0	0	0	0	28	0	0	0	0	43	0	0	0	0	58	0	0	0	0
14	0	0	0	0	29	0	0	0	0	44	0	0	0	0	59	0	0	0	0

Remarks:

COMPLETED mcb 8-6-15

Avg. opacity for period: 0.0 Highest six minute average: 0.0

Other data reduction:

Observer: Greg Shelnutt date certified: 4-16-15 Signature: [signature]

ENVIRONMENTAL MONITORING LABORATORIES - RIDGELAND, MISSISSIPPI - 601/856-3092

VISIBLE EMISSIONS EVALUATION RECORD (EML V-0 Effective 093013)

PLANT Westervelt RE Aliceville, AL

Emission Point RTO #1

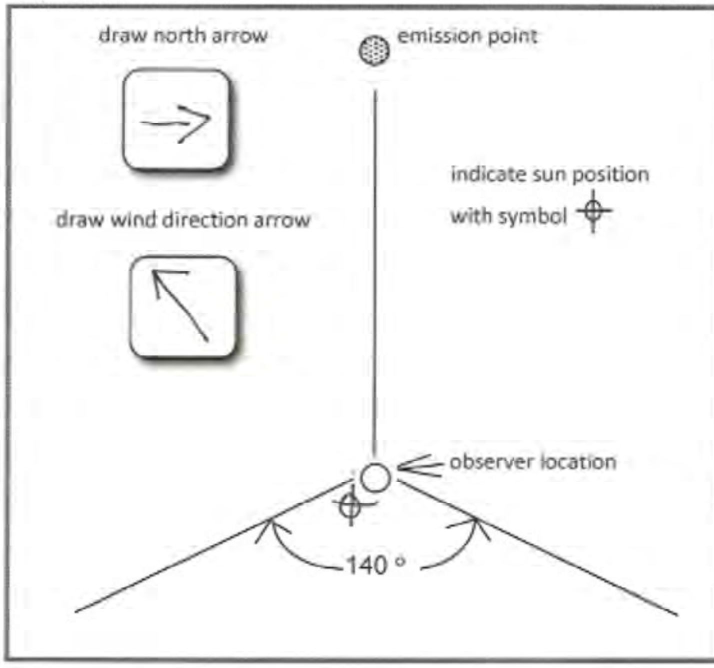
Date 7-30-15

Stack height 40'

Distance to source 100'

Direction from source EAST

CONDITIONS	START	STOP
Time	1315	1415
Wind direction	NE	NE
Wind speed	5-10	5-10
Ambient temp. °F	95	94
Sky cover	P. cloudy	P. cloudy
Plume color	N/A	N/A
Plume background	Sky	Sky



Condensing water vapor? Yes Detached [X] Attached [ ] Distance visible 100'

min	0	15	30	45	min	0	15	30	45	min	0	15	30	45	min	0	15	30	45
0	0	0	0	0	15	0	0	0	0	30	0	0	0	0	45	0	0	0	0
1	0	0	0	0	16	0	0	0	0	31	0	0	0	0	46	0	0	0	0
2	0	0	0	0	17	0	0	0	0	32	0	0	0	0	47	0	0	0	0
3	0	0	0	0	18	0	0	0	0	33	0	0	0	0	48	0	0	0	0
4	0	0	0	0	19	0	0	0	0	34	0	0	0	0	49	0	0	0	0
5	0	0	0	0	20	0	0	0	0	35	0	0	0	0	50	0	0	0	0
6	0	0	0	0	21	0	0	0	0	36	0	0	0	0	51	0	0	0	0
7	0	0	0	0	22	0	0	0	0	37	0	0	0	0	52	0	0	0	0
8	0	0	0	0	23	0	0	0	0	38	0	0	0	0	53	0	0	0	0
9	0	0	0	0	24	0	0	0	0	39	0	0	0	0	54	0	0	0	0
10	0	0	0	0	25	0	0	0	0	40	0	0	0	0	55	0	0	0	0
11	0	0	0	0	26	0	0	0	0	41	0	0	0	0	56	0	0	0	0
12	0	0	0	0	27	0	0	0	0	42	0	0	0	0	57	0	0	0	0
13	0	0	0	0	28	0	0	0	0	43	0	0	0	0	58	0	0	0	0
14	0	0	0	0	29	0	0	0	0	44	0	0	0	0	59	0	0	0	0

Remarks:

COMPLETED MCB 8-6-15

Avg. opacity for period: 0.0 Highest six minute average: 0.0

Other data reduction:

Observer: Greg Shelnutt date certified: 4-16-15 Signature: [signature]

APPENDIX B

CALIBRATION DATA AND

VE READER CERTIFICATION

ENVIRONMENTAL MONITORING LABORATORIES, INC.

P.O. Box 655 624 Ridgewood Road
Ridgeland, Mississippi 39158

Phone: 601/856-3092
Fax 601/853-2151

May 4, 2015

Mr. Greg Shelnutt
Environmental Monitoring Laboratories, Inc.
P.O. Box 655
Ridgeland, MS 39158

Dear Mr. Shelnutt:

Please be advised that you have successfully participated in the Visible Emissions Evaluation Certification conducted for the Mississippi Department of Environmental Quality (MDEQ), Office of Pollution Control and by Environmental Monitoring Laboratories on April 16 and 17, 2015, in Jackson, Mississippi. You met the following standards as specified in the November 12, 1974, issue of the Federal Register (Volume 39, No. 219, Method 9):

1) Maintained an average deviation of less than 7.5% for sets of 25 white and 25 black smoke readings.
2) Did not have any one reading with a deviation greater than 15%.

The deviations for your qualifying run, Run No. 16-2W were:

White Smoke	4.0%
Black Smoke:	1.8%

Your certification will expire on October 16, 2015.

The Office of Pollution Control has the original of your test paper. Connie Simmons of the MDEQ can be contacted at 601/961-5171 for assistance concerning this matter.

Very truly yours

ENVIRONMENTAL MONITORING LABORATORIES

Daniel G. Russell

Daniel G. Russell

DRY GAS METER CALIBRATION
By Critical Orifice

Meter ID	Nutech 4	**Date**	07/06/15	DGM	1348734
Orifice ID	1312	**By**	Shelnutt		
T, Amb	76	**Pbar**	30.17		

Orifice			ΔH	VAC	Time	Meter						Vmstd	Vcrstd	Y	ΔH@
No.	K'	Q'	in.	in.	min.	Vi	Vf	Temp. in		Temp out					
		cfm	H_2O	Hg		ft^3	ft^3	init.	final	init.	final				
12	0.3169	0.42	0.56	21	16.00	546.149	552.937	77	77	76	76	6.736	6.675	0.991	1.789
17	0.4391	0.58	1.10	20	9.00	552.937	558.219	77	77	76	76	5.242	5.185	0.989	1.840
23	0.6091	0.80	2.10	17	8.00	558.219	564.686	77	77	76	76	6.418	6.357	0.991	1.842
26	0.6905	0.92	2.70	15	8.00	564.686	572.020	77	78	76	76	7.275	7.311	1.005	1.788
31	0.8293	1.10	3.70	12	5.00	572.020	577.337	78	78	76	76	5.272	5.463	1.036	1.710
														1.002	1.79

Calculations:

Vm = [Vf-Vi]

Vmstd = [(17.64)(Vm)(Pbar+ΔH/13.6)/Tm]

Vcrstd = K'[(Pbar)(θ)/(T,amb)]

Y = [(Vcrstd/Vmstd)]

Q = [(Vm/θ)(Tm out/Tm)(Y)]

K = [Q(√((Pm Mm)/((Tm out)(ΔH))]

ΔH@ = [$0.921/K^2$]

Where:

Pbar = Barometric pressure; in. Hg

Tm = Average Temp. at meter, ^oR

Pm = Meter pressure, (Pbar + DH/13.6); in. Hg

Mm = molecular weight of air (29)

Y = Meter correction factor; dimensionless

DRY GAS METER CALIBRATION
By Critical Orifice

Meter ID Nutech 4 **Date** 07/31/15 DGM 1348734

Orifice ID 1312 **By** Norwood

T, Amb 90 **Pbar** 29.88

Orifice			ΔH	VAC	Time	Meter						Vmstd	Vcrstd	Y	ΔH@
No.	K'	Q'	in.	in.	min.	Vi	Vf	Temp. in		Temp out					
		cfm	H_2O	Hg		ft^3	ft^3	init.	final	init.	final				
17	0.4391	0.58	1.15	22.0	9.00	145.800	150.994	90	92	88	89	4.982	5.005	1.005	1.998
23	0.6091	0.80	2.10	21.0	7.00	150.994	156.685	93	95	89	90	5.439	5.369	0.987	1.910
26	0.6905	0.92	2.70	20.0	6.00	156.685	162.255	95	96	90	91	5.311	5.292	0.996	1.851
														0.996	1.92

Calculations:

Vm = [Vf-Vi]

Vmstd = [(17.64)(Vm)(Pbar+ΔH/13.6)/Tm]

Vcrstd = K'[(Pbar)(θ)/(T,amb)]

Y = [(Vcrstd/Vmstd)]

Q = [(Vm/θ)(Tm out/Tm)(Y)]

K = [Q(√((Pm Mm)/((Tm out)(ΔH))]

ΔH@ = [$0.921/K^2$]

Where:

Pbar = Barometric pressure; in. Hg

Tm = Average Temp. at meter, ^oR

Pm = Meter pressure, (Pbar + ΔH/13.6); in. Hg

Mm = molecular weight of air (29)

Y = Meter correction factor; dimensionless

ANALYZER CALIBRATION RECORD (EML V-0 Effective 093013)

Plant	Westervelt Renewable Energy Aliceville, AL	DATE	7-30-15
Source	RTO 1		
Test For	CO - NOx - VOC		
Operators	Norwood		

Analyte, units / Analyzer ID / Span / DAQ Channel	Level	Cal. Value	Cyl. Ref.	Diluted Y/N	Cal. Reading	Start / End / Bias \ Run			
						Start	0953	1130	1315
						End	1104	1250	1420
						Bias \ Run	1	2	3
%CO2	Zero	0.0	N2	N	0.0	0.0	0.0	0.0	0.0
1415D3053	Low								
20.0	Mid	10.0	1	Y	10.0	10.0	10.0	10.0	10.0
2	High	20.0	1	Y	20.0				
%O2	Zero	0.0	N2	N	0.0	0.1	0.1	0.1	0.1
1420D3053	Low								
20.9	Mid	10.5	N2/Air	Y	10.5	10.4	10.4	10.4	10.4
3	High	20.9	Air	N	20.9				
ppm CO	Zero	0	Air	N	1	1	1	1	0
48i-0517511690	Low	175	2	Y	174	174	173	175	174
700	Mid	350	2	Y	351	351			
4	High	700	2	Y	701				
ppm NOx	Zero	0	Air	N	-1	0	1	1	0
42CHL-56482-308	Low								
100	Mid	50	2	Y	50	50	48	52	52
5	High	100	2	Y	100				
ppmw C3H8	Zero	0	Air	N		0.0	-0.8	-0.5	-0.5
VIG2841006	Low	30	3	Y		29.7	28.5	28.0	28.9
100	Mid	50	3	Y		50.1			
8	High	80	3	Y		80.0			
	Zero								
	Low								
	Mid								
	High								

Cylinder Ref.	Cylinder No.	Contents	Expiration Date	Notes:
1	CC473045	17.93% O2, 24.92% CO2	7-9-21	NOx conv. eff. Cyl. 4
2	CC407328	2486 ppm CO, 1250 ppm NO	5-4-23	073015@0845 66.5 ppm
3	CC104311	2215 ppm C3H8	9-5-20	
4	CC415503	69.31 ppm NO2	10-16-15	

Analyst's signature: Bill Norwood

Method Specifications:

Methods 3A, 6C, 7E	Method 25A
Zero < 20 % of span (can be zero)	Zero < 0.1 % of span
Mid = 40 to 60 % of span	Low = 25 to 35 % of span
High = span	Mid = 45 to 60 % of span
	High = 80 to 90 % of span

Error Specifications:

Calibration Error Allowable	< 2% of span	[|(Cyl. Value - Reading) / span|* 100%]
25A Calibration Error Allowable	< 5% Cyl. Value	[(Cyl. Value - Reading) / (Cyl Value) *100%]
System Bias	< 5% span (not for 20 & 25A)	[(System Cal - Reading)/span*100]
Drift	< 3%	[(Initial System Cal. - Final System Cal.) / Span * 100%]
Method 20 Drift	< 2%	[(initial system cal. - final system cal.) / Span * 100%]

CT ADEM

METHOD 205 - VERIFICATION OF GAS DILUTION SYSTEMS (EML V-0 Effective 093013)

DATE	7-29-15

PROJECT: Westervelt - Aliceville, AL

ANALYST: Norwood   SIGNATURE: Bill Norwood

DILUTION SYSTEM

MAKE	Environics
MODEL	4040-4477
NO. OF DIL. DEVICES	4
TYPE OF DIL. DEVICE	MFC

REFERENCE MONITOR

TYPE	Oxygen
MAKE	Servomex
MODEL	1400
SPAN	20.9

HIGH LEVEL SUPPLY GAS CONC.	20.9	CYLINDER ID	Zero Air
MID LEVEL SUPPLY GAS CONC.	10.5	CYLINDER ID	CC220330
DILUTION GAS	0.0	CYLINDER ID	Zero N2

MFC No.										
Target Value	10.5	5.2								

Injections **(Triplicate injection of 2 dilutions per MFC to be used)**

1st	10.5	5.2								
2nd	10.5	5.2								
3rd	10.5	5.2								
Average	10.5	5.2								

% Difference = ((target conc. - Avg. conc.)/target conc.)*100   **Must be within 2% of avg.**

1st inject	0.0	0.0								
2nd inject	0.0	0.0								
3rd inject	0.0	0.0								

Triplicate injection of Mid Level Gas to Reference Monitor. Must be within 10% of one dilution

	Response	% Difference
1st	10.5	0.0
2nd	10.5	0.0
3rd	10.5	0.0
Average	10.5	0.0

Average must be within +/- 2% of the certified gas concentration.

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E02NI89E15A1597	Reference Number:	122-124402900-1
Cylinder Number:	CC220330	Cylinder Volume:	145.3 CF
Laboratory:	ASG - Durham - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22013	Valve Outlet:	590
Gas Code:	O2,BALN	Certification Date:	Nov 04, 2013

Expiration Date: Nov 04, 2021

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
OXYGEN	10.50 %	10.49 %	G1	+/- 0.4% NIST Traceable	11/04/2013
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	09060211	CC262370	9.961 % OXYGEN/NITROGEN	+/- 0.3%	Nov 08, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba MPA510 O2 41499150042	Paramagnetic	Oct 24, 2013

Triad Data Available Upon Request

Signature on file

Approved for Release

Airgas

Airgas Specialty Gases
630 United Drive
Durham, NC 27713
(919)544-3773 Fax: (919)544-3774
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E03NI57E15A0000	Reference Number:	122-124382840-1
Cylinder Number:	CC437045	Cylinder Volume:	163.9 CF
Laboratory:	ASG - Durham - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22013	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Jul 09, 2013

Expiration Date: Jul 09, 2021

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
OXYGEN	18.00 %	17.93 %	G1	+/- 0.4% NIST Traceable	07/08/2013
CARBON DIOXIDE	25.00 %	24.92 %	G2	+/- .6% NIST Traceable	07/09/2013
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	09061416	CC273522	22.53 % OXYGEN/NITROGEN	+/- 0.4%	Mar 08, 2019
NTRM	07120704	CC214716	6.986 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	Mar 23, 2017

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA510 CO2 42399380022	Nondispersive Infrared (NDIR)	Jun 24, 2013
Horiba MPA510 O2 41499150042	Paramagnetic	Jul 03, 2013

Triad Data Available Upon Request

Notes:

Approved for Release

Airgas

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI79E15A0015	Reference Number:	122-124484613-1
Cylinder Number:	CC14207	Cylinder Volume:	157.2 CF
Laboratory:	ASG - Durham - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22015	Valve Outlet:	660
Gas Code:	CO2,SO2,BALN	Certification Date:	Mar 30, 2015

Expiration Date: Mar 30, 2023

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
SULFUR DIOXIDE	2200 PPM	2184 PPM	G1	+/- 0.6% NIST Traceable	03/23/2015, 03/30/2015
CARBON DIOXIDE	20.00 %	20.02 %	G1	+/- 0.7% NIST Traceable	03/23/2015
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12062519	CC367506	2003.2 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.5%	Jun 13, 2018
NTRM	12061552	CC354891	19.87 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	Jan 27, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801549 CO2	FTIR	Mar 12, 2015
Nicolet 6700 AHR0801549 SO2	FTIR	Mar 12, 2015

Triad Data Available Upon Request

Signature on file

Approved for Release

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Products
Airgas Specialty Gasses
630 United Drive
Durham, NC 27713
(919)544-3773 Fax: (919)544-3774
www.airgas.com

Part Number:	E02AI99E15A0090	Reference Number:	122-124334251-1
Cylinder Number:	CC104311	Cylinder Volume:	146 Cu.Ft.
Laboratory:	ASG - Durham - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22012	Valve Outlet:	590
Gas Code:	APPVD	Analysis Date:	Sep 05, 2012

Expiration Date: Sep 05, 2020

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
PROPANE	2200 PPM	2215 PPM	G1	+/- 1% NIST Traceable
Air	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	010507	SG872065N	2579PPM PROPANE/NITROGEN	Mar 30, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801333 C3H8	FTIR	Aug 15, 2012

Triad Data Available Upon Request

Notes:

Approved for Release

Airgas

CERTIFICATE OF ANALYSIS

Grade of Product: CERTIFIED STANDARD-SPEC

Airgas Specialty Gases
630 Ued Drive
Durham NC 27713
919-544-3773 Fax: 919-544-3774
www.airgas.com

Part Number:	X02AI99C15AC038	Reference Number:	122-124339171-1
Cylinder Number:	CC415503	Cylinder Volume:	146.2 CF
Laboratory:	ASG - Durham - NC	Cylinder Pressure:	2015 PSIG
Analysis Date:	Oct 16, 2012	Valve Outlet:	660

Expiration Date: Oct 16, 2013

Product composition verified by direct comparison to calibration standards traceable to NIST ASTM Class 1 weights and/or NIST gas mixture reference materials.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration (Mole %)	Analytical Uncertainty
NITROGEN DIOXIDE	70.00 PPM	69.31 PPM	+/- 2%
AIR	Balance		

Notes:

Approved for Release

Airgas

CERTIFICATE OF ANALYSIS

Grade of Product: CERTIFIED STANDARD-SPEC

Part Number:	X02AI99C15AC038	Reference Number:	122-124392492-1
Cylinder Number:	CC216831	Cylinder Volume:	146.2 Cubic Feet
Laboratory:	ASG - Durham - NC	Cylinder Pressure:	2015 PSIG
Analysis Date:	Sep 09, 2013	Valve Outlet:	660
Lot Number:	122-124392492-1		

Expiration Date: Sep 09, 2015

Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration (Mole %)	Analytical Uncertainty
NITROGEN DIOXIDE	70.00 PPM	68.01 PPM	+/- 2%
AIR	Balance		

Signature on file

Approved for Release

APPENDIX C

ANALYZERS DATA LOG

	% CO2	% O2	ppm CO	ppm NOx	ppmw C3H8	
07/30/2015 8:05	0.1	21.0	1.0	-0.5	-0.5	
07/30/2015 8:06	0.1	21.0	1.0	-0.5	-0.5	
07/30/2015 8:07	0.1	21.0	1.2	-0.5	-0.5	
07/30/2015 8:08	0.1	21.0	1.1	-0.5	-0.5	
07/30/2015 8:09	0.1	21.0	1.3	-0.5	-0.5	
07/30/2015 8:10	0.1	16.2	2.0	-0.5	11.6	
07/30/2015 8:11	0.0	0.5	0.7	-0.5	1.8	
07/30/2015 8:12	0.0	0.0	0.5	-0.5	0.5	
07/30/2015 8:13	0.0	0.0	0.5	-0.5	1.4	
07/30/2015 8:14	0.0	0.0	0.5	-0.5	-0.2	
07/30/2015 8:15	0.0	0.0	0.6	-0.5	-0.3	
07/30/2015 8:16	0.0	0.0	0.5	-0.5	1.7	
07/30/2015 8:17	0.1	16.1	1.0	-0.5	0.0	
07/30/2015 8:18	0.1	21.9	1.2	-0.5	1.0	
07/30/2015 8:19	0.1	20.9	1.2	-0.5	0.5	
07/30/2015 8:20	0.1	17.8	1.2	-0.5	1.5	
07/30/2015 8:21	0.1	10.5	0.9	-0.5	1.4	
07/30/2015 8:22	0.2	11.3	0.6	-0.5	0.6	
07/30/2015 8:23	15.3	18.3	0.0	-0.5	1.5	
07/30/2015 8:24	19.9	18.6	-0.1	-0.5	0.4	
07/30/2015 8:25	20.0	18.6	-0.1	-0.5	0.3	
07/30/2015 8:26	20.0	18.6	-0.1	-0.5	-0.6	
07/30/2015 8:27	16.0	19.0	0.0	-0.5	2.3	
07/30/2015 8:28	10.1	19.8	0.5	-0.5	0.4	
07/30/2015 8:29	10.0	19.7	0.5	-0.5	0.3	
07/30/2015 8:30	10.0	19.7	0.5	-0.5	0.3	
07/30/2015 8:31	6.2	19.7	58.8	26.5	0.3	
07/30/2015 8:32	0.2	15.2	703.5	145.2	0.3	
07/30/2015 8:33	0.1	15.0	698.0	200.1	0.3	
07/30/2015 8:34	0.1	15.0	679.0	200.1	0.2	
07/30/2015 8:35	0.1	17.6	396.4	200.1	0.2	
07/30/2015 8:36	0.1	17.9	351.4	178.8	0.2	
07/30/2015 8:37	0.1	18.7	258.8	128.3	0.2	
07/30/2015 8:38	0.1	19.2	198.3	97.7	0.2	
07/30/2015 8:39	0.1	19.2	199.2	97.4	0.2	
07/30/2015 8:40	0.1	19.2	199.2	99.7	0.2	
07/30/2015 8:41	0.1	19.2	193.0	92.1	0.2	
07/30/2015 8:42	0.1	19.9	109.0	51.2	0.2	
07/30/2015 8:43	0.1	20.0	96.8	49.5	0.2	
07/30/2015 8:44	0.1	20.1	77.1	38.1	0.2	
07/30/2015 8:45	0.1	20.6	15.5	15.6	0.2	
07/30/2015 8:46	0.0	20.9	5.3	61.8	0.2	
07/30/2015 8:47	0.0	21.0	0.5	65.8	0.2	
07/30/2015 8:48	0.0	21.1	0.5	66.5	0.1	NO2 conv eff.
07/30/2015 8:49	0.0	21.1	0.5	66.6	0.2	
07/30/2015 8:50	0.1	21.0	0.5	29.9	0.1	
07/30/2015 8:51	0.1	20.8	0.9	0.3	0.7	
07/30/2015 8:52	0.0	5.0	2.2	0.0	-0.5	
07/30/2015 8:53	0.0	0.1	0.5	-0.1	-0.5	
07/30/2015 8:54	0.0	0.1	0.5	-0.2	-0.4	
07/30/2015 8:55	0.0	0.5	0.5	-0.2	0.2	
07/30/2015 8:56	0.0	9.7	1.1	-0.1	0.4	
07/30/2015 8:57	0.0	10.4	1.1	-0.1	0.7	
07/30/2015 8:58	0.0	10.8	1.0	-0.2	0.9	
07/30/2015 8:59	6.6	18.5	0.5	-0.2	1.0	
07/30/2015 9:00	9.9	19.6	0.5	-0.2	1.0	
07/30/2015 9:01	10.0	19.6	0.5	-0.1	1.5	
07/30/2015 9:02	4.4	17.5	238.5	128.9	1.6	
07/30/2015 9:03	0.1	17.4	405.1	175.6	1.4	
07/30/2015 9:04	0.1	17.9	350.7	172.0	1.5	
07/30/2015 9:05	0.3	17.8	334.6	164.3	2.9	
07/30/2015 9:06	1.4	18.3	135.6	59.0	2.1	
07/30/2015 9:07	0.1	20.0	96.9	49.7	1.9	
07/30/2015 9:08	0.1	20.0	96.3	50.1	7.5	
07/30/2015 9:09	1.4	19.1	50.9	22.1	67.7	
07/30/2015 9:10	0.1	20.9	2.2	0.4	49.6	
07/30/2015 9:11	0.1	20.9	1.5	0.1	47.8	
07/30/2015 9:12	0.1	20.9	1.1	0.1	50.3	
07/30/2015 9:13	0.1	20.9	1.1	-0.1	50.4	
07/30/2015 9:14	0.1	20.9	1.1	-0.1	28.3	

