TITLE V AIR PERMIT APPLICATION REVIEW – RENEWAL & Modification

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Applicant :	**Site Location:**	**County:**
Franklin Baking Company, LLC 500 West Grantham Street	Goldsboro	Wayne

Technical Contact:		**Responsible Official:**	**Title:**
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Review Engineer:	**Signature:**	**Begin Review Date:**	**End Review Date:**
Booker T. Pullen		May 25, 2004	XXXXXx, 2004

Regional Contact:	**Regional Office:**	**SIC Code:**	**Application Number:**
Robert Fisher	Washington	2051 (Bread Cake and Related Products)	9600235.04A

Existing Permit Number:	**New Permit Number:**	**Applicability:**
07844T04	07844T05	Title V Renewal; facility is exempt from CAM because the uncontrolled emissions of individual PM10 sources are less than 100 tpy prior to entering the filters on the silos. VOC sources are uncontolled.

I. Introduction:

The Frankin Baking Company, LLC (Franklin) located in Goldsboro, Wayne County, N.C. currently operates under Title V Operating Permit No. 07844T04. Application No. 9600235.04A was received by the DAQ, Central Office on January 29, 2004 requesting the renewal of the existing Air Permit. The application was received prior to the February 1, 2004 deadline date for permit renewal application submittal. Therefore, the existing permit shall not expire until the renewal permit has been issued or denied. All terms and conditions of the existing permit shall remain in effect until the renewal permit has been issued or denied. This renewal and modification permit will be updated with the latest Permit language and go through both public (30 day) and EPA (45 day) notice. All requirements will become federally enforceable except any "State Enforceable Only" regulations.

II. Facility Description:

Franklin operates a commercial bakery to produce loaf bread, buns, and rolls. This source is a Title V facility because the potential volatile organic compounds (VOCs) exceed the major source threshold of 100 tons per year.

III. Application Chronology:

Since the initial Title V permit was issued, Franklin Baking Company has made several changes at the facility, as described below:

- Silos (ID Nos. ES-S-O-1 through ES-S-O-4) have been retired from service. No permit modification was required.

- Two new flour storage silos (ID Nos. ES-S8 & ES-S9) were installed. Both the new flour storage silos were considered insignificant activities at that time in accordance with 15A NCAC 2Q .0503(8). No permit modification was required.

- Modified baking oven (ID No. ES-S-O-1) by reducing its size (capacity) and removing some burners in order to convert it from a bread oven to a bun oven. No permit modification was required.

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- Transfer the ink jet printers in the label printing operation to the body of the permit, and remove them from the insignificant activities list, because the emission of an individual HAP was discovered to be greater than 1000 pounds per year. Also, theses sources will be a part of the VOC PSD Avoidance condition. These printers are used to label bread and bun packages with manufacturing information including "baked on" and "good through" dates.

- Add the five flour storage silos (ID Nos. ES-S5, S6, S7, S8, and S9) to the body of the permit. It has been determined by the DAQ, that the bin filters on each silo will be considered as added-on control devices that are not integral to the tank, and the before-control emissions are greater than 5 tons per year for each silo.

- The emissions of VOCs from the sources at the plant are currently less than 250 tons per year of actual emissions based on current usage. The applicant wishes to place a PSD Avoidance condition, with operational limitations into the permit to avoid the future exceedence of the PSD limit.

IV. Statement of Compliance

The DAQ has reviewed the compliance status of this facility. On its latest inspection, performed on May 1, 2003 by Mr. Robert L. Bright of the Washington Regional Office (WaRO), the facility was in compliance with all applicable requirements.

