

## Application Review

Issue Date: 08/03/2020

Region: Fayetteville Regional Office  
County: Robeson  
NC Facility ID: 7800242  
Inspector's Name:  
Date of Last Inspection:  
Compliance Code:

### Facility Data

Applicant (Facility's Name): Active Energy Renewable Power

#### Facility Address:

Active Energy Renewable Power  
1885 Alamac Road  
Lumberton, NC 28358

SIC: 3999 / Manufacturing Industries, Nec

NAICS: 321999 / All Other Miscellaneous Wood Product Manufacturing

Facility Classification: Before: N/A After: Small

Fee Classification: Before: N/A After: Small

### Permit Applicability (this application only)

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

## GREENFIELD FACILITY

### Contact Data

#### Facility Contact

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### Application Data

Application Number: 7800242.19A  
Date Received: 11/04/2019  
Application Type: Greenfield Facility  
Application Schedule: State  
Existing Permit Data  
Existing Permit Number: N/A  
Existing Permit Issue Date: N/A  
Existing Permit Expiration Date: N/A

Review Engineer: Gregory Reeves

Review Engineer's Signature:

*Gregory W Reeves*

Date:

*08/03/2020*

### Comments / Recommendations:

Issue 10636/R00

Permit Issue Date: 08/03/2020

Permit Expiration Date: 07/31/2028

### 1. Purpose of Application:

Active Energy Renewable Power (AERP) is a greenfield wood pellet manufacturing facility located in Lumberton, Robeson County. The company has requested the initial air quality permit for this facility.

The facility will be classified as small, as the potential emissions before controls do not exceed the Title V permitting thresholds.

The application did not contain any confidential information.

The facility contact for the permit application is Antonio Esposito, chief operating officer, (910-547-1920). The facility utilized a consultant to prepare the permit application. The contact at the consultant, CP Engineering and Environmental Solutions, is Chalam Pakala, P.E. (704-541-4042).

## 2. Facility Description

Active Energy Renewable Power (AERP) is a proposed greenfield facility located at 1885 Alamac Road, Lumberton, Robeson County, North Carolina, will manufacture “black” wood pellets as a fuel source for power plants and industry, as a replacement for coal. The facility will receive dry wood chips as the raw material which will be pressure cooked using steam generated from a 20 mmBtu/hr natural gas-fired boiler. The water vapor and volatile organic compounds released from the pressure cooker process will be condensed by utilizing a water-cooled condenser using well water. The non-contact cooling water will be pulled from the facility’s on-site wastewater treatment system and discharged back into the treatment system lagoons in a closed loop system. The treatment system is currently permitted to discharge into the Cape Fear River. The company asserts that approximately 80% of the VOCs from the cooker process will be condensed, with the remainder vented to atmosphere. The condensed liquids will either be disposed of or the condensed organic liquids separated and sold, with the separated water processed through the facility’s wastewater treatment plant, then discharged to the Cape Fear River. Wet cellulosic material from the pressure cooker will be sent to a Screw Press for additional de-watering prior to sending to a pellet press. Finished pellets will pass through a 4 mmBtu/hr natural gas-fired dryer to remove any residual surface moisture, then transported via conveyor to a pellet storage bin. The company asserts that 80-90% of the VOCs in the raw wood chips will be removed during the pressure cooking process and small amounts of VOCs will be released from the Screw Press/Pellet Making/Drying process.

The Pressure Cooker Process uses a “steam explosion” process to separate the cellulosic materials from the hemicellulosic materials and terpene chemicals in the wood, then the resultant solids are formed into pellets. A brief explanation of this process follows:

### *What is Steam Explosion?*

*The SE method of wood fiber pretreatment involves exposing the material to saturated steam. The steam temperature and pressure, and the time in the reaction vessel, determines how much of the hemicellulose degrades, and what fraction of the feedstock matter gets converted into volatiles and biochemical compounds. The subsequent steam explosion is the rapid release of pressure. This explosive expansion of water in the cell walls of lignocellulosic feedstocks causes a breakdown of the wood fibers into very small particles. The severity of the steam treatment is controlled such that the cellulose and lignin are minimally affected, while the hemicellulose is partially degraded. When compared to white pellets, the resulting material, after densification in a pellet press, has a higher specific energy content in Btu/lb, improved grindability, is hard and produces fewer fines, and its affinity to water is changed from hygroscopic to hydrophobic.*

*The steam explosion process causes the lignin to emerge on the surface of the fine wood fibers in the form of small beads. When the fiber is densified in the pellet press, these beads form a film-like surface coating on the broken-down wood fibers, and results in hard, highly water-resistant pellets that produce almost no fines.*

### 3. Application Chronology:

- 09/19/19 Greg Reeves spoke with Chuck Pakala by phone regarding the proposed pellet process at the site of the previous Alamac American facility in Lumberton. An applicability determination was proposed as a possibility in lieu of a permit, as the facility believed emissions to be <5 tons per year of VOC. Mr. Pakala was directed to submit information on the process, emission controls, and emission factors with the determination request.
- 10/02/19 Greg Reeves spoke with Chuck Pakala regarding emission factors for the various processes at the facility. The facility does not have any EFs available from previous stack testing at other plants. Therefore, it was suggested that EFs from the recent stack testing at the Enviva Sampson pellet facility be used as the best available information from a similar facility. It was noted to Mr. Pakala that it was understood that these EFs may not be totally representative of the actual processes, and that stack testing will be required after startup of the facility to verify the emissions. Using these factors and the throughputs provided by Mr. Pakala, it appears that VOC emissions are > 5 tons/yr and aggregate emissions >25 tons/yr. Therefore, an air permit will be required. Also discussed were that the wastewater treatment system, the emergency generator engine, and the fire pump engine would be exempt from permitting and added to the insignificant/exempt activities listing. Rescission of the existing air permit for Lumberton Energy Holdings was also discussed, and Mr. Pakala will discuss this with the facility management.
- 10/07/19 Mr. Pakala sent an email to Greg Reeves with a request to review the project for permit exemption. Greg Reeves spoke with Chuck Pakala by phone regarding the source and appropriateness of the emission factors used in the emissions calculations.
- 10/14/19 Greg Reeves spoke with Mr. Pakala and sent Mr. Pakala an email regarding the conversation. Based on the conversation and emission calculations, it would appear that the project will require an air permit.
- 10/16/19 FRO received the request for rescission of the permit for Lumberton Energy Holdings.
- 10/24/19 Mr. Pakala emailed Greg Reeves to ask if emission factors from the Enviva Ahsokie facility might be used for the dryer emissions.
- 10/25/19 Greg Reeves emailed Mr. Pakala regarding the email of 10/24. Mr. Pakala was advised that a permit application would be required if either the Enviva Sampson or the Enviva Ahsokie emission factors were utilized, and that stack testing would be required after startup of the process in order to confirm emissions
- 10/28/19 Greg Reeves sent Mr. Pakala information on the emission factors from the recent Enviva Sampson testing, and was advised to use these as best available factors in the permit application.
- 10/29/19 The permit for Lumberton Energy Holdings was rescinded.

- 11/04/19 FRO received the permit application package. The application package included a check in the amount of \$50 for the applicable permit processing fees and a request for a Zoning Consistency Determination to the Robeson County Zoning and Planning Department. The application appeared to be complete for processing. The application package was sealed by a P.E.
- 11/05/19 FRO sent the facility a letter acknowledging receipt of the completed application.
- 11/18/19 FRO received the completed Zoning Consistency Determination, which stated that "*...The proposed operation IS consistent with applicable zoning ordinances...*"
- 12/19/19 Heather Hillaker of SELC emailed Abdul Kadir, asking for a copy of the permit application. Mr. Kadir sent her an electronic copy of the application.
- 01/01/20 Application re-assigned to Greg Reeves for processing.
- 01/09/20 Greg Reeves requested additional information from Mr. Pakala regarding the inlet and outlet temperatures of the vapor stream to the condenser.  
**PERMIT APPLICATION CLOCK OFF**
- 01/10/20 Mr. Pakala called Greg Reeves to discuss the condenser temperatures. The boiling point temperatures on the Form C7 are listed as 50-150°F, but are in reality °C. Therefore, the boiling points are actually 130-356°F. Mr. Pakala will call back with a proposed maximum outlet vapor temperature for the condenser control to include in the 02D .0611 condenser requirements permit condition.
- 01/10/20 Mr. Pakala sent an email to Greg Reeves proposing the maximum outlet vapor temperature for the condenser to be 99°C (210°F).  
**PERMIT APPLICATION CLOCK ON**
- 01/31/20 The DAQ Director determined that the draft permit would be noticed to the public and posted for a public comment period. A public meeting will also be held in the Lumberton, Robeson County area in order to receive comments from the public concerning the draft permit.  
**PERMIT APPLICATION CLOCK OFF**
- 02/06/20 Greg Reeves called Mr. Esposito and confirmed that the facility will be processing 50% softwood, 50% hardwood in their process.
- 02/14/20 A notice was published in the Robesonian newspaper and on the DAQ website scheduling a public meeting for 3/16/20 to accept public comments and discuss the proposed permit.
- 03/14/20 Due to public safety concerns surrounding the COVID-19 pandemic, the public hearing was cancelled.

- 05/23/20 A notice was published in the Robesonian newspaper and on the DAQ website scheduling a “virtual” public hearing for 6/22/20 to accept public comments and discuss the proposed permit. The hearing was to be conducted via a Webex meeting online.
- 06/22/20 The virtual public hearing was held and public comments accepted. DAQ is required to take final action on the permit within 30 days after the hearing, or by 7/22/20.
- 06/26/20 The public comment period ended for the application.
- 07/15/20 The hearing officer for the public hearing submitted the hearing report to DAQ management.
- 07/21/20 An additional information request was sent to the company asking for information about future expansion plans.
- 08/02/20 The DAQ Director submitted final recommendations and the final EJ report to the permit engineer for incorporation of changes to the permit.
- 08/03/20 The permit was issued.

#### 4. Review of Similar Processes

At the time of this review, there were no commercial operations in the United States utilizing the steam explosion process for wood pellet production. There are a number of “white” wood pellet processes currently in operation, including four large production plants located in North Carolina owned by Enviva Pellets (Ahoskie, Northampton, Sampson, and Hamlet facilities). There is also a hybrid facility in Selma, Alabama owned by Zilkha BioMass that combines processes from the traditional “white” pellet manufacturing with the steam explosion process to produce “black” wood pellets.

##### **Enviva Pellets – Sampson, Hamlet, Ahoskie, & Northampton, North Carolina**

Traditional “white” wood pellet manufacture includes initial drying of ground wood chips utilizing a wood-fired dryer. The dried wood is then sent to the pellet press to produce the “white” wood pellets. This is the process utilized by Enviva at all of their facilities. Pollutant emissions from these facilities consist of Particulate Matter (PM), Carbon Monoxide (CO), Nitrogen Oxides (NOx), Sulfur Dioxide (SO<sub>2</sub>), Volatile Organic Compounds (VOC), various Hazardous Air Pollutants (HAP), and various Toxic Air Pollutants (TAP). PM is controlled from most material handling processes in these facilities by either fabric filters or cyclones. PM from the dryer systems are generally controlled by an electrostatic precipitator (ESP) and a regenerative thermal oxidizer (RTO). Emissions of PM from the hammermill operations and pellet press operations are generally controlled either by use of cyclones or fabric filters. VOC emissions from the drying operations are generally controlled by an RTO, and VOC emissions from pellet presses are generally either uncontrolled or controlled by an RTO or regenerative catalytic oxidizer (RCO). The emissions of CO, NOx, SO<sub>2</sub>, and most of the HAPs and TAPs, are caused by the combustion of wood in the wood dryer process, the combustion of natural gas in the RTO, and the destructive oxidation of VOC in the RTO or RCO. PM emissions are caused by the dry material handling processes, the wood drying process, and the dry wood pellet process. VOC emissions occur from wood storage and handling, wood drying, wood grinding, and pellet production.

### **Zilkha Biomass – Selma, Alabama**

The Zilkha BioMass facility in Selma, Alabama initially started operation as a traditional “white” wood pellet facility, utilizing a wood-fired rotary dryer to dry the wood prior to pelletizing. This facility was modified to include a steam pressure cooker prior to the pellet press to produce “black” wood pellets. However, the facility still utilizes the wood-fired rotary dryer to dry the wood feed prior to the steam cooker. Emissions are controlled by an ESP and RTO on the dryer operation, and an RTO on the pellet press operation. Pollutant emissions from this facility consist of PM, CO, NO<sub>x</sub>, SO<sub>2</sub>, VOC, HAP, and TAP. As with the Enviva facilities, CO, NO<sub>x</sub>, SO<sub>2</sub>, and majority of HAP and TAP emissions are caused due to the combustion of wood in the dryer operation or the destructive oxidation of VOC in the RTOs.

### **Active Energy - Utah Test Facility**

Active Energy operated a test “black” pellet production facility in Utah in conjunction with the University of Utah. This plant was a very small scale facility used to test the finished pellet product for viability as an alternative to coal. The facility was exempt from air permitting, and no emissions testing was conducted while in operation.

### **Active Energy – Lumberton Facility**

The proposed Active Energy facility in Lumberton will not utilize any drying of the wood feed prior to the pressure cooker. Since the pressure cooker has only very small amounts of oxygen inside the vessel, no significant amount of oxidation of the organic compounds is expected. The only TAP that is naturally occurring in the wood to be used is Acetic Acid, which is not expected to be volatilized. Since no oxidation of the organics is expected, it is expected that the steam cooker process will not produce any of the TAPs that are emitted at the white wood pellet facilities, as these are in general products of the oxidation processes in the wood dryers.

## **5. Zoning**

The permit application included a request for a Zoning Consistency Determination from the Robeson County Zoning and Planning Department.

A completed Zoning Consistency Determination was received on 11/14/19 from the Robeson County Zoning and Planning Department. The determination was signed by Dixon Ivey, Director of Planning & Inspections on 11/12/19 and indicated that “...*The proposed operation IS consistent with applicable zoning ordinances...*”

## **6. Changes in Equipment, Emissions and Regulations and PE Review Requirements**

A PE Seal was required for this permit under 15A NCAC 02Q .0112. The permit application contained Form D5 that was sealed and signed by Chalam Pakala, P.E. (N.C. Seal #19807) on 10/30/2019.

The facility’s permitted emission sources and controls are as follows:

<b>Emission Source ID</b>	<b>Emission Source Description</b>	<b>Control System ID</b>	<b>Control System Description</b>
ES-B-1 (NSPS)	Natural Gas-Fired Boiler 20 mmBtu/hr maximum heat input	N/A	N/A
ES-P-1	Pressure Cooker Process	CD-1	Water Circulation Condenser
ES-SPD-1	Screw Press/Pellet Press/Natural Gas-fired Dryer Process 4 mmBtu/hr maximum heat input	N/A	N/A

The facility's Insignificant / Exempt Activities are as follows:

Source	Exemption Regulation	Source of TAPs?	Source of Title V Pollutants?
IES-WWTP Wastewater Treatment Plant	02Q .0102 (g)(6)	Yes	No
IES-FP 180 HP Diesel-fired Fire Pump (NESHAP ZZZZ)	02Q .0102 (h)(5)	Yes	Yes
IES-GEN 15 HP Diesel-fired Emergency Generator (NESHAP ZZZZ)	02Q .0102 (h)(5)	Yes	Yes
IES- PROPANE Propane Vaporizer	02Q .0102 (h)(5)	Yes	Yes
IES- PSTG Pellet Storage	02Q .0102 (h)(5)	Yes	Yes
IES-SAW Green Wood Saw Mill Operations	02Q .0102(g)(12)	No	Yes

**7. NSPS, NESHAP, PSD, Attainment Status, and 112(r)**

- **NSPS**

- ✓ The Natural gas-fired Boiler (20 mmBtu/hr maximum heat input) (ID No. ES-B-1) is subject to NSPS Subpart Dc.
- ✓ The diesel-fired fire pump (IES-FP) is not subject to NSPS Subpart IIII since it was manufactured in April 1984.
- ✓ The diesel-fired emergency generator (IES-GEN) is not subject to NSPS Subpart IIII since it was manufactured in 1972.

- **NESHAP**

- ✓ The Natural gas-fired Boiler (20 mmBtu/hr maximum heat input) (ID No. ES-B-1) is not subject to NESHAP Subpart JJJJJ "Industrial, Commercial, and Institutional Boilers Area Sources" since it is a gas-fired boiler, only capable of firing gaseous fuels.
- ✓ The diesel-fired fire pump and diesel-fired emergency generator (IES-FP and IES-GEN) are subject to NESHAP subpart ZZZZ. These are considered existing engines under this rule.

- **PSD** – The potential emissions do not exceed PSD threshold limits; therefore, this facility does not trigger a PSD review. PSD minor-source increment tracking has been triggered in Robeson County for PM<sub>10</sub> and SO<sub>2</sub>. This application will consume 0.01 lb/hr of PM<sub>10</sub> and 0.15 lb/hr of SO<sub>2</sub>.
- **Attainment Status** – Robeson County is in attainment
- **112(r)** – The facility does not store any of the subject materials at or above the 112(r) threshold quantities and is therefore not required to maintain a written Risk Management Plan (RMP).

## 8. PUBLIC MEETING/PUBLIC HEARING

DAQ determined that there was significant public interest in this application and that a public information meeting was warranted. On February 14, 2020, DAQ published a public notice for the public meeting to be held on March 16, 2020 and simultaneously opened a 30-day comment period. The public notice was published in the Robesonian newspaper and on the DAQ website. The public comment period was scheduled to close on March 20, 2020, and public comments were to be submitted either via mail to the DAQ Fayetteville Regional Office, via mail to the Raleigh Central Office, or by email to [DAQ.publiccomments@ncdenr.gov](mailto:DAQ.publiccomments@ncdenr.gov). The public meeting was scheduled for March 16, 2020 at the Bill Sapp Recreation Center in Lumberton NC.

On March 14, 2020, based on guidance to avoid large gatherings to minimize the spread of the COVID-19 virus, the public meeting was cancelled. On March 16, 2020, the public comment period was extended until March 27, 2020, and a video presentation about the draft air permit for the proposed facility was posted on the DAQ website for the public to view. On March 26, 2020, the DAQ further extended the public comment period until April 27, 2020. This action was taken to balance the regulatory requirements under the statutes and rules with public health concerns and public interest. Given the uncertainty of how long public gatherings will be limited, as an alternative to the public meeting, a brief video presentation on the draft permit was posted to the DAQ website. Additionally, a phone number was published to allow for the public to make comments orally by leaving a message. On April 27, 2020, in response to community concerns regarding the impact of COVID-19 on public participation, DAQ further extended the comment period until May 27, 2020.

On May 23, 2020, a “virtual” public hearing was scheduled. A notice was published in the Robesonian newspaper May 23-24, 2020 and on the DAQ website. The public hearing was to be held on June 22, 2020 via Webex meeting. The hearing was held as scheduled.

## 9. HEARING OFFICER REPORT/PUBLIC COMMENTS/RECOMMENDATIONS

Joe Foutz, Regional Compliance Supervisor of the Mooresville Regional Office, DAQ, was the Hearing Officer for the public hearing held on June 22, 2020. His hearing officer report was submitted to DAQ management on July 15, 2020. The report reviewed the draft permit, public comments received by DAQ during the public hearing and via email, voicemail, or in writing during the comment period. The following summarizes the major comments received and the hearing officer’s recommendations. The comments were grouped into two sections. The first section included comments received from the Environmental Integrity Project (EIP) and the Southern Environmental Law Center (SELC), and the second section included comments from individual comments, either representing themselves or on behalf of an organization. For a more detailed review of these comments, the hearing officer’s responses, and the hearing officer’s recommendations, see the hearing officer report.

- a. **Comment: (EIP/SELC Item I)** Acrolein and Formaldehyde emissions from the AERP process exceed their relevant TPERs, requiring air dispersion modeling.

**Recommendation:** Require AERP to conduct stack testing to determine HAP and TAP emissions from the pressure cooker operation and screw press/pellet press/dryer operation, to include Formaldehyde, Acrolein, Acetaldehyde, Methanol, Phenol, and Propionaldehyde, plus any other suspected HAP or TAP of concern from these processes.

**Action Taken:** The permit will contain a requirement for source testing for these two emission sources for HAP and TAP emissions, to include at a minimum, Formaldehyde, Acrolein, Acetaldehyde, Methanol, Phenol, and Propionaldehyde, plus any other suspected HAP or TAP of concern from these processes.

- b. **Comment: (EIP/SELC Item II)** AERP omitted significant Carbon Monoxide emissions for the pressure cooking operation.

**Recommendation:** No changes to the permit are recommended.

- c. **Comment: (EIP/SELC Item III)** The Condenser's 80% control efficiency is likely overstated.

**Recommendation:** Require AERP to conduct stack testing to determine HAP and TAP emissions from the pressure cooker operation and screw press/pellet press/dryer operation, to include Formaldehyde, Acrolein, Acetaldehyde, Methanol, Phenol, and Propionaldehyde, plus any other suspected HAP or TAP of concern from these processes.

**Action Taken:** The permit will contain a requirement for source testing for these two emission sources for HAP and TAP emissions, to include at a minimum, Formaldehyde, Acrolein, Acetaldehyde, Methanol, Phenol, and Propionaldehyde, plus any other suspected HAP or TAP of concern from these processes.

- d. **Comment: (EIP/SELC Item IV)** AERP has likely underestimated Particulate Matter Emissions.

**Recommendation:** No changes to the permit are recommended.

- e. **Comment: (EIP/SELC Item V)** DAQ should require more comprehensive stack testing for this novel manufacturing process.

**Recommendation:** Require AERP to conduct stack testing to determine HAP and TAP emissions from the pressure cooker operation and screw press/pellet press/dryer operation, to include Formaldehyde, Acrolein, Acetaldehyde, Methanol, Phenol, and Propionaldehyde, plus any other suspected HAP or TAP of concern from these processes.

- f. **Comment: (EIP/SELC Item VI)** AERP may not take advantage of the "One-Time Doubling" mechanism to avoid future permitting requirements.

**Recommendation:** No changes to the permit are recommended.

**Note that if the facility wishes to expand its operations in the future, this will require a permit application to modify the permit, including submittal of all relevant information required by state and federal permitting rules. DAQ will perform a full review and evaluation of the information submitted in the permit application based on the facility classification at that time.**

- g. Comment: (EIP/SELC Item VII)** DAQ should include enforceable permit conditions to limit emissions.

**Recommendation:** Include permit language that limits the facility's feedstock to wood that is no more than 50% softwood.

**Action Taken:** A permit condition has been included in the permit which limits the process feedstock to wood with no more than 50% softwood by weight. If the facility wishes to increase the softwood percentage above this level, a permit modification application and additional source testing will be required.

- h. Comment: (EIP/SELC Item VIII)** DAQ must ensure that AERP is not a modification of North Carolina Renewable Power (NCRP).

**Recommendation:** No changes to the permit are recommended.

- i. Comment: (EIP/SELC Item IX)** It appears that AERP has constructed its pellet plant without receiving the required air permit.

**Recommendation:** No changes to the permit are recommended.

- j. Comment: (EIP/SELC Item X)** DAQ must include emissions from AERP unpermitted lumber mill in facility-wide emissions calculations.

**Recommendation:** The lumber mill should be included in the air permit review and AERP's air permit.

**Action Taken:** The lumber mill will be included in the Insignificant/Exempt Activities listing which is Attachment A to the permit. Further, per the DAQ Director's recommendation, a permit condition will be included which will require AERP to calculate monthly and submit semi-annual reports of the monthly and rolling 12-month totals for emissions of PM, PM<sub>10</sub>, CO, NO<sub>x</sub>, SO<sub>2</sub>, VOC, and HAP/TAP from the facility processes, including the lumber mill.

- k. Comment: (EIP/SELC Item XI)** DAQ failed to consider the environmental justice impacts of the proposed facility to nearby communities.

**Recommendation:** No changes to the permit are recommended.

- l. Comment: (EIP/SELC Item XI.B)** DAQ's two-step environmental justice review process is inadequate to ensure meaningful participation.

**Recommendation:** No changes to the permit are recommended.

- m. Comment: (EIP/SELC Item XII)** DAQ's draft permit is inconsistent with Governor Cooper's Executive Order on Climate Change.

**Recommendation:** No changes to the permit are recommended.

- n. Comment: (Individual – 1<sup>st</sup> Comment Grouping)** People living near existing wood pellet plants complain of consistent issues with fugitive dust; DAQ should all steps necessary to ensure compliance with federal environmental requirement including requiring AERP to conduct additional testing, provide air toxics modeling, and add enforceable production and operation restrictions. The current draft permit allows AERP to evade Clean Air Act and Title V permitting requirements.

**Recommendation:** No changes to the permit are recommended.

- o. Comment: (Individual – 2<sup>nd</sup> Comment Grouping)** Extend comment period in response to COVID-19; Many people in Robeson County do not have internet access and cannot fully participate in the public hearing; DAQ needs to conduct an in-person public hearing so citizens can express their concerns to DAQ.

**Recommendation:** No changes to the public participation process are recommended.

- p. Comment: (Individual – 3<sup>rd</sup> Comment Grouping)** Various comments concerning damage to forests.

**Recommendation:** No changes to the permit are recommended.

- q. Comment: (Individual – 4<sup>th</sup> Comment Grouping)** Concern about ozone formation due to facility emissions and concerns with fine particulate matter and subsequent impacts on health.

**Recommendation:** No changes to the permit are recommended.

- r. Comment (Individual – 5<sup>th</sup> Comment Grouping)** These comments were not directly related to the expressed intent of the public meeting, including that AERP is in financial difficulty; the wood pellet industry only exists because of subsidies in Europe; if European subsidies are removed, then Robeson County will be left without jobs and with a potentially stranded asset and deforested landscape; increased truck traffic due the operations; fires and explosions in the wood pellet industry; contaminants in wastewater but the wastewater permit has expired.

**Recommendation:** No changes to the permit are recommended.

**10. Facility Emissions Review:**

Pollutant	Expected Actual Emissions (tons/yr)	Potential Emissions Before Controls (tons/yr)	Potential Emissions After Controls (tons/yr)
PM	0.05	0.05	0.05
PM <sub>10</sub>	0.05	0.05	0.05
PM <sub>2.5</sub>	0.05	0.05	0.05
SO <sub>2</sub>	0.05	0.05	0.05
NO <sub>x</sub>	9.41	10.31	10.31
CO	7.91	8.65	8.65
VOC	23.63	49.48	25.87
Highest Individual HAP (Acetaldehyde)	1,479 lbs/yr	1,619 lbs/yr	1,619 lbs/yr
Total HAP	4,963 lbs/yr	5,435 lbs/yr	5,435 lbs/yr

The Expected Actual Emissions in the table above are taken from the permit application. The emissions due to natural gas combustion from both the Natural Gas-Fired Boiler and the natural gas-fired Dryer (ID Nos. ES-B-1 and ES-SPD-1) are estimated using the NCDENR "Natural Gas Combustion Emissions Calculator Revision N 01/05/2017". The expected actual VOC emissions from the Screw Press, Pellet Press and Natural Gas-fired Dryer (ES ID No. ES-SPD-1) and Pressure Cooker (ES ID No. ES-P-1) are calculated using the emission factor obtained from stack testing conducted in March 2017 and March 2018 at Enviva Pellets Sampson, LLC (Facility ID No. 8200152), and applying the 80% control of VOC for the condenser on the cooker process. The Enviva testing was conducted with the facility processing a mixture of 52% softwood and 48% hardwood. The Active Energy facility is proposing to use 50% softwood and 50% hardwood in their process. Therefore, since the emissions are based on this 50/50 mix of softwood/hardwood, the permit will include a condition limiting the mixture to no more than 50% softwood. If the facility wishes to increase softwood percentage above this level, a permit application and additional testing will be required. The only expected process emissions from the cooker and the screw press/pellet press/dryer are VOC. There are no expected particulate emissions from these processes. Particulate, SO<sub>2</sub>, NO<sub>x</sub>, and CO emissions listed in the table are from combustion of natural gas in the boiler and dryer. Potential uncontrolled process VOC emissions from the cooker and screw press/pellet press/dryer are calculated using the uncontrolled emission factor from the Enviva Sampson stack testing in March 2017 and March 2018 (1.07 lb/ODT for cooker, 1.07 lb/ODT for screw press/pellet press/dryer processes = 2.14 lb/ODT total for the cooker and dryer operations combined) and the stated maximum throughput of 39,420 ODT/yr. The potential after control VOC emissions are calculated applying the 80% VOC control for the condenser for the cooker operation only.

Note that the facility asserts that the emission factors used in the emission calculations are very conservative numbers, and that the actual emissions from the process will be lower than indicated in the table above. However, they have provided no empirical test data to substantiate this assertion. As such, DAQ will require source testing for VOC and HAP/TAP emissions from both the Pressure Cooker Process (ID No. ES-P-1) and from the Screw Press/Pellet Press/Dryer Process (ID No. ES-SPD-1) within 90 days after startup to verify the VOC emissions from the two processes.

**11. Facility Wide Air toxics:**

Toxic pollutant emissions from the facility operations are detailed in the table below. There are no toxic pollutant emissions that exceed the toxic air pollutant permitting emissions rates (TPERs). Therefore, no air dispersion modeling demonstration is required. There will be a 02Q .0711 toxics condition in the permit, but there is not a 02D .1100 toxics condition in the permit.

Pollutant	Expected Actual Emissions After Controls	TPER (02Q .0711(b))	% TPER	Exceed TPER?
Acetaldehyde	0.074 lb/hr	28.43 lb/hr	0.26	No
Acrolein	4.23E-07 lb/hr	0.02 lb/hr	0.002	No
Ammonia	0.0752 lb/hr	2.84 lb/hr	2.65	No
Benzene	0.433 lb/yr	11.069 lb/yr	3.91	No
Benzo(a)pyrene	2.5E-04 lb/yr	3.044 lb/yr	0.008	No
Formaldehyde	0.064 lb/hr	0.16 lb/hr	40.0	No
n-hexane	0.93 lb/day	46.3 lb/day	2.01	No
Toluene	1.8E-04 lb/day	197.96 lb/day	0.00009	No
	8.0E-05 lb/hr	58.94 lb/hr	0.0001	No

Expected actual emissions of Acetaldehyde and Formaldehyde from the cooker operation are based on uncontrolled emission factors from the Enviva Sampson stack testing of March 2017 and April 2017, using expected throughput of 36,000 ODT/yr and applying a control efficiency of 80% for the condenser. Note that the uncontrolled emission factors are as follows (total for both cooker and screw press/pellet press/dryer processes):

Acetaldehyde      0.320 lb/ODT  
 Formaldehyde      0.369 lb/ODT

Expected actual emissions of other TAPs listed in the table above are based on the expected natural gas combustion in the boiler and dryer operations. TPERs listed in the table are for unobstructed, vertical stacks from 02Q .0711(b).

Note also that while the emission factors above for Acetaldehyde and Formaldehyde are being utilized in the permit application as very conservative emission estimates, these pollutants are not expected to be emitted by the pressure cooker or pellet processes. Source testing will be required to verify emissions for these and other HAP/TAP.

**12. Facility Compliance Status:**

This is a greenfield facility and has no previous compliance history. The facility has not commenced construction.

**13. Stipulation Review:**

The following regulations are applicable to this facility:

Regulation	Affected Sources	Emission Limit or Requirement
15A NCAC 02D .0202	Facility-wide	Permit Renewal and Emission Inventory Requirement
15A NCAC 02D .0503	Boiler ES-1	PM ≤ 0.50 lb/mmBtu
15A NCAC 02D .0515	ES-P-1 ES-SPD-1	$E = 4.10 * (P)^{0.67}$ for P ≤ 30 tons/hr $E = 55 * (P)^{0.11} - 40$ for P > 30 tons/hr
15A NCAC 02D .0516	Facility-wide	SO <sub>2</sub> d 2.3 lb/mmBtu
15A NCAC 02D .0521	Facility-wide	20% opacity
15A NCAC 02D .0524 NSPS Subpart Dc	Boiler ES-B-1	Notification of initial startup within 15 days of startup Recordkeeping - Monthly Fuel Usage
15A NCAC 02D .0535	Facility-wide	Notification requirement
15A NCAC 02D .0540	Facility-wide	Fugitive Dust Control Requirement
Ad-Hoc 15A NCAC 02D .0605	ES-P-1 ES-SPD-1	Testing Requirements Test for VOC and HAP/TAP emissions from Cooker (ES-P-1) and from Screw Press/Pellet Press/Dryer (ES-SPD-1) within 90 days of startup to confirm emission factors Submit Test Report within 30 days after testing completed
Ad-Hoc 15A NCAC 02D .0605	Facility-wide	Recordkeeping/Reporting Requirements Wood processed – softwood/hardwood Emissions – criteria pollutants + HAP/TAP
15A NCAC 02D .0611	Condenser CD-1	Condenser Requirements Maintain outlet exhaust temperature <99°C (210°F) Continuously record temperature I & M per Manufacturer's Recommendations, Annual Inspection, Recordkeeping
15A NCAC 02D .1806	Facility-wide	Odor Requirement
15A NCAC 02Q .0102	IES-FR IES-GEN	Applicability of NESHAP Subpart ZZZZ to fire pump engine and emergency generator engine
15A NCAC 02Q .0309	Facility-wide	Written Startup Notification within 15 days after startup
15A NCAC 02Q .0711	Facility-wide	Toxics Emissions exceeding TPERs requires permitting
Ad-Hoc NCGS 143-215.108	Facility-wide	Process feedstock limited to no more than 50% softwood by weight. Increase above 50% softwood will require permit modification and additional source testing.

**14. Conclusions, Comments, and Recommendations:**

I recommend that air permit 10636R00 be issued to Active Energy Renewable Power.

- The following modifications have been made to IBEAM Permit Writer:
  - ✓ Adjusted column widths, bolded and shaded to improve appearance.
  - ✓ Added Ad-Hoc condition for testing of pressure cooker process and screw press/pellet press/dryer process, to include testing for VOC, HAP, and TAP.
  - ✓ Added Ad-Hoc condition for recordkeeping and semi-annual reporting.
  - ✓ Deleted the sentence in the 02Q 0309 Startup Notification condition that states that “...*Any existing equipment being replaced is permitted to operate in compliance until the replacement equipment is operational...*”
  - ✓ Added Ad-Hoc condition limiting feedstock for the pellet production process to no more than 50% by weight softwood on a monthly average basis.

Review Engineer: Gregory W Reeves Date: 08/03/2020

Permit Coordinator: Jay Cole Date: 8/3/20

AQ Supervisor: Heath Cart Date: 8/3/2020

\gwr

cc: FRO Files