07/30/2015 9:15	0.1	20.9	1.1	-0.1	29.5
07/30/2015 9:16	0.1	20.9	1.1	-0.1	75.3
07/30/2015 9:17	0.1	20.9	1.1	-0.1	68.2
07/30/2015 9:51	9.7	10.6	44.8	48.7	8.9
07/30/2015 9:52	9.9	10.3	40.5	47.1	8.3
START RUN 1	% CO2	% O2	ppm CO	ppm NOx	ppmw C3H8
07/30/2015 9:53	9.9	10.3	81.8	44.3	20.7
07/30/2015 9:54	9.9	10.4	84.9	45.8	10.1
07/30/2015 9:55	10.1	10.1	41.3	48.3	9.7
07/30/2015 9:56	10.1	10.2	43.2	47.6	21.7
07/30/2015 9:57	9.8	10.4	54.1	48.0	9.2
07/30/2015 9:58	9.9	10.4	35.9	47.4	8.1
07/30/2015 9:59	9.7	10.5	57.1	45.2	18.4
07/30/2015 10:00	9.4	10.8	90.8	44.4	11.0
07/30/2015 10:01	9.4	10.9	39.3	44.8	9.3
07/30/2015 10:02	9.5	10.8	36.3	44.6	9.9
07/30/2015 10:03	9.7	10.5	55.3	45.1	18.9
07/30/2015 10:04	9.8	10.4	33.4	46.5	8.0
07/30/2015 10:05	9.5	10.8	43.6	44.0	7.8
07/30/2015 10:06	9.3	11.0	96.5	39.4	19.4
07/30/2015 10:07	9.5	10.8	58.6	42.0	9.3
07/30/2015 10:08	9.5	10.7	34.0	44.7	9.1
07/30/2015 10:09	9.2	11.0	44.6	43.0	21.4
07/30/2015 10:10	7.7	12.6	35.1	32.1	7.6
07/30/2015 10:11	9.3	10.9	43.3	44.8	7.8
07/30/2015 10:12	9.7	10.6	104.0	43.7	20.0
07/30/2015 10:13	9.9	10.3	91.0	47.4	9.3
07/30/2015 10:14	9.9	10.4	46.4	46.6	8.9
07/30/2015 10:15	9.8	10.5	52.6	45.4	20.4
07/30/2015 10:16	9.8	10.4	60.7	46.7	8.4
07/30/2015 10:17	10.0	10.3	43.1	48.1	7.7
07/30/2015 10:18	10.0	10.3	78.2	45.6	19.1
07/30/2015 10:19	9.9	10.4	114.4	45.4	9.5
07/30/2015 10:20	10.0	10.2	50.3	47.0	9.0
07/30/2015 10:21	9.7	10.6	43.5	45.4	16.5
07/30/2015 10:22	9.5	10.7	57.1	45.1	15.8
07/30/2015 10:23	9.8	10.5	33.7	46.6	8.2
07/30/2015 10:24	9.9	10.4	48.6	45.5	8.2
07/30/2015 10:25	9.9	10.3	99.0	43.8	18.6
07/30/2015 10:26	9.0	11.3	46.4	42.8	8.3
07/30/2015 10:27	9.5	10.8	38.9	45.1	8.5
07/30/2015 10:28	9.4	10.9	57.6	45.1	19.8
07/30/2015 10:29	9.4	10.9	39.2	46.7	8.2
07/30/2015 10:30	9.5	10.8	40.1	45.5	7.9
07/30/2015 10:31	9.6	10.7	95.3	43.7	18.4
07/30/2015 10:32	9.9	10.4	85.1	47.3	8.9
07/30/2015 10:33	9.9	10.4	44.2	47.7	8.5
07/30/2015 10:34	9.6	10.7	49.1	45.8	20.8
07/30/2015 10:35	9.4	10.9	50.9	45.8	8.5
07/30/2015 10:36	9.5	10.8	37.8	46.2	7.8
07/30/2015 10:37	9.7	10.6	73.4	45.4	18.8
07/30/2015 10:38	9.9	10.4	106.0	45.5	9.2
07/30/2015 10:39	10.1	10.2	53.6	46.9	8.5
07/30/2015 10:40	10.1	10.1	53.1	46.0	18.9
07/30/2015 10:41	9.8	10.4	67.8	46.1	9.9
07/30/2015 10:42	9.9	10.3	38.7	47.4	7.9
07/30/2015 10:43	9.9	10.4	54.5	47.1	7.8
07/30/2015 10:44	9.1	11.1	92.9	38.4	17.3
07/30/2015 10:45	9.7	10.5	54.9	46.7	8.5
07/30/2015 10:46	9.6	10.7	47.3	44.9	8.5
07/30/2015 10:47	6.9	13.4	39.9	26.3	4.3
07/30/2015 10:48	6.6	14.0	25.0	40.7	7.7
07/30/2015 10:49	9.9	10.4	46.8	47.2	7.5
07/30/2015 10:50	10.0	10.3	98.0	45.3	18.1
07/30/2015 10:51	9.9	10.3	73.0	47.3	8.7
07/30/2015 10:52	9.8	10.5	42.5	46.8	8.3
07/30/2015 10:53	9.7	10.6	51.5	46.7	19.8
07/30/2015 10:54	9.5	10.7	48.6	47.8	8.2
07/30/2015 10:55	9.6	10.7	39.9	46.9	7.7
07/30/2015 10:56	10.0	10.3	81.5	46.3	18.7
07/30/2015 10:57	10.1	10.1	103.1	46.6	8.7

07/30/2015 10:58	10.2	10.0	49.7	48.4	8.1
07/30/2015 10:59	10.1	10.2	50.0	47.8	19.2
07/30/2015 11:00	9.8	10.5	63.7	47.7	9.0
07/30/2015 11:01	9.8	10.5	33.5	47.3	7.6
07/30/2015 11:02	9.8	10.5	46.6	45.2	14.3
07/30/2015 11:03	9.9	10.4	87.1	45.4	12.5
AVG R 1	9.6	10.6	58.3	45.2	11.9
07/30/2015 11:04	9.9	10.4	49.1	47.9	7.9
07/30/2015 11:05	5.2	6.6	38.7	19.5	0.6
07/30/2015 11:06	0.1	0.1	1.4	1.0	-0.8
07/30/2015 11:07	0.0	0.1	0.5	0.6	-1.2
07/30/2015 11:08	0.1	2.9	1.3	1.2	-1.0
07/30/2015 11:09	0.1	10.3	0.8	0.4	-1.0
07/30/2015 11:10	0.0	10.4	0.5	0.3	-1.0
07/30/2015 11:11	0.0	10.4	0.5	0.1	-1.0
07/30/2015 11:12	0.0	10.4	0.5	0.1	-0.9
07/30/2015 11:13	0.0	10.4	0.5	0.1	0.3
07/30/2015 11:14	3.7	12.2	7.1	12.5	0.2
07/30/2015 11:15	9.8	19.5	0.9	0.2	-0.7
07/30/2015 11:16	10.0	19.6	0.5	0.1	-0.7
07/30/2015 11:17	10.0	19.6	0.5	0.1	-0.8
07/30/2015 11:18	9.8	18.4	9.6	8.1	2.0
07/30/2015 11:19	1.3	19.4	78.3	39.5	-0.2
07/30/2015 11:20	0.1	20.0	95.2	44.8	-0.2
07/30/2015 11:21	0.1	20.0	95.5	48.7	-0.1
07/30/2015 11:22	0.1	20.0	95.3	45.1	1.7
07/30/2015 11:23	1.4	18.4	129.6	69.1	0.3
07/30/2015 11:24	0.1	19.4	172.3	80.0	0.3
07/30/2015 11:25	0.1	19.4	170.9	81.0	2.2
07/30/2015 11:26	2.2	18.1	66.0	27.9	16.3
07/30/2015 11:27	0.1	20.8	4.8	2.0	28.5
07/30/2015 11:28	0.1	20.8	2.4	2.2	18.8
07/30/2015 11:29	7.8	12.8	47.3	46.9	8.0
START RUN 2	% CO2	% O2	ppm CO	ppm NOx	ppmw C3H8
07/30/2015 11:30	10.3	10.0	52.6	50.4	7.9
07/30/2015 11:31	10.4	9.9	66.0	50.6	19.6
07/30/2015 11:32	10.4	10.0	50.7	52.6	8.0
07/30/2015 11:33	10.2	10.2	41.5	50.8	7.7
07/30/2015 11:34	10.1	10.2	78.0	48.0	19.4
07/30/2015 11:35	10.3	10.1	74.3	50.7	8.9
07/30/2015 11:36	10.5	9.8	40.5	51.3	8.5
07/30/2015 11:37	10.3	10.0	46.9	49.5	21.1
07/30/2015 11:38	10.1	10.3	54.4	48.5	8.9
07/30/2015 11:39	10.4	9.9	37.4	50.7	8.0
07/30/2015 11:40	10.6	9.7	69.1	49.2	18.8
07/30/2015 11:41	10.6	9.7	117.6	47.9	9.6
07/30/2015 11:42	10.6	9.8	57.7	49.4	8.6
07/30/2015 11:43	10.6	9.7	54.6	51.6	15.4
07/30/2015 11:44	10.7	9.6	75.2	51.8	12.5
07/30/2015 11:45	10.8	9.6	45.9	53.4	8.0
07/30/2015 11:46	10.8	9.5	66.6	50.2	8.1
07/30/2015 11:47	10.9	9.4	137.6	47.5	19.5
07/30/2015 11:48	10.9	9.4	80.2	50.7	8.7
07/30/2015 11:49	11.0	9.2	57.3	51.4	8.6
07/30/2015 11:50	10.9	9.3	77.2	49.4	20.2
07/30/2015 11:51	11.1	9.1	55.3	53.0	8.3
07/30/2015 11:52	11.3	8.9	54.0	51.8	8.1
07/30/2015 11:53	11.3	8.9	104.8	48.6	18.3
07/30/2015 11:54	11.2	9.0	90.7	49.8	9.2
07/30/2015 11:55	11.4	8.9	54.2	49.0	8.8
07/30/2015 11:56	11.3	9.0	61.7	47.2	21.9
07/30/2015 11:57	11.1	9.1	61.4	46.8	8.9
07/30/2015 11:58	11.1	9.2	43.0	46.6	8.3
07/30/2015 11:59	11.2	9.1	78.6	45.1	20.6
07/30/2015 12:00	11.4	8.9	107.3	46.9	9.5
07/30/2015 12:01	11.2	9.1	52.2	46.8	8.9
07/30/2015 12:02	11.3	9.0	57.3	47.0	19.3
07/30/2015 12:03	11.5	8.9	76.2	48.9	9.8
07/30/2015 12:04	11.4	8.9	50.3	48.8	8.0
07/30/2015 12:05	11.3	9.0	80.7	46.8	8.5
07/30/2015 12:06	11.1	9.2	149.8	45.7	18.7

07/30/2015 12:07	11.0	9.3	80.0	47.7	8.7
07/30/2015 12:08	11.1	9.2	60.2	48.4	8.7
07/30/2015 12:09	11.1	9.2	80.3	47.9	20.3
07/30/2015 12:10	11.2	9.1	53.8	50.2	8.2
07/30/2015 12:11	11.4	8.9	60.5	47.4	7.9
07/30/2015 12:12	11.1	9.2	119.7	43.7	19.6
07/30/2015 12:13	11.1	9.2	90.3	46.7	8.9
07/30/2015 12:14	11.5	8.8	60.0	48.6	8.7
07/30/2015 12:15	11.6	8.7	73.9	47.4	10.7
07/30/2015 12:16	10.2	10.1	53.8	46.0	7.8
07/30/2015 12:17	11.0	9.2	47.7	46.0	7.6
07/30/2015 12:18	11.0	9.3	81.3	43.1	20.2
07/30/2015 12:19	11.1	9.2	100.4	42.8	9.3
07/30/2015 12:20	11.1	9.1	49.0	44.0	8.7
07/30/2015 12:21	10.9	9.4	55.0	43.1	19.3
07/30/2015 12:22	10.9	9.4	71.1	44.2	8.6
07/30/2015 12:23	10.9	9.4	46.3	43.3	7.6
07/30/2015 12:24	10.8	9.4	81.3	40.8	15.1
07/30/2015 12:25	10.9	9.4	142.4	41.1	11.3
07/30/2015 12:26	11.2	9.1	69.8	44.7	8.6
07/30/2015 12:27	11.3	9.0	61.0	44.4	8.9
07/30/2015 12:28	11.2	9.1	83.8	45.0	19.1
07/30/2015 12:29	11.1	9.2	55.0	46.3	7.6
07/30/2015 12:30	11.0	9.3	69.9	45.2	7.6
07/30/2015 12:31	11.2	9.1	140.7	44.3	18.8
07/30/2015 12:32	11.5	8.8	91.3	48.8	8.7
07/30/2015 12:33	11.6	8.7	60.0	49.8	8.4
07/30/2015 12:34	11.0	9.4	71.3	47.2	20.7
07/30/2015 12:35	11.6	8.7	67.7	48.3	7.9
07/30/2015 12:36	11.4	8.9	55.9	45.4	7.5
07/30/2015 12:37	10.8	9.4	91.3	41.5	18.7
07/30/2015 12:38	10.4	9.9	92.0	40.8	9.3
07/30/2015 12:39	10.9	9.4	47.3	43.6	8.8
07/30/2015 12:40	11.2	9.1	54.9	44.0	20.5
07/30/2015 12:41	11.1	9.2	68.5	45.0	8.2
07/30/2015 12:42	11.0	9.2	48.1	45.4	7.4
07/30/2015 12:43	11.3	9.0	79.1	45.9	17.7
07/30/2015 12:44	11.2	9.1	128.4	44.7	10.0
07/30/2015 12:45	10.9	9.3	53.4	46.6	8.6
07/30/2015 12:46	10.5	9.8	46.6	44.4	9.0
07/30/2015 12:47	10.6	9.7	68.3	45.3	19.8
07/30/2015 12:48	11.0	9.3	50.1	47.7	7.4
07/30/2015 12:49	11.2	9.1	71.5	47.4	7.4
AVG R 2	11.0	9.3	71.1	47.2	11.8
07/30/2015 12:50	11.2	9.1	143.7	45.4	21.9
07/30/2015 12:51	5.8	6.3	47.2	16.3	1.0
07/30/2015 12:52	0.1	0.1	0.7	1.3	-0.5
07/30/2015 12:53	0.0	0.1	0.5	0.9	-0.8
07/30/2015 12:54	0.0	0.0	0.5	0.6	-0.4
07/30/2015 12:55	0.1	5.7	0.7	0.5	-0.7
07/30/2015 12:56	0.0	10.3	0.4	0.4	-0.7
07/30/2015 12:57	0.0	10.4	0.5	0.2	-0.8
07/30/2015 12:58	0.0	10.4	0.5	0.2	-0.8
07/30/2015 12:59	0.3	10.4	2.8	1.7	1.7
07/30/2015 13:00	7.8	16.3	7.2	4.5	-0.3
07/30/2015 13:01	10.0	19.6	0.5	0.2	-0.2
07/30/2015 13:02	8.5	18.7	30.7	19.8	3.1
07/30/2015 13:03	0.4	19.2	162.0	78.8	-0.2
07/30/2015 13:04	0.1	19.3	170.7	77.0	-0.3
07/30/2015 13:05	0.1	19.3	172.6	79.0	-0.1
07/30/2015 13:06	0.1	19.3	172.5	87.1	1.0
07/30/2015 13:07	1.1	18.8	112.6	57.2	0.0
07/30/2015 13:08	0.1	20.0	97.4	51.6	0.0
07/30/2015 13:09	0.1	20.0	97.2	51.7	1.2
07/30/2015 13:10	1.4	19.0	58.1	32.7	12.5
07/30/2015 13:11	0.1	20.7	6.2	2.9	27.7
07/30/2015 13:12	0.1	20.8	1.3	1.0	27.9
07/30/2015 13:13	0.1	20.8	1.1	0.7	22.4
07/30/2015 13:14	5.6	15.1	30.4	36.1	7.6
START RUN 3	% CO2	% O2	ppm CO	ppm NOx	ppmw C3H8
07/30/2015 13:15	10.5	9.8	104.4	49.2	17.1

07/30/2015 13:16	10.9	9.4	81.6	53.6	9.0
07/30/2015 13:17	11.3	9.0	46.4	55.1	8.8
07/30/2015 13:18	11.1	9.1	58.2	53.2	17.4
07/30/2015 13:19	10.7	9.6	63.7	52.6	8.2
07/30/2015 13:20	10.5	9.8	45.4	53.1	7.7
07/30/2015 13:21	10.4	9.9	77.9	51.3	18.2
07/30/2015 13:22	10.5	9.8	101.9	51.5	9.6
07/30/2015 13:23	10.7	9.5	49.8	53.6	9.0
07/30/2015 13:24	11.0	9.3	52.5	55.1	18.1
07/30/2015 13:25	11.1	9.2	75.3	54.8	9.2
07/30/2015 13:26	11.3	8.9	48.1	57.6	7.8
07/30/2015 13:27	11.1	9.2	70.8	53.5	8.2
07/30/2015 13:28	10.7	9.6	128.2	50.7	19.4
07/30/2015 13:29	10.5	9.8	60.4	52.9	9.0
07/30/2015 13:30	10.5	9.8	48.1	53.6	9.1
07/30/2015 13:31	10.6	9.7	69.4	53.2	17.8
07/30/2015 13:32	9.2	11.1	45.8	48.0	7.7
07/30/2015 13:33	10.2	10.1	58.9	55.6	7.4
07/30/2015 13:34	10.2	10.1	117.0	53.4	17.4
07/30/2015 13:35	10.2	10.0	82.1	56.2	8.6
07/30/2015 13:36	10.2	10.1	49.6	56.7	8.3
07/30/2015 13:37	10.1	10.2	62.1	54.3	17.7
07/30/2015 13:38	10.2	10.0	60.7	54.4	8.0
07/30/2015 13:39	10.7	9.5	45.3	56.2	7.7
07/30/2015 13:40	10.6	9.6	78.3	53.7	18.5
07/30/2015 13:41	10.5	9.7	92.0	53.8	9.0
07/30/2015 13:42	10.5	9.7	43.9	52.9	8.8
07/30/2015 13:43	10.3	10.0	46.8	50.5	19.3
07/30/2015 13:44	10.1	10.2	60.0	50.6	8.7
07/30/2015 13:45	10.2	10.0	40.4	52.2	7.7
07/30/2015 13:46	10.3	9.9	67.7	50.7	15.9
07/30/2015 13:47	9.9	10.4	118.6	49.3	10.4
07/30/2015 13:48	9.7	10.6	54.4	51.7	8.3
07/30/2015 13:49	9.6	10.7	46.8	51.1	8.4
07/30/2015 13:50	9.8	10.5	67.6	52.8	17.2
07/30/2015 13:51	10.0	10.3	44.9	54.3	7.3
07/30/2015 13:52	10.0	10.2	55.0	53.0	7.3
07/30/2015 13:53	9.8	10.5	110.7	49.2	18.4
07/30/2015 13:54	9.6	10.7	70.8	50.9	8.6
07/30/2015 13:55	9.7	10.6	51.6	50.4	8.5
07/30/2015 13:56	10.0	10.2	70.9	51.2	19.2
07/30/2015 13:57	10.2	10.1	61.8	51.8	7.5
07/30/2015 13:58	10.1	10.1	57.4	50.3	7.3
07/30/2015 13:59	10.3	9.9	111.5	48.3	18.6
07/30/2015 14:00	10.4	9.9	110.0	50.5	8.9
07/30/2015 14:01	10.5	9.7	49.2	50.9	8.5
07/30/2015 14:02	10.2	10.0	47.1	48.3	20.4
07/30/2015 14:03	10.0	10.2	56.3	49.7	8.1
07/30/2015 14:04	10.2	10.0	40.6	49.3	7.5
07/30/2015 14:05	10.2	10.0	68.7	45.9	16.1
07/30/2015 14:06	9.5	10.8	99.5	44.7	9.6
07/30/2015 14:07	10.0	10.3	51.2	49.1	8.4
07/30/2015 14:08	10.2	10.2	49.1	49.1	13.1
07/30/2015 14:09	10.2	10.0	68.7	48.2	15.1
07/30/2015 14:10	10.1	10.2	43.9	47.5	7.7
07/30/2015 14:11	10.3	10.0	58.7	48.1	7.9
07/30/2015 14:12	10.4	9.8	124.5	45.7	19.7
07/30/2015 14:13	10.4	9.8	75.0	47.5	8.6
07/30/2015 14:14	10.4	9.9	53.5	47.2	8.5
AVG R 3	10.3	10.0	67.5	51.5	11.5
07/30/2015 14:15	10.3	9.9	71.8	47.1	20.6
07/30/2015 14:16	10.1	10.2	56.6	49.1	7.7
07/30/2015 14:17	9.8	10.5	55.8	49.9	7.2
07/30/2015 14:18	9.6	10.7	117.8	49.5	16.4
07/30/2015 14:19	9.3	10.9	107.2	51.2	8.0
07/30/2015 14:20	8.9	11.3	57.8	51.5	7.4
07/30/2015 14:21	8.6	11.7	57.8	48.1	13.6
07/30/2015 14:22	2.0	4.1	16.2	6.8	0.1
07/30/2015 14:23	0.0	0.1	0.5	1.1	-0.6
07/30/2015 14:24	0.0	0.1	0.5	0.8	-0.7
07/30/2015 14:25	0.0	4.6	0.5	0.6	-0.6

07/30/2015 14:26	0.0	10.3	0.5	0.5	-0.6
07/30/2015 14:27	0.0	10.4	0.5	0.3	-0.6
07/30/2015 14:28	0.0	10.4	0.5	0.3	-0.6
07/30/2015 14:29	0.0	10.9	0.4	0.3	-0.5
07/30/2015 14:30	7.1	18.5	0.3	0.3	-0.6
07/30/2015 14:31	10.0	19.6	-0.2	0.3	-0.5
07/30/2015 14:32	10.0	19.6	-0.2	0.3	-0.5
07/30/2015 14:33	10.0	19.6	-0.2	0.3	-0.5
07/30/2015 14:34	6.9	19.7	27.1	25.7	1.3
07/30/2015 14:35	0.2	19.3	165.8	89.5	-0.2
07/30/2015 14:36	0.1	19.3	173.9	88.6	-0.2
07/30/2015 14:37	0.1	19.3	174.4	89.3	-0.2
07/30/2015 14:38	0.1	19.3	174.3	90.2	-0.2
07/30/2015 14:39	0.1	19.4	151.8	77.1	-0.3
07/30/2015 14:40	0.1	19.9	96.1	52.3	-0.3
07/30/2015 14:41	0.1	19.9	97.1	52.3	-0.3
07/30/2015 14:42	0.1	19.9	90.9	47.9	-0.3
07/30/2015 14:43	0.1	20.6	22.6	8.0	22.0
07/30/2015 14:44	0.1	20.8	2.9	1.3	28.8
07/30/2015 14:45	0.1	20.8	1.2	0.8	29.5

APPENDIX D

CONDENSABLE PM ANALYSIS

ENTHALPY

Environmental Monitoring Labs

624 Ridgewood Rd.
Ridgeland, MS 39158

Westervelt RE

Aliceville, AL

Analytical Report
(0815-57)

EPA Method 202

Condensable Particulate Matter

Enthalpy Analytical, Inc.

Phone: (919) 850 - 4392 / Fax: (919) 850 - 9012 / www.enthalpy.com
800-1 Capitola Drive Durham, NC 27713-4385

I certify that to the best of my knowledge all analytical data presented in this report:

- Have been checked for completeness
- Are accurate, error-free, and legible
- Have been conducted in accordance with approved protocol, and that all deviations and analytical problems are summarized in the appropriate narrative(s)

This analytical report was prepared in Portable Document Format (.PDF) and contains 15 pages.