V. Permit Modification and Changes

Changes to existing the Title V Permit No. 07844T04 per this application (9600235.04A):

Old Page No.	New Page No.	Condition No.	Changes
Page 1	Page 1	Cover letter	Changed date, revised permit number.
Page 2	Page 2	Cover letter	Changed date on letter, effective date of permit,
None	Page 3	Cover letter	Added insignificant activities table, and table listing the changes to the existing permit per this application
Body of the Permit			
Page 1	Page 1	Permit	Revised permit number, changed issue date, effective date, expiration date of the permit, renewal date, and complete application date
Page 2	Page 2	Table of Contents	Added Part II "Construction" section to permit
Page 3	Page 3	Permitted Emission Source Table	Added silos (ID Nos. ES-S5, S6, S7, S8, and S9), added label making operation to permit,
Page 6	Page 6 & 7	Specific Limitations and Conditions	Added permit conditions for silos (ID Nos. ES-S5, S6, S7, S8, and S9)
Page 8	Page 8 & 9	Specific Limitations and Conditions	Added permit conditions for the label making operation to the permit
Page 10	Page 10	Multiple Emissions Section	Added PSD Avoidance condition for volatile organic compounds
N/A	Page 10	General Conditions	Added most current General Conditions to the permit
Part II Construction			
N/A	Page 19	Permitted Emission Source Table	Added newly permitted sources to the table
N/A	Page 19	Specific Limitations and Conditions	Added applicable regulations to the newly permitted sources

VI. Process Description:

Bread baking at Franklin Baking Company is a highly mechanized process. Bulk quantities of flour are shipped to the facility in tank trucks and conveyed into one of the storage silos. These silos, utilize process filters to minimize loss of flour during loading. The flour is then weighed and mixed with sugar, yeast, water, and other miscellaneous ingredients. Sugar is shipped in bulk liquid form by tank truck.

There are four basic types of dough mixing processed: sponge dough, straight dough, liquid brew, and no-time dough. These processes vary in the manner in which the various dough ingredients are mixed, which determines the amount of fermentation time available. Fermentation time can vary from five hours or more, to 20 minutes or less, usually averaging 2 - 2.5 hours. The baking process actually occurs in the baking ovens (ID Nos. S-O-1, S-O-2, and S-O-3) themselves, which causes expansion of the loaf to final volume, crust formation, yeast and enzymatic activity inactivation, coagulation of the dough proteins, partial gelatinization of the starch, and reduction of loaf moisture. All these things are necessary to produce high-quality product.

Franklin's operations consist of three high-speed production lines that produce loaf bread, rolls, and buns, utilizing predominantly liquid brew processes. Franklin also uses the straight dough and sponge dough processes. In the liquid brew process, the mixing of various ingredients produces a "brew" which is pumped into a fermentation tank and allowed to ferment for a set time period. This initiates a long series of complex biochemical changes that end in the oven, where the bread is baked. From the fermentation tank, the brew is pumped to the mixer and blended with additional flour and the remaining ingredients to create the final dough. In the *straight dough process*, all ingredients are combined in the mixer and blended to create the final dough. In the *sponge dough process*, some of the ingredients are mixed together to form a "sponge." The sponge is then put into a trough where the dough is allowed to ferment for several hours before it is returned to another mixer where the balance of the ingredients are added and mixed to create the final dough. In all cases, the final dough is transferred to the make-up equipment where it is kneaded, cut to the proper size, and deposited into a pan.

Before entering the oven, the dough is allowed to rise in a "proof box". Steam for this high temperature, high-humidity proof box environment is supplied by boilers. Oven emissions are generated by two processes: the combustion of natural gas or propane, and off-gassing from the bread itself. Bread off-gasses are generated as result of the fermentation process, which causes the sugars and starches to be converted to ethanol, carbon dioxide, and water. Fermentation begins immediately following the initial mixing of ingredients and continues until the yeast is killed in the oven. During the initial fermentation period, a skin forms on the top of the dough. The skin keeps the ethanol and carbon dioxide in the dough, thereby allowing the dough to rise minimizing fugitive emissions. As a result, most of the ethanol generated by fermentation is released in the oven when the skin breaks during the baking process.

The baking of bread (loaf and rolls) usually requires 15 to 20 minutes. Once the bread exists the oven, it is allowed to cool while it is transferred via conveyor to the slicing and packaging area. Once sliced and packaged, the product is shipped to customers by truck. The bun process is nearly identical to the bread production, with the only difference being the makeup equipment and shorter baking times.

VII. Summary of Emission Sources and Control Devices For which this Renewal & Modification Is Being Issued

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
Boilers			
ES-B-1	Natural gas/No. 2 fuel oil-fired boiler (4.2 million Btu per hour maximum heat input)	N/A	N/A
ES-B-2	Natural gas/No. 2 fuel oil-fired boiler (6.1 million Btu per hour maximum heat input)	N/A	N/A
ES-B-3	Natural gas/No. 2 fuel oil-fired boiler (4.2 million Btu per hour maximum heat input)	N/A	N/A
ES-B-4	Natural gas/No. 2 fuel oil-fired boiler (3.3 million Btu per hour maximum heat input)	N/A	N/A
Ovens			
ES-S-O-1	Natural gas/propane -fired oven (5.4 million Btu per hour maximum heat input)	N/A	N/A
ES-S-O-2	Natural gas/propane -fired oven (5.4 million Btu per hour maximum heat input)	N/A	N/A
ES-S-O-3	Natural gas/propane -fired oven (4.1 million Btu per hour maximum heat input)	N/A	N/A
Silos			
ES-S5	Flour storage silo 5 (100 ton capacity)	CD-BF6	One bin vent bagfilter (25 square feet of filter surface area)
ES-S6	Flour storage silo 6 (100 ton capacity)	CD-BF7	One bin vent bagfilter (25 square feet of filter surface area)
ES-S7	Flour storage silo 7 (100 ton capacity)	CD-BF8	One bin vent bagfilter (25 square feet of filter surface area)

Table continued on the next page

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
Silos (Continued)			
ES-S8	Flour storage silo 8 (100 ton capacity)	CD-BF9	One bin vent bagfilter (103 square feet of filter surface area each)
ES-S9	Flour storage silo 9 (100 ton capacity)	CD-BF10	One bin vent bagfilter (103 square feet of filter surface area)
ES-P1	Label printing operation (ink jet printing, eight stations total)	N/A	N/A

VI. Emission Source-by-Source Evaluation

A. Four natural gas/No. 2 fuel oil-fired boilers (ID Nos. ES-B-1 through ES-B-4);

1. **Description:** These boilers provide steam to the "proof box" which is a high temperature, high humidity box that is used to make the dough rise prior to being sent to the baking ovens.

2. **Applicable Regulatory Requirements**:
These boilers are subject to the following regulations:
- 15A NCAC 2D .0503
- 15A NCAC 2D .0516
- 15A NCAC 2D .0521

No regulatory review is required at this time since there are no new applicable regulations for these sources under this permit revision.

B. Three natural gas/propane-fired ovens (ID Nos. ES-S-O-1 through ES-S-O-3);

1. Description: These ovens are used to bake the raw dough into loaves if bread or buns.

2. Applicable Regulatory Requirements:
These ovens are subject to the following regulations:
- 15A NCAC 2D .0503
- 15A NCAC 2D .0516
- 15A NCAC 2D .0521

No regulatory review is required at this time since there are no new applicable regulations for these sources under this permit revision.

C. Five flour storage silos (100 ton capacity each)
- **ID No. ES-S5 with associated bin vent bagfilter (25 square feet of filter surface area, ID No. CD-BF6)**
- **ID No. ES-S6 with associated bin vent bagfilter (25 square feet of filter surface area, ID No. CD-BF7)**
- **ID No. ES-S7 with associated bin vent bagfilter (25 square feet of filter surface area, ID No. CD-BF8)**
- **ID No. ES-S8 with associated bin vent bagfilter (103 square feet of filter surface area, ID No. CD-BF9)**
- **ID No. ES-S9 with associated bin vent bagfilter (103 square feet of filter surface area, ID No. CD-BF10)**

1. Description: These silos are used to store bulk quantities of flour. The flour is shipped to the facility in tank trucks and conveyed into the silos.

2. Applicable Regulatory Requirements:
These silos will be subject to 20% opacity. There are no New Source Performance Standards for the silos and there are no MACT standards for the silos.

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

Regulated Pollutant	Limits/Standards	Applicable Regulation
Particulate	$E = 4.10 \times P^{0.67}$ Where E = allowable emission rate in pounds per hour P = process weight in tons per hour	15A NCAC 2D .0515
Visible emissions	20 percent opacity	15A NCAC 2D .0521

VI. Emission Source-by-Source Evaluation (Continued)

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

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

$E_{allow} = 4.10 \times P^{0.67}$

Where E = allowable emission rate in pounds per hour
P = process weight in tons per hour (45.0 tons/hr)

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

$E_{allow} = 4.10 \times P^{0.67}$
$E_{allow} = 4.10 \times (45)^{0.67}$
$E_{allow} = 4.10 \times (12.81) = 52.53$ lbs PM/hr

An example calculation for silo (ID NO. ES-S8) is done below.

Calculation of PM emissions from the silos were done using AP-42 factors, Section 11.12 – Concrete Batching, table 11.12-2 "Cement unloading to elevated storage silo (pneumatic)".

Emission Factor: 0.72 lbs PM/ton of material
Emission Factor: 0.46 lbs PM_{10}/ton of material
Maximum throughput capacity for each silo = 90,000 lbs/hour (45 tons per hour)

$$\frac{0.72\ lbs\ PM}{ton\ material} \times \frac{45.0\ tons\ flour}{hour} = \frac{32.4\ lbs\ PM}{hour}\ uncontroled\ \ for\ each\ silo$$

ID No.	Maximum throughput	Uncontrolled Emission Rate	Control efficiency	Controlled Emission Rate	Allowable Emission Rate
ES-S5	45 tons/hr	32.4 lbs PM/hr	99.9%	0.032 lbs PM/hr	52.5 lbs PM/hr
ES-S6	45 tons/hr	32.4 lbs PM/hr	99.9%	0.032 lbs PM/hr	52.5 lbs PM/hr
ES-S7	45 tons/hr	32.4 lbs PM/hr	99.9%	0.032 lbs PM/hr	52.5 lbs PM/hr
ES-S8	45 tons/hr	32.4 lbs PM/hr	99.9%	0.032 lbs PM/hr	52.5 lbs PM/hr
ES-S9	45 tons/hr	32.4 lbs PM/hr	99.9%	0.032 lbs PM/hr	52.5 lbs PM/hr

Compliance is indicated with this regulation because the actual emission rate (32.4 lbs/hr) is less than the allowable emission rate (52.5 lbs PM/hr) for each silo prior to control.

Testing [15A NCAC 2D .0501 (c)(3)]

ii. If emissions testing is required, the testing shall be performed in accordance with General Condition JJ. If the results of this test are above the limit given in Section VI. C. 2. a. i. above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0515.

Monitoring/Recordkeeping [15A NCAC 2Q .0508(f)]

iii. Particulate matter emissions from each silo shall be controlled by the bagfilter. To assure compliance, the Permittee shall perform inspections and maintenance as recommended by the manufacturer. In addition to the manufacturer s inspection and maintenance recommendations, or if there is no manufacturer s inspection and maintenance recommendations, as a minimum, the inspection and maintenance requirement shall include the following:

(A) a monthly visual inspection of the system ductwork and material collection unit for leaks; and
(B) an annual (for each 12 month period following the initial inspection) internal inspection of the bagfilter's structural integrity.

The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0515 if the ductwork and bagfilters are not inspected and maintained.

VI. Emission Source-by-Source Evaluation (Continued)

iv. The results of inspection and maintenance 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:
(A) the date and time of each recorded action;
(B) the results of each inspection;
(C) the results of any maintenance performed on the bagfilters; and
(D) any variance from manufacturer's recommendations, if any, and corrections made.
The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0515 if these records are not maintained.

Reporting [15A NCAC 2Q .0508(f)]

v. The Permittee shall submit the results of any maintenance performed on the bagfilters within 30 days of a written request by the DAQ.

vi. The Permittee shall submit a summary report of monitoring and recordkeeping activities postmarked on or before 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.

b. 15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS

i. Visible emissions from each silo (ID No. ES-S5, S6, S7, S8, & S9) shall not be more than **20 percent opacity** when averaged over a six-minute period. However, six-minute averaging periods may exceed 20 percent not more than once in any hour and not more than four times in any 24-hour period. In no event shall the six-minute average exceed 87 percent opacity. [15A NCAC 2D .0521 (d)]

Testing [15A NCAC 2D .0501(c)(8)]

ii. If emissions testing is required, the testing shall be performed in accordance with 15A NCAC 2D .0501(c)(8) and General Condition JJ. If the results of this test are above the limit given in Section VI. C. 2. b. i. above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0521.

Monitoring [15A NCAC 2Q .0508(f)]

iii. To assure compliance, **once a month when the silo is being loaded**, the Permittee shall observe the emission points of this source for any visible emissions above normal. The Permittee shall establish normal for the source in the first 30 days following the effective date of the permit If visible emissions from this source are observed to be above normal, the Permittee shall either:
(A) take appropriate action to correct the above-normal emissions within the monitoring period and record the action taken as provided in the recordkeeping requirements below, or
(B) demonstrate that the percent opacity from the emission points of the emission source in accordance with 15A NCAC 2D .0501(c)(8) is below the limit given in Section VI. C. 2. b. i. above.
If the above-normal emissions are not corrected per (A) above or if the demonstration in (B) above cannot be made, the Permittee shall be deemed to be in noncompliance with 15A NCAC 2D .0521.

Recordkeeping [15A NCAC 2Q .0508(f)]

iv. The results of the monitoring 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:
(A) the date and time of each recorded action;
(B) the results of each observation and/or test noting those sources with emissions that were observed to be in noncompliance along with any corrective actions taken to reduce visible emissions; and
(C) the results of any corrective actions performed.
The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0521 if these records are not maintained.

Reporting [15A NCAC 2Q .0508(f)]

v. The Permittee shall submit a summary report of the observations postmarked on or before 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.

D. Label Printing Operation (ID No. ES-P1, ink jet printing, eight stations)

1. Description: The printing operation uses inkjet printers to apply "baked on" and "good through" dates and other similar information onto the bread or bun packages.

2. Applicable Regulatory Requirements:

New Source Performance Standards, Subpart QQ, "Standards of Performance for the Graphic Arts Industry: Publication Rotogravure Printing" does not apply because this printing operation is an ink jet printer and not a rotogravure printing operation. There are no MACT standards for this operation.

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

Regulated Pollutant	Limits/Standards	Applicable Regulation
Volatile organic compounds	See Multiple Emissions Section VII	15A NCAC 2Q .0317 (15A NCAC 2D .0530) **PSD Avoidance**

VII. Multiple Emissions Section

- Four natural gas/No. 2 fuel oil-fired boilers (ID Nos. ES- B-1, B-2, B-3, and B-4)
- Three natural gas/propane-fired ovens (ID Nos. ES-S-O-1, S-O-2, and S-O-3)
- Label printing operation (ID No. ES-P1)
- VOC emitting insignificant activities (parts washer)

A. 15A NCAC 2Q. 0317: Avoidance Conditions For 15A NCAC 2D. 0530: Prevention Of Significant Deterioration

1. In order to avoid applicability of this regulation, the above emission sources shall discharge into the atmosphere less than **250 tons of VOCs** per consecutive 12-month period. [15A NCAC 2D .0530]

Four natural gas/No. 2 fuel oil-fired boilers (ID Nos. ES- B-1, B-2, B-3, and B-4)

- The total heat input for these four boilers is (4.2 mmBtu/hr + 6.1 mmBtu/hr + 4.2 mmBtu/hr + 3.3 mmBtu/hr = 17.8 mmBtu per hour heat input)
- The worse case VOC emitting fuel is natural gas
- Emission factor (AP-42, fifth edition, table 1.4-2) = 5.5 tons VOC per million cubic feet

$$\frac{17.8\ mmBtu}{hour} \times \frac{1.0\ cubic\ feet\ nat.\ gas}{1020\ Btu} \times \frac{5.5\ lbs\ VOCs}{mmcubic\ feet} \times \frac{8760\ hours}{year} \times \frac{1\ ton}{2000\ lbs} = \frac{0.35\ tons\ VOCs}{year}\ total$$

Three natural gas/propane-fired ovens (ID Nos. ES-S-O-1, S-O-2, and S-O-3)
{VOCs from fuel combustion only}

- The total heat input for the three boilers is (5.4 mmBtu/hr + 5.4 mmBtu/hr + 4.1 mmBtu/hr = 14.9 mmBtu per hour heat input)
- The worse case VOC emitting fuel is propane
- Emission factor (AP-42, fifth edition, table 1.5-1) = 0.5 lbs VOC per 1000 gallons

$$\frac{14.9\ x10^{6}\ Btu}{hour} \times \frac{1\ gallon}{91{,}000\ Btu} \times \frac{0.5\ lbs\ VOCs}{1000\ gallons} \times \frac{1\ ton VOCs}{2000\ lbs VOCs} \times \frac{8760\ hrs}{year} = \frac{0.36\ tons\ VOCs}{year}\ total\ from\ fuel\ combustion$$

Three natural gas/propane-fired ovens (ID Nos. ES-S-O-1, S-O-2, and S-O-3)
{VOCs from baking only}

VOC Emission Factor = $0.95Y_i + 0.195t_i - 0.51S - 0.86t_s + 1.90$

VOC emissions associated with bread and bun production are estimated using the following emission factor equation contained in AP-42, Section 9.96 – Bread Baking, February 1997:

Where: VOC E.F. = pounds of VOC per ton of baked bread (emission factor)
Y_i = initial baker's percent of yeast
t_i = total yeast action time in hours
S = final (spike) baker's percent of yeast
t_s = spiking time in hours

Franklin utilizes many different formulas in the production of bread and buns; therefore, a different emission factor is calculated for each formula. The maximum hourly VOC emissions rates of the bread and bun ovens are calculated using the formula generating the highest emission factor. The variables and emission factor for the "worst case" formula for each oven are summarized in the table below.

Table 1 – Worse Case VOC Emission Factors

Dough	Y_i	t_i	S	t_s	Emission Factor
Oven 1 All	3.3	3.2	0.0	1.2	5.659 lbs VOCs/ton of baked bread
Oven 2 straight dough	10.7	1.1	0.0	0.0	12.2795 lbs VOCs/ton of baked bread
Oven 2 Other	3.7	3.1	0.0	1.1	6.0195 lbs VOCs/ton of baked bread
Oven 3 All	3.3	3.2	0.0	1.2	5.659 lbs VOCs/ton of baked bread

The facility utilizes numerous formulas in the production of bread baked in the bun and bread ovens. For ovens 1 and 3, the "worst case" dough has a VOC emission factor of 5.659 lbs VOC/ton. For oven 2, the worst-case dough (a straight dough) has an emission factor of 12.2795; however, this dough is not one of the oven's primary products. Of the "other doughs" used in oven 2, the worst-case emission factor is 6.0195 lb VOC/ton. Assuming that each oven baked the product with the highest VOC emission factor 8,760 hours per year, the potential facility-wide VOC emissions would exceed the 250-ton Prevention of Significant Deterioration (PSD) major source applicability threshold. However, this is not a realistic scenario since the worse-case bread comprises a relatively small percentage of total production. Franklin Baking requested the following production limits in order to restrict VOC emissions below the 250 ton per year limit.

- Oven S-O-1 (all doughs) – 30,000,000 pounds per year * (with a maximum emission factor of 5.659 lbs VOCs/ton)
- Oven S-O-2 (all doughs) – 70,000,000 pounds per year *
  - Of the 70,000,000 lbs, no more than 15,000,000 lbs per year will be straight dough.
  - The production of "other doughs" will be limited to 70,000,000 lbs per year.
  - For potential emissions calculation purposes, a maximum emission factor of 12.2795 lb VOC per ton will be applied to 15,000,000 lbs per year of straight dough, and a maximum emission factor of 6.1095 lbs VOC per ton will be applied to 55,000,000 lbs per year of "other" dough.
- Oven S-O-3 (all doughs with highest emission factor of 5.659 lbs VOC per ton) – 42,000,000 pounds per year *

$$\frac{30{,}000{,}000\ lbs\ bread/buns + 70{,}000{,}000\ lbs\ bread/buns + 42{,}000{,}000\ lbs\ bread/buns}{2000\ lbs\ bread/buns} = \frac{71{,}000\ tons\ bread/buns}{year}$$

***Note: Production values represent "as-baked" weights. "Pre-backed" dough loses approximately 10