

1ST TIME TITLE V AIR PERMIT APPLICATION REVIEW

APPLICANT: U.S. Flue Cured Tobacco Growers, Inc.	SITE LOCATION: Timberlake	COUNTY: Person
TECHNICAL CONTACT: John H. Schmelzer, P.E.	PHONE: (919) 645-6043	RESPONSIBLE OFFICIAL: John H. Schmelzer, P.E.
		TITLE: Plant Manager
REVIEW ENGINEER: Susan McCarthy, P.E.	SIGNATURE:	DATE: April 25, 2006
REGIONAL CONTACT: Charles McEachern, P.E.	REGIONAL OFFICE: Raleigh	SIC CODE: 2111, 2141
APPLICATION NUMBER: 7300070.04A	EXISTING PERMIT NUMBER: 09162R05	NEW PERMIT NUMBER: 09162T06

I. Introduction

The U.S. Environmental Protection Agency (EPA) has given interim approval to North Carolina's Title V operating permits program effective on December 15, 1995. This EPA approval triggered the requirements for Title V facilities to submit permit applications to the Division of Air Quality (DAQ). Title V facilities are required to obtain an operating permit which addresses all applicable regulations under the State Implementation Plan, Federal Implementation Plan, and other provisions of the Clean Air Act (CAA). The Title V Operating Permit will define all of the facility's obligations under the CAA.

This 1st time Title V Air Permit Application Review intends to convey all pertinent emissions data, rules, policies, and engineering assumptions used to construct the DRAFT Title V operating permit. The primary source of information used to construct the DRAFT permit is the above referenced air permit application.

II. Background Information

The DRAFT Title V operating permit will replace an existing Air Quality Construction and Operation Permit No. 09162R05, which was issued on September 29, 2004 and is currently scheduled to expire on August 31, 2006. Pursuant to 15A NCAC 2Q .0506 the previous owner, Vector Tobacco, submitted its 1st time Title V application to the DAQ on June 28, 2002. The application was considered complete for processing on August 27, 2002.

U.S. Flue Cured Tobacco Growers, Inc.(US FCTG) bought this tobacco processing and cigarette manufacturing facility from Vector Tobacco on July 13, 2004. US FCTG also requested that the Raleigh Central Office (RCO) to continue processing the Title V application, as submitted by Vector Tobacco Company. The primary difference between the two companies is that the previous owner, Vector Tobacco, produced low or no-nicotine cigarettes using a genetically modified tobacco leaf, and the current owner, US FCTG, will use regular tobacco leaves to make the traditional cigarettes.

In addition, in lieu of the \$10 billion dollar buyout proposed by Congress, ending the subsidies for tobacco farmers, US FCTG hopes to support the local tobacco market and also will restore jobs to the community.

The DRAFT permit is required to go to public notice pursuant to 15A NCAC 2Q .0521.

III. Facility Description

The facility processes tobacco and manufactures cigarettes. According to the inspection report by Tammy Manning of the RRO, the basic flow of tobacco processing to cigarette manufacturing is as follows:

Stems are removed in the stemmery, and then, the tobacco is steamed to add moisture. Next, it is threshed, separated, mixed, and rolled into cigarettes. Then, the filter is added to the rolled cigarettes, and the cigarettes are packaged into soft or hard boxes, the individual boxes are packed into cases, and the cases are packed for shipment into cardboard boxes.

Although the facility is currently classified as synthetic minor, they are requesting Title V status to allow flexibility, due to anticipated VOC emissions in excess of 100 tons per year.

In addition, to avoid PSD applicability, US FCTG requests that a 250 tons per year facility-wide VOC limitation be included in the Title V permit. US FCTG will ensure compliance with the VOC limit by tracking VOC emissions from all sources. Quantities of top flavoring, menthol, fuel, and degreasing solvent will be recorded on a monthly basis. Tobacco throughput rates and hours of operation will be tracked and the data used to estimate VOC emissions from tobacco dryers and conditioning units.

IV. Statement of Compliance

The DAQ has reviewed the compliance status of this facility.

Based on the latest inspection of November 16, 2005 by Tammy Manning of the RRO, the facility was in compliance. During the tour of the facility, Ms. Manning noted inaccurate equipment descriptions and differences between the permitted equipment and actual equipment at the facility.

Mr. Doug Bensinger, of Bensinger & Garrison Environmental, Inc. requested via an November 18, 2005 email that we wait until the facility's review of the DRAFT Title V permit to fix the discrepancies in the permit equipment list.

Based on the facility's prior inspection of 12/09/04 by Tammy Manning of the RRO, the facility was in compliance with all applicable requirements. (Note: A NOV was issued for operating a source without its concurrent control device due to a misunderstanding and misidentification of the equipment and mislabeling in the air permit, but the permit was corrected, and the NOV was rescinded.)

The applicant has certified that the facility will be in compliance with all applicable requirements at the time of permit issuance and will continue to comply with these requirements. The applicant has also certified that the facility will be in compliance with any applicable requirements taking effect during the term of the permit and will meet such requirements on a timely basis.

V. Summary of Emission Sources and Control Devices

The following table identifies all emission sources and associated control devices for which the 1st time Title V Operating Permit is being issued:

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
• ES-SD-001	Stemmery Leaf Dryer No. 1 (20,000 pounds per hour capacity leaves)	• ES-CD-001	Central Dust Collection System
• ES-SD-002	Stemmery Stem Dryer No. 2 (7,000 pounds per hour)		

	pounds per hour Capacity stems)		
• ES-DC-001	Direct Cylinder Conditioning and Casing	• N/A	N/A
• ES-AD-001	Tobacco Blend Drying including: Annular Dryer and Conveyor discharge from the annular dryer	• CD-AD-001A • CD-AD-001B	One duel cyclone (25.5 inches in diameter) Bagfilter (2,727 square feet of filter area)
• ES-PD-001A	Pilot Scale Dryer	• N/A	N/A
• ES-PS-001	Puff Stem Process including: • Puff Stem-Admoist process • ❖ Raw stem Separator ❖ Admoist Process	• ES-CD-001 ❖ CD-PS-001A ❖ CD-PS-001B	Central Dust Collection System, preceded by: Bagfilter (2,112 square feet of filter area), and Bagfilter (581 square feet of filter area)
• ES-PS-003	• Fluidized Bed Stem Dryer	• CD-PS-003B, CD-PS-003A	Bagfilter (1,848 square feet of filter area) and multicyclone (4 tubes, 30 inches in diameter, each)
• ES-TF-001	Tobacco Top Flavoring Process	• N/A	N/A
• ES-MA-001 • ES-MA-002	Menthol Application Process	• N/A	N/A
• ES-CM-001 • ES-CM-002	Cigarette Manufacturing	• CD-CM-001A • CD-CM-001B	Bagfilters (517 square feet of filter area and 1,862 square feet of filter area, respectively)
• ES-CD-001	Central Dust Collection System	• CD-CD-001A • CD-CD-001B	Cyclone (27 inches in diameter) followed by a bagfilter (1,087 square feet of filter area)
• ES-RS-001	Ripper System	• CD-RS-001	Cyclone (72 inches in diameter)
NSPS • ES-B-001 • ES-B-002	Two natural gas/propane-fired boilers (33.48 million Btu per hour and 25.1 million Btu per hour, respectively)	• N/A	N/A

VI. Emission Source-by-Source Evaluation
A. Stemmary Leaf Dryer and Stem Dryer (ID Nos. ES-SD-001 and ES-SD-002), with emissions collected by the Central Dust Collection System (ID No. ES-CD-001)

1. Description

The two steam-operated dryers are used to dry and condition raw tobacco. The leaf (ID No. ES-SD-001) and stem (ID No. ES-SD-002) dryers have maximum capacities of 20,000 pounds per hour and 7,000 pounds per hour, respectively. VOCs and particulates generated during the heating process are exhausted to the outside. Particulate emissions from the stemmary feed system are controlled by means of a hood and are pneumatically conveyed to the Central Dust Collection system.

As for toxics, these dryers are sources of acetic acid and ammonia emissions. VOC and ammonia emissions are based on stack test data for a Proctor Schwartz Dryer made available by Mr. Dave Skelly, Virginia Department of Environmental Quality.

Leaf dryer (ES-SD-001): 1.51 lbs/hr acetic acid, 1.22 lbs/hour ammonia
 Stem dryer (ES-SD-002): 0.53 lbs/hr acetic acid, 0.43 lbs/hour ammonia

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/ Standards	Applicable Regulation
particulate matter	$E=4.10P^{0.67}$ where E = allowable emission rate in pounds per hour P = process weight in tons per hour	2D .0515
visible emissions	20 percent opacity	2D .0521
VOCs	Work practice standards; See Section VII.(A)(1)	2D .0958
VOCs	Less than 250 tons per year; See Section VII.(A)(2)	2D .0530
toxic air pollutants	State-enforceable only; See Section VII.(B)(1)	2Q .0711
toxic air pollutants	State-enforceable only; See Section VII.(B)(2)	2D .1100
odors	State-enforceable only; See Section VII.(A)(3)	2D .1806

a. 2D .0515 “Particulates from Miscellaneous Industrial Processes”

(1) Regulatory Analysis

The allowable particulate emission limit is calculated by the following equation:

$$E = 4.10 \times (P)^{0.67}$$

where E = allowable emission rate for particulate matter in pounds/hour, and
 P = process weight in tons per hour

Leaf Dryer (ID No. ES-SD-001)

The tobacco leaf process rate to the stem dryer (ID No. ES-SD-001) is 20,000 pounds per hour or 10 tons per hour. Thus, the allowable emission rate is:

$$E = 4.10 \times (10)^{0.67} = 19.18 \text{ lbs/hour}$$

According to the Title V application, the particulate emissions factor for the leaf dryer is 0.206 lb/ton (based on Standard Commercial Tobacco 1996 air emissions inventory). Thus, the potential particulate emissions from this source are:

10 tons/hour x 0.206 lb/ton = 2.06 lbs/hour.
Thus, compliance is indicated.

Stem Dryer (ID No. ES-SD-002, 7,000 pounds per hour)

The tobacco leaf process rate to the stem dryer (ID No. ES-SD-002) is 7,000 pounds per hour or 3.5 tons per hour. Thus, the allowable emission rate is:

$$E = 4.10 \times (3.5)^{0.67} = 9.49 \text{ lbs/hour}$$

According to the Title V application, the particulate emissions factor for the leaf dryer is 0.356 lb/ton (based on Standard Commercial Tobacco 1996 air emissions inventory). Thus, the potential particulate emissions from this source are as follows and compliance is indicated:

$$3.5 \text{ tons/hour} \times 0.356 \text{ lb/ton} = 1.246 \text{ lbs/hour}$$

(2) Monitoring/Recordkeeping Requirements

A daily log book will be kept of the type and amount of materials introduced into the stem dryers that could cause emissions of particulate matter. Stack testing is not required to ensure compliance with this regulation. However the test method condition will be put in the permit in the event that DAQ or EPA finds that due to improper operation violations, etc, source testing is required.

(3) Reporting Requirements

A summary report of the monitoring will be submitted by January 30 and July 30 of each year.

b. 2D .0521 "Control of Visible Emissions"

(1) Regulatory Analysis

These stem leaf dryers were first operated in October 2001. Since they were established after July 1, 1971, they are subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period. Compliance is indicated with this regulation because the latest inspection report did not cite any opacity exceedances.

(2) Monitoring Requirements

One weekly visual observation of the emission stack shall be performed with the requirement to reduce visible emissions to the greatest extent possible.

(3) Recordkeeping Requirements

The recordkeeping requirements to ensure compliance with the particulate matter standard will be followed. In addition, a log will be kept of the weekly visible emission stack observation.

C. Direct Cylinder Conditioning and Casing Operation (ID No. ES-DC-001)

1. Description

In the direct cylinder conditioning and casing operation (ID No. ES-DC-001), additives or “casing” are applied to the tobacco leaf along with steam. The casings include glycerin and propylene glycol and are applied at a rate of 2,840 pounds per hour to 20,000 pounds per hour of tobacco. Temperatures maintained during the casing process are sufficiently low to prevent evaporative loss of the casing materials. Therefore, there are no emissions of glycerin or propylene glycol from this process. However, small quantities of propylene glycol and glycerin are lost during drying in the Rotary Dryers (RD-001 through RD-003) and Annular Dryer (ID No. AD-001) and are accounted for as part of the total VOC emissions from these dryers.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
VOCs	Work practice standards; See Section VII.(A)(1)	2D .0958
VOCs	Less than 250 tons per year; See Section VII.(A)(2)	2D .0530
toxic air pollutants	State-enforceable only; See Section VII.(B)(1)	2Q .0711
toxic air pollutants	State-enforceable only; See Section VII.(B)(2)	2D .1100
odors	State-enforceable only; See Section VII.(A)(3)	2D .1806

D. Rotary Dryers (ID Nos. ES-RD-001, ES-RD-002, and ES-RD-003)

1. Description

ACCORDING TO TAMMY MANNING, RRO INSPECTOR, THIS EQUIPMENT HAS BEEN SOLD AND REMOVED FROM SITE.

According to the Title V application, the cased tobacco is blended with the reclaimed tobacco and is blended one of two ways – the Annular Dryer described in VII.(E) or the rotary dryers.

In the Rotary Dryer Process, some tobacco is treated with a palladium catalyst to remove certain organics from the tobacco. Next, the tobacco is dried in one of three Rotary Dryers, which have a maximum process rate of 18,000 pounds per hour collectively of tobacco, then treated with the palladium solution in an enclosed cylinder, and then transferred to the Annular Dryer to remove moisture prior to the addition of the top flavoring. Although there are no

emissions from the palladium process itself, VOCs, particulates, and ammonia are emitted in the dryer exhaust as a result of heating the tobacco. Particulate emissions from the rotary dryers have been demonstrated to be low, and therefore, no control technology is required for these dryers.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/ Standards	Applicable Regulation
particulate matter	$E=4.10P^{0.67}$ where E = allowable emission rate in pounds/hour P = process weight in tons per hour	2D .0515
visible emissions	20 percent opacity	2D .0521
VOCs	Work practice standards; See Section VII.(A)(1)	2D .0958
VOCs	Less than 250 tons per year; See Section VII.(A)(2)	2D .0530
toxic air pollutants	State-enforceable only; See Section VII.(B)(1)	2Q .0711
toxic air pollutants	State-enforceable only; See Section VII.(B)(2)	2D .1100
odors	State-enforceable only; See Section VII.(A)(3)	2D .1806

a. 2D .0515 “Particulates from Miscellaneous Industrial Processes”

(1) Regulatory Analysis

The allowable particulate emission limit is calculated by the following equation:

$$E = 4.10 \times (P)^{0.67}$$

where E = allowable emission rate for particulate matter in pounds/hour, and
P = process weight in tons per hour

Rotary Dryers (ID Nos. ES-RD-001, ES-RD-002, and ES-RD-003, 18,000 pounds per hour of tobacco total)

The three rotary dryers (ID Nos. ES-RD-001, ES-RD-002, and ES-RD-003) collectively have a tobacco leaf process rate of 18,000 pounds per hour (9 tons per hour). Thus, the allowable emission rate from these dryers together is:

$$E = 4.10 \times (9)^{0.67} = 17.9 \text{ lbs/hour}$$

According to the Title V application, the potential particulate emissions from this source are calculated based on process estimates by Liggett Myers in Durham, NC., which lead to an emission factor of 0.000174 lb particulate/lb tobacco.

$$0.000174 \text{ lb particulate/lb tobacco} \times 18,000 \text{ lb/hr tobacco} = 3.13 \text{ lbs/hour PM}$$

Thus, compliance is indicated.

(2) Monitoring/Recordkeeping Requirements

A daily log book will be kept of the type and amount of materials introduced into the rotary dryers that could cause emissions of particulate matter. Stack testing is not required to ensure compliance with this regulation. However the test method condition will be put in the permit in the event that DAQ or EPA finds that due to improper operation violations, etc, source testing is required.

(3) Reporting Requirements

A summary report of the monitoring will be submitted by January 30 and July 30 of each year.

b. 2D .0521 “Control of Visible Emissions”

(1) Regulatory Analysis

These rotary dryers were first operated in March 2002. Since they were established after July 1, 1971, they are subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period. Compliance is indicated with this regulation because the latest inspection report did not cite any opacity exceedances.

(2) Monitoring Requirements

One weekly visual observation of the emission stack shall be performed with the requirement to reduce visible emissions to the greatest extent possible.

(3) Recordkeeping Requirements

The recordkeeping requirements to ensure compliance with the particulate matter standard will be followed. In addition, a log will be kept of the weekly visible emission stack observation.