QA Review Performed by: Michael Steven Schapira

Report Issued: 8/19/15

Summary of Results

Enthalpy Analytical

Company: Environmental Monitoring Labs

Client No.: Westervelt RE: Aliceville, AL

Job No.: 0815-57

Parameters: 1. EPA Method 202 Analysis

Samples: 6 Runs, 3 Blanks, and 1 Train Blank

Analyst: khoffman

Summary Report

	RTO1-Run 1	RTO1-Run 2	RTO1-Run 3
Net Organic Catch (mg)	4.8	4.6	4.9
Corrected Inorganic (mg)	6.9	10.4	6.9
CPM (mg)	11.6	15.0	11.8
TB Corrected CPM (mg)	9.6	13.0	9.8

	RTO2-Run 1	RTO2-Run 2	RTO2-Run 3
Net Organic Catch (mg)	3.7	3.7	3.5
Corrected Inorganic (mg)	3.4	3.2	2.4
CPM (mg)	7.1	6.9	6.0
TB Corrected CPM (mg)	5.1	4.9	4.0

	Train Blank
Net Organic Catch (mg)	3.0
Corrected Inorganic (mg)	1.6
CPM (mg)	4.6

Results

Enthalpy Analytical

Company: Environmental Monitoring Labs
Client No.: Westervelt RE: Aliceville, AL
Job No.: 0815-57

Parameters: 1. EPA Method 202 Analysis
Samples: 6 Runs, 3 Blanks, and 1 Train Blank
Analyst: khoffman

Results

	RTO1-Run 1		RTO1-Run 2		RTO1-Run 3		Train Blank	
Beaker Number	8338		8339		8340		8344	
Initial Solvent Volume (mL)	154		158		170		126	
Org Final Weight 1 (g)	2.713284	08/14/15 10:04	2.686496	08/14/15 10:05	2.708538	08/14/15 10:06	2.693710	08/14/15 10:08
Org Final Weight 2 (g)	2.713194	08/14/15 16:13	2.686555	08/14/15 16:13	2.708660	08/14/15 16:13	2.693806	08/14/15 16:15
Tare (g)	2.708426	08/04/15 16:22	2.681928	08/04/15 16:22	2.703731	08/04/15 16:23	2.690792	08/04/15 16:24
Organic Catch (mg)	4.77		4.63		4.93		3.01	
Inorganic								
Beaker Number	8432		8433		8434		8438	
Weight 1 (g)	2.653108	08/14/15 9:59	2.668967	08/17/15 9:01	2.685902	08/14/15 10:00	2.716276	08/14/15 10:02
Weight 2 (g)	2.653208	08/14/15 16:07	2.668820	08/17/15 15:03	2.686093	08/14/15 16:08	2.716397	08/14/15 16:10
Tare (g)	2.646375	08/10/15 17:00	2.658522	08/10/15 17:00	2.679238	08/10/15 17:01	2.714839	08/10/15 17:02
Initial Water Vol (mL)	840		912		838		204	
Water Added by Lab (mL)	75		75		75		75	
Aliq 1 Removed (mL)	0.5		0.5		0.5		0.5	
Resuspend Vol (mL)	100		100		100		100	
Aliq 2 Removed (mL)	0.5		0.5		0.5		0.5	
Net Inorganic Catch (mg)	6.87		10.35		6.89		1.57	
Titrant Normality	0.10		0.10		0.10		0.10	
Titrant Vol (mL)	0.08		0.07		0.07		0.04	
Titrant Blank Vol (mL)	0.05		0.05		0.05		0.05	
Ammonium Corr (mg)	0.00		0.00		0.00		0.00	
Corrected Inorganic (mg)	6.87		10.35		6.89		1.57	
Condensible Particulate (mg)	11.64		14.98		11.82		4.58	
TB Corrected CPM (mg)	9.64		12.98		9.82			

Enthalpy Analytical

Company: Environmental Monitoring Labs
Client No.: Westervelt RE: Aliceville, AL
Job No.: 0815-57

Parameters: 1. EPA Method 202 Analysis
Samples: 6 Runs, 3 Blanks, and 1 Train Blank
Analyst: khoffman

Results

	RTO2-Run 1		RTO2-Run 2		RTO2-Run 3		Train Blank	
Beaker Number	8341		8342		8343		8344	
Initial Solvent Volume (mL)	174		146		154		126	
Org Final Weight 1 (g)	2.733222	08/14/15 10:06	2.695139	08/14/15 10:07	2.719985	08/14/15 10:07	2.693710	08/14/15 10:08
Org Final Weight 2 (g)	2.733273	08/14/15 16:14	2.695216	08/14/15 16:14	2.720061	08/14/15 16:15	2.693806	08/14/15 16:15
Tare (g)	2.729546	08/04/15 16:23	2.691498	08/04/15 16:24	2.716512	08/04/15 16:24	2.690792	08/04/15 16:24
Organic Catch (mg)	3.73		3.72		3.55		3.01	
Inorganic								
Beaker Number	8435		8436		8437		8438	
Weight 1 (g)	2.668614	08/14/15 10:01	2.678969	08/14/15 10:01	2.649258	08/14/15 10:02	2.716276	08/14/15 10:02
Weight 2 (g)	2.668729	08/14/15 16:09	2.679149	08/14/15 16:09	2.649356	08/14/15 16:09	2.716397	08/14/15 16:10
Tare (g)	2.665367	08/10/15 17:01	2.675991	08/10/15 17:01	2.646960	08/10/15 17:02	2.714839	08/10/15 17:02
Initial Water Vol (mL)	200		194		192		204	
Water Added by Lab (mL)	75		75		75		75	
Aliq 1 Removed (mL)	0.5		0.5		0.5		0.5	
Resuspend Vol (mL)	100		100		100		100	
Aliq 2 Removed (mL)	0.5		0.5		0.5		0.5	
Net Inorganic Catch (mg)	3.39		3.18		2.41		1.57	
Titrant Normality	0.10		0.10		0.10		0.10	
Titrant Vol (mL)	0.05		0.07		0.07		0.04	
Titrant Blank Vol (mL)	0.05		0.05		0.05		0.05	
Ammonium Corr (mg)	0.00		0.00		0.00		0.00	
Corrected Inorganic (mg)	3.39		3.18		2.41		1.57	
Condensible Particulate (mg)	7.11		6.90		5.96		4.58	
TB Corrected CPM (mg)	5.11		4.90		3.96			

Enthalpy Analytical

Company: Environmental Monitoring Labs
Client No.: Westervelt RE: Aliceville, AL
Job No.: 0815-57

Parameters: 1. EPA Method 202 Analysis
Samples: 6 Runs, 3 Blanks, and 1 Train Blank
Analyst: khoffman

Reagent Blanks

		Hexane		Acetone		Water	
In House	Beaker	8346		8348		8440	
	Weight 1 (g)	2.714094	08/14/15 10:09	2.719483	08/14/15 10:10	2.695493	08/14/15 10:03
	Weight 2 (g)	2.714138	08/14/15 16:16	2.719511	08/14/15 16:17	2.695602	08/14/15 16:11
	Tare (g)	2.714223	08/04/15 16:25	2.719652	08/04/15 16:26	2.694166	08/10/15 17:03
	Residue (g)	-0.0001		-0.0001		0.0014	
	Vol (mL)	225		200		250	
	Max Residue (g)	0.0001		0.0002		0.0003	
		Hexane		Acetone		Water	
Client's	Beaker	8345		8347		8439	
	Weight 1 (g)	2.713225	08/14/15 10:08	2.731491	08/14/15 10:09	2.685638	08/14/15 10:03
	Weight 2 (g)	2.713247	08/14/15 16:15	2.731532	08/14/15 16:16	2.685764	08/14/15 16:11
	Tare (g)	2.712652	08/04/15 16:25	2.731405	08/04/15 16:26	2.683419	08/10/15 17:03
	Residue (g)	0.0006		0.0001		0.0023	
	Vol (mL)	100		102		100	
	Max Residue (g)	0.0001		0.0001		0.0001	

Narrative Summary

Enthalpy Analytical Narrative Summary

Company	Env. Monitoring Labs
Analyst	KTH / JMM
Parameters	EPA Method 202

Client #	Westervelt RE
Job #	0815-57
# Samples	6, 3 Rgnt Blks, 1 Train Blank

Custody

Summer Mims received the samples on 8/5/15 after being relinquished by Environmental Monitoring Labs. The samples were received at 26.4 °C and in good condition. Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, Inc.

Analysis

The samples were analyzed for condensable particulate matter using the analytical procedures in EPA Method 202, Determination of Condensible Particulate Emissions from Stationary Sources (40 CFR Part 51, Appendix M).

All samples were weighed on Balance 8 (Sartorius Model ME 5-F, Serial # 23104965), certified by Mettler Toledo through July 31, 2016.

QC Notes

A field (train) blank was received and analyzed with these samples. The method specifies that blank corrections are accomplished by subtracting the particulate mass determined for the 'Field Train Blank' or 2 mg (whichever is less) from the sample weight.

Reagent blanks were received with these samples. Laboratory Reagent Blanks were also dried down with the samples. All these reagent blanks are reported, though no blank corrections were made using their results.

The inorganic results for the samples were corrected for the ammonium ions used to precipitate the sulfate, per the formula in the method (Section 12.2.1).

Reporting Notes

Gravimetric analyses are considered to be accurate to ±0.5 mg. Therefore, negative catch weights between 0 and –0.5 mg are not investigated. Negative catch weights less than -0.5 mg are investigated. There were no sample fractions with negative catch weights less than -0.5 mg for this set of Method 202 samples.

These analyses met the requirements of the TNI Standard. Any deviations from the requirements of the reference method or TNI Standard have been stated above.

The results presented in this report are representative of the samples as provided to the laboratory.

General Reporting Notes

The following are general reporting notes that are applicable to all Enthalpy Analytical, Inc. data reports, unless specifically noted otherwise.

- Any analysis which refers to the method as ***"Type"*** represents a planned deviation from the reference method. For instance a Hydrogen Sulfide assay from a Tedlar bag would be labeled as "EPA Method 16-Type" because Tedlar bags are not mentioned as one of the collection options in EPA Method 16.
- The acronym ***MDL*** represents the Minimum Detection Limit. Below this value the laboratory cannot determine the presence of the analyte of interest reliably.
- The acronym ***LOQ*** represents the Limit of Quantification. Below this value the laboratory cannot quantitate the analyte of interest within the criteria of the method.
- The acronym ***ND*** following a value indicates a non-detect or analytical result below the MDL.
- The letter ***J*** in the Qualifier or Flag column in the results indicates that the value is between the MDL and the LOQ. The laboratory can positively identify the analyte of interest as present, but the value should be considered an estimate.
- The letter ***E*** in the Qualifier or Flag column indicates an analytical result exceeding 100% of the highest calibration point. The associated value should be considered as an estimate.
- The acronym ***DF*** represents Dilution Factor. This number represents dilution of the sample during the preparation and/or analysis process. The analytical result taken from a laboratory instrument is multiplied by the DF to determine the final undiluted sample results.
- The addition of ***MS*** to the Sample ID represents a Matrix Spike. An aliquot of an actual sample is spiked with a known amount of analyte so that a percent recovery value can be determined. The MS analysis indicates what effect the sample matrix may have on the target analyte, i.e. whether or not anything in the sample matrix interferes with the analysis of the analyte(s).
- The addition of ***MSD*** to the Sample ID represents a Matrix Spike Duplicate. Prepared in the same manner as a MS, the use of duplicate matrix spikes allows further confirmation of laboratory quality by showing the consistency of results gained by performing the same steps multiple times.
- The addition of ***LD*** to the Sample ID represents a Laboratory Duplicate. The analyst prepares an additional aliquot of sample for testing and the results of the duplicate analysis are compared to the initial result. The result should have a difference value of within 10% of the initial result (if the results of the original analysis are greater than the LOQ).
- The addition of ***AD*** to the Sample ID represents an Alternate Dilution. The analyst prepares an additional aliquot at a different dilution factor (usually double the initial factor). This analysis helps confirm that no additional compound is present and coeluting or sharing absorbance with the analyte of interest, as they would have a different response/absorbance than the analyte of interest.

General Reporting Notes

(continued)

- The Sample ID ***LCS*** represents a Laboratory Control Sample. Clean matrix, similar to the client sample matrix, prepared and analyzed by the laboratory using the same reagents, spiking standards and procedures used for the client samples. The LCS is used to assess the control of the laboratory's analytical system. Whenever spikes are prepared for our client projects, two spikes are retained as LCSs. The LCSs are labeled with the associated project number and kept in-house at the appropriate temperature conditions. When the project samples are received for analysis, the LCSs are analyzed to confirm that the analyte could be recovered from the media, separate from the samples which were used on the project and which may have been affected by source matrix, sample collection and/or sample transport.
- **Significant Figures**: Where the reported value is much greater than unity (1.00) in the units expressed, the number is rounded to a whole number of units, rather than to 3 significant figures. For example, a value of 10,456.45 ug catch is rounded to 10,456 ug. There are five significant digits displayed, but no confidence should be placed on more than two significant digits.
- **Manual Integration**: The data systems used for processing will flag manually integrated peaks with an "M". There are several reasons a peak may be manually integrated. These reasons will be identified by the following two letter designations on sample chromatograms, if provided in the report. The peak was ***not integrated*** by the software **"NI"**, the peak was ***integrated incorrectly*** by the software **"II"** or the ***wrong peak*** was integrated by the software **"WP"**. These codes will accompany the analyst's manual integration stamp placed next to the compound name on the chromatogram.

Sample Custody

Copy 1 of 2

CHAIN OF CUSTODY AND REQUEST FOR ANALYSIS

ENVIRONMENTAL MONITORING LABORATORIES POST OFFICE BOX 655 RIDGELAND, MISSISSIPPI 39158 PHONE: 601/856-3092 FAX: 601/853-2151 Attention: Danny Russell	Laboratory: Enthalpy Analytical, Inc. 2202 Ellis Road Durham, NC 27703-5518 PHONE: 919/850-4392 Attention: Bryan Tyler

Project: Westervelt RE -- Aliceville, AL
Nos. 1 and 2 RTO's for total PM on July 29 and 30, 2015

TAT: Routine

ANALYSES REQUESTED: gravimetric as per Method 202

No. of containers	DG	SAMPLE ID			gravimetric as per Method 202				UNITS
1		RTO 1 CPM C1 R1		Condensate Plus Water Rinse	x				milligrams
1		RTO 1 CPM C1 R2		Condensate Plus Water Rinse	x				
1		RTO 1 CPM C1 R3		Condensate Plus Water Rinse	x				
1	*	RTO 1 CPM C2 R1		Acetone/Hexane Rinse	x				
1	*	RTO 1 CPM C2 R2		Acetone/Hexane Rinse	x				
1	*	RTO 1 CPM C2 R3		Acetone/Hexane Rinse	x				
1		RTO 1 CPM C3 R1		CPM Hexane Treated Filter	x				
1		RTO 1 CPM C3 R2		CPM Hexane Treated Filter	x				
1		RTO 1 CPM C3 R3		CPM Hexane Treated Filter	x				
1		RTO 2 CPM C1 R1		Condensate Plus Water Rinse	x				
1		RTO 2 CPM C1 R2		Condensate Plus Water Rinse	x				
1		RTO 2 CPM C1 R3		Condensate Plus Water Rinse	x				
1	*	RTO 2 CPM C2 R1		Acetone/Hexane Rinse	x				
1	*	RTO 2 CPM C2 R2		Acetone/Hexane Rinse	x				
1	*	RTO 2 CPM C2 R3		Acetone/Hexane Rinse	x				
1		RTO 2 CPM C3 R1		CPM Hexane Treated Filter	x				
1		RTO 2 CPM C3 R2		CPM Hexane Treated Filter	x				
1		RTO 2 CPM C3 R3		CPM Hexane Treated Filter	x				
1		FTB C1		Condensate Plus Water Rinse	x				
1	*	FTB C2		Acetone/Hexane Rinse					
1		FTB C3		CPM Hexane Treated Filter					
1	*	CPM C6		Acetone Blank	x				
1		CPM C7		Water Blank	x				
1	*	CPM C8		Hexane Blank	x				

Relinquished by: (print name; initial)	Date/time	Received by: (print name; initial)	Date/time
Bill Norwood	07/30/15	Russell	07/30/2015
Relinquished by: (print name; initial)	Date/time	Received by: (print name; initial)	Date/time
Relinquished by: (print name; initial) Russell	Date/time 08/04/15	Received by: (print name; initial)	Date/time
COURIER FED EX	Date Shipped 08/04/15	Received for lab by: Temp = 26.4°C RGL	Date/time 8-5-15/1230

This Is The Last Page Of This Report.

APPENDIX E

OPERATING RECORDS

(WESTERVELT)

Date and Time	Air Permit: highest oxidation temperatur	Furnace oxygen controller actual value in physical unit	Furnace temperature control firing rate	Wet flake silo discharge screw 1 motor 1 PV 1
7/30/15 9:53	1558.1	5.73	19.97	45
7/30/15 9:54	1558.6	5.73	22.17	45
7/30/15 9:55	1559.9	5.73	27.20	45
7/30/15 9:56	1557.3	5.73	25.31	45
7/30/15 9:57	1556.5	5.73	22.64	45
7/30/15 9:58	1557.0	5.73	22.38	45
7/30/15 9:59	1555.7	5.71	18.13	45
7/30/15 10:00	1556.6	5.71	20.34	45
7/30/15 10:01	1559.3	5.73	20.34	45
7/30/15 10:02	1558.5	5.72	28.83	45
7/30/15 10:03	1558.3	5.70	22.93	45
7/30/15 10:04	1559.6	5.72	24.80	45
7/30/15 10:05	1559.6	5.72	19.78	45
7/30/15 10:06	1560.1	5.73	19.33	45
7/30/15 10:07	1562.2	5.71	20.95	45
7/30/15 10:08	1562.6	5.73	20.11	45
7/30/15 10:09	1561.5	5.73	12.76	45
7/30/15 10:10	1562.0	5.73	20.40	45
7/30/15 10:11	1562.6	5.71	23.19	45
7/30/15 10:12	1562.2	5.73	30.35	45
7/30/15 10:13	1562.9	5.73	30.69	45
7/30/15 10:14	1562.4	5.73	21.70	45
7/30/15 10:15	1558.6	5.73	25.63	45
7/30/15 10:16	1557.3	5.73	27.02	45
7/30/15 10:17	1557.0	5.73	31.35	45
7/30/15 10:18	1554.9	5.73	26.76	45
7/30/15 10:19	1555.1	5.73	21.96	45
7/30/15 10:20	1557.5	5.73	26.29	45
7/30/15 10:21	1555.3	5.73	15.30	45
7/30/15 10:22	1554.8	5.73	15.64	45
7/30/15 10:23	1556.0	5.74	20.66	45
7/30/15 10:24	1556.3	5.74	16.81	45
7/30/15 10:25	1558.0	5.74	22.60	45
7/30/15 10:26	1561.9	5.73	27.76	45
7/30/15 10:27	1563.5	5.73	24.54	45
7/30/15 10:28	1563.8	5.73	19.05	45
7/30/15 10:29	1564.9	5.73	22.99	45
7/30/15 10:30	1564.8	5.73	24.53	45
7/30/15 10:31	1563.7	5.73	29.34	45
7/30/15 10:32	1564.4	5.73	26.65	45
7/30/15 10:33	1564.4	5.73	23.46	45
7/30/15 10:34	1560.4	5.73	16.76	45
7/30/15 10:35	1559.1	5.73	15.63	45
7/30/15 10:36	1559.3	5.73	24.54	45
7/30/15 10:37	1557.9	5.74	26.04	45
7/30/15 10:38	1558.4	5.73	28.60	45
7/30/15 10:39	1560.5	5.74	33.73	45
7/30/15 10:40	1558.2	5.74	29.12	45
7/30/15 10:41	1557.7	5.73	18.32	45
7/30/15 10:42	1557.9	5.74	19.15	45
7/30/15 10:43	1556.4	5.74	17.41	45
7/30/15 10:44	1556.6	5.74	25.88	45
7/30/15 10:45	1559.0	5.73	22.47	45
7/30/15 10:46	1558.6	5.74	19.66	45
7/30/15 10:47	1557.8	5.75	27.69	45
7/30/15 10:48	1558.9	5.75	27.49	45
7/30/15 10:49	1559.2	5.74	23.13	45
7/30/15 10:50	1559.5	5.74	25.62	45
7/30/15 10:51	1561.2	5.75	18.91	45
7/30/15 10:52	1561.6	5.73	20.15	45
7/30/15 10:53	1559.4	5.74	17.92	45
7/30/15 10:54	1559.5	5.74	24.57	45
7/30/15 10:55	1560.6	5.73	23.51	45
7/30/15 10:56	1559.8	5.74	35.05	45
7/30/15 10:57	1561.0	5.74	26.63	45
7/30/15 10:58	1562.9	5.75	26.46	45
7/30/15 10:59	1559.8	5.74	21.74	45
7/30/15 11:00	1559.0	5.73	20.30	45
7/30/15 11:01	1559.2	5.73	22.97	45
7/30/15 11:02	1557.4	5.73	24.18	45
7/30/15 11:03	1557.7	5.73	27.78	45
7/30/15 11:04	1560.5	5.72	23.49	45
Average	1559.5	5.73	23.30	45

Date and Time	Air Permit: highest oxidation temperatur	Furnace oxygen controller actual value in physical unit	Furnace temperature control firing rate	Wet flake silo discharge screw 1 motor 1 PV 1
7/30/15 11:30	1554.3	5.60	21.98	45
7/30/15 11:31	1551.7	5.61	21.15	45
7/30/15 11:32	1552.2	5.61	24.01	45
7/30/15 11:33	1553.8	5.59	22.66	45
7/30/15 11:34	1555.1	5.60	18.18	45
7/30/15 11:35	1559.1	5.60	21.57	45
7/30/15 11:36	1563.8	5.62	25.52	45
7/30/15 11:37	1564.4	5.61	20.40	45
7/30/15 11:38	1566.5	5.58	14.06	45
7/30/15 11:39	1568.8	5.59	24.58	45
7/30/15 11:40	1568.0	5.58	27.33	45
7/30/15 11:41	1568.8	5.57	27.01	45
7/30/15 11:42	1570.9	5.55	24.56	45
7/30/15 11:43	1566.9	5.56	31.31	45
7/30/15 11:44	1564.2	5.55	28.46	45
7/30/15 11:45	1563.2	5.54	24.03	45
7/30/15 11:46	1560.2	5.52	25.11	45
7/30/15 11:47	1558.3	5.52	26.99	45
7/30/15 11:48	1558.4	5.51	31.09	45
7/30/15 11:49	1556.6	5.49	29.25	45
7/30/15 11:50	1553.8	5.49	16.29	45
7/30/15 11:51	1553.1	5.49	19.25	45
7/30/15 11:52	1552.9	5.47	24.42	45
7/30/15 11:53	1553.0	5.45	18.49	45
7/30/15 11:54	1555.4	5.43	19.14	45
7/30/15 11:55	1558.1	5.42	22.26	45
7/30/15 11:56	1557.5	5.41	17.47	45
7/30/15 11:57	1559.2	5.38	12.54	45
7/30/15 11:58	1561.7	5.38	16.99	45
7/30/15 11:59	1561.9	5.37	20.16	45
7/30/15 12:00	1564.5	5.35	18.58	45
7/30/15 12:01	1568.2	5.33	15.99	45
7/30/15 12:02	1566.6	5.32	22.44	45
7/30/15 12:03	1566.4	5.31	27.18	45
7/30/15 12:04	1567.2	5.28	23.11	45
7/30/15 12:05	1565.1	5.24	24.23	45
7/30/15 12:06	1563.8	5.22	27.21	45
7/30/15 12:07	1563.9	5.20	20.77	45
7/30/15 12:08	1559.9	5.17	19.95	45
7/30/15 12:09	1556.3	5.15	17.16	45
7/30/15 12:10	1555.1	5.14	22.37	45
7/30/15 12:11	1554.2	5.11	19.29	45
7/30/15 12:12	1553.4	5.09	16.72	45
7/30/15 12:13	1555.3	5.08	24.30	45
7/30/15 12:14	1557.5	5.07	31.84	45
7/30/15 12:15	1557.3	5.05	27.30	45
7/30/15 12:16	1558.4	5.02	22.13	45
7/30/15 12:17	1559.1	5.00	13.61	45
7/30/15 12:18	1558.3	5.00	16.26	45
7/30/15 12:19	1560.3	4.97	16.41	45
7/30/15 12:20	1564.3	4.96	19.57	45
7/30/15 12:21	1562.6	4.93	19.04	45
7/30/15 12:22	1563.0	4.92	20.90	45
7/30/15 12:23	1565.2	4.90	23.74	45
7/30/15 12:24	1564.8	4.88	20.82	45
7/30/15 12:25	1565.1	4.86	27.53	45
7/30/15 12:26	1565.6	4.86	23.60	45
7/30/15 12:27	1561.8	4.84	23.50	45
7/30/15 12:28	1559.1	4.82	23.70	45
7/30/15 12:29	1558.3	4.82	20.00	45
7/30/15 12:30	1556.3	4.80	17.37	45
7/30/15 12:31	1555.4	4.79	24.79	45
7/30/15 12:32	1556.6	4.78	29.62	45
7/30/15 12:33	1556.3	4.77	29.09	45
7/30/15 12:34	1554.7	4.77	18.76	45
7/30/15 12:35	1554.8	4.76	19.46	45
7/30/15 12:36	1555.0	4.73	21.29	45
7/30/15 12:37	1554.3	4.74	12.89	45
7/30/15 12:38	1556.3	4.72	10.30	45
7/30/15 12:39	1560.1	4.71	23.79	45
7/30/15 12:40	1559.4	4.70	24.08	45
7/30/15 12:41	1560.8	4.69	24.45	45
7/30/15 12:42	1563.2	4.68	20.34	45
7/30/15 12:43	1562.7	4.66	32.29	45
7/30/15 12:44	1564.0	4.66	19.64	45
7/30/15 12:45	1565.9	4.65	20.53	45
7/30/15 12:46	1562.3	4.63	13.11	45
7/30/15 12:47	1560.2	4.62	22.43	45
7/30/15 12:48	1560.5	4.62	32.82	45
7/30/15 12:49	1559.5	4.61	30.23	45
7/30/15 12:50	1559.0	4.60	26.72	45
Average	1560.1	5.14	22.22	45

Date and Time	Air Permit: highest oxidation temperatur	Furnace oxygen controller actual value in physical unit	Furnace temperature control firing rate	Wet flake silo discharge screw 1 motor 1 PV 1
7/30/15 13:15	1557.2	4.42	18.79	45
7/30/15 13:16	1560.2	4.42	29.43	45
7/30/15 13:17	1562.6	4.41	28.44	45
7/30/15 13:18	1561.2	4.41	26.32	45
7/30/15 13:19	1561.8	4.41	15.67	45
7/30/15 13:20	1562.6	4.40	18.78	45
7/30/15 13:21	1560.8	4.39	19.84	45
7/30/15 13:22	1561.2	4.39	21.90	45
7/30/15 13:23	1563.5	4.38	20.75	45
7/30/15 13:24	1560.5	4.39	32.56	45
7/30/15 13:25	1559.5	4.39	26.23	45
7/30/15 13:26	1560.2	4.39	22.64	45
7/30/15 13:27	1558.8	4.38	20.35	45
7/30/15 13:28	1558.6	4.36	21.51	45
7/30/15 13:29	1559.8	4.36	25.10	45
7/30/15 13:30	1557.4	4.38	24.13	45
7/30/15 13:31	1555.6	4.38	20.58	45
7/30/15 13:32	1555.9	4.38	26.93	45
7/30/15 13:33	1555.6	4.36	26.01	45
7/30/15 13:34	1555.7	4.37	25.29	45
7/30/15 13:35	1557.2	4.36	22.65	45
7/30/15 13:36	1556.7	4.36	25.28	45
7/30/15 13:37	1554.6	4.36	17.33	45
7/30/15 13:38	1554.9	4.37	27.23	45
7/30/15 13:39	1555.8	4.38	22.05	45
7/30/15 13:40	1555.2	4.37	18.06	45
7/30/15 13:41	1558.0	4.38	20.25	45
7/30/15 13:42	1563.1	4.39	17.37	45
7/30/15 13:43	1562.4	4.38	15.48	45
7/30/15 13:44	1563.7	4.38	19.38	45
7/30/15 13:45	1566.5	4.38	21.22	45
7/30/15 13:46	1566.7	4.41	25.35	45
7/30/15 13:47	1567.7	4.42	24.43	45
7/30/15 13:48	1569.4	4.42	25.55	45
7/30/15 13:49	1566.6	4.42	28.24	45
7/30/15 13:50	1563.9	4.43	29.32	45
7/30/15 13:51	1562.7	4.43	26.06	45
7/30/15 13:52	1560.1	4.44	23.60	45
7/30/15 13:53	1557.9	4.44	22.26	45
7/30/15 13:54	1558.9	4.45	28.35	45
7/30/15 13:55	1558.8	4.45	30.50	45
7/30/15 13:56	1556.9	4.47	31.21	45
7/30/15 13:57	1556.5	4.49	30.39	45
7/30/15 13:58	1556.2	4.50	29.76	45
7/30/15 13:59	1555.6	4.51	30.50	45
7/30/15 14:00	1556.8	4.52	31.96	45
7/30/15 14:01	1557.8	4.54	29.44	45
7/30/15 14:02	1554.1	4.55	22.01	45
7/30/15 14:03	1553.9	4.55	17.95	45
7/30/15 14:04	1555.7	4.56	19.34	45
7/30/15 14:05	1555.5	4.57	24.50	45
7/30/15 14:06	1558.1	4.57	25.03	45
7/30/15 14:07	1562.8	4.57	20.27	45
7/30/15 14:08	1563.1	4.59	23.45	45
7/30/15 14:09	1564.0	4.62	25.27	45
7/30/15 14:10	1566.0	4.62	18.97	45
7/30/15 14:11	1565.8	4.63	30.29	45
7/30/15 14:12	1565.7	4.63	25.07	45
7/30/15 14:13	1567.4	4.64	29.02	45
7/30/15 14:14	1566.1	4.64	26.90	45
7/30/15 14:15	1563.1	4.65	15.71	45
7/30/15 14:16	1562.2	4.65	17.34	45
7/30/15 14:17	1561.1	4.66	28.30	45
7/30/15 14:18	1559.3	4.68	28.97	45
7/30/15 14:19	1559.4	4.68	27.03	45
7/30/15 14:20	1558.3	4.70	23.24	45
Average	1560.2	4.47	24.14	45
Overall Average	1559.9	5.13	23.15	45

THIS IS THE LAST PAGE

OF THIS REPORT

VOC EMISSIONS TEST

REGENERATIVE CATALYTIC OXIDIZER NO.2 (RTO2)
BAGHOUSE (BH1)

WESTERVELT PELLETS I, LLC

ALICEVILLE, ALABAMA PELLET PLANT

PERMIT NO. 409-0010-X011

Aliceville, Alabama
October 2-3, 2018

Westervelt Pellets I, LLC
6777 Highway 17
Aliceville, Alabama 35442

Performed by:

EML, LLC

624 Ridgewood Road
P.O. Box 655
Ridgeland, Mississippi 39158

Phone: (601)856-3092

REPORT OF
AIR EMISSIONS TEST
FOR
WESTERVELT PELLETS I, LLC
REGENERATIVE CATALYTIC OXIDIZER NO. 2 (RTO2)
AND THE BAGHOUSE (BH1)

Aliceville, Alabama
October 2-3, 2018

PERMIT NO. 409-0010-X011

Westervelt Pellets I, LLC
Post Office Box 48999
Tuscaloosa, Alabama 35404

Contact: Keith Dollar
Phone: 205/562-5475
Email:kdollar@westervelt.com

Performed By:
EML, LLC
Ridgeland, Mississippi
⮘601/856-3092⮚

EXECUTIVE SUMMARY OF AIR EMISSIONS TEST

Westervelt Pellets I, LLC - Aliceville, Alabama

Report date: October 9, 2018

On October 2-3, 2018, EML, LLC performed air emissions testing for Westervelt Pellets I, LLC in Aliceville, Alabama. Testing was performed to measure VOCs as propane from the RCO No. 2 (RTO2) and the Baghouse (BH1). At the time of the baghouse test, the aspiration system valves that connect the four pellet shaker screens, and the pre and post-conveyors to the baghouse were closed. This change to the baghouse system is considered to be temporary and it is understood that additional compliance testing for the baghouse will be required should these valves be opened. This testing was done in accordance with requirements of Air Permit No. 409-0010-X011 issued and administered by the Alabama Department of Environmental Management (ADEM.)

Measured emissions are summarized in the tables below. The results reported are the average of three 60-minute sample runs.

Source	VOC, ppm as propane	VOC, lb/hr as propane
RTO2	8.5	0.66
BH1	99.9	5.52
Permit Limit	---	44.29 Total

Keith Dollar of Westervelt Pellets coordinated the testing project. The EML test team included Otis Rayburn, Greg Shelnutt and Cory Harkins. Jared Avrard of ADEM were present to witness the test.

Following is a report of the test.

REPORT OF AIR EMISSIONS TESTING
FOR WESTERVELT PELLETS I, LLC
RTO2 and BAGHOUSE (BH1)
ALICEVILLE, ALABAMA
OCTOBER 2-3, 2018

CONTENTS

REPORT CERTIFICATION

I certify that I have examined the information submitted herein, and based upon inquires of those responsible for obtaining the data or upon my direct acquisition of data, I believe the submitted information is true, accurate and complete.

Signed ______________________

Manager

1.0 TEST RESULTS

The following table is a summary of the measured flow parameters and test results for emissions testing done on October 2-3, 2018, for the RCO No. 2 and the Baghouse at Westervelt's wood pellet plant in Aliceville, Alabama.

RCO No. 2

Run No.		1	2	3	AVG
Date		10/2/2018	10/2/2018	10/2/2018	-------
Time Start		0922	1247	1355	-----
Time End		1236	1347	1553	-----
VOC EMISSIONS C3H8	#/hr	0.67	0.66	0.65	0.66
VOC EMISSIONS C3H8	ppm	8.7	8.4	8.4	8.5
O_2	%	20.65	20.60	20.60	20.62
VOLUMETRIC FLOW RATE	acfm	50256	52327	52192	52192
VOLUMETRIC FLOW RATE	dscfm	40916	41774	41819	41503
VELOCITY	ft./sec.	29.1	30.3	30.2	29.9
STACK TEMPERATURE	ºF	142	144	146	144
MOISTURE	%	7.8	9.2	8.5	8.5

Baghouse (BH1)

Run No.		1	2	3	AVG
Date		10/3/2018	10/3/2018	10/3/2018	-------
Time Start		0747	1000	1109	-----
Time End		0953	1100	1209	-----
VOC EMISSIONS C3H8	#/hr	4.78	5.47	6.32	5.52
VOC EMISSIONS C3H8	ppm	83.7	99.9	116.1	99.9
O_2	%	20.70	20.70	20.70	20.70
VOLUMETRIC FLOW RATE	acfm	34865	34411	34159	34478
VOLUMETRIC FLOW RATE	dscfm	30516	29280	29126	29641
VELOCITY	ft./sec.	55.0	54.3	53.9	54.4
STACK TEMPERATURE	°F	119	126	132	126
MOISTURE	%	4.4	5.8	4.7	5.0

2.0 SOURCE DESCRIPTION:

Westervelt Pellets I, LLC in Aliceville, Alabama is a producer of pine wood pellets. Chips, shavings, and sawdust are sent to the rotary dryer to be dried for pellet production. Once the material is sent through the dryer, it goes to the dry silo before being fed to eight pellet presses and the material is formed into pellets in the pellet presses. Finished pellets are sent to four pellet coolers and the exhaust from the pellet coolers go through four cyclones and then to RCO No. 2 via a common duct.

The RCO exhausts to the atmosphere by way of a 72.625-inch circular vertical stack. Two sample ports are provided at a location that is 192 inches (2.6 diameters) below the stack exit and 180 inches (2.5 diameters) above the blower duct to stack.

The Baghouse exhausts to the atmosphere by way of a 44.0-inch circular vertical stack. Two sample ports are provided at a location that is 24 inches below the stack exit (0.5 diameters) and 106 inches (2.4 diameters) above the nearest flow disturbance.

3.0 TEST PROCEDURES:

Test procedures used are those described in the Code of Federal Regulations, Title 40, Part 60, Appendix A. All test parameters were measured simultaneously. The test consisted of triplicate 60-minute sample runs.

Sample and Velocity Traverses – EPA Method 1

Selection of sampling locations was as described in Method 1. Sample ports are installed at locations meeting requirements of the Method. Laminar airflow at sample locations was confirmed using the null Pitot technique.

Determination of Stack Gas Velocity and Volumetric Flow Rate – EPA Method 2

Stack gas velocity was measured using an S-Type Pitot tube and Method 2. Pitot tube design and its orientation with respect to the sample probe and nozzle permitted the use of a correction factor (Cp) of 0.84 as described in Method 2. Stack temperature measurements were made with a type K thermocouple and NBS calibration traceable digital thermometer.

Gas Analysis for the Determination of Dry Molecular Weight – EPA Method 3A

Oxygen and carbon dioxide content was measured by continuous monitoring with calibrated analyzers as described in Method 3A. Zero and mid level span checks were performed following each sample run. Pre test calibrations were made by introducing the gas standards at the inlet to the sample conditioner; post run zero and span checks were made through the sample system by introducing calibration gas at the inlet to the sample probe

Determination of Moisture Content in Stack Gas – EPA Method 4

Moisture content was determined from volumetric and gravimetric analysis of impinger contents of the Method 5 sample train.

Determination of Total Volatile Organic Compounds – EPA Method 25A

VOC (as carbon) was measured using Method 25A. A calibrated TECO Model 51 heated flame ionization detector was used to continuously monitor VOC concentration on a wet basis. A sample was directed to the analyzers by way of a Teflon sample line heated to 250^{O} F. A helium/hydrogen fuel was used to reduce oxygen synergism impact on the measurements. The instrument was calibrated with known concentrations of propane. For this testing project, results are expressed in terms of propane. Triplicate 60 minute sampling periods constituted a test. Pre test calibrations and post run zero and span checks were made through the sample system by introducing calibration gas at the inlet to the sample probe.

Preparation of Calibration Gases – EPA Method 205

Calibration gas concentrations were prepared using cylinders of EPA Protocol 1 gas mixtures and an Environics gas diluter verified by Method 205.

Data Acquisition.

Instrument data was recorded on a Fluke Hydra data logger at 5-second intervals and reduced to 60-second averages. The arithmetic average of each instrument's output was used to calculate emissions.

4.0 CALCULATIONS

RCO 2
VOC Emissions Test - October 2, 2018

Collected Test Data:

				RUN 1	RUN 2	RUN 3
	Date	:		10/2/2018	10/2/2018	10/2/2018
	Time start	:		0922	1247	1355
	Time end	:		1236	1347	1553
1.	As	:	sq ft	28.7673	28.7673	28.7673
2.	Cp	:	dimensionless	0.84	0.84	0.84
3.	Theta	:	minutes	60.00	60.00	60.00
4.	Y	:	dimensionless	0.997	0.997	0.997
5.	Pbar	:	in. Hg	30.12	30.11	30.08
6.	Pg	:	in. H2O	-0.18	-0.18	-0.18
7.	Vm	:	cf (dry gas)	29.048	29.383	29.890
8.	√(ΔP),avg	:	in.H2O^.5	0.4800	0.4973	0.4958
9.	ΔH	:	in. H2O	0.7000	0.7000	0.7000
10.	ts	:	degrees F	141.83	144.29	145.71
11.	tm	:	degrees F	76.38	79.29	81.29
12.	Vlc	:	ml	51.5	62	58
13.	CO2	:	percent	0.21	0.21	0.20
14.	O2	:	percent	20.65	20.60	20.60
15.	C,VOC	:	ppm as Propane	8.04	7.65	7.64

RCO 2

VOC Emissions Test - October 2, 2018

Calculations:

				RUN 1	RUN 2	RUN 3	AVG.
1.	Pm	:	in.Hg (ΔH/13.6)+Pbar	30.171	30.161	30.131	30.155
2.	Ps	:	in. Hg (Pg/13.6)+Pbar	30.107	30.097	30.067	30.090
3.	Vmstd	:	dscf Vm Y(Pm/Pstd)(Tstd/Tm)	28.748	28.913	29.274	28.978
4.	Vwstd	:	scf (.04707cf/ml)(Vlc)	2.424	2.918	2.730	2.691
5.	Bws	:	dimensionless Vwstd/(Vwstd+Vmstd)	0.0778	0.0917	0.0853	0.0849
6.	Md	:	mol.wt. dry basis .44 CO2+.32 O2+.28(CO+N2)	28.86	28.86	28.86	28.86
7.	Ms	:	mol.wt. wet basis Md(1-Bws)+18 Bws	28.02	27.86	27.93	27.94
8.	Vs	:	ft/sec Kp Cp (√ΔP)√(Ts/(Ps Ms))	29.12	30.32	30.24	29.89
9.	Q	:	cfm Vs As(60 sec/min)	50256	52327	52192	51592
10.	Qstw	:	scfm Q(Ps/Pstd)(Tstd/Ts)	44366	45991	45719	45359
11.	Qstd	:	dscfm Qstw(1-Bws)	40916	41774	41819	41503

12.	C'VOC	:	ppm as Propane, dry (((C,VOC)/(1-Bws))	8.7	8.4	8.4	8.5
13.	E,VOC	:	pounds/hr (C'VOC)(3.116e-8)(Qstd)(60)	0.67	0.66	0.65	0.66

Baghouse (BH1)
VOC Emissions Test - October 3, 2018

Collected Test Data:

				RUN 1	RUN 2	RUN 3
	Date	:		10/3/2018	10/3/2018	10/3/2018
	Time start	:		0747	1000	1109
	Time end	:		0953	1100	1209
1.	As	:	sq ft	10.5592	10.5592	10.5592
2.	Cp	:	dimensionless	0.84	0.84	0.84
3.	Theta	:	minutes	60.00	60.00	60.00
4.	Y	:	dimensionless	0.997	0.997	0.997
5.	Pbar	:	in. Hg	30.06	30.06	30.06
6.	Pg	:	in. H2O	-0.56	-0.56	-0.56
7.	Vm	:	cf (dry gas)	29.080	29.485	29.677
8.	√(ΔP),avg	:	in.H2O^.5	0.9296	0.9090	0.8999
9.	ΔH	:	in. H2O	0.7000	0.7000	0.7000
10.	ts	:	degrees F	118.70	126.35	132.05
11.	tm	:	degrees F	76.05	79.60	80.65
12.	Vlc	:	ml	28	38	30.5
13.	CO2	:	percent	0.10	0.10	0.10
14.	O2	:	percent	20.70	20.70	20.70
15.	C,VOC	:	ppm as Propane	80.06	94.11	110.60

Baghouse (BH1)

VOC Emissions Test - October 3, 2018

Calculations:

					RUN 1	RUN 2	RUN 3	AVG.
1.	Pm	:	in.Hg	(ΔH/13.6)+Pbar	30.111	30.111	30.111	30.111
2.	Ps	:	in. Hg	(Pg/13.6)+Pbar	30.019	30.019	30.019	30.019
3.	Vmstd	:	dscf	Vm Y(Pm/Pstd)(Tstd/Tm)	28.740	28.949	29.081	28.923
4.	Vwstd	:	scf	(.04707cf/ml)(Vlc)	1.318	1.789	1.436	1.514
5.	Bws	:	dimensionless	Vwstd/(Vwstd+Vmstd)	0.0438	0.0582	0.0470	0.0497
6.	Md	:	mol.wt. dry basis	.44 CO2+.32 O2+.28(CO+N2)	28.84	28.84	28.84	28.84
7.	Ms	:	mol.wt. wet basis	Md(1-Bws)+18 Bws	28.37	28.21	28.33	28.31
8.	Vs	:	ft/sec	Kp Cp (√ΔP)√(Ts/(Ps Ms))	55.03	54.31	53.92	54.42
9.	Q	:	cfm	Vs As(60 sec/min)	34865	34411	34159	34478
10.	Qstw	:	scfm	Q(Ps/Pstd)(Tstd/Ts)	31915	31089	30564	31189
11.	Qstd	:	dscfm	Qstw(1-Bws)	30516	29280	29126	29641

12.	C'VOC	:	ppm as Propane, dry	(((C,VOC)/(1-Bws))	83.7	99.9	116.1	99.91
13.	E,VOC	:	pounds/hr	(C'VOC)(3.116e-8)(Qstd)(60)	4.78	5.47	6.32	5.52

5.0 NOMENCLATURE

SYMBOL	UNITS	DESCRIPTION
An	ft^2	Nozzle cross sectional area
As	ft^2	Stack cross sectional area
Bws	dimensionless	Wet gas fraction
CO_2	percent	Carbon dioxide content by volume
CO	percent	Carbon monoxide content by volume
Cp	dimensionless	Pitot correction factor
C,X	as labeled	Concentration of pollutant X
DGF	dimensionless	Dry gas fraction
Dn	inches	Nozzle diameter
ΔH (delta H)	in. H_2O	Pressure drop across meter orifice
ΔP (delta P)	in. H_2O	Stack gas velocity pressure
E,X	#/hr	Emission rate of pollutant X
E'X	#/MM Btu	Emission rate of pollutant X
F	dscf	Volume of flue gas per MM Btu
I	percent	Nozzle velocity/stack gas velocity
Kp	consistent	Pitot tube constant
M,X	milligrams	Sample weight of pollutant X
Md	#/# mole	Dry molecular weight of stack gas
Ms	#/# mole	Wet molecular weight of stack gas
N2	percent	Nitrogen content by volume, dry basis
O_2	percent	Oxygen content by volume, dry basis
Pbar	in. Hg	Barometric pressure
Pg	in. Hg	Stack static pressure
Pm	in. Hg	Total pressure at meter (Pbar+(ΔH/13.6)
Ps	in. Hg	Total stack pressure (Pbar+(Pg/13.6))
Pstd	in. Hg	Standard barometric pressure = 29.92
Q	acfm	Volumetric flow rate at stack conditions
Qstd	dscfm	Volumetric flow rate at standard conditions, dry basis
Qstdw	scfm	Volumetric flow rate at standard conditions, wet basis
θ (theta)	minutes	Sample duration
tm	ºF	Meter temperature (Tm denotes ºR)
ts	ºF	Stack temperature (Ts denotes ºR)
tw	ºF	Stack gas wet bulb temperature
Tstd	ºR	Standard temperature = 528ºR
Vlc	ml	volume of water collected
Vm	ft^3	Volume of dry gas sampled through meter
Vmstd	dscf	Sample volume at standard conditions
Vwstd	scf	Sample volume of water vapor
Y	dimensionless	Meter coefficient
Xsair	percent	Excess air

6.0 CALIBRATIONS

Measurement devices used by EML, LLC that are subject to changes in measurement precision are initially calibrated prior to use. Those instruments for which calibration factors are subject to change or for which calibration checks are required are calibrated following each field use or as otherwise directed and noted. Calibration procedures for specific equipment are as follows.

Dry Gas Meter:

Dry gas meters are periodically removed from the sampling consoles and cleaned and repaired. Following the overhaul of a meter, the measuring precision is checked by the Bell Prover Method and adjusted when necessary to read to within 2% of 100% accuracy. Midsouth Meter Service in Pearl, Mississippi provides this service. At 6-month intervals, or following any meter repair a five point calibration is performed described in APTD-0576 using either a wet test meter, calibrated dry gas meter (used exclusively for calibrations), or a calibrated orifice set as a standard reference. Following field use, gas meter calibrations are checked at intermediate orifice settings. If a meter coefficient obtained from pre-test and post-test checks differs by more than 5%, the coefficient (Y) giving the lower sample volume is used in the calculations.

Orifice:

The orifice coefficient is initially determined and is rechecked following a major gas meter repair and calibration. The calibration is included with the Dry Gas Meter Calibration.

Nozzles:

Nozzles are checked before each field use with a precision (.001 in.) dial caliper. Three measurements on different axes are made; an average of those three readings is used in calculations. If the tolerance among measurements exceeds 0.004 inches (highest to lowest reading) the nozzle is repaired and recalibrated or discarded.

Pitot Tubes:

Pitot tubes meeting EPA geometry standards are assigned a coefficient of 0.84. Pitot tubes are visually inspected for damage before, during and after use. Those Pitot tubes not meeting the geometry standards are assigned a coefficient from the manufacturer's calibration that it retains unless damaged.

Temperature Measuring Instruments:

All temperature measurements are made with type K thermocouples and digital thermocouple thermometers that have an initial calibration traceable to NBS. Additionally, thermocouple meters are checked annually for ± 2 degree accuracy using an electronic Fluke calibrator that is calibrated annually by the manufacturer. Thermocouples are checked during a test series against a reference thermometer. Continuity and proper thermocouple contact location are checked by challenging the thermocouple with a temperature change. (EMC Alternate Method (ALT-011))

Barometer:

Aneroid field barometers are checked against and adjusted to readings from a mercury barometer or readings obtained from local weather authorities.

Differential Pressure Gauges:

Velocity head (ΔP) and orifice pressure differential (ΔH) measurements are made using water manometers of the appropriate range unless otherwise noted in the test data. Manometers do not require calibration. When Magnehelic® type gauges are used, they are calibrated against a water manometer prior to and following each use.

Analytical Balance:

Analytical balances are calibrated annually by Mettler-Toledo. Prior to each use, or daily, a quality control check is made using Class A weights of 0.5000 grams and 100.0000 grams. This check is conducted after leveling the balance and performing an internal zero and calibration.

7.0 APPENDICES

A. Field Data

B. Calibration Data

C. Analyzers Data Log

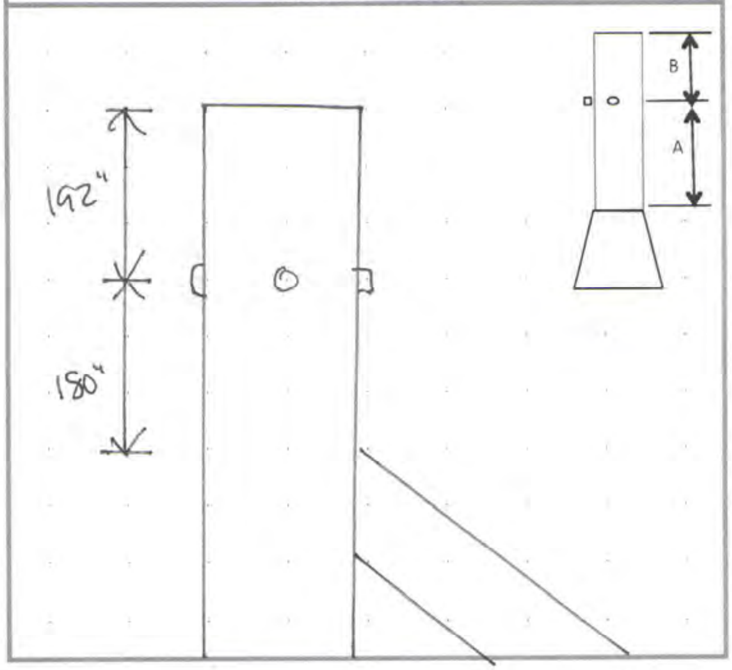
APPENDIX A

FIELD DATA

STACK CONFIGURATION AND SAMPLE POINT LAYOUT (EML V-0 Effective 093013)

PLANT: Westervelt Aliceville, AL   Date: 10-2-18
SOURCE: ~~RTO B~~ RCO B
TEST FOR: vel. moisture
TEST OPERATORS: Shelnutt

SKETCH OF STACK



PERCENT OF DIAMETER (for circular stacks)

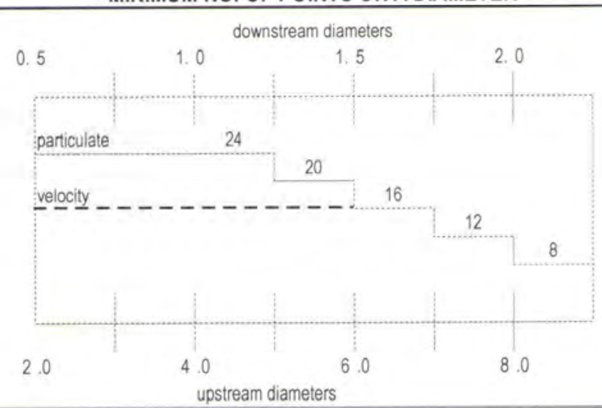
points on a diameter

point no.	2	4	6	8	10	12	14	16
1	14.6	6.7	4.4	3.2	2.6	2.1	1.8	1.6
2	85.4	25.0	14.6	10.5	8.2	6.7	5.7	4.9
3		75.0	29.6	19.4	14.6	11.8	9.9	8.5
4		93.3	70.4	32.3	22.6	17.7	14.6	12.5
5			85.4	67.7	34.2	25.0	20.1	16.9
6			95.6	80.6	65.8	35.6	26.9	22.0
7				89.5	77.4	64.4	36.6	28.3
8				96.8	85.4	75.0	63.4	37.5
9					91.8	82.3	73.1	62.5
10					97.4	88.2	79.9	71.7
11						93.3	85.4	78.0
12						97.9	90.1	83.1
13							94.3	87.5
14							98.2	91.5
15								95.1
16								98.4

STACK DIAMETER:	72.625"
Distance from ports to disturbance:	
A. to upstream disturbance	180"
B. to downstream disturbance	192"
Upstream diameters:	2.5
Downstream diameters:	2.6
Minimum No. sample points required:	24
No. sample points selected:	12x2
Port Length:	5 7/8"
Port Type:	4" pipe nipple
Port Access:	platform/board

Point No.	inches from wall	velocity head αP1	αP2
1	1.5	0	0
2	4.9	0	0
3	8.6	0	0
4	12.9	0	0
5	18.2	0	0
6	25.9	0	0
7	46.8	0	0
8	54.5	1	0
9	59.8	0	0
10	64.1	0	0
11	67.8	0	0
12	71.1	0	0

MINIMUM NO. OF POINTS ON A DIAMETER



Pitot ID: 72610-1 Pitot Cp: 0.84 Stack Temp:

Remarks:

Plant: Westervelt Aliceville, Al

Source: ~~RTO B~~ RCO B

Test For: Velocity · Moisture

Test Operators: Shelnutt · Harkins T1

RUN NO. 1

Date 10-2-18

Time start 0922 end 1236

Meter Box	AT3 / 0.997
Sample Box	A
Probe/Pitot	72610-1
Pitot Cp	.84
Nozzle Dia.	N/A
Filter No.	N/A
Amb. Temp. °F	74
Bar. Press "Hg	30.12
Static Press. "H_2O	-0.18

No. Sample Pts.	12 x 2
Minutes/Pt.	2.5

K FACTOR SETUP

ΔH@	1.76
Meter Temp	
%H_2O	
Stack Temp.	
K Factor	

GAS ANALYSIS: CEM

CO_2		
O_2		
CO		
Time		

CONDENSATE: NOTES

init. ~~200~~ final 51.5

SILICA GEL:

init. ______ final ______

Notes: DOWN 0954

UP 1207

Jared Avrard-ADEM

	TARE	Final
1)	761.5	802
2)	639	643.5
3)	651.5	652
4)	875	881

Port Point	Elapsed Time Min:sec	DGM Reading Ft.³	Velocity Head ΔP in. H_2O	Orifice ΔH in. H_2O	Stack Temp °F	Meter Temp °F in	Meter Temp °F out	Oven Temp °F	Imp. Temp °F	VAC in Hg
1	000	321.002	0.33	0.70	148	77	75	N/A	69	2
2	230	322.1	0.37	0.70	144	76	75		61	2
3	500	323.4	0.35	0.70	136	75	75		59	2
4	730	324.6	0.29	0.70	135	75	75		57	2
5	1000	325.8	0.27	0.70	149	75	75		57	2
6	1230	327.0	0.28	0.70	142	75	75		57	2
7	1500	328.2	0.26	0.70	136	76	75		57	2
8	1730	329.4	0.19	0.70	149	76	75		57	2
9	2000	330.7	0.15	0.70	141	76	75		58	2
10	2230	331.8	0.13	0.70	135	76	75		58	2
11	2500	333.0	0.09	0.70	151	76	75		58	2
12	2730	334.3	0.05	0.70	145	76	75		59	2
1	30/00	335.526	0.25	0.70	138	76	75		60	2
2	230	336.7	0.27	0.70	133	79	77		74	2
3	500	337.9	0.27	0.70	136	78	77		68	2
4	730	339.1	0.29	0.70	147	78	77		65	2
5	1000	340.3	0.28	0.70	136	78	77		63	2
6	1230	341.5	0.28	0.70	135	78	77		62	2
7	1500	342.7	0.27	0.70	146	78	77		61	2
8	1730	344.0	0.23	0.70	143	78	77		60	2
9	2000	345.1	0.22	0.70	137	78	77		62	2
10	2230	346.4	0.24	0.70	154	78	77		62	2
11	2500	347.6	0.20	0.70	147	78	77		62	2
12	2730	348.8	0.16	0.70	141	78	77		63	2
END	60/00	350.050								
		29.048	0.4800	0.7000	141.83	76.38				

COMPLETED 100418 BN

Leak Checks: Sample Train: .005 --> .008 = .003 cfm @ 8 "Hg

Pitot Tubes: High ☐ @ ____ "H_2O || Low ☐ @ ____ "H_2O

Pretest: AR Sample Train ☑ Pitot Tubes ☑

Plant: Westervelt Aliceville, Al
Source: RCO B
Test For: vel. moisture
Test Operators: Shelnutt. Harkins T1

RUN NO. 2
Date 10-2-18
Time start 1247 end 1347

Meter Box	NT3 y=0.997
Sample Box	No. 2
Probe/Pitot	72610-1
Pitot Cp	0.84
Nozzle Dia.	N/A
Filter No.	N/A
Amb. Temp. °F	86
Bar. Press "Hg	30.11
Static Press. "H_2O	-0.18

No. Sample Pts.	12x2
Minutes/Pt.	2.5

K FACTOR SETUP

ΔH@	1.76
Meter Temp	
%H_2O	
Stack Temp.	
K Factor	

GAS ANALYSIS: CEM

CO_2			
O_2			
CO			
Time			

CONDENSATE: NOTES
init. ______ final 62
SILICA GEL:
init. ______ final ______

Notes:

	TARE	Final
1 GS	~~6~~ 712	752
2	750	760
GS 3	~~657~~ 712	661
4	865	873

Port Point	Elapsed Time Min/sec	DGM Reading Ft.³	Velocity Head ΔP in. H_2O	Orifice ΔH in. H_2O	Stack Temp °F	Meter Temp °F in	Meter Temp °F out	Oven Temp °F	Imp. Temp °F	VAC in Hg
1	000	350.274	0.35	0.70	146	79	78	N/A	72	2
2	230	351.3	0.34	0.70	138	79	78		72	2
3	500	352.6	0.34	0.70	151	80	78		70	2
4	730	353.9	0.32	0.70	147	80	78		68	2
5	1000	355.1	0.30	0.70	139	80	78		68	2
6	1230	356.3	0.32	0.70	148	80	78		68	2
7	1500	357.5	0.22	0.70	154	80	78		67	2
8	1730	358.7	0.18	0.70	138	80	78		67	2
9	2000	360.0	0.17	0.70	137	80	78		67	2
10	2230	361.2	0.13	0.70	154	80	78		68	2
11	2500	362.4	0.11	0.70	144	80	78		68	2
12	2730	363.6	0.08	0.70	137	80	78		68	2
		.	.	.						
1	30/00	364.894	0.25	0.70	158	80	78		67	2
2	230	366.1	0.28	0.70	145	80	79		67	2
3	500	367.3	0.29	0.70	138	80	79		68	2
4	730	368.6	0.31	0.70	148	80	79		68	2
5	1000	369.7	0.31	0.70	146	80	79		68	2
6	1230	371.0	0.33	0.70	145	81	79		68	2
7	1500	372.2	0.30	0.70	137	80	79		68	2
8	1730	373.4	0.27	0.70	150	80	79		67	2
9	2000	374.7	0.24	0.70	146	81	79		67	2
10	2230	375.9	0.25	0.70	139	81	79		67	2
11	2500	377.2	0.22	0.70	140	81	79		68	2
12	2730	378.4	0.19	0.70	138	81	79		68	2
End	60/00	379.657	.	.						
		.	.	.						
		.	.	.						
		.	.	.						
		.	.	.						
		.	.	.						
		29.383	0.4973	0.7000	~~143.88~~ 144.29 BN		79.29			

COMPLETED 100418 BN

Leak Checks: Sample Train: .094 → .095 = .001 cfm @ 7 "Hg
Pitot Tubes: High ☐ @ ______ "H_2O || Low ☐ @ ______ "H_2O

Pretest: Sample Train ☑ GS
Pitot Tubes ☐

Plant: Westervelt — Aliceville, MS
Source: RTO B
Test For: Velocity, Moisture
Test Operators: Shelnutt, Harkins — T1

RUN NO. 3
Date: 10-2-18
Time start: 1355 end: 1553

Meter Box	NT34=0.997
Sample Box	No.
Probe/Pitot	72610-1
Pitot Cp	.84
Nozzle Dia.	N/A
Filter No.	N/A
Amb. Temp. °F	88
Bar. Press. "Hg	30.08
Static Press. "H_2O	-0.18

No. Sample Pts.	12x2
Minutes/Pt.	2.5

K FACTOR SETUP

ΔH@	1.76
Meter Temp	
%H_2O	
Stack Temp.	
K Factor	

GAS ANALYSIS: CEM

CO_2			
O_2			
CO			
Time			

CONDENSATE NOTES: init. ____ final ~~58.5~~ 58 BN
SILICA GEL: init. ____ final ____

Notes:
Down 1400
Up 1457

	Tare	Final
1	758.5	794.5
2	639	644
3	663.5	665.5
4	892	899

Port Point	Elapsed Time Min/sec	DGM Reading Ft.³	Velocity Head ΔP in. H_2O	Orifice ΔH in. H_2O	Stack Temp °F	Meter Temp °F in	Meter Temp °F out	Oven Temp °F	Imp. Temp °F	VAC in. Hg
1	000	379.812	0.34	0.70	148	82	79	N/A	77	2
2	230	381.0	0.30	0.70	139	81	79		72	2
3	500	382.3	0.35	0.70	159	81	79		70	2
4	730	383.5	0.33	0.70	137	83	80		74	2
5	1000	384.7	0.32	0.70	143	83	80		69	2
6	1230	386.0	0.31	0.70	158	82	80		61	2
7	1500	387.2	0.23	0.70	137	82	80		61	2
8	1730	388.4	0.19	0.70	148	82	80		58	2
9	2000	389.6	0.15	0.70	156	83	80		57	2
10	2230	390.9	0.13	0.70	139	82	81		58	2
11	2500	392.1	0.13	0.70	138	83	81		59	2
12	2730	393.3	0.10	0.70	161	82	81		59	2
1	30/00	394.601	0.26	0.70	143	82	81		61	2
2	230	395.8	0.28	0.70	139	82	81		62	2
3	500	397.0	0.32	0.70	149	82	81		62	2
4	730	398.2	0.34	0.70	146	82	81		62	2
5	1000	399.5	0.35	0.70	140	82	81		62	2
6	1230	400.7	0.37	0.70	138	82	81		62	2
7	1500	401.9	0.28	0.70	149	82	81		62	2
8	1730	403.2	0.21	0.70	151	82	81		62	2
9	2000	404.4	0.21	0.70	137	82	81		62	2
10	2230	405.6	0.20	0.70	152	82	81		63	2
11	2500	406.8	0.19	0.70	150	82	81		63	2
12	2730	408.3	0.18	0.70	140	82	81		63	2
End	60/00	409.702								
		29.890	0.4958	0.7000	145.71	~~81.25~~ BN 81.29				

COMPLETED 100418 BN

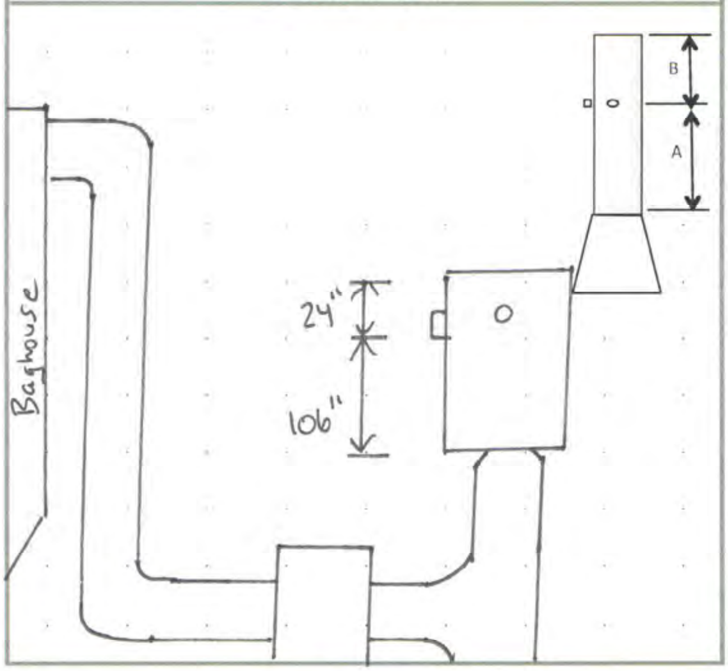
Leak Checks: Sample Train: .040 - .043 = .003 cfm @ 7 "Hg
Pitot Tubes: High ✓ @ 4.9 "H_2O || Low ✓ @ 4.8 "H_2O

Pretest: Sample Train ☑ GS
Pitot Tubes ☐

STACK CONFIGURATION AND SAMPLE POINT LAYOUT (EML V-0 Effective 093013)

PLANT: Westervelt Aliceville, AL **Date:** 10-3-18
SOURCE: pellet baghouse
TEST FOR: velocity + moisture
TEST OPERATORS: Shelnutt T1

SKETCH OF STACK



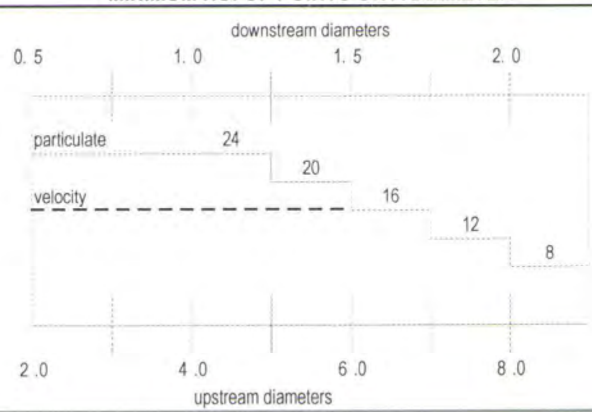
PERCENT OF DIAMETER (for circular stacks)

point no.	2	4	6	8	10	12	14	16
1	14.6	6.7	4.4	3.2	2.6	2.1	1.8	1.6
2	85.4	25.0	14.6	10.5	8.2	6.7	5.7	4.9
3		75.0	29.6	19.4	14.6	11.8	9.9	8.5
4		93.3	70.4	32.3	22.6	17.7	14.6	12.5
5			85.4	67.7	34.2	25.0	20.1	16.9
6			95.6	80.6	65.8	35.6	26.9	22.0
7				89.5	77.4	64.4	36.6	28.3
8				96.8	85.4	75.0	63.4	37.5
9					91.8	82.3	73.1	62.5
10					97.4	88.2	79.9	71.7
11						93.3	85.4	78.0
12						97.9	90.1	83.1
13							94.3	87.5
14							98.2	91.5
15								95.1
16								98.4

STACK DIAMETER: 44.0"
Distance from ports to disturbance:
A. to upstream disturbance 106"
B. to downstream disturbance 24"
Upstream diameters: 2.4
Downstream diameters: 0.5
Minimum No. sample points required: 16
No. sample points selected: 10 x 2
Port Length: 1.75"
Port Type: 3" pipe nipple
Port Access: Manlift + board

Point No.	inches from wall	velocity head Cos K	Cos t
1	1.1	2	3
2	3.6	3	4
3	6.4	2	2
4	9.9	0	0
5	15.0	0	1
6	29.0	0	0
7	34.1	0	0
8	37.6	4	5
9	40.4	3	4
10	42.9	5	4

MINIMUM NO. OF POINTS ON A DIAMETER



Pitot ID 06216-05 Pitot Cp: 0.84 Stack Temp:
Remarks:

T1

Plant: Westervelt — Aliceville, AL
Source: Pellet cooler Baghouse
Test For: Velocity · Moisture
Test Operators: Shelnutt · Harkins — T1

RUN NO. 1
Date 10-3-18
Time start 0747 end 0953

Meter Box	NT3 y=.997
Sample Box	No.
Probe/Pitot	624165
Pitot Cp	.84
Nozzle Dia.	N/A
Filter No.	N/A
Amb. Temp. °F	72
Bar. Press. "Hg	30.06
Static Press. "H_2O	-0.56

No. Sample Pts. 10x2
Minutes/Pt. 3.0

K FACTOR SETUP
ΔH@ 1.76
Meter Temp
%H_2O
Stack Temp.
K Factor

GAS ANALYSIS: CEM
CO_2
O_2
CO
Time

CONDENSATE: init. notes final 28
SILICA GEL: init. final

Notes:
DOWN 0823
UP 0929

	Tare	Final
1)	761	781
2)	641	643
3)	656	656.5
4)	873	878.5

Port Point	Elapsed Time Min/sec	DGM Reading Ft.³	Velocity Head ΔP in. H_2O	Orifice ΔH in. H_2O	Stack Temp °F	Meter Temp °F in	Meter Temp °F out	Oven Temp °F	Imp. Temp °F	VAC in Hg
1	000	410.100	0.90	0.70	116	75	74	N/A	71	2
2	3	411.3	0.83	0.70	116	75	74		54	2
3	6	413.0	0.73	0.70	116	75	74		54	2
4	9	414.5	0.70	0.70	116	75	74		55	2
5	12	415.9	0.68	0.70	117	75	74		54	2
6	15	417.3	0.49	0.70	116	75	74		55	2
7	18	418.6	0.62	0.70	117	76	75		57	2
8	21	420.0	0.83	0.70	117	76	75		59	2
9	24	421.5	0.64	0.70	116	76	75		58	2
10	27	423.0	0.41	0.70	117	76	75		59	2
1	30/00	424.413	0.83	0.70	117	76	75		59	2
2	3	425.9	1.20	0.70	117	76	75		59	2
3	6	427.3	1.05	0.70	116	77	75		59	2
4	9	428.8	0.94	0.70	122	78	77		73	2
5	12	430.3	0.71	0.70	122	78	77		68	2
6	15	431.7	0.96	0.70	123	78	77		66	2
7	18	433.2	1.15	0.70	123	79	77		66	2
8	21	434.6	1.40	0.70	123	79	77		66	2
9	24	436.2	1.45	0.70	123	79	77		66	2
10	27	437.7	1.20	0.70	124	79	78		66	2
END	60/00	439.180								
		29.080	0.9296	0.7000	118.70 / ~~118.92~~	76.05 / ~~76.04~~				

COMPLETED 100418 BN

Leak Checks: Sample Train: .026 → .027 = .001 cfm @ 7 "Hg
Pitot Tubes: High □ @ "H_2O // Low □ @ "H_2O
Pretest: OK Sample Train ✓ Pitot Tubes ✓

Plant: Westervelt — Aliceville, AL

Source: Pellet Cooler Baghouse

Test For: Velocity · Moisture

Test Operators: Shelnutt · Harkins — TI

RUN NO. 2

Date 10-3-18

Time start 1000 end 1100

Meter Box	NT3 y. 997
Sample Box	No.
Probe Pitot	624165
Pitot Cp	.84
Nozzle Dia.	N/A
Filter No.	N/A
Amb. Temp. °F	81
Bar. Press. "Hg	30.06
Static Press. "H_2O	-0.56

No. Sample Pts.	10x2
Minutes/Pt.	3.0

K FACTOR SETUP

ΔH@	1.76
Meter Temp	
%H_2O	
Stack Temp.	
K Factor	

GAS ANALYSIS: CEM

CO_2			
O_2			
CO			
Time			

CONDENSATE: init. Water final 38

SILICA GEL: init. final

Notes:

	Tare	Final
1)	750	778
2)	756	758.5
3)	608	610
4)	860	865.5

Port Point	Elapsed Time Min/sec	DGM Reading Ft.³	Velocity Head ΔP in. H_2O	Orifice ΔH in. H_2O	Stack Temp °F	Meter Temp °F in	Meter Temp °F out	Oven Temp °F	Imp. Temp °F	Vac in. Hg
1	0/00	439.552	0.80	0.70	127	81	78	N/A	78	2
2	3	441.0	1.10	0.70	127	81	78		73	2
3	6	442.4	1.00	0.70	127	81	78		72	2
4	9	443.9	0.87	0.70	126	81	78		70	2
5	12	445.4	0.68	0.70	127	81	79		70	2
6	15	446.9	0.90	0.70	126	81	79		68	2
7	18	448.4	1.15	0.70	126	81	79		68	2
8	21	449.8	1.40	0.70	126	81	79		68	2
9	24	451.3	1.10	0.70	126	80	79		67	2
10	27	452.8	1.00	0.70	125	80	79		67	2
1	30/00	454.324	0.86	0.70	126	80	79		68	2
2	3	455.8	0.83	0.70	125	80	79		66	2
3	6	457.2	0.81	0.70	125	80	79		64	2
4	9	458.7	0.73	0.70	126	80	79		63	2
5	12	460.2	0.71	0.70	126	80	79		63	2
6	15	461.7	0.45	0.70	126	80	79		63	2
7	18	463.2	0.62	0.70	127	80	79		63	2
8	21	464.6	0.80	0.70	128	80	79		61	2
9	24	466.1	0.65	0.70	128	80	79		62	2
10	27	467.5	0.40	0.70	127	80	79		62	2
END	60/00	469.037								
		29.485	0.9090	0.7000	126.35		79.60			

COMPLETED 100418 BN

Leak Checks: Sample Train: .052 → .053 = .001 cfm @ 7 "Hg

Pitot Tubes: High [ ] @ "H_2O Low [ ] @ "H_2O

Pretest: Sample Train ☑ GS

Pitot Tubes [ ]

Plant: Westervelt Aliceville, AL
Source: Pellet Cooler Baghouse
Test For: Velocity, Moisture
Test Operators: Shelnutt, Harkins T1

RUN NO. 3
Date 10-3-18
Time start 1109 end 1209

Meter Box	NT3 γ=.997
Sample Box	No.
Probe Pitot	624165
Pitot Cp	.84
Nozzle Dia.	N/A
Filter No.	N/A
Amb. Temp. °F	85
Bar. Press. "Hg	30.06
Static Press. "H_2O	-0.56

No. Sample Pts. 10x2
Minutes/Pt. 3.0

K FACTOR SETUP
ΔH@ 1.76
Meter Temp
%H_2O
Stack Temp.
K Factor

GAS ANALYSIS: CEM

CO_2			
O_2			
CO			
Time			

CONDENSATE: NOTES init. final 30.5
SILICA GEL: init. final

Notes:

	Tare	Final
1)	763	784.5
2)	639	641
3)	653.5	654.5
4)	878.5	884.5

Port Point	Elapsed Time Min:sec	DGM Reading Ft.³	Velocity Head ΔP in. H_2O	Orifice ΔH in. H_2O	Stack Temp °F	Meter Temp °F in	Meter Temp °F out	Oven Temp °F	Imp. Temp °F	Vac in Hg
1	000	469.320	0.80	0.70	131	81	79	N/A	80	2
2	3	470.7	0.97	0.70	131	81	79		75	2
3	6	472.2	1.10	0.70	131	81	79		72	2
4	9	473.8	0.92	0.70	132	81	79		70	2
5	12	475.2	0.73	0.70	132	81	79		68	2
6	15	476.6	0.86	0.70	132	81	79		67	2
7	18	478.1	1.20	0.70	132	81	79		66	2
8	21	479.6	1.35	0.70	131	82	80		63	2
9	24	481.2	1.20	0.70	132	82	80		62	2
10	27	482.7	1.15	0.70	132	82	80		60	2
1	30/00	484.219	0.86	0.70	132	82	80		61	2
2	3	485.6	0.81	0.70	132	82	80		61	2
3	6	487.1	0.69	0.70	132	82	80		62	2
4	9	488.5	0.66	0.70	132	82	80		62	2
5	12	490.1	0.65	0.70	132	82	80		63	2
6	15	491.6	0.42	0.70	132	82	80		63	2
7	18	493.0	0.55	0.70	133	82	80		63	2
8	21	494.5	0.75	0.70	134	82	80		63	2
9	24	496.0	0.57	0.70	133	82	80		64	2
10	27	497.5	0.38	0.70	133	82	80		64	2
END	60/00	498.997								
		29.677	0.8999	0.7000	132.05		80.65			

COMPLETED 100418BN

Leak Checks: Sample Train: .078 --> .080 = .002 cfm @ 9 "Hg
Pitot Tubes: High ✓ @ 6.0 "H_2O Low ✓ @ 4.2 "H_2O

Pretest: Sample Train ✓ GS
Pitot Tubes

APPENDIX B

CALIBRATION DATA

ANALYZER CALIBRATION RECORD (EML V-0 Effective 093013)

Plant	Westervelt	Aliceville, AL	DATE 10.2.18
Source	200 B		
Test For	VOC		
Operators	Slowatt		

Analyte, units / Analyzer ID / Span / DAQ Channel	Level	Cal. Value	Cyl. Ref.	Diluted Y/N	Cal. Reading	Start / End / Run / Bias	0922 / 1236 / 1	1247 / 1347 / 2	1355 / / 3
% CO_2	Zero	0.0	N_2	N	0.0	0.1			
14150 3053	Low								
10.0	Mid	5.0	1	Y	5.0	5.1			
2	High	10.0	1	Y	10.0				
% O_2	Zero	0.0	N_2	N	0.0	0.1			
14200 3053	Low								
20.9	Mid	10.5	1	Y	10.5	10.4			
3	High	20.9	Air	N	20.8				
ppmw C_3H_8	Zero	0.0	Air	N		0.0	-.2	-.2	-.2
SICHT 0618 11715	Low	24.0	2	Y		24.0	23.4	23.5	23.6
80	Mid	40.0	2	Y		40.1			
8	High	64.0	2	Y		63.9			
	Zero								
	Low								
	Mid								
	High								
	Zero								
	Low								
	Mid								
	High								
	Zero								
	Low								
	Mid								
	High								

Cylinder Ref.	Cylinder No.	Contents	Expiration Date	Notes:
1	CC168917	SO_2 20.2 CO_2 20.1	4.10.26	response time 1 min
2	CC103399	C_3H_8 399	8.8.25	

Analyst's signature: [signature]

Method Specifications:

Methods 3A, 6C, 7E	Method 25A
Zero < 20 % of span (can be zero)	Zero < 0.1 % of span
Mid = 40 to 60 % of span	Low = 25 to 35 % of span
High = span	Mid = 45 to 60 % of span
	High = 80 to 90 % of span

Error Specifications:

Calibration Error Allowable	< 2% of span	[((Cyl. Value - Reading) / span)* 100%]
25A Calibration Error Allowable	< 5% Cyl. Value	[(Cyl. Value - Reading) / (Cyl Value) *100%]
System Bias	< 5% span (not for 20 & 25A)	[(System Cal - Reading)/span*100]
Drift	< 3%	[(Initial System Cal. - Final System Cal.) / Span * 100%]
Method 20 Drift	< 2%	[(initial system cal. - final system cal.) / Span * 100%]

METHOD 205 - VERIFICATION OF GAS DILUTION SYSTEMS (EML V-0 Effective 093013)

DATE: 10-1-18

PROJECT: Westervelt Aliceville, AL

ANALYST: G. Shelnutt SIGNATURE: [signature]

DILUTION SYSTEM

MAKE	Environics
MODEL	4040/3616
NO. OF DIL. DEVICES	4
TYPE OF DIL. DEVICE	MFC

REFERENCE MONITOR

TYPE	% O2
MAKE	Servomex
MODEL	1420D/3053
SPAN	20.9

HIGH LEVEL SUPPLY GAS CONC.	20.9 %	CYLINDER ID	Zero Air
MID LEVEL SUPPLY GAS CONC.	10.55 %	CYLINDER ID	XC025858B
DILUTION GAS	0.0	CYLINDER ID	Zero N2

MFC No.										
Target Value	10.5	5.2								

Injections (Triplicate injection of 2 dilutions per MFC to be used)

1st	10.5	5.2								
2nd	10.5	5.2								
3rd	10.5	5.2								
Average	10.5	5.2								

% Difference = ((target conc. - Avg. conc.)/target conc.)*100 **Must be within 2% of avg.**

1st inject	0.0	0.0								
2nd inject	0.0	0.0								
3rd inject	0.0	0.0								

Triplicate injection of Mid Level Gas to Reference Monitor. Must be within 10% of one dilution

	Response	% Difference
1st	10.5	0.0
2nd	10.5	0.0
3rd	10.5	0.0
Average	10.5	0.0

Average must be within +/- 2% of the certified gas concentration.

PITOT TUBE GEOMETRY CALIBRATION (EML V-0 Effective 093013) T1

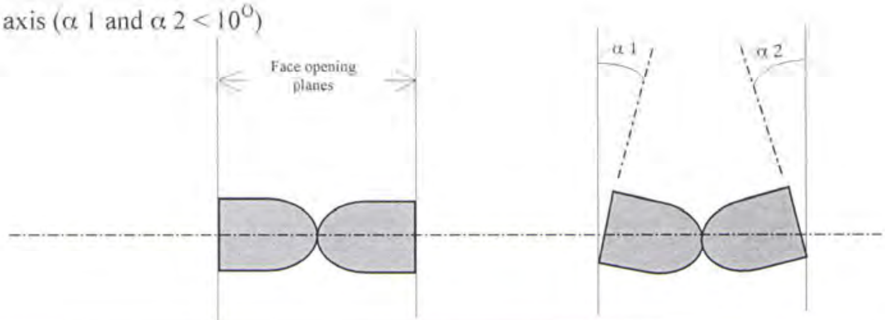
Pitot tube/probe identification: 72610-1 Date Checked: 10-2-18 By: GS

I. Pitot tubes having the following geometric characteristics are assigned a pitot tube coefficient of 0.84.

1. Face openings perpendicular to transverse axis (α 1 and α 2 < 10^{O})

α 1 = 0

α 2 = 1

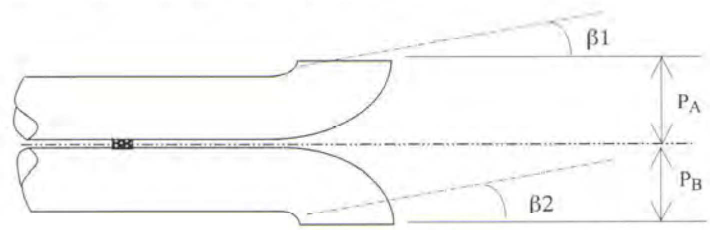


2. Face openings parallel to longitudinal axis: (β1 and β2 < 5^{O}; P = 1.05 D_t to 1.50 D_t; P_A = P_B

Dt = 0.250 β1 = 1

P_A = 0.368 β2 = 2

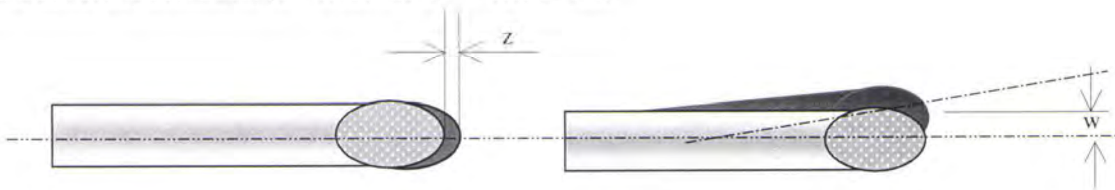
P_B = 0.368



3. Both legs equal in length and centerline coincident (z < 0.125 inch; w < 0.031 inch)

z = 0.013

w = 0



PITOT/PROBE CLEARANCE CHECK:

Nozzle ID: N/A Nozzle diameter: N/A Date N/A By N/A

II. Pitot/probe/nozzle assemblies have the same Cp as the isolated Pitot tube when the following conditions exist.

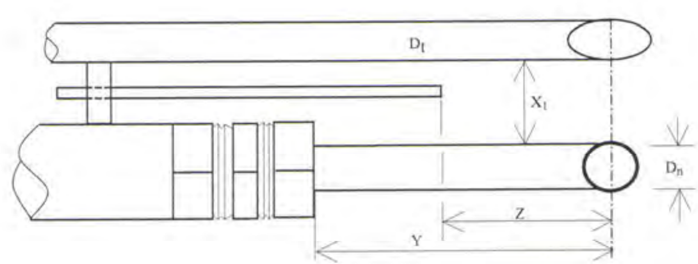
1. $D_t \geq 0.188$ and < 0.375 inch D_t = N/A

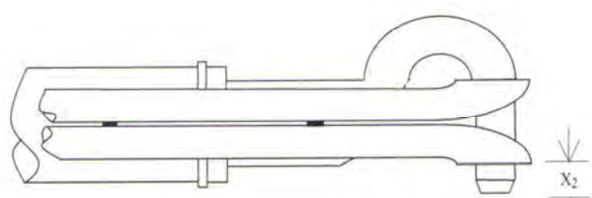
2. $X_1 \geq 0.75$ inch X_1 = N/A

3. $X_2 \geq 0$ inch X_2 = N/A

4. Y ≥ 3.0 inch Y = N/A

5. Z ≥ 2.0 inch Z = N/A





ANALYZER CALIBRATION RECORD (EML V-0 Effective 093013)

Plant	Westervelt Aliceville, AL	DATE	10-3-18
Source	Pellet Cooler Baghouse		
Test For	VOC		
Operators	Rayburn		

Analyte, units / Analyzer ID / Span / DAQ Channel	Level	Cal. Value	Cyl. Ref.	Diluted Y/N	Cal. Reading	Bias	Run 1	Run 2	Run 3
						Start	0747	1000	1109
						End	0953	1100	1209
ppmw C_3H_8	Zero	0	Air	N		[illegible]	1	1	1
SIC 0618117185	Low	60	1	Y		58			
200	Mid	100	1	Y		99	99	100	99
8	High	160	1	Y		162			
	Zero								
	Low								
	Mid								
	High								
	Zero								
	Low								
	Mid								
	High								
	Zero								
	Low								
	Mid								
	High								
	Zero								
	Low								
	Mid								
	High								
	Zero								
	Low								
	Mid								
	High								

Cylinder Ref.	Cylinder No.	Contents	Expiration Date	Notes:
1	CC103399	C_3H_8 399.	08-08-25	response time = 1 min

Analyst's signature: [signature]

Method Specifications:

Methods 3A, 6C, 7E
Zero < 20 % of span (can be zero)
Mid = 40 to 60 % of span
High = span

Method 25A
Zero < 0.1 % of span
Low = 25 to 35 % of span
Mid = 45 to 60 % of span
High = 80 to 90 % of span

Error Specifications:

Calibration Error Allowable	< 2% of span	[((Cyl. Value - Reading) / span)* 100%]
25A Calibration Error Allowable	< 5% Cyl. Value	[(Cyl. Value - Reading) / (Cyl Value) *100%]
System Bias	< 5% span (not for 20 & 25A)	[(System Cal - Reading)/span*100]
Drift	< 3%	[(Initial System Cal. - Final System Cal.) / Span * 100%]
Method 20 Drift	< 2%	[(initial system cal. - final system cal.) / Span * 100%]

PITOT TUBE GEOMETRY CALIBRATION

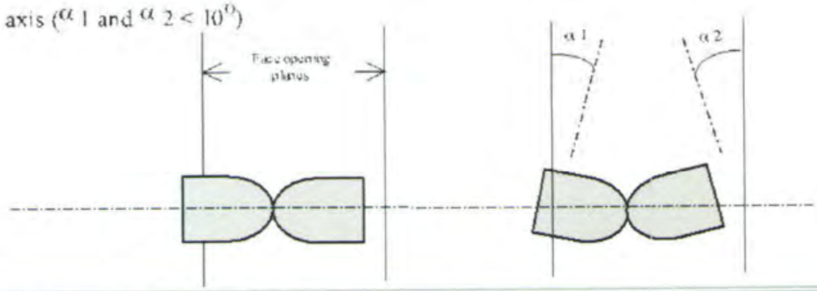
Pitot tube/probe identification: 06 2416 5 Date Checked: 10·3·18 By: OR

I. Pitot tubes having the following geometric characteristics are assigned a pitot tube coefficient of 0.84.

1. Face openings perpendicular to transverse axis (α1 and α2 < 10^{0})

α1 – 0

α2 – Ø

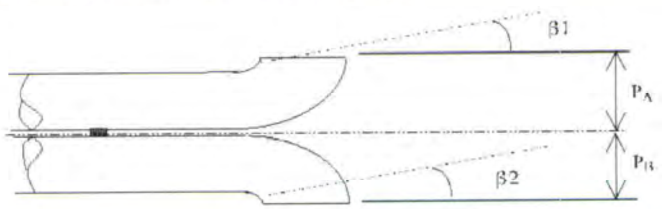


2. Face openings parallel to longitudinal axis: (β1 and β2 < 5^{0}; P – 1.05 D_t to 1.50 D_t; P_A – P_B

Dt – 0.378 β1 – 1

P_A – 0.482 β2 – 0

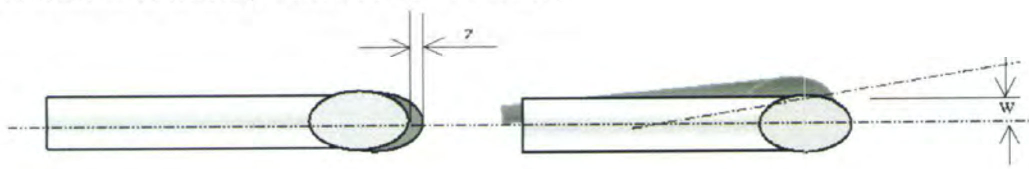
P_B – 0482



3. Both legs equal in length and centerline coincident (z < 0.125 inch; w < 0.031 inch)

z – Ø

w – Ø

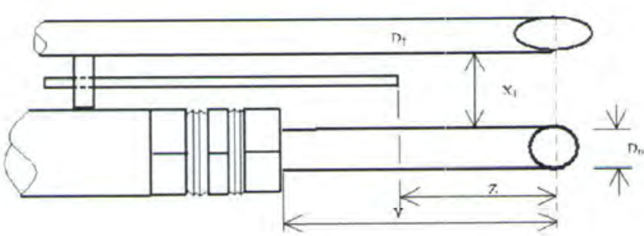


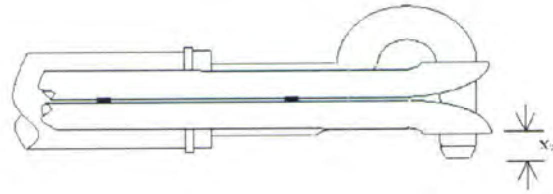
PITOT/PROBE CLEARANCE CHECK:

Nozzle ID: N/A Nozzle diameter: N/A Date N/A By N/A

II. Pitot/probe/nozzle assemblies have the same Cp as the isolated Pitot tube when the following conditions exist.

1. $D_t \geq 0.188$ and < 0.375 inch D_t – N/A
2. $X_1 \geq 0.75$ inch X_1 – N/A
3. $X_2 \geq 0$ inch X_2 – N/A
4. $Y \geq 3.0$ inch Y – N/A
5. $Z \geq 2.0$ inch Z – N/A





THERMOCOUPLE CALIBRATION

DATE/PLANT: 10-3-18 Westervelt Aliceville AL BY: OR

REFERENCE THERMOMETER: ~~omega CL3512A SN338~~ Omega CL3512A S/N 487

All thermocouple devices used are all originally calibrated against a NIST traceable voltage source by the manufacturer.

After or during each test series, the accuracy of each thermocouple system is checked at ambient or room temperature against an ASTM reference thermometer. Those temperatures are to agree within +/- 2° F. Thermocouple continuity and proper junction location is checked by subjecting the thermocouple to a change in temperature.

Field Thermocouple	Reference Temp. °F	T'couple Temp. °F	continuity/junction check
C82196 cond. temp	129	131	✓
120216027-26 stack	63	65	✓
120216043 NT3 meter in	82	80	✓
120216044 NT3 meter out	79	79	✓

DRY GAS METER CALIBRATION
By Critical Orifice

Meter ID	NT3 2962160	**Date**	10/04/18
Orifice ID	1312	**By**	GS
T, Amb	76	**Pbar**	29.90

Orifice			ΔH	VAC	Time	Meter						Vmstd	Vcrstd	Y	ΔH@
No.	K'	Q'	in.	in.	min.	Vi	Vf	Temp. in		Temp out					
		cfm	H_2O	Hg		ft^3	ft^3	init.	final	init.	final				
17	0.4391	0.58	1.10	21.0	9.00	521.927	527.327	82	82	81	81	5.261	5.139	0.977	1.839
23	0.6091	0.80	2.10	19.0	7.00	527.326	533.076	82	82	81	81	5.603	5.513	0.984	1.841
26	0.6905	0.92	2.65	18.0	6.00	533.076	538.678	82	83	81	81	5.456	5.434	0.996	1.755
														0.986	1.81

Calculations:

Vm = [Vf-Vi]

Vmstd = [(17.64)(Vm)(Pbar+ΔH/13.6)/Tm]

Vcrstd = K'[(Pbar)(θ)/(T,amb)]

Y = [(Vcrstd/Vmstd)]

Q = [(Vm/θ)(Tm out/Tm)(Y)]

K = [Q(√((Pm Mm)/((Tm out)(ΔH))]

ΔH@ = $[0.921/K^2]$

Where:

Pbar = Barometric pressure; in. Hg

Tm = Average Temp. at meter, ^oR

Pm = Meter pressure, (Pbar + ΔH/13.6); in. Hg

Mm = molecular weight of air (29)

Y = Meter correction factor; dimensionless

DRY GAS METER CALIBRATION
By Critical Orifice

Meter ID Nutech 3 2962160 **Date** 06/01/18

Orifice ID 1312 **By** Shelnutt

T, Amb 79 **Pbar** 29.80

Orifice			ΔH	VAC	Time	Meter						Vmstd	Vcrstd	Y	ΔH@
No.	K'	Q'	in.	in.	min.	Vi	Vf	Temp. in		Temp out					
		cfm	H_2O	Hg		ft^3	ft^3	init.	final	init.	final				
12	0.3169	0.42	0.50	22	13.00	696.128	701.538	79	77	80	79	5.281	5.327	1.009	1.625
17	0.4391	0.58	1.00	21	7.00	701.538	705.625	77	75	79	77	4.002	3.961	0.990	1.707
23	0.6091	0.80	2.15	18	7.00	705.625	711.240	75	75	77	77	5.509	5.464	0.992	1.927
26	0.6905	0.92	2.60	17	6.00	711.240	716.745	75	76	77	77	5.399	5.386	0.998	1.760
31	0.8293	1.10	3.75	15	5.00	716.745	722.227	76	76	77	76	5.376	5.366	0.998	1.772
														0.997	1.76

Calculations:

Vm = [Vf-Vi]

Vmstd = [(17.64)(Vm)(Pbar+ΔH/13.6)/Tm]

Vcrstd = K'[(Pbar)(θ)/(T,amb)]

Y = [(Vcrstd/Vmstd)]

Q = [(Vm/θ)(Tm out/Tm)(Y)]

K = [Q(sqrt((Pm Mm)/((Tm out)(ΔH))]

ΔH@ = [0.921/K^2]

Where:

Pbar = Barometric pressure; in. Hg

Tm = Average Temp. at meter, ^oR

Pm = Meter pressure, (Pbar + ΔH/13.6); in. Hg

Mm = molecular weight of air (29)

Y = Meter correction factor; dimensionless

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
630 United Drive
Durham, NC 27713
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI79E15A0030	Reference Number:	122-401151785-1B
Cylinder Number:	CC168917	Cylinder Volume:	156.9 CF
Laboratory:	124 - Durham (SAP) - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22018	Valve Outlet:	660
Gas Code:	CO2,SO2,BALN	Certification Date:	Apr 10, 2018

Expiration Date: Apr 10, 2026

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
SULFUR DIOXIDE	200.0 PPM	201.9 PPM	G1	+/- 0.7% NIST Traceable	04/03/2018, 04/10/2018
CARBON DIOXIDE	20.00 %	20.13 %	G1	+/- 0.6% NIST Traceable	04/03/2018
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	15060606	CC449754	248.1 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.6%	Dec 17, 2020
NTRM	13060621	CC413679	13.359 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	May 09, 2019

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801549 CO2	FTIR	Mar 29, 2018
Nicolet 6700 AHR0801549 SO2	FTIR	Mar 29, 2018

Triad Data Available Upon Request

Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
630 United Drive
Durham, NC 27713
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E02AI99E15A0484	Reference Number:	122-400969212-1
Cylinder Number:	CC103399	Cylinder Volume:	146.3 CF
Laboratory:	124 - Durham (SAP) - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22017	Valve Outlet:	590
Gas Code:	PPN,BALA	Certification Date:	Aug 08, 2017

Expiration Date: Aug 08, 2025

Certification performed in accordance with “EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)” document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
PROPANE	400.0 PPM	399.3 PPM	G1	+/- 0.9% NIST Traceable	08/08/2017
AIR	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	08061109	CC262318	249.1 PPM PROPANE/AIR	+/- 0.6%	Jun 22, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801333 C3H8	FTIR	Jul 26, 2017

Triad Data Available Upon Request

Signature on file

Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
630 United Drive
Durham, NC 27713
Airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI89E15A1597	Reference Number:	122-124526735-1
Cylinder Number:	XC025858B	Cylinder Volume:	145.3 CF
Laboratory:	124 - Durham (SAP) - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22015	Valve Outlet:	590
Gas Code:	O2,BALN	Certification Date:	Dec 04, 2015

Expiration Date: Dec 04, 2023

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
OXYGEN	10.50 %	10.55 %	G1	+/- 0.4% NIST Traceable	12/04/2015
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	09060211	CC262370	9.961 % OXYGEN/NITROGEN	+/- 0.3%	Nov 08, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba MPA510 O2 41499150042	Paramagnetic	Dec 02, 2015

Triad Data Available Upon Request

Signature on file
Approved for Release

APPENDIX C

ANALYZERS DATA LOG

RCO 2

	ppm C3H8
10/1/2018 17:13	-6.5
10/1/2018 17:14	-6.7
10/1/2018 17:15	-6.7
10/1/2018 17:16	-6.8
10/1/2018 17:17	-6.8
10/1/2018 17:18	-6.8
10/1/2018 17:19	-6.8
10/1/2018 17:20	-6.8
10/1/2018 17:21	-6.9
10/1/2018 17:22	-7.1
10/1/2018 17:23	-7.1
10/1/2018 17:24	-7.1
10/1/2018 17:25	-7.1
10/1/2018 17:26	-7.1
10/1/2018 17:27	-7.1
10/1/2018 17:28	170000000.0
10/1/2018 17:29	330000000.0
10/1/2018 17:30	83000000.0
10/1/2018 17:31	170000000.0
10/1/2018 17:32	20.6
10/1/2018 17:33	15.4
10/1/2018 17:34	9.8
10/1/2018 17:35	9.2
10/1/2018 17:36	7.1
10/1/2018 17:37	6.2
10/1/2018 17:38	4.1
10/1/2018 17:39	-1.4
10/1/2018 17:40	-5.6
10/1/2018 17:41	-8.9
10/1/2018 17:42	-5.7
10/1/2018 17:43	-10.2
10/1/2018 17:44	-8.5
10/1/2018 17:45	-11.6
10/1/2018 17:46	-10.8
10/1/2018 17:47	-9.9
10/1/2018 17:48	-12.0
10/1/2018 17:49	-13.0
10/1/2018 17:50	-8.2
10/1/2018 17:51	-9.0
10/1/2018 17:52	-11.4
10/1/2018 17:53	-8.8
10/1/2018 17:54	-12.4
10/1/2018 17:55	-13.6
10/1/2018 17:56	-12.4
10/1/2018 17:57	-10.4
10/1/2018 17:58	-13.1
10/1/2018 17:59	-23.9
10/1/2018 18:00	-10.9
10/1/2018 18:01	-10.5
10/1/2018 18:02	16.7
10/1/2018 18:03	-9.6

10/1/2018 18:04	-13.0
10/1/2018 18:05	-32.3
10/1/2018 18:06	-14.6
10/1/2018 18:07	-11.7
10/1/2018 18:08	-21.7
10/1/2018 18:09	-19.5
10/1/2018 18:10	-19.3
10/1/2018 18:11	-15.4
10/1/2018 18:12	-13.1
10/1/2018 18:13	-7.5
10/1/2018 18:14	-5.7
10/1/2018 18:15	-1.4
10/1/2018 18:16	2.8
10/1/2018 18:17	1.2
10/1/2018 18:18	1.1
10/1/2018 18:19	4.9
10/1/2018 18:20	4.4
10/1/2018 18:21	5.5
10/1/2018 18:22	5.4
10/1/2018 18:23	4.8
10/1/2018 18:24	6.8
10/1/2018 18:25	8.5
10/1/2018 18:26	6.3
10/1/2018 18:27	9.4
10/1/2018 18:28	10.0
10/1/2018 18:29	12.6
10/1/2018 18:30	11.5
10/1/2018 18:31	11.7
10/1/2018 18:32	83000000.0
10/1/2018 18:33	83000000.0
10/1/2018 18:34	13.5
10/1/2018 18:35	16.5
10/1/2018 18:36	15.8
10/1/2018 18:37	17.8
10/1/2018 18:38	6.4
10/1/2018 18:39	1.6
10/1/2018 18:40	83000000.0
10/1/2018 18:41	300000000.0
10/1/2018 18:42	500000000.0
10/1/2018 18:43	250000000.0
10/1/2018 18:44	500000000.0
10/1/2018 18:45	330000000.0
10/1/2018 18:46	370000000.0
10/1/2018 18:47	0.6
10/1/2018 18:48	-0.9
10/1/2018 18:49	-1.6
10/1/2018 18:50	-2.1
10/1/2018 18:51	-2.6
10/1/2018 18:52	-3.1
10/1/2018 18:53	-3.3
10/1/2018 18:54	-3.5
10/1/2018 18:55	-3.6
10/1/2018 18:56	-1.3
10/1/2018 18:57	3.4
10/1/2018 18:58	4.3
10/1/2018 18:59	1.6

10/1/2018 19:00	1.1
10/1/2018 19:01	1.3
10/1/2018 19:02	4.7
10/1/2018 19:03	1.3
10/1/2018 19:04	1.3
10/1/2018 19:05	4.8
10/1/2018 19:06	1.6
10/1/2018 19:07	1.3
10/1/2018 19:08	1.3
10/1/2018 19:09	4.8
10/1/2018 19:10	1.4
10/1/2018 19:11	1.4
10/1/2018 19:12	4.7
10/1/2018 19:13	1.7
10/1/2018 19:14	1.3
10/1/2018 19:15	1.4
10/1/2018 19:16	4.9
10/1/2018 19:17	1.4
10/1/2018 19:18	1.3
10/1/2018 19:19	5.0
10/1/2018 19:20	1.7
10/1/2018 19:21	1.3
10/1/2018 19:22	1.3
10/1/2018 19:23	5.0
10/1/2018 19:24	1.4
10/1/2018 19:25	1.3
10/1/2018 19:26	5.1
10/1/2018 19:27	1.8
10/1/2018 19:28	1.3
10/1/2018 19:29	1.4
10/1/2018 19:30	4.9
10/1/2018 19:31	1.5
10/1/2018 19:32	1.4
10/1/2018 19:33	5.1
10/1/2018 19:34	1.8
10/1/2018 19:35	1.3
10/1/2018 19:36	1.3
10/1/2018 19:37	4.2
10/1/2018 19:38	1.3
10/1/2018 19:39	1.3
10/1/2018 19:40	3.8
10/1/2018 19:41	1.5
10/1/2018 19:42	1.0
10/1/2018 19:43	1.0
10/1/2018 19:44	3.7
10/1/2018 19:45	1.2
10/1/2018 19:46	1.1
10/1/2018 19:47	3.9
10/1/2018 19:48	1.5
10/1/2018 19:49	1.0
10/1/2018 19:50	1.0
10/1/2018 19:51	3.7
10/1/2018 19:52	1.1
10/1/2018 19:53	1.1
10/1/2018 19:54	3.7
10/1/2018 19:55	1.3

10/1/2018 19:56	1.0
10/1/2018 19:57	1.0
10/1/2018 19:58	3.6
10/1/2018 19:59	1.0
10/1/2018 20:00	0.9
	ppm C3H8
10/2/2018 6:18	-0.7
10/2/2018 6:19	-0.4
10/2/2018 6:20	-0.4
10/2/2018 6:21	1.1
10/2/2018 6:22	-0.4
10/2/2018 6:23	-0.4
10/2/2018 6:24	-0.4
10/2/2018 6:25	-0.4
10/2/2018 6:26	-0.3
10/2/2018 6:27	-0.2
10/2/2018 6:28	-0.1
10/2/2018 6:29	31.1
10/2/2018 6:30	40.4
10/2/2018 6:31	40.2
10/2/2018 6:32	40.1
10/2/2018 6:33	40.1
10/2/2018 6:34	48.2
10/2/2018 6:35	63.9
10/2/2018 6:36	63.9
10/2/2018 6:37	35.3
10/2/2018 6:38	25.0
10/2/2018 6:39	24.4
10/2/2018 6:40	23.9
10/2/2018 6:41	6.2
10/2/2018 6:42	0.6
10/2/2018 6:43	0.3
10/2/2018 6:44	0.2
10/2/2018 6:45	0.1
10/2/2018 6:46	0.0
10/2/2018 6:47	0.2
10/2/2018 6:48	0.8
10/2/2018 6:49	-1.2
10/2/2018 6:50	-1.3
10/2/2018 6:51	-0.2
10/2/2018 6:52	0.0
10/2/2018 6:53	0.0
10/2/2018 6:54	0.0
10/2/2018 6:55	-0.1
10/2/2018 6:56	-0.1
10/2/2018 6:57	-0.1
10/2/2018 6:58	1.5
10/2/2018 6:59	22.8
10/2/2018 7:00	23.6
10/2/2018 7:01	17.5
10/2/2018 7:02	0.1
10/2/2018 7:03	-0.1
10/2/2018 7:04	-0.1
10/2/2018 7:05	-0.2
10/2/2018 7:06	-0.2
10/2/2018 7:07	-0.1

10/2/2018 7:08	-0.1
10/2/2018 7:09	-0.2
10/2/2018 7:10	-0.2
10/2/2018 7:11	-0.2
10/2/2018 7:12	-0.2
10/2/2018 7:13	11.7
10/2/2018 7:14	5.4
10/2/2018 7:15	4.7
10/2/2018 7:16	5.4
10/2/2018 7:17	12.0
10/2/2018 7:18	4.0
10/2/2018 7:19	4.3
10/2/2018 7:20	13.0
10/2/2018 7:21	5.0
10/2/2018 7:22	3.9
10/2/2018 7:23	4.8
10/2/2018 7:24	12.6
10/2/2018 7:25	4.2
10/2/2018 7:26	4.4
10/2/2018 7:27	13.5
10/2/2018 7:28	5.3
10/2/2018 7:29	4.1
10/2/2018 7:30	4.7
10/2/2018 7:31	12.2
10/2/2018 7:32	4.2
10/2/2018 7:33	4.4
10/2/2018 7:34	13.7
10/2/2018 7:35	5.5
10/2/2018 7:36	4.8
10/2/2018 7:37	5.4
10/2/2018 7:38	13.8
10/2/2018 7:39	4.9
10/2/2018 7:40	5.1
10/2/2018 7:41	14.6
10/2/2018 7:42	6.3
10/2/2018 7:43	5.1
10/2/2018 7:44	5.8
10/2/2018 7:45	14.9
10/2/2018 7:46	5.3
10/2/2018 7:47	5.5
10/2/2018 7:48	16.2
10/2/2018 7:49	6.8
10/2/2018 7:50	5.5
10/2/2018 7:51	5.8
10/2/2018 7:52	13.8
10/2/2018 7:53	4.8
10/2/2018 7:54	4.9
10/2/2018 7:55	13.6
10/2/2018 7:56	6.0
10/2/2018 7:57	4.8
10/2/2018 7:58	5.3
10/2/2018 7:59	13.3
10/2/2018 8:00	4.9
10/2/2018 8:01	4.9
10/2/2018 8:02	14.0
10/2/2018 8:03	6.0

10/2/2018 8:04	5.2
10/2/2018 8:05	5.5
10/2/2018 8:06	13.6
10/2/2018 8:07	5.1
10/2/2018 8:08	5.0
10/2/2018 8:09	14.1
10/2/2018 8:10	6.2
10/2/2018 8:11	4.7
10/2/2018 8:12	4.9
10/2/2018 8:13	13.4
10/2/2018 8:14	5.5
10/2/2018 8:15	4.9
10/2/2018 8:16	14.5
10/2/2018 8:17	6.1
10/2/2018 8:18	4.9
10/2/2018 8:19	4.8
10/2/2018 8:20	11.7
10/2/2018 8:21	4.3
10/2/2018 8:22	4.2
10/2/2018 8:23	11.6
10/2/2018 8:24	5.2
10/2/2018 8:25	4.3
10/2/2018 8:26	4.6
10/2/2018 8:27	11.8
10/2/2018 8:28	4.4
10/2/2018 8:29	4.6
10/2/2018 8:30	14.0
10/2/2018 8:31	6.1
10/2/2018 8:32	5.0
10/2/2018 8:33	5.4
10/2/2018 8:34	13.9
10/2/2018 8:35	5.1
10/2/2018 8:36	5.1
10/2/2018 8:37	14.5
10/2/2018 8:38	6.4
10/2/2018 8:39	5.2
10/2/2018 8:40	5.5
10/2/2018 8:41	13.8
10/2/2018 8:42	5.1
10/2/2018 8:43	5.1
10/2/2018 8:44	14.2
10/2/2018 8:45	6.0
10/2/2018 8:46	4.7
10/2/2018 8:47	5.7
10/2/2018 8:48	14.2
10/2/2018 8:49	5.3
10/2/2018 8:50	5.5
10/2/2018 8:51	16.0
10/2/2018 8:52	6.7
10/2/2018 8:53	5.8
10/2/2018 8:54	6.7
10/2/2018 8:55	16.5
10/2/2018 8:56	6.0
10/2/2018 8:57	6.0
10/2/2018 8:58	16.7
10/2/2018 8:59	7.3

10/2/2018 9:00	6.0
10/2/2018 9:01	6.4
10/2/2018 9:02	15.9
10/2/2018 9:03	5.9
10/2/2018 9:04	5.9
10/2/2018 9:05	16.6
10/2/2018 9:06	7.4
10/2/2018 9:07	6.0
10/2/2018 9:08	6.3
10/2/2018 9:09	15.5
10/2/2018 9:10	6.0
10/2/2018 9:11	6.0
10/2/2018 9:12	3.4
10/2/2018 9:13	-0.1
10/2/2018 9:14	21.1
10/2/2018 9:15	23.5
10/2/2018 9:16	23.6
10/2/2018 9:17	23.4
10/2/2018 9:18	24.0
10/2/2018 9:19	27.2
10/2/2018 9:20	8.3
10/2/2018 9:21	5.0

Run 1	ppm C3H8
10/2/2018 9:22	5.5
10/2/2018 9:23	15.4
10/2/2018 9:24	5.6
10/2/2018 9:25	5.7
10/2/2018 9:26	16.2
10/2/2018 9:27	6.3
10/2/2018 9:28	4.9
10/2/2018 9:29	5.6
10/2/2018 9:30	15.8
10/2/2018 9:31	5.6
10/2/2018 9:32	5.4
10/2/2018 9:33	16.3
10/2/2018 9:34	6.8
10/2/2018 9:35	5.5
10/2/2018 9:36	5.6
10/2/2018 9:37	15.9
10/2/2018 9:38	5.5
10/2/2018 9:39	5.3
10/2/2018 9:40	15.8
10/2/2018 9:41	6.3
10/2/2018 9:42	5.3
10/2/2018 9:43	5.5
10/2/2018 9:44	15.1
10/2/2018 9:45	5.0
10/2/2018 9:46	4.9
10/2/2018 9:47	15.5
10/2/2018 9:48	6.5
10/2/2018 9:49	5.3
10/2/2018 9:50	5.3
10/2/2018 9:51	15.1
10/2/2018 9:52	5.3

10/2/2018 9:53	4.9	Plant
10/2/2018 9:54	12.5	Down
10/2/2018 9:55	5.5	
10/2/2018 9:56	4.5	
10/2/2018 9:57	4.4	
10/2/2018 9:58	11.5	
10/2/2018 9:59	4.3	
10/2/2018 10:00	3.9	
10/2/2018 10:01	11.0	
10/2/2018 10:02	4.5	
10/2/2018 10:03	3.5	
10/2/2018 10:04	3.5	
10/2/2018 10:05	11.1	
10/2/2018 10:06	4.1	
10/2/2018 10:07	3.8	
10/2/2018 10:08	11.8	
10/2/2018 10:09	4.7	
10/2/2018 10:10	3.7	
10/2/2018 10:11	4.2	
10/2/2018 10:12	11.7	
10/2/2018 10:13	4.0	
10/2/2018 10:14	3.9	
10/2/2018 10:15	12.5	
10/2/2018 10:16	4.8	
10/2/2018 10:17	3.8	
10/2/2018 10:18	4.5	
10/2/2018 10:19	12.5	
10/2/2018 10:20	4.2	
10/2/2018 10:21	4.0	
10/2/2018 10:22	12.6	
10/2/2018 10:23	5.0	
10/2/2018 10:24	4.0	
10/2/2018 10:25	4.6	
10/2/2018 10:26	12.4	
10/2/2018 10:27	4.2	
10/2/2018 10:28	3.9	
10/2/2018 10:29	12.0	
10/2/2018 10:30	4.8	
10/2/2018 10:31	3.7	
10/2/2018 10:32	4.1	
10/2/2018 10:33	11.9	
10/2/2018 10:34	4.0	
10/2/2018 10:35	3.9	
10/2/2018 10:36	12.7	
10/2/2018 10:37	4.8	
10/2/2018 10:38	3.8	
10/2/2018 10:39	4.4	
10/2/2018 10:40	12.1	
10/2/2018 10:41	4.2	
10/2/2018 10:42	4.0	
10/2/2018 10:43	11.8	
10/2/2018 10:44	4.7	
10/2/2018 10:45	3.8	
10/2/2018 10:46	4.2	

10/2/2018 10:47	11.7
10/2/2018 10:48	3.7
10/2/2018 10:49	3.6
10/2/2018 10:50	11.4
10/2/2018 10:51	4.7
10/2/2018 10:52	3.9
10/2/2018 10:53	4.0
10/2/2018 10:54	11.6
10/2/2018 10:55	4.2
10/2/2018 10:56	4.0
10/2/2018 10:57	4.0
10/2/2018 10:58	1.3
10/2/2018 10:59	0.9
10/2/2018 11:00	0.7
10/2/2018 11:01	3.2
10/2/2018 11:02	1.0
10/2/2018 11:03	0.6
10/2/2018 11:04	1.8
10/2/2018 11:05	1.4
10/2/2018 11:06	1.9
10/2/2018 11:07	1.9
10/2/2018 11:08	0.6
10/2/2018 11:09	0.2
10/2/2018 11:10	0.1
10/2/2018 11:11	0.3
10/2/2018 11:12	0.4
10/2/2018 11:13	0.0
10/2/2018 11:14	0.0
10/2/2018 11:15	0.4
10/2/2018 11:16	0.0
10/2/2018 11:17	0.0
10/2/2018 11:18	0.3
10/2/2018 11:19	0.2
10/2/2018 11:20	-0.1
10/2/2018 11:21	-0.1
10/2/2018 11:22	1.2
10/2/2018 11:23	4.7
10/2/2018 11:24	2.1
10/2/2018 11:25	0.1
10/2/2018 11:26	0.4
10/2/2018 11:27	0.8
10/2/2018 11:28	2.3
10/2/2018 11:29	1.5
10/2/2018 11:30	0.5
10/2/2018 11:31	0.5
10/2/2018 11:32	2.8
10/2/2018 11:33	1.8
10/2/2018 11:34	0.9
10/2/2018 11:35	1.4
10/2/2018 11:36	7.1
10/2/2018 11:37	2.1
10/2/2018 11:38	2.2
10/2/2018 11:39	4.2
10/2/2018 11:40	1.5

10/2/2018 11:41	0.6
10/2/2018 11:42	0.4
10/2/2018 11:43	2.9
10/2/2018 11:44	0.6
10/2/2018 11:45	2.0
10/2/2018 11:46	1.1
10/2/2018 11:47	2.0
10/2/2018 11:48	2.7
10/2/2018 11:49	3.3
10/2/2018 11:50	12.7
10/2/2018 11:51	3.5
10/2/2018 11:52	3.1
10/2/2018 11:53	12.6
10/2/2018 11:54	4.7
10/2/2018 11:55	3.8
10/2/2018 11:56	3.7
10/2/2018 11:57	13.7
10/2/2018 11:58	4.0
10/2/2018 11:59	3.8
10/2/2018 12:00	13.8
10/2/2018 12:01	5.3
10/2/2018 12:02	4.2
10/2/2018 12:03	4.4
10/2/2018 12:04	14.1
10/2/2018 12:05	4.6
10/2/2018 12:06	4.3
10/2/2018 12:07	14.3
10/2/2018 12:08	5.7
10/2/2018 12:09	4.7
10/2/2018 12:10	4.7
10/2/2018 12:11	14.8
10/2/2018 12:12	4.8
10/2/2018 12:13	4.3
10/2/2018 12:14	14.2
10/2/2018 12:15	5.9
10/2/2018 12:16	4.8
10/2/2018 12:17	4.8
10/2/2018 12:18	14.4
10/2/2018 12:19	4.9
10/2/2018 12:20	4.5
10/2/2018 12:21	14.1
10/2/2018 12:22	5.8
10/2/2018 12:23	4.6
10/2/2018 12:24	4.7
10/2/2018 12:25	14.1
10/2/2018 12:26	4.8
10/2/2018 12:27	4.5
10/2/2018 12:28	14.2
10/2/2018 12:29	5.8
10/2/2018 12:30	4.7
10/2/2018 12:31	4.9
10/2/2018 12:32	14.6
10/2/2018 12:33	5.0
10/2/2018 12:34	4.6

10/2/2018 12:35	14.5
Avg Run 1	8.0
10/2/2018 12:36	5.7
10/2/2018 12:37	0.1
10/2/2018 12:38	-0.3
10/2/2018 12:39	5.2
10/2/2018 12:40	22.0
10/2/2018 12:41	23.6
10/2/2018 12:42	22.5
10/2/2018 12:43	21.6
10/2/2018 12:44	4.0
10/2/2018 12:45	4.6
10/2/2018 12:46	14.5

Run 2	ppm C3H8
10/2/2018 12:47	4.8
10/2/2018 12:48	4.5
10/2/2018 12:49	14.6
10/2/2018 12:50	5.8
10/2/2018 12:51	4.7
10/2/2018 12:52	4.9
10/2/2018 12:53	14.6
10/2/2018 12:54	5.0
10/2/2018 12:55	4.6
10/2/2018 12:56	14.0
10/2/2018 12:57	5.9
10/2/2018 12:58	4.7
10/2/2018 12:59	4.7
10/2/2018 13:00	14.3
10/2/2018 13:01	4.7
10/2/2018 13:02	4.4
10/2/2018 13:03	14.4
10/2/2018 13:04	5.8
10/2/2018 13:05	4.7
10/2/2018 13:06	4.7
10/2/2018 13:07	13.8
10/2/2018 13:08	4.8
10/2/2018 13:09	4.6
10/2/2018 13:10	14.6
10/2/2018 13:11	6.0
10/2/2018 13:12	4.7
10/2/2018 13:13	4.9
10/2/2018 13:14	14.6
10/2/2018 13:15	4.9
10/2/2018 13:16	4.6
10/2/2018 13:17	14.4
10/2/2018 13:18	6.0
10/2/2018 13:19	4.9
10/2/2018 13:20	4.9
10/2/2018 13:21	14.9
10/2/2018 13:22	5.0
10/2/2018 13:23	4.7
10/2/2018 13:24	14.8
10/2/2018 13:25	6.0
10/2/2018 13:26	4.7

10/2/2018 13:27	4.7
10/2/2018 13:28	14.5
10/2/2018 13:29	4.7
10/2/2018 13:30	4.5
10/2/2018 13:31	14.0
10/2/2018 13:32	5.9
10/2/2018 13:33	4.6
10/2/2018 13:34	4.8
10/2/2018 13:35	14.5
10/2/2018 13:36	4.9
10/2/2018 13:37	4.6
10/2/2018 13:38	14.1
10/2/2018 13:39	5.9
10/2/2018 13:40	4.8
10/2/2018 13:41	4.9
10/2/2018 13:42	14.2
10/2/2018 13:43	4.8
10/2/2018 13:44	4.5
10/2/2018 13:45	14.5
10/2/2018 13:46	6.1
Avg Run 2	7.7
10/2/2018 13:47	5.3
10/2/2018 13:48	0.0
10/2/2018 13:49	-0.3
10/2/2018 13:50	19.7
10/2/2018 13:51	23.5
10/2/2018 13:52	23.4
10/2/2018 13:53	7.9
10/2/2018 13:54	4.5

Run 3	ppm C3H8
10/2/2018 13:55	4.7
10/2/2018 13:56	14.1
10/2/2018 13:57	4.7
10/2/2018 13:58	4.4
10/2/2018 13:59	9.3
10/2/2018 14:00	3.3
10/2/2018 14:01	1.9
10/2/2018 14:02	1.2
10/2/2018 14:03	1.7
10/2/2018 14:04	4.3
10/2/2018 14:05	4.3
10/2/2018 14:06	4.2
10/2/2018 14:07	1.1
10/2/2018 14:08	0.4
10/2/2018 14:09	3.8
10/2/2018 14:10	0.5
10/2/2018 14:11	0.5
10/2/2018 14:12	0.8
10/2/2018 14:13	3.2
10/2/2018 14:14	0.2
10/2/2018 14:15	0.1
10/2/2018 14:16	2.0
10/2/2018 14:17	1.0
10/2/2018 14:18	1.6

10/2/2018 14:19	9.5
10/2/2018 14:20	6.0
10/2/2018 14:21	3.9
10/2/2018 14:22	4.6
10/2/2018 14:23	15.1
10/2/2018 14:24	5.4
10/2/2018 14:25	3.4
10/2/2018 14:26	9.8
10/2/2018 14:27	5.8
10/2/2018 14:28	3.7
10/2/2018 14:29	4.2
10/2/2018 14:30	14.1
10/2/2018 14:31	5.2
10/2/2018 14:32	4.0
10/2/2018 14:33	10.1
10/2/2018 14:34	5.5
10/2/2018 14:35	3.7
10/2/2018 14:36	4.1
10/2/2018 14:37	13.7
10/2/2018 14:38	4.0
10/2/2018 14:39	3.7
10/2/2018 14:40	9.9
10/2/2018 14:41	5.6
10/2/2018 14:42	3.7
10/2/2018 14:43	4.1
10/2/2018 14:44	14.6
10/2/2018 14:45	4.3
10/2/2018 14:46	4.0
10/2/2018 14:47	10.3
10/2/2018 14:48	5.9
10/2/2018 14:49	3.9
10/2/2018 14:50	4.3
10/2/2018 14:51	14.8
10/2/2018 14:52	4.5
10/2/2018 14:53	4.2
10/2/2018 14:54	10.8
10/2/2018 14:55	6.3
10/2/2018 14:56	4.1
10/2/2018 14:57	4.3
10/2/2018 14:58	15.2
10/2/2018 14:59	4.6
10/2/2018 15:00	4.2
10/2/2018 15:01	10.9
10/2/2018 15:02	6.1
10/2/2018 15:03	4.2
10/2/2018 15:04	4.5
10/2/2018 15:05	15.4
10/2/2018 15:06	5.1
10/2/2018 15:07	4.4
10/2/2018 15:08	11.4
10/2/2018 15:09	6.4
10/2/2018 15:10	4.3
10/2/2018 15:11	4.6
10/2/2018 15:12	15.5

10/2/2018 15:13	5.2
10/2/2018 15:14	4.6
10/2/2018 15:15	11.6
10/2/2018 15:16	6.6
10/2/2018 15:17	4.4
10/2/2018 15:18	4.7
10/2/2018 15:19	15.8
10/2/2018 15:20	5.4
10/2/2018 15:21	4.6
10/2/2018 15:22	11.5
10/2/2018 15:23	6.6
10/2/2018 15:24	4.5
10/2/2018 15:25	4.6
10/2/2018 15:26	16.0
10/2/2018 15:27	5.2
10/2/2018 15:28	4.4
10/2/2018 15:29	11.8
10/2/2018 15:30	6.4
10/2/2018 15:31	4.2
10/2/2018 15:32	4.5
10/2/2018 15:33	15.6
10/2/2018 15:34	5.1
10/2/2018 15:35	4.4
10/2/2018 15:36	12.0
10/2/2018 15:37	6.7
10/2/2018 15:38	4.5
10/2/2018 15:39	4.8
10/2/2018 15:40	15.7
10/2/2018 15:41	5.4
10/2/2018 15:42	4.7
10/2/2018 15:43	11.8
10/2/2018 15:44	6.7
10/2/2018 15:45	4.5
10/2/2018 15:46	4.8
10/2/2018 15:47	15.5
10/2/2018 15:48	5.4
10/2/2018 15:49	4.7
10/2/2018 15:50	11.9
10/2/2018 15:51	6.8
10/2/2018 15:52	10.8
Avg Run 3	7.6
10/2/2018 15:53	23.4
10/2/2018 15:54	23.7
10/2/2018 15:55	23.8
10/2/2018 15:56	10.4
10/2/2018 15:57	-0.4
10/2/2018 15:58	-0.3
10/2/2018 15:59	0.3
10/2/2018 16:00	1.5
10/2/2018 16:01	-0.3
10/2/2018 16:02	-0.4
10/2/2018 16:03	-0.4
10/2/2018 16:04	-0.4

Baghouse	BH1	ppm C3H8
10/3/2018	6:34	-1.3
10/3/2018	6:35	0.0
10/3/2018	6:36	-0.1
10/3/2018	6:37	-0.1
10/3/2018	6:38	-0.2
10/3/2018	6:39	-0.2
10/3/2018	6:40	-0.1
10/3/2018	6:41	0.1
10/3/2018	6:42	0.3
10/3/2018	6:43	0.1
10/3/2018	6:44	85.0
10/3/2018	6:45	93.7
10/3/2018	6:46	98.6
10/3/2018	6:47	99.3
10/3/2018	6:48	99.5
10/3/2018	6:49	97.1
10/3/2018	6:50	153.8
10/3/2018	6:51	161.6
10/3/2018	6:52	108.5
10/3/2018	6:53	59.3
10/3/2018	6:54	58.8
10/3/2018	6:55	58.5
10/3/2018	6:56	58.4
10/3/2018	6:57	59.2
10/3/2018	6:58	59.1
10/3/2018	6:59	59.1
10/3/2018	7:00	58.9
10/3/2018	7:01	35.7
10/3/2018	7:02	0.9
10/3/2018	7:03	0.7
10/3/2018	7:04	0.6
10/3/2018	7:05	0.5
10/3/2018	7:06	0.4
10/3/2018	7:07	0.3
10/3/2018	7:08	0.2
10/3/2018	7:09	0.2
10/3/2018	7:10	0.1
10/3/2018	7:11	0.1
10/3/2018	7:12	0.1
10/3/2018	7:13	0.2

10/3/2018 7:14	0.1
10/3/2018 7:15	0.2
10/3/2018 7:16	0.1
10/3/2018 7:17	0.1
10/3/2018 7:18	1.7
10/3/2018 7:19	70.6
10/3/2018 7:20	82.7
10/3/2018 7:21	86.0
10/3/2018 7:22	82.8
10/3/2018 7:23	81.9
10/3/2018 7:24	80.9
10/3/2018 7:25	81.7
10/3/2018 7:26	80.6
10/3/2018 7:27	79.8
10/3/2018 7:28	79.2
10/3/2018 7:29	78.5
10/3/2018 7:30	75.4
10/3/2018 7:31	71.6
10/3/2018 7:32	71.6
10/3/2018 7:33	73.5
10/3/2018 7:34	72.9
10/3/2018 7:35	73.1
10/3/2018 7:36	74.4
10/3/2018 7:37	75.7
10/3/2018 7:38	74.5
10/3/2018 7:39	75.2
10/3/2018 7:40	75.2
10/3/2018 7:41	75.9
10/3/2018 7:42	76.7
10/3/2018 7:43	74.8
10/3/2018 7:44	73.0
10/3/2018 7:45	76.3
10/3/2018 7:46	79.4

Run 1	**ppm C3H8**
10/3/2018 7:47	76.4
10/3/2018 7:48	74.8
10/3/2018 7:49	75.5
10/3/2018 7:50	77.3
10/3/2018 7:51	75.7
10/3/2018 7:52	74.4
10/3/2018 7:53	73.4
10/3/2018 7:54	75.6
10/3/2018 7:55	77.2
10/3/2018 7:56	80.3
10/3/2018 7:57	84.7
10/3/2018 7:58	83.6
10/3/2018 7:59	79.5
10/3/2018 8:00	79.2
10/3/2018 8:01	78.7

10/3/2018 8:02	79.3	
10/3/2018 8:03	79.0	
10/3/2018 8:04	80.7	
10/3/2018 8:05	79.9	
10/3/2018 8:06	78.1	
10/3/2018 8:07	78.2	
10/3/2018 8:08	76.4	
10/3/2018 8:09	76.7	
10/3/2018 8:10	76.2	
10/3/2018 8:11	74.2	
10/3/2018 8:12	75.7	
10/3/2018 8:13	77.6	
10/3/2018 8:14	80.3	
10/3/2018 8:15	80.8	
10/3/2018 8:16	80.3	
10/3/2018 8:17	76.9	
10/3/2018 8:18	77.0	
10/3/2018 8:19	78.4	
10/3/2018 8:20	76.0	
10/3/2018 8:21	73.7	
10/3/2018 8:22	71.8	
10/3/2018 8:23	72.2	down
10/3/2018 8:24	73.0	
10/3/2018 8:25	72.0	
10/3/2018 8:26	72.8	
10/3/2018 8:27	74.0	
10/3/2018 8:28	75.8	
10/3/2018 8:29	76.0	
10/3/2018 8:30	73.5	
10/3/2018 8:31	71.3	
10/3/2018 8:32	70.7	
10/3/2018 8:33	70.5	
10/3/2018 8:34	68.5	
10/3/2018 8:35	68.2	
10/3/2018 8:36	65.7	
10/3/2018 8:37	62.7	
10/3/2018 8:38	61.6	
10/3/2018 8:39	60.1	
10/3/2018 8:40	59.6	
10/3/2018 8:41	58.8	
10/3/2018 8:42	58.2	
10/3/2018 8:43	59.9	
10/3/2018 8:44	58.4	
10/3/2018 8:45	58.6	
10/3/2018 8:46	60.7	
10/3/2018 8:47	61.4	
10/3/2018 8:48	61.2	
10/3/2018 8:49	63.5	

10/3/2018 8:50	64.4
10/3/2018 8:51	64.8
10/3/2018 8:52	66.1
10/3/2018 8:53	67.3
10/3/2018 8:54	68.2
10/3/2018 8:55	68.5
10/3/2018 8:56	70.8
10/3/2018 8:57	71.1
10/3/2018 8:58	71.9
10/3/2018 8:59	72.4
10/3/2018 9:00	72.1
10/3/2018 9:01	73.5
10/3/2018 9:02	73.7
10/3/2018 9:03	73.7
10/3/2018 9:04	73.3
10/3/2018 9:05	73.5
10/3/2018 9:06	75.9
10/3/2018 9:07	77.0
10/3/2018 9:08	77.1
10/3/2018 9:09	75.7
10/3/2018 9:10	75.4
10/3/2018 9:11	75.7
10/3/2018 9:12	76.0
10/3/2018 9:13	76.0
10/3/2018 9:14	75.9
10/3/2018 9:15	75.5
10/3/2018 9:16	75.5
10/3/2018 9:17	76.0
10/3/2018 9:18	76.7
10/3/2018 9:19	75.2
10/3/2018 9:20	75.1
10/3/2018 9:21	74.1
10/3/2018 9:22	73.3
10/3/2018 9:23	75.4
10/3/2018 9:24	76.0
10/3/2018 9:25	76.1
10/3/2018 9:26	77.1
10/3/2018 9:27	78.2
10/3/2018 9:28	79.7
10/3/2018 9:29	81.6
10/3/2018 9:30	82.6
10/3/2018 9:31	82.8
10/3/2018 9:32	84.2
10/3/2018 9:33	84.9
10/3/2018 9:34	84.1
10/3/2018 9:35	85.2
10/3/2018 9:36	84.9
10/3/2018 9:37	83.3

10/3/2018 9:38	83.0
10/3/2018 9:39	82.5
10/3/2018 9:40	82.6
10/3/2018 9:41	84.4
10/3/2018 9:42	83.7
10/3/2018 9:43	85.0
10/3/2018 9:44	85.2
10/3/2018 9:45	85.3
10/3/2018 9:46	86.3
10/3/2018 9:47	86.2
10/3/2018 9:48	86.0
10/3/2018 9:49	88.4
10/3/2018 9:50	87.5
10/3/2018 9:51	87.9
10/3/2018 9:52	62.2
AVG Run 1	**80.1**
10/3/2018 9:53	0.8
10/3/2018 9:54	0.5
10/3/2018 9:55	44.6
10/3/2018 9:56	99.1
10/3/2018 9:57	96.1
10/3/2018 9:58	85.1
10/3/2018 9:59	91.1

Run 2	**ppm C3H8**
10/3/2018 10:00	91.1
10/3/2018 10:01	94.7
10/3/2018 10:02	94.6
10/3/2018 10:03	94.2
10/3/2018 10:04	95.4
10/3/2018 10:05	96.3
10/3/2018 10:06	98.9
10/3/2018 10:07	95.7
10/3/2018 10:08	96.9
10/3/2018 10:09	96.2
10/3/2018 10:10	95.9
10/3/2018 10:11	94.2
10/3/2018 10:12	97.8
10/3/2018 10:13	95.2
10/3/2018 10:14	94.1
10/3/2018 10:15	93.7
10/3/2018 10:16	93.0
10/3/2018 10:17	91.0
10/3/2018 10:18	90.1
10/3/2018 10:19	90.2
10/3/2018 10:20	91.3
10/3/2018 10:21	90.9
10/3/2018 10:22	90.5
10/3/2018 10:23	89.4

10/3/2018 10:24	89.0
10/3/2018 10:25	89.4
10/3/2018 10:26	90.4
10/3/2018 10:27	89.2
10/3/2018 10:28	87.9
10/3/2018 10:29	90.2
10/3/2018 10:30	88.7
10/3/2018 10:31	90.3
10/3/2018 10:32	92.1
10/3/2018 10:33	90.7
10/3/2018 10:34	89.1
10/3/2018 10:35	92.2
10/3/2018 10:36	91.1
10/3/2018 10:37	90.6
10/3/2018 10:38	91.3
10/3/2018 10:39	93.0
10/3/2018 10:40	92.5
10/3/2018 10:41	91.0
10/3/2018 10:42	88.7
10/3/2018 10:43	89.2
10/3/2018 10:44	90.4
10/3/2018 10:45	92.7
10/3/2018 10:46	96.3
10/3/2018 10:47	98.1
10/3/2018 10:48	98.7
10/3/2018 10:49	95.9
10/3/2018 10:50	97.6
10/3/2018 10:51	99.7
10/3/2018 10:52	102.3
10/3/2018 10:53	101.5
10/3/2018 10:54	101.4
10/3/2018 10:55	100.5
10/3/2018 10:56	103.3
10/3/2018 10:57	103.3
10/3/2018 10:58	105.2
10/3/2018 10:59	102.0
AVG Run 2	**94.1**
10/3/2018 11:00	102.7
10/3/2018 11:01	49.3
10/3/2018 11:02	0.8
10/3/2018 11:03	29.7
10/3/2018 11:04	32.7
10/3/2018 11:05	94.7
10/3/2018 11:06	99.9
10/3/2018 11:07	94.0
10/3/2018 11:08	111.8
Run 3	**ppm C3H8**
10/3/2018 11:09	109.7

10/3/2018 11:10	110.5
10/3/2018 11:11	109.3
10/3/2018 11:12	110.6
10/3/2018 11:13	110.8
10/3/2018 11:14	117.3
10/3/2018 11:15	115.7
10/3/2018 11:16	109.9
10/3/2018 11:17	109.7
10/3/2018 11:18	116.0
10/3/2018 11:19	115.1
10/3/2018 11:20	112.7
10/3/2018 11:21	109.5
10/3/2018 11:22	108.4
10/3/2018 11:23	110.5
10/3/2018 11:24	110.7
10/3/2018 11:25	111.9
10/3/2018 11:26	105.0
10/3/2018 11:27	104.4
10/3/2018 11:28	107.7
10/3/2018 11:29	107.0
10/3/2018 11:30	108.2
10/3/2018 11:31	108.3
10/3/2018 11:32	111.2
10/3/2018 11:33	108.0
10/3/2018 11:34	110.5
10/3/2018 11:35	110.2
10/3/2018 11:36	109.9
10/3/2018 11:37	111.9
10/3/2018 11:38	112.1
10/3/2018 11:39	111.4
10/3/2018 11:40	111.8
10/3/2018 11:41	113.1
10/3/2018 11:42	111.8
10/3/2018 11:43	112.9
10/3/2018 11:44	113.7
10/3/2018 11:45	111.7
10/3/2018 11:46	109.4
10/3/2018 11:47	109.0
10/3/2018 11:48	109.3
10/3/2018 11:49	108.6
10/3/2018 11:50	107.3
10/3/2018 11:51	110.5
10/3/2018 11:52	111.6
10/3/2018 11:53	108.9
10/3/2018 11:54	110.3
10/3/2018 11:55	111.3
10/3/2018 11:56	110.9
10/3/2018 11:57	114.3

10/3/2018 11:58	113.1
10/3/2018 11:59	110.6
10/3/2018 12:00	111.7
10/3/2018 12:01	112.6
10/3/2018 12:02	110.5
10/3/2018 12:03	113.2
10/3/2018 12:04	110.8
10/3/2018 12:05	108.6
10/3/2018 12:06	106.6
10/3/2018 12:07	107.4
10/3/2018 12:08	110.6
AVG Run 3	**110.6**
10/3/2018 12:09	8.0
10/3/2018 12:10	1.2
10/3/2018 12:11	18.7
10/3/2018 12:12	109.7
10/3/2018 12:13	95.6
10/3/2018 12:14	99.3
10/3/2018 12:15	97.9
10/3/2018 12:16	13.1
10/3/2018 12:17	1.3
10/3/2018 12:18	0.0

THIS IS THE LAST PAGE

OF THIS REPORT

Georgia Department of Natural Resources
Environmental Protection Division • Air Protection Branch
4244 International Parkway • Suite 120 • Atlanta • Georgia 30354
404/363-7000 • Fax: 404/363-7100
Judson H. Turner, Director

GAEPD RECOMMENDED EMISSION FACTORS FOR WOOD PELLET MANUFACTURING

Emission Source	Uncontrolled Emission Factor	Basis of Emission factor	Control Device
Rotary Dryer Direct wood fired processing green softwood	6.0 lb/ODT for VOC	AP-42 Table 10.6.2-3 SCC 3-07-006-25 (Adjusted)	If emissions are routed to the dryer with WESP/RTO controls use 95% DRE for VOC and HAP
	5.3 lb/ODT for CO	AP-42 Table 10.6.1-2 SCC3-07-010-09	
	2.7 lb/ODT for NOx	AP-42 Table 10.6.2-2 SCC 3-07-006-25	
	2.2 lb/ODT for PM total	AP-42 Table 10.6.2-1 SCC 3-07-006-25	
	1.1 lb/ODT for PM Condensible	AP-42 Table 10.6.2-1 SCC 3-07-006-25	
	0.11 lb/ODT for Acetaldehyde	AP-42 Table 10.6.2-3 SCC 3-07-006-25 (Adjusted)	
	0.14 lb/ODT for Formaldehyde	AP-42 Table 10.6.2-3 SCC 3-07-006-25	
	0.11 lb/ODT ton for Methanol	AP-42 Table 10.6.2-3 SCC 3-07-006-25	If WESP is used for PM control use 70% removal efficiency for HCl (pH of the water needs to be monitored and maintained)
	1.9 E-02 lb/MM Btu for HCl	AP-42 Table 1.6-3	
Hammermill	2.5 lb VOC/ton product	Georgia Biomass Testing	If emissions are routed to dryer 90 % DRE for VOC and HAP
	0.004 lb/ton of product for Acetaldehyde	Georgia Biomass- prorated from Pellet Cooler testing	
	0.008 lb/ton of product for Formaldehyde	Georgia Biomass-prorated from Pellet Cooler testing	If emissions are routed to RTO use 95 % DRE for VOC and HAP. .
	0.004 lb/ton for Methanol	Georgia Biomass-prorated from Pellet Cooler testing	

Emission Source	Uncontrolled Emission Factor	Basis of Emission factor	Control Device
Pelletizer/Pellet Cooler (without Steam injection or extraction)	0.5 lb VOC/ton of Product	Georgia Biomass Testing	If emissions are routed to dryer 90 % DRE for VOC and HAP
	0.001 lb/ton of product for Acetaldehyde	Georgia Biomass Testing	
	0.002 lb/ton of product for Formaldehyde	Georgia Biomass Testing	If emissions are routed to RTO use 95 % DRE for VOC and HAP.
	0.001 lb/ton of product for Methanol	Georgia Biomass Testing	
Pelletizer/Pellet Cooler (with Steam injection)	1.3 lb VOC/ton of product	Georgia Biomass Testing	If emissions are routed to dryer 90 % DRE for VOC and HAP
	0.002 lb/ton of product for Acetaldehyde	Georgia Biomass- prorated from Pellet Cooler testing	
	0.004 lb/ton of product for Formaldehyde	Georgia Biomass- prorated from Pellet Cooler testing	If emissions are routed to RTO use 95 % DRE for VOC and HAP.
	0.002 lb/ton of product for Methanol	Georgia Biomass- prorated from Pellet Cooler testing	
Storage/Handling	0.4 lb VOC/ton of product	Georgia Biomass Testing	If emissions are routed to dryer 90 % DRE for VOC and HAP
	0.001 lb/ton of product for Acetaldehyde	Georgia Biomass- prorated from Pellet Cooler testing	
	0.002 lb/ton of product for Formaldehyde	Georgia Biomass- prorated from Pellet Cooler testing	If emissions are routed to RTO use 95 % DRE for VOC and HAP
	0.001 lb/ton of product for Methanol	Georgia Biomass- prorated from Pellet Cooler testing	

Note: These are GAEPD recommended emission factors. Use of these emission factors does not guarantee compliance with all state and federal regulations

WOOD AND CHIP HANDLING
in Kraft Pulp and Paper Mills
April 1, 1995

Cutting is the process of cutting the long logs into usable segments. Generally, logs are cut into 'long' segments or 'short' segments, depending on the requirements of the barkers and chippers. Both long and short segments may be utilized at the same facility.

BACT: Utilization of water (or equivalent) as necessary to prevent nuisance conditions.

Barking. The most common type of barking involves a horizontal rotating drum into which the cut logs are placed. The motion of the logs and the drum separate the bark from the log, and the bark falls through slits in the side of the drum to a conveyor system. The bark is then stockpiled for use in the power boiler. The logs are sent to storage to await chipping.

BACT: Utilization of water (or equivalent) as necessary to prevent nuisance conditions.

Chipping sizes the logs into small chips that are suitable for cooking in the digestors. This is most often accomplished by pushing the log segments onto a rotating disc with blades. The chips pass through to a conveyor and are carried to a scalping screen to remove oversize material.

BACT: Utilization of water (or equivalent) as necessary to prevent nuisance conditions.

Storage of the chips is usually in well maintained stockpiles that have automated feed systems (augers or other equipment) to load conveyors. Usually, a bulldozer is at work maintaining the proper shape of the pile to allow the augers to function properly.

BACT: Utilization of water (or equivalent) as necessary to prevent nuisance conditions.

Screening of the chipped material from the stockpiles removes the fines (sawdust) and sends the material to the power boiler. The accepted material is conveyed to the digestors. Oversize is usually sent to a rechipper for size reduction.

BACT: Utilization of water (or equivalent) as necessary to prevent nuisance conditions.

FEDERAL REGULATIONS

None of the above facilities is subject to NSPS, nor is any NESHAPS contaminant present in the emissions.

Kraft pulp mills are a named source, so all emissions (including fugitives) are subject to PSD regulations and nonattqinment review in nonattainment areas. Particulate matter is subject to the NAAQS (150• g/m^3 / 50• g/m^3). A MACT standard should be promulgated by the EPA in the Spring of 1996 that regulates Kraft pulp and paper mills and may affect the wood and chip handling operations. Probably all of the Texas Kraft mills will be subject to Title V permitting after its implementation.

STATE REGULATION

These facilities are subject to Regulation VI, and particulate matter is subject to Regulation I. The state has been delegated the authority to implement the federal PSD and nonattainment programs.

OTHER REQUIREMENTS

Effects Screening Levels (ESLs) will be used when applicable during a permit review. Note that pinene is based on an odor threshold, which will be considered when reviewing impacts.

Particulate ESL[f]
Hardwood 10• g/m^3
Softwood 50• g/m^3
Volatile Organics
(•,•) Pinene[g] 64• g/m3

EMISSION FACTORS FOR WOOD AND CHIP HANDLING

Emission Point	Factor[e]	Reference
Cutting (PM)	0.1050 lb PM/ton	AP-42 10.3-1[a]
Barker (PM)	0.0072 lb PM/ton	AP-42 10.3-1[a]
Chipping (PM)	0.00003 lb PM/ton	AP-42 8.19.2[b]
Stockpiles (PM)	3.9600 lb/acre/day	AP-42 8.19.1-1[c]
Screening (PM)	0.0084 lb PM/ton	TNRCC[b]
Conveyors (PM)	variable	material handling guidance sheet

Stockpiles (VOC)

Hardwood	negligible	TNRCC
Softwood	(0.00343)x(24.5)x(chips)x(RT) lb VOC/day	TNRCC[d]

where: 24.5= lb turpentine/ton of softwood
chips= ton of softwood processed/day
RT= Average residence time in days (<14 days)

Notes:

(a)The factors include 70% control for high moisture content

(b)These factors were based on numbers derived from the new rock crusher numbers published by EPA. The material moisture is included in the factor. (see Rock Crusher Standardized Packet, TNRCC).

(c)Based on active stockpiles and 70% control for moisture content.

(d)Derived from "Sulfate Turpentine Recovery", Pulp Chemicals Association, 1971. Assumes a linear loss of turpentine over the inital two weeks of residence time. Also estimates turpentine • 100% of VOCs

(e)These factors are subject to change as more information becomes available.

(f)Taken from the April 1, 1994, ESL list. (TNRCC). The ESLs are subject to change.

(g)ESL is based on odor threshold (Handbook of Environmental Data on Organic Chemicals, 2nd edition, Karel Verschueren, Van Nostrand Reinhold Co., Inc, NY, 1983). Health threshold is 2,000• g/m^3 for turpentine.