E. Annular Dryer (ID No. ES-AD-001) and associated cyclone (ID No. CD-AD-001A, 25.5 inches in diameter), with

- ❖ The conveyor discharge from the annular dryer controlled by one bagfilter (2,727 square feet of filter area, ID No. CD-AD-001B), and
- ❖ The emissions from the cooling end of the dryer exhausted to the Central Dust Collection System (ES-CD-001)

1. Description

In this operation, the cased tobacco is blended with the reclaimed tobacco and is blended one of two ways – the Rotary Dryers described in VII.(D) or the Annular Dryer. In the Annular Dryer, the moisture is reduced from about 20% to 14.5% prior to the addition of top flavoring. There, VOCs and ammonia are emitted during the drying of the tobacco. Particulates contained in the dryer exhaust are controlled by a dual cyclone (ID No. CD-AD-001), which exhausts to the outside. On the cooling end of the dryer, tobacco fines from the conveyor belt are pneumatically conveyed to the Central Dust Collection System. In addition, particulates in the exhaust are controlled by a separate bagfilter (ID No. CD-AD-001B), which exhausts to

the outside.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/ Standards	Applicable Regulation
particulate matter	$E=4.10P^{0.67}$ where E = allowable emission rate in pounds/hour P = process weight in tons per hour	2D .0515
visible emissions	20 percent opacity	2D .0521
VOCs	Work practice standards; See Section VII.(A)(1)	2D .0958
VOCs	Less than 250 tons per year; See Section VII.(A)(2)	2D .0530
toxic air pollutants	State-enforceable only; See Section VII.(B)(1)	2Q .0711
toxic air pollutants	State-enforceable only; See Section VII.(B)(2)	2D .1100
odors	State-enforceable only; See Section VII.(A)(3)	2D .1806

a. 2D .0515 “Particulates from Miscellaneous Industrial Processes”

(1) Regulatory Analysis

The allowable particulate emission limit is calculated by the following equation:

$$E = 4.10 \times (P)^{0.67}$$

where E = allowable emission rate for particulate matter in pounds/hour, and
P = process weight in tons per hour

Annular Dryer (ID No. ES-AD-001, 24,000 pounds per hour)

The tobacco leaf process rate is 24,000 pounds per hour (12 tons per hour).

$$E = 4.10 \times (12)^{0.67} = 21.7 \text{ lbs/hour}$$

According to the Title V application, the after control particulate emissions from this source are 1.05 lbs/hour.

The before and after control emission rates to fabric filter (ID No. CD-AD-001B, 2,727 square feet of filter area) are 30 lbs./hour and 0.45 lbs/hour, respectively, with the bagfilter achieving 98.5% control. The bagfilter (ID No. CD-AD-001B) controls dust generated by the pneumatic pickup system on the cooling end of the Annular Dryer. Emissions were estimated using October 2001 stack test data from a Liggett/Hauni for a rotary dryer with a similar discharge/conveyance system. Liggett/Hauni data are as follows:

Tobacco throughput rate for stack test: 1320 lbs/hour

Uncontrolled tobacco dust: 1.65 lbs/hour
Dust generation rate: 1.65 lbs dust/1320 lbs tobacco = .00125 lb dust/lb tobacco

$(0.0125 \text{ lb dust/lb tobacco}) \times (24,000 \text{ lbs/hour}) = 30 \text{ lbs/hour generated}$

After control emissions = $30 \text{ lbs/hour PM} \times (1-0.985) = 0.45 \text{ lbs/hour}$

The before and after control emission rates to the cyclone (ID No. CD-AD-001A, 25.5 inches in diameter) are 6.0 lbs/hour and 0.6 lbs/hour, respectively, with the cyclone achieving 90% control. The before control emissions to this source are based on 1993 emissions data from American Tobacco Company who reported uncontrolled particulate emissions of 5.0 lbs/hour, based on 20,000 pounds per hour tobacco throughput. Since USFCTG processes 24,000 pounds per hour tobacco, following are the uncontrolled emissions:

$5.0 \text{ lbs/hr} \times (24,000 / 20,000) \text{ lbs/hr} = 6.0 \text{ lbs/hr}$

With a reported 90% control efficiency for the cyclone, controlled particulate emissions are:

$6.0 \text{ lbs/hour} \times (1.0-0.9) = 0.6 \text{ lb/hour particulate}$

The applicant ran a NCDAQ Cyclone Design an Evaluation spreadsheet which confirmed that a 90% cyclone control efficiency is reasonable, with a 95.64% control efficiency predicted using the Method of Leith-Licht. Thus, compliance is expected with proper operation and maintenance of the control equipment.

(2) Monitoring/Recordkeeping Requirements

To ensure that optimum control efficiency of particulate matter is obtained by this bagfilter and cyclone, monthly inspections and maintenance will be performed on the bagfilter and cyclone as recommended by the manufacturer. As a minimum, the inspections will include a monthly external inspection of the bagfilter and ductwork and an annual internal inspection of the bagfilter and cyclone to ensure structural integrity. Stack testing is not required to ensure compliance with this regulation. However the test method condition will be put in the permit in the event that DAQ or EPA finds that due to improper operation violations, etc. source testing is required. Testing requirements are specified in 2D .0501(c).

(3) Recordkeeping Requirements

The results of inspection and maintenance shall be recorded in a log book.

(4) Reporting Requirements

A summary report of the monitoring will be submitted by January 30 and July 30 of each year. The results of any maintenance to the ductwork and filters shall be reported within 30 days of a written request by DAQ.

b. 2D .0521 "Control of Visible Emissions"

(1) Regulatory Analysis

The annular dryer was first operated in March 2002. Since it was established after July 1, 1971, they are subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period. Compliance is indicated with this regulation because the latest inspection report did not cite any opacity exceedances.

(2) Monitoring Requirements

One weekly visual observation of the emission stack shall be performed with the requirement to reduce visible emissions to the greatest extent possible.

(3) Recordkeeping Requirements

The recordkeeping requirements to ensure compliance with the particulate matter standard will be followed. In addition, a log will be kept of the weekly visible emission stack observation.

F. Puff Stem Process (ID Nos. ES-PS-001 and ES-PS-003) including:

- **Puff Stem-Admoist Process No. 1 (ID No. ES-PS-001) consisting of:**
 - ❖ **Raw stem/separator controlled by bagfilter (2,112 square feet of filter area, ID No. CD-PS-001A)**
 - ❖ **Admoist process controlled by bagfilter (581 square feet of filter area, ID No. CD-PS-001B),**
 - ❖ **The collected dust from the puff stem process is conveyed to the Central Dust Collection System (ID No. CD-001)**
- **One stem dryer (ID No. ES-PS-003) controlled by one bagfilter (1,848 square feet of filter area, ID No. CD-PS-003B) and one multicyclone (4 tubes, 30 inches in diameter each, ID No. CD-PS-003A)**

1. Description

According to the Title V application, following is a description of this process:

Tobacco stems are prepared for an introduction to the blend line. Stems are introduced into the process just prior to the introduction of the top flavoring and after tobacco blend drying. Puff Stem operations include the following four separate but continuous processes:

- A. **Admoist Steamer (ID No. PS-001):** This process adds moisture to the tobacco stem through exposure to both hot water and steam. VOCs are emitted from the heating of the tobacco. Two bagfilters (ID Nos. CD-PS-001A and CD-PS-001B) control the dust emissions associated with the Admoist Process; one bagfilter (ID No. CD-PS-001A) controls dust emissions from the raw stem/separator at the front end of the process, while the other bagfilter (ID No. CD-PS-001B) collects dust from various pickup points associated with the bulkers. The bagfilters exhaust to the outside, and the collected dust is conveyed to the Central Dust Collection System (ID No. CD-001).
- B. **Puff Stem/STS Conditioner (ID No. PS-002):** Tobacco stems are conditioned through the addition of steam. It is assumed that no additional VOCs are emitted from the process and only heat is released from the stack associated with this STS conditioner (PS-002).

There are no applicable requirements for this source. This source is listed under insignificant activities.

- C. Wetting Cylinder: A solution of water and diammonium phosphate, prepared in the mix kitchen, is sprayed onto the stems to promote softening and conditioning. There are no emissions and no stacks associated with this process. This source is listed under insignificant activities.
- D. Fluidized Bed Steam Dryer (ID No. PS-003): Moisture in the tobacco stems is reduced from greater than 40% to approximately 13% in this dryer. VOC emissions from this source are assumed to be negligible and are accounted for in the Admoist Process. The dust collected from the the multicyclone and the elutriator associated with this puff stem dryer is pneumatically transferred to bulkers for recycling back into the process. Dust from the transfer operation is controlled by a bagfilter (ID No. CD-PS-003B) which exhausts back outside.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/ Standards	Applicable Regulation
particulate matter	$E=4.10P^{0.67}$ where E = allowable emission rate in pounds/hour P = process weight in tons per hour	2D .0515
visible emissions	20 percent opacity	2D .0521
VOCs	Work practice standards; See Section VII.(A)(1)	2D .0958
VOCs	Less than 250 tons per year; See Section VII.(A)(2)	2D .0530
toxic air pollutants	State-enforceable only; See Section VII.(B)(1)	2Q .0711
toxic air pollutants	State-enforceable only; See Section VII.(B)(2)	2D .1100
odors	State-enforceable only; See Section VII.(A)(3)	2D .1806

a. 2D .0515 “Particulates from Miscellaneous Industrial Processes”

(1) Regulatory Analysis

The allowable particulate emission limit is calculated by the following equation:

$$E = 4.10 \times (P)^{0.67}$$

where E = allowable emission rate for particulate matter in pounds/hour, and
P = process weight in tons per hour

Puff Stem-Admoist Process (ID No. ES-PS-001)

The tobacco process rate to this source is 5,000 pounds per hour or 2.5 tons per hour. Thus, the allowable emission rate from this source is as follows:

$$E = 4.10 \times (2.5)^{0.67} = 7.58 \text{ lbs/hour}$$

According to the Title V application, the before and after control emissions from the bagfilter (ID No. CD-PS-001A) are 18.13 lbs/hour and 0.272 lbs/hour, respectively, with this bagfilter achieving 98.5% control. The before and after control emissions to bagfilter (ID No. CD-PS-001B) are reported to be 2.7 and 0.041 lbs/hour, respectively, with this bagfilter also achieving 98.5% control. Thus, compliance is expected with proper operation and maintenance of the control equipment.

Dust generated for CD-PS-001A

The quantity of dust generated by the Raw stem/Separator is estimated based on 1999 operating data from Liggett Group. In 1999, 25,774 lbs of dust were collected from bagfilters CD-PS-001A and CD-PS-001B.

$$(25,774 \text{ lbs/yr dust} / 3,848,503 \text{ lbs/yr tobacco}) / 0.985 = 0.0068 \text{ lb dust/lb tobacco uncontrolled}$$

The quantity of dust collected from the two bagfilters at Liggett were estimated by air flow to each filter.

$$\begin{aligned} \text{Bagfilter CD-PS-001A: } & 2112 \text{ ft}^3/\text{min} \quad 53.33\% \\ \text{Bagfilter CD-PS-003A: } & \frac{1848 \text{ ft}^3/\text{min}}{3930 \text{ ft}^3/\text{min}} \quad 46.67\% \end{aligned}$$

$$\begin{aligned} &= 0.5333 * 0.0068 \text{ lb dust/lb tobacco} = 0.0036 \text{ lb dust/lb tobacco} \\ &0.0036 \text{ lb/lb} * 5000 \text{ lbs/hour} = 18.13 \text{ lbs/hour uncontrolled} \\ &18.13 \text{ lbs/hour} * (1-0.985) = 0.272 \text{ lbs/hour} \end{aligned}$$

Dust Generated for CD-PS-001B

Particulate emissions from this source are based on the total dust collected from bagfilter CD-PS-001B at Liggett Durham. The system typically collected 1800 pounds of dust per year and operated 960 hrs/year. Based on a process rate of 3,500 lbs/hr at the Liggett Plant for this source, the emission factor is calculated to be:

$$\begin{aligned} &((1,800 \text{ lbs/yr}) / (960 \text{ hrs/yr})) / (3,500 \text{ lbs/hour}) = (0.000536 \text{ lb/lb tobacco}) / 0.985 \\ &= 0.00054 \text{ lb dust generated /lb tobacco} \end{aligned}$$

$$\begin{aligned} &= 0.00054 \text{ lb/lb tobacco} \times 5000 \text{ lb/hr} = 2.70 \text{ lb/hour uncontrolled} \\ &2.70 \text{ lb/hour} \times (1-0.985) = 0.041 \text{ lb/hr controlled} \end{aligned}$$

Puff Stem Fluidized Bed Dryer (ID No. ES-PS-003)

The tobacco process rate to this source is 5,000 pounds per hour or 2.5 tons per hour. Thus, the allowable emission rate from this source is as follows:

$$E = 4.10 \times (2.5)^{0.67} = 7.58 \text{ lbs/hour}$$

According to the Title V application, the before and after control emissions from the bagfilter (ID No. CD-PS-003B) are 15.85 lbs/hour and 0.238 lbs/hour, respectively, with this bagfilter achieving 98.5% control. The before and after control emissions to the multicyclone (ID No. CD-PS-003A) are 16.2 and 0.32 lbs/hour, respectively, with this multicyclone achieving 98% control. Thus, compliance is expected with proper operation and maintenance of the control equipment.

Dust generated for CD-PS-003

Particulates generated from the drying of stems in the Fluidized Bed Dryer are controlled by a series of four multicyclones (ID No. CD-PS-003A), which exhaust to the outside. Dust collected by the multicyclones and the elutriator are transferred to Central Dust Collector System. A bagfilter (ID No. CD-PS-003B) controls dust generated during the transport process.

The quantity of dust generated by this process is estimated based on 1999 operating data from Liggett Group. In 1999, 25,774 lbs of dust were collected from bagfilters CD-PS-001A and CD-PS-001B.

$(25,774 \text{ lbs/yr dust} / 3,848,503 \text{ lbs/yr tobacco}) / 0.985 = 0.0068 \text{ lb dust/lb tobacco uncontrolled}$

The quantity of dust collected from the two bagfilters at Liggett were estimated by air flow to each filter, as stated above:

Bagfilter CD-PS-001A: 2112 ft³/min 53.33%
Bagfilter CD-PS-003B: 1848 ft³/min 46.67%
3930 ft³/min

$= 0.4667 * 0.0068 \text{ lb dust/lb tobacco} = 0.00317 \text{ lb dust/lb tobacco}$
 $0.00317 \text{ lb/lb} * 5000 \text{ lbs/hour} = 15.85 \text{ lbs/hour uncontrolled}$
 $15.85 \text{ lbs/hour} * (1 - 0.985) = 0.238 \text{ lbs/hour}$

(2) Monitoring/Recordkeeping Requirements

To ensure that optimum control efficiency of particulate matter is obtained by the bagfilters (ID Nos. CD-PS-001A, CD-PS-001B, and CD-PS-003B) and multicyclone (ID No. CD-PS-003A), monthly inspections and maintenance will be performed on the bagfilters and multicyclone as recommended by the manufacturer. As a minimum, the inspections will include a monthly external inspection of the bagfilters and multicyclone and ductwork and an annual internal inspection of the bagfilters to ensure structural integrity. Stack testing is not required to ensure compliance with this regulation. However, the test method condition will be put in the permit in the event that DAQ or EPA finds that due to improper operation violations, etc, source testing is required. Testing requirements are specified in 2D .0501(c).

(3) Recordkeeping Requirements

The results of inspection and maintenance shall be recorded in a log book.

(4) Reporting Requirements

A summary report of the monitoring will be submitted by January 30 and July 30 of each year. The results of any maintenance to the ductwork and filters shall be reported within 30 days of a written request by DAQ.

b. 2D .0521 "Control of Visible Emissions"

(1) Regulatory Analysis

These puff stem operations (ID No. ES-PS-001 and ES-PS-003) were first operated

in March 2002. Since they were first established after July 1, 1971, they are subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period, except that six-minute averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period. Compliance is indicated with this regulation because the latest inspection report did not cite any opacity exceedances.

(2) Monitoring Requirements

One weekly visual observation of the emission stack shall be performed with the requirement to reduce visible emissions to the greatest extent possible.

(3) Recordkeeping Requirements

The recordkeeping requirements to ensure compliance with the particulate matter standard will be followed. In addition, a log will be kept of the weekly visible emission stack observation.

G. Top Flavoring Operation (ID Nos. ES-TF-001):

1. Description

According to the Title V application, following is a description of this process:

Tobacco top flavoring is prepared in a mix kitchen. Tobacco blend and stems, combined after drying, receive a top flavoring consisting of 62% ethanol and the remainder water. VOCs are emitted during the preparation of the top flavoring in the mix kitchen as well as during the application to the tobacco blend. VOCs are emitted at a rate of 280.6 pounds per hour from this source. However, USFCTG requests a 250 tons per year limit on VOCs from the facility to avoid the applicability of PSD.

Tobacco entering the process includes:

- Leaf blend: 20,000 lbs/hour
- Stems: 4,000 lbs/hour
- Shorts: 1,000 lbs/hour
- Total = 25,000 lbs/hour

Maximum % ethanol in top flavoring process = 62%

Top flavoring application rate (based on an application rate of 2.5 gallons top flavoring/1000 lbs tobacco) = 0.0181 lb/lb of tobacco

0.0181 lb/lb tobacco * (25,000 lbs/hour tobacco) * 62% ethanol = 280.55 lb/hr VOCs potential

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/ Standards	Applicable Regulation
---------------------	-------------------	-----------------------

VOCs	Work practice standards; See Section VII.(A)(1)	2D .0958
VOCs	Less than 250 tons per year; See Section VII.(A)(2)	2D .0530
odors	State-enforceable only; See Section VII.(A)(3)	2D .1806

H. Menthol Application Process (ID No. MA-001 and MA-002)

1. Description

According to the Title V application, two menthol applicators will be used to apply melted menthol crystals at a rate of 31.68 pounds per hour to 36,000 pounds per hour of foil, which will be used as the inner lining for cigarette packaging. Fugitive VOC emissions are generated from the application of menthol.

Emissions Calculations form this source are as follows:

Application rate = 600 ft/min x 2 packs/linear ft. x 100 mg/pack x 60 min/hr = 7,200,000 mg/hr
 ((7,200,000 mg/hr)/ (454.5 g/lb)) x (1g/1000 mg) = 15.84 lbs/hr
 15.84 lbs/hour x 10% emitted x 2 units = 3.17 lbs/hour VOCs

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/ Standards	Applicable Regulation
VOCs	Work practice standards; See Section VII.(A)(1)	2D .0958
VOCs	Less than 250 tons per year; See Section VII.(A)(2)	2D .0530
odors	State-enforceable only; See Section VII.(A)(3)	2D .1806

I. Cigarette Manufacturing Operation (ID No. CM-001 through CM-012) and associated bagfilters (ID Nos. CD-CM-001A and CD-CM-001B, 517 square feet of filter area and 1,862 square feet of filter area, respectively) with dust collected by the bagfilters transferred to the Central Dust Collection System (ID No. CD-001)

1. Description

According to the Title V application, cigarettes will be manufactured, utilizing processed tobacco blend, papers, filters, and adhesives as the raw materials in this operation. Paraffin-based adhesive will be applied to the cigarette paper using a “hot-melt” process. Only small quantities of VOCs are emitted at the operating temperature of the hot melt process.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the

application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/ Standards	Applicable Regulation
particulate matter	$E=4.10P^{0.67}$ where E = allowable emission rate in pounds per hour P = process weight in tons per hour	2D .0515
visible emissions	20 percent opacity	2D .0521
VOCs	Work Practice Standards; See Section VII.(A)(1)	2D .0958
VOCs	Less than 250 tons per year; See Section VII.(A)(2)	2D .0530
odors	State-enforceable only; See Section VII.(A)(3)	2D .1806

a. 2D .0515 “Particulates from Miscellaneous Industrial Processes”

(1) Regulatory Analysis

The allowable particulate emission limit is calculated by the following equation:

$$E = 4.10 \times (P)^{0.67}$$

where E = allowable emission rate for particulate matter in pounds/hour, and
P = process weight in tons per hour

Entering this process are 9,072 pounds per hour of tobacco, 6,708 pounds per hour of paper, and 263 pounds per hour of adhesives for a total process rate of 16,043 pounds per hour or 8.02 tons/hour.

Process rate = 8.02 tons per hour

$$E = 4.10 \times (8.02)^{0.67} = 16.5 \text{ lbs/hour}$$

Based on operating data from the Liggett Group, Inc., the amount of dust generated from the cigarette manufacturing process is 0.035 lb/lb tobacco. 80% of the dust is expected to be handled by Bagfilter CD-CM-001A, and 20% of the dust is expected to be handled by bagfilter CD-CM-001B. According to the Title V application, the after control particulate emissions from bagfilter (ID No. CD-CM-001A) are 0.95 pounds/hour and the after control particulate emissions from the bagfilter (ID No. CD-CM-001B) are 3.81 pounds per hour for a total after-control emission rate of 4.76 pounds per hour. Thus, compliance is expected with proper operation and maintenance of the bagfilters.

(2) Monitoring/Recordkeeping Requirements

To ensure that optimum control efficiency of particulate matter is obtained by these bagfilters (ID Nos. CD-CM-001A and CD-CM-001B), monthly inspections and maintenance will be performed on the bagfilters, as recommended by the manufacturer. As a minimum, the inspections will include a monthly external inspection of the bagfilters and ductwork and an annual internal inspection of the

bagfilters to ensure structural integrity. Stack testing is not required to ensure compliance with this regulation. However, the test method condition will be put in the permit in the event that DAQ or EPA finds that due to improper operation violations, etc, source testing is required. Testing requirements are specified in 2D .0501(c).

(3) Recordkeeping Requirements

The results of inspection and maintenance shall be recorded in a log book.

(4) Reporting Requirements

A summary report of the monitoring will be submitted by January 30 and July 30 of each year. The results of any maintenance to the ductwork and filters shall be reported within 30 days of a written request by DAQ.

b. 2D .0521 “Control of Visible Emissions”

(1) Regulatory Analysis

The cigarette manufacturing operation (ID No. CM-001) was first operated in March 2002. Since this operation was established after July 1, 1971, it is subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period. Compliance is indicated with this regulation because the latest inspection report did not cite any opacity exceedances.

(2) Monitoring Requirements

One weekly visual observation of the emission stack shall be performed with the requirement to reduce visible emissions to the greatest extent possible.

(3) Recordkeeping Requirements

The recordkeeping requirements to ensure compliance with the particulate matter standard will be followed. In addition, a log will be kept of the weekly visible emission stack observation.

J. Central Dust Collection System (ID No. ES-CD-001) consisting of one cyclone (27 inches in diameter, ID No. CD-CD-001A) followed by one bagfilter (1,087 square feet of filter area, ID No. CD-CD-001B)

1. Description

According to the Title V application, dust from the various process areas, including the stemmery feed system, the puff stem admoist bagfilters, the puff stem dryer bagfilter, the annular dryer bagfilter, the cigarette manufacturing pneumatic transport bagfilter, and the cigarette manufacturing cigarette machine bagfilter.

Dust Source	Amount to CD-001 (lb/hour)
Stemmery Hood	31.25
Cigarette Manufacturing	312.76
Puff Stem – Admoist	20.52
Annular Dryer	29.55
Total	394.08

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/ Standards	Applicable Regulation
particulate matter	$E=4.10P^{0.67}$ where E = allowable emission rate in pounds per hour P = process weight in tons per hour	2D .0515
visible emissions	20 percent opacity	2D .0521

a. 2D .0515 “Particulates from Miscellaneous Industrial Processes”

(1) Regulatory Analysis

The allowable particulate emission limit is calculated by the following equation:

$$E = 4.10 \times (P)^{0.67}$$

where E = allowable emission rate for particulate matter in pounds/hour, and
P = process weight in tons per hour

At a maximum process rate of 394 lbs/hour to the Central Dust System (0.197 tons/hour), the allowable emission rate is:

$$E = 4.10 \times (0.197)^{0.67} = 1.4 \text{ lbs/hour}$$

According to the Title V application, the after control particulate emissions from this source are 0.89 lbs/hour, assuming 85% cyclone control and 98.5% bagfilter control. Thus, compliance is indicated with proper operation and maintenance of the cyclone and bagfilter.

(2) Monitoring/Recordkeeping Requirements

To ensure that optimum control efficiency of particulate matter is obtained by the cyclone (ID No. CD-CD-001A) and bagfilter (ID Nos. CD-CD-001B), monthly inspections and maintenance will be performed, as recommended by the manufacturer. As a minimum, the inspections will include a monthly external

inspection of the cyclone and bagfilter and ductwork and an annual internal inspection of the bagfilter to ensure structural integrity. Stack testing is not required to ensure compliance with this regulation. However, the test method condition will be put in the permit in the event that DAQ or EPA finds that due to improper operation violations, etc, source testing is required. Testing requirements are specified in 2D .0501(c).

(3) Recordkeeping Requirements

The results of inspection and maintenance shall be recorded in a log book.

(4) Reporting Requirements

A summary report of the monitoring will be submitted by January 30 and July 30 of each year. The results of any maintenance to the ductwork, cyclone, and bagfilter shall be reported within 30 days of a written request by DAQ.

b. 2D .0521 “Control of Visible Emissions”

(1) Regulatory Analysis

The Central Dust Collection System was first operated in March 2002. Since it was established after July 1, 1971, it is subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period. Compliance is indicated with this regulation because the latest inspection report did not cite any opacity exceedances.

(2) Monitoring Requirements

One weekly visual observation of the emission stack shall be performed with the requirement to reduce visible emissions to the greatest extent possible.

(3) Recordkeeping Requirements

The recordkeeping requirements to ensure compliance with the particulate matter standard will be followed. In addition, a log will be kept of the weekly visible emission stack observation.

K. Ripper System (ID No. ES-RS-001) and associated cyclone (72 inches in diameter, ID No. CD-RS-001)

1. Description

According to the Title V application, the ripper system recovers tobacco from packaged cigarettes that are returned. A ripper system separates the tobacco and tobacco fines from the paper. The tobacco is then recovered and the paper, along with some entrained tobacco dust, will be conveyed to a collection bin. Dust emissions are then controlled by a cyclone (ID No. CD-RS-001A), located outside the facility.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/ Standards	Applicable Regulation
particulate matter	$E=4.10P^{0.67}$ where E = allowable emission rate in pounds per hour P = process weight in tons per hour	2D .0515
visible emissions	20 percent opacity	2D .0521

a. 2D .0515 “Particulates from Miscellaneous Industrial Processes”

(1) Regulatory Analysis

The allowable particulate emission limit is calculated by the following equation:

$$E = 4.10 \times (P)^{0.67}$$

where E = allowable emission rate for particulate matter in pounds/hour, and
P = process weight in tons per hour

According to the Title V application, paper enters this process at a rate of 234 pounds/hour and tobacco enters this process at a rate of 316 pounds/hour, for a total process rate of 550 pounds/hour or 0.275 tons/hour.

$$E = 4.10 \times (0.275)^{0.67} = 1.72 \text{ lbs/hour}$$

According to the Title V application, the after control particulate emissions from this source are 1.58 pounds per hour, assuming 95% cyclone control efficiency. Thus, compliance is indicated with proper operation and maintenance of the cyclone (ID No. CD-RS-001). The applicant ran the DAQ Cyclone Design and Evaluation Spreadsheet for this source. This spreadsheet confirmed that the 95% control efficiency estimation for the cyclone is reasonable, as 97.57% particulate control was estimated using the Method of Leith-Licht.

(2) Monitoring Requirements

To ensure that optimum control efficiency of particulate matter is obtained by the cyclone (ID No. CD-RS-001), monthly inspections and maintenance will be performed on the cyclone, as recommended by the manufacturer. As a minimum, the inspections will include a monthly external inspection of the cyclone and ductwork to ensure structural integrity. Stack testing is not required to ensure compliance with this regulation. However, the test method condition will be put in the permit in the event that DAQ or EPA finds that due to improper operation violations, etc, source testing is required. Testing requirements are specified in 2D .0501(c).

(3) Recordkeeping Requirements

The results of inspection and maintenance shall be recorded in a log book.

(4) Reporting Requirements

A summary report of the monitoring will be submitted by January 30 and July 30 of each year. The results of any maintenance to the ductwork and cyclone shall be reported within 30 days of a written request by DAQ.

b. 2D .0521 “Control of Visible Emissions”

(1) Regulatory Analysis

The ripper system has an operation date of July 2002. Since it was established after July 1, 1971, it is subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period. Compliance is indicated with this regulation because the latest inspection report did not cite any opacity exceedances.

(2) Monitoring Requirements

One weekly visual observation of the emission stack shall be performed with the requirement to reduce visible emissions to the greatest extent possible.

(3) Recordkeeping Requirements

The recordkeeping requirements to ensure compliance with the particulate matter standard will be followed. In addition, a log will be kept of the weekly visible emission stack observation.

L. Two NSPS-affected natural gas/propane-fired boilers (33.48 million Btu per hour and 25.1 million Btu per hour, respectively, ID Nos. ES-B-001 and ES-B-002)

1. Description

According to the Title V application, the two NSPS-affected boilers (ID Nos. ES-B-001 and ES-B-002) are used for steam generation for the various tobacco drying and conditioning processes. Natural gas is the primary fuel for the boilers with propane as the backup fuel.

2. Applicable Regulatory Requirements

The following provides a summary of emission and/or operation limits for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
particulate matter	0.36 pound per million Btu	15A NCAC 2D .0503
sulfur dioxide	2.3 pounds per million Btu heat input	15A NCAC 2D .0516
visible emissions	20 percent opacity	15A NCAC 2D .0521
NA	Recordkeeping only; monthly fuel records	15ANCAC 2D .0524 (40 CFR Part 60 Subpart Dc)

a. 2D .0503(a) "Particulates from Fuel Burning Indirect Heat Exchangers"

(1) Regulatory Analysis

This rule applies to installations burning fuel, including natural gas, propane and fuel oils, for the purpose of producing heat or power by indirect heat transfer. Allowable emissions of particulate matter from natural gas and propane combustion in these boilers shall be calculated as follows:

$$E = 1.090 Q^{-0.2594}$$

where: E = allowable particulate emission rate, pounds per million Btu
Q = maximum heat input rate (total at plant site) million Btu per hour

Allowable particulate emissions for boilers (ID Nos. ES-B-001 and ES-B-002) are determined based on a total plant site heat input rate from the fuel-fired indirect heat exchangers at the facility

Boiler (ID No. ES-B-001): 33.48 million Btu/hour
Boiler (ID No. ES-B-002): 25.1 million Btu/hour
Boiler (ID No. IES-B-003): 6.278 million Btu/hour
Boiler (ID No. IES-B-004): 6.278 million Btu/hour
Total heat input to facility = 71.136 million Btu/hour

Thus, allowable particulate emissions are:

$$E = 1.09 \times (71.136)^{-0.2594} = 0.36 \text{ pound per million Btu}$$

combustion The AP-42 emission factor for total particulate emissions from natural gas is 7.6 pounds of particulate per million cubic feet combusted [ref: AP-42 Table 1.4-2; July 1998]. Assuming a heating value of 1,020 Btu per cubic foot, this equates to:

$$\frac{7.6 \text{ lb particulate}}{1,000,000 \text{ cubic ft}} \times \frac{1 \text{ cuft}}{1,020 \text{ Btu}} \times \frac{1,000,000 \text{ Btu}}{\text{million Btu}} = 0.007 \frac{\text{pounds particulate}}{\text{million Btu heat input}}$$

The AP-42 emission factor for total particulate emissions from propane combustion in industrial boilers (10 to 100 million Btu per hour capacity) is 0.6 pounds of particulate matter per 1,000 gallons of propane gas combusted [ref: AP-42 Table 1.5-1; October 1996]. Assuming a heating value of 90,500 Btu per gallon, this equates to:

$$\frac{0.6 \text{ lb particulate}}{1,000 \text{ gal propane}} \times \frac{1 \text{ gal}}{90,500 \text{ Btu}} \times \frac{1,000,000 \text{ Btu}}{\text{million Btu}} = 0.007 \frac{\text{pounds particulate}}{\text{million Btu heat input}}$$

Thus, particulate emissions from the combustion of natural gas and propane are both well under the applicable particulate emissions limit of 0.36 lb/million Btu.

(2) Monitoring/Recordkeeping/Reporting Requirements

Since the potential particulate emissions are less than the allowable, no monitoring, recordkeeping, or reporting are required for the combustion of natural gas or

propane from these two boilers. Stack testing is not required to ensure compliance with this regulation. However the test method condition will be put in the permit in the event that DAQ or EPA finds that due to improper operation violations, etc, source testing is required.

b. 2D .0516 “Sulfur Dioxide Emissions from Combustion Sources”

(1) Regulatory Analysis

Sulfur dioxide emissions from any source of combustion that is discharged from any vent, stack, or chimney shall not exceed 2.3 pounds per million Btu heat input.

(2) Monitoring/Recordkeeping/Reporting Requirements

There are testing, monitoring, recordkeeping, and reporting requirements for this source due to the inherently low sulfur content of natural gas and propane.

The AP-42 emission factor for total sulfur dioxide emissions from natural gas combustion is 0.6 pounds of sulfur dioxide per million cubic feet combusted [ref: AP-42 Table 1.4-2; July 1998]. Assuming a heating value of 1,020 Btu per cubic foot, this equates to:

$$\frac{0.6 \text{ lb sulfur dioxide}}{1,000,000 \text{ cubic ft}} \times \frac{1 \text{ cuft}}{1,020 \text{ Btu}} \times \frac{1,000,000 \text{ Btu}}{\text{million Btu}} = 0.0006 \frac{\text{pounds sulfur dioxide}}{\text{million Btu heat input}}$$

The AP-42 emission factor for total sulfur dioxide emissions from propane combustion is 0.10S pounds of sulfur dioxide per 1,000 gallons combusted [ref: AP-42 Table 1.5-1; October 1996], where S is in grains per 100 cubic feet. The applicant reports the sulfur content of the propane as negligible. Thus, the sulfur dioxide emissions from propane combustion are expected to be negligible.

$$\frac{0.10S \text{ lb SO}_2 \times \text{negligible}}{1,000,000 \text{ cubic ft}} \times \frac{1 \text{ gal}}{90,500 \text{ Btu}} \times \frac{1,000,000 \text{ Btu}}{\text{million Btu}} = \text{negligible} \frac{\text{lbs sulfur dioxide}}{\text{million Btu}}$$

c. 2D .0521 “Control of Visible Emissions”

(1) Regulatory Analysis

Visible emissions shall not exceed 20 percent opacity when averaged over a six-minute period for sources established after July 1, 1971. Compliance with this regulation will be indicated by inspection of the facility.

(2) Monitoring Requirements

There are no monitoring/recordkeeping/reporting requirements for visible emissions from propane and natural gas-fired boilers.

d. 2D .0524 “New Source Performance Standards” (40 CFR 60 Subpart Dc)

(1) Regulatory Analysis

These boilers are subject to the visible emission and sulfur dioxide limitations in 40 CFR NSPS Part 60, Subpart Dc since they were constructed after June 9, 1989 and have a maximum design heat input capacity greater than 10 million Btu per hour. There are no Subpart Dc emission limitations for natural gas and propane combustion. The initial notification reporting requirements of Subpart Dc have already been met, and compliance is indicated. The only other NSPS Subpart Dc requirement is the condition under 40 CFR 60.48c(g) which requires that “the owner or operator of each affected facility shall record and maintain records of the amounts of each fuel burned each day.” EPA has since determined that monthly accounting of the amount of natural gas and propane fired in a given unit is acceptable. [ref: 12/7/2000 letter from R. Douglas Neeley, Chief, Air and Radiation Technology Branch’ Air Pesticides, and Toxics Management Division, to Rob Raney, P.E.]

(2) Monitoring/Recordkeeping/Reporting Requirements

As stated above, the facility must keep monthly records of the amount of natural gas and propane fired in a given unit. No reporting shall be required.

VII. Multiple Emission Source Limits

A. Facility-wide affected sources including:

- **Stemmary leaf dryer and stem dryer (ID Nos. ES-SD-001 and ES-SD-002),**
- **Direct cylinder conditioning and casing operation (ID No. ES-DC-001),**
- **Annular Dryer (ID No. ES-AD-001) and associated cyclone (ID No. CD-AD-001A) and bagfilter (ID No. CD-AD-001B),**
- **Puff Stem Process (ID No. ES-PS-001 and ES-PS-003) and associated bagfilters (ID Nos. CD-PS-001A, CD-PS-001B, and CD-PS-003B) and cyclone (ID No. CD-PS-003A),**
- **Top flavoring process (ID No. ES-TF-001), and**
- **Menthol application process (ID No. ES-MA-001 and ES-MA-002)**

The above emission sources are subject to these multiple emission source limits and/or standards:

Regulated Pollutant	Limits/Standards	Applicable Regulation
VOCs	Work practice standards	2D .0958
VOCs	Less than 250 tons per year	Avoidance of NCAC 2D .0530
odors	State enforceable only; odorous emissions must be controlled	2D .1806

1. 2D .0958 “Work Practices for Sources of Volatile Organic Compound Emissions”

A. Description

Each of the above sources use or emit volatile organic compounds and are subject to 2D .0958.

B. Regulatory Analysis

Pursuant to 15A NCAC 2D .0958, for all sources that use volatile organic compounds (VOC) as solvents, carriers, material processing media, or industrial chemical reactants, or in similar uses that mix, blend, or manufacture volatile organic compounds, or emit volatile organic compounds as a product of chemical reactions, and whose emissions of VOC are greater than 15 pounds per day; the Permittee shall:

1. Store all material, including waste material, containing volatile organic compounds in tanks or in containers covered with a tightly fitting lid that is free of cracks, holes, or other defects, when not in use,
2. clean up spills of volatile organic compounds as soon as possible following proper safety procedures,
3. store wipe rags containing volatile organic compounds in closed containers,
4. not clean sponges, fabric, wood, paper products, and other absorbent materials with volatile organic compounds,
5. transfer solvents containing volatile organic compounds used to clean supply lines and other coating equipment into closable containers and close such containers immediately after each use, or transfer such solvents to closed tanks, or to a treatment facility regulated under section 402 of the Clean Water Act,
6. clean mixing, blending, and manufacturing vats and containers containing volatile organic compounds by adding cleaning solvent and close the vat or container before agitating the cleaning solvent. The spent cleaning solvent shall then be transferred into a closed container, a closed tank or a treatment facility regulated under section 402 of the Clean Water Act. [15A NCAC 2D .0958(c)]

When cleaning parts with a solvent containing a volatile organic compound, the Permittee shall:

1. flush parts in the freeboard area,
2. take precautions to reduce the pooling of solvent on and in the parts,
3. tilt or rotate parts to drain solvent and allow a minimum of 15 seconds for drying or until all dripping has stopped, whichever is longer,
4. not fill cleaning machines above the fill line,
5. not agitate solvent to the point of causing splashing. [15A NCAC 2D .0958(d)]

C. Monitoring Requirements

To assure compliance with paragraphs (a) and (b) above, the Permittee shall, at a minimum, perform a visual inspection once per month of all operations and processes utilizing volatile organic compounds. The inspections shall be conducted during normal operations. If the required inspections are not conducted the Permittee shall be deemed to be in noncompliance with 15A NCAC 2D .0958.

D. Recordkeeping Requirements

The results of the inspections shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request. The logbook shall record the following:

1. the date and time of each inspection; and
2. the results of each inspection noting whether or not noncompliant conditions were observed.

E. Reporting Requirements

The Permittee shall submit a summary report of the observations by January 30 of each calendar year for the preceding six-month period between July and December and July 30 of each calendar year for the preceding six-month period between January and June. All instances of deviations from the requirements of this permit must be clearly identified.

2. **2D .0530 “Prevention of Significant Deterioration”**

A. Description

The facility will take a limit on the VOC emissions from the facility to avoid applicability of PSD.

B. Regulatory Analysis

Volatile organic compound emissions are limited to less than 250 tons per year.

C. Monitoring/ Recordkeeping Requirements

Calculation of the monthly VOC emissions must be made at the end of each month. VOC emissions shall be determined by multiplying the total amount of each type of VOC-containing material consumed during the month by the VOC content of the material. This calculation and the total amount of VOC emissions must be recorded in a monthly emissions log. In addition, the Permittee shall make available to the officials of DAQ, upon request, copies of the monthly emissions log.

D. Reporting Requirements

A summary report of the monthly VOC emissions for the previous 14 months shall be submitted to the DAQ semi annually, by January 30 for the preceding 6 month period between July and December and by July 30 for the preceding month period between January and June. The report shall contain the following:

- i. The monthly VOC emissions for the previous 14 months. The emissions shall be calculated for each of the 12-month periods over the previous 14 months.

STATE-ONLY REQUIREMENT

3. **2D .1806 “Control and Prohibition of Odorous Emissions”**

A. Regulatory Requirements

The Permittee shall not operate the facility without implementing management practices or installing and operating odor control equipment sufficient to prevent odorous emissions from the facility from causing or contributing to objectionable odors beyond the facility's boundary.

B. Facility-wide affected sources including:

- Stemmy leaf dryer and stem dryer (ID Nos. ES-SD-001 and ES-SD-002),
- Direct cylinder conditioning and casing operation (ID No. ES-DC-001),

- Annular Dryer (ID No. ES-AD-001) and associated cyclone (ID No. CD-AD-001A) and bagfilter (ID No. CD-AD-001B),
- Puff Stem Process (ID No. ES-PS-001 and ES-PS-003) and associated bagfilters (ID Nos. CD-PS-001A, CD-PS-001B, and CD-PS-003B) and cyclone (ID No. CD-PS-003A),

The above emission sources are subject to these multiple emission source limits and/or standards:

Regulated Pollutant	Limits/Standards	Applicable Regulation
toxic air pollutants	State-enforceable only; Less than toxic pollutant exemption rates.	2Q .0711
toxic air pollutants	State enforceable only; Less than acceptable ambient levels.	2D .1100

STATE-ENFORCEABLE ONLY

1. 2Q .0711 “Toxic Air Pollutant Emissions Limitation Requirement”

A. Description

Pursuant to 15A NCAC 2Q .0711 “Emission Rates Requiring a Permit,” for each of the below listed toxic air pollutants (TAPs), the Permittee has made a demonstration that facility-wide actual emissions do not exceed the Toxic Permit Emission Rates (TPERs) listed in 15A NCAC 2Q .0711.

B. Regulatory Analysis

The facility shall be operated and maintained in a such a manner that emissions of any listed TAPs from the facility, including fugitive emissions, will not exceed TPERs listed in 15A NCAC 2Q .0711.

1. A permit to emit any of the below listed TAPs shall be required for this facility if actual emissions from all sources will become greater than the corresponding TPERs.
2. PRIOR to exceeding any of these listed TPERs, the Permittee shall be responsible for obtaining a permit to emit TAPs and for demonstrating compliance with the requirements of 15A NCAC 2D .1100 "Control of Toxic Air Pollutants".

C. Monitoring Requirements

1. In accordance with the approved application, the Permittee shall maintain records of operational information demonstrating that the TAP emissions do not exceed the TPERs as listed below:

Pollutant (CAS Number)	TPERs Limitations			
	Carcinogens (lb/yr)	Chronic Toxicants (lb/day)	Acute Systemic Toxicants (lb/hr)	Acute Irritants (lb/hr)
acetaldehyde (75-07-0)				6.8
acrolein (107-02-8)				0.02
benzene (71-43-2)	8.1			

carbon disulfide (75-15-0)		3.9		
cresol (1319-77-3)			0.56	
phenol (108-95-2)			0.24	
styrene (100-42-5)			2.7	
toluene (108-88-3)		98		14.4
trichlorofluoro methane (75-69-4)			140	
methyl ethyl ketone (78-93-3)		78		22.4

STATE-ONLY REQUIREMENT

1. 2D .1100 “Control of Toxic Air Pollutants”

A. Description

Pursuant to 15A NCAC 2D .1100 “Control of Toxic Air Pollutants,” for each of the below listed toxic air pollutants (TAPs), the Permittee has made a demonstration that these pollutants are below their respective acceptable ambient levels (AALs).

B. Regulatory Analysis

Pursuant to 15A NCAC 2D .1100 and in accordance with the approved application for an air toxic compliance demonstration, the following permit limit shall not be exceeded:

Emission Sources	Toxic Air Pollutants	Emission Limits
Tobacco leaf dryer (ID No. ES-SD-001)	Acetic acid Ammonia	1.51 lb/hour 1.22 lb/hour
Tobacco stem dryer (ID No. ES-SD-002)	Acetic acid Ammonia	0.53 lb/hour 0.43 lb/hour
Annular dryers (ID No. AD-001)	Acetic acid Ammonia Formaldehyde	1.48 lb/hour 0.06 lb/hour 0.0037 lb/hour
Puff stem process (ID No. ES-PS-001)	Acetic acid Ammonia Formaldehyde	0.153 lb/hour 0.0011 lb/hour 0.0007 lb/hour
Direct cylinder casing and conditioning operation (ID No. ES-DCC-001)	Acetic acid Ammonia Formaldehyde	0.611 lb/hour 0.044 lb/hour 0.003 lb/hour
Ordering cylinder for ammonia application process (ID No. ES-AA-	Ammonia	30.0 lb/hour

C. Monitoring/Recordkeeping Reporting Requirements

The maximum potential emissions for each source of ammonia, acetic acid, and formaldehyde were determined based on maximum tobacco throughput rates. The potential facility emissions (lbs/hour) were converted to (g/s) for the model. Since the maximum potential emissions were modeled, no monitoring/recordkeeping/reporting is required for compliance with this regulation.

VIII. MACT/CAM Applicability and Requirements

Based on a review of the facility's current operations and emission sources, the facility is not subject to any promulgated or proposed MACT standards.

CAM will not be evaluated until the next significant modification or renewal.

IX. Permit Shield (including non-applicable requirements)

In accordance with 2Q .0512 the permit will contain a provision stating that compliance with the terms, conditions, and limitations of the Title V permit shall be deemed in compliance with applicable requirements specifically identified in the permit, as of the date of permit issuance. If the permit does not expressly state that a permit shield exists then it shall be presumed not to provide such a shield.

X. Other Applicable Requirements

None

XI. General Conditions

The "General Conditions" section of the Title V Operating Permit lists additional applicable rule requirements that the Permittee must adhere to, as with any other permit condition. These requirements in general are common to all Title V facilities. The general conditions include provisions such as annual fee payment, permit renewal and expiration, transfer of ownership or operation, property rights, submission of documents, inspections and entry procedures, reopen for cause, severability, etc.

XII. Insignificant Activities

The insignificant activities listed in the application have been reviewed and verified.

Although each insignificant activity is not listed in the Title V permit, a general condition is placed in the Title V permit stating that all insignificant activities shall comply with the applicable requirements. Those sources which qualify for exemption from permitting under regulation 2Q .0102(b)(2) will be attached to the cover letter of the permit.

Following are the insignificant activities at this facility:

List of Insignificant Activities

Emission Source I.D.	Emission Source Description	Insignificant Regulation	Applicability
		15A NCAC 2Q .0503 (8)	< 5 tpy of any criteria

IES-GM-001	Solvent degreasing (Parts cleaning using non-HAP solvents)		pollutant and < 1,000 lbs/yr of any HAPs
IES-PD-001	Pilot Scale Dryer	15A NCAC 2Q .0503 (8)	< 5 tpy of any criteria pollutant and < 1,000 lbs/yr of any HAPs
IES-PS-002	Puff Stem/STS Conditioner	15A NCAC 2Q .0503 (8)	< 5 tpy of any criteria pollutant and < 1,000 lbs/yr of any HAPs
IES-WC-001	Wetting Cylinder	15A NCAC 2Q .0503 (8)	< 5 tpy of any criteria pollutant and < 1,000 lbs/yr of any HAPs
IES-F-001, IES-F-002	Two 1.25 mmBtu/hr natural gas-fired furnaces used for comfort heat	15A NCAC 2Q .0503 (8)	< 5 tpy of any criteria pollutant and < 1,000 lbs/yr of any HAPs
IES-F-003, IES-F-004	Two 0.937 mmBtu/hr natural gas-fired furnaces used for comfort heat	15A NCAC 2Q .0503 (8)	< 5 tpy of any criteria pollutant and < 1,000 lbs/yr of any HAPs
IES-B-003 and IES-B-004	Two natural gas/propane-fired boilers (6.38 million Btu per hour each)	15A NCAC 2Q .0503 (8)	< 5 tpy of any criteria pollutant and < 1,000 lbs/y of any HAPs

XIII. Public Notice

Pursuant to 15A NCAC 2Q. 0521, a notice of the draft Title V Operating Permit shall be placed in a newspaper of general circulation in the area where the facility is located. The notice will provide for a 30 day comment period, with an opportunity for a public hearing. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA.

XIV. Recommendations

U.S. Flue Cured Tobacco Growers' 1st time Title V application has been reviewed by the DAQ to determine compliance with all procedures and requirements under 15A NCAC 2Q .0500 and 40 CFR Part 70. The DAQ has made a preliminary determination that the facility is complying or will achieve compliance as specified in the draft permit with all applicable requirements. Therefore, the DAQ is proposing to issue the Title V Operating Permit upon completion of the public comment period and the EPA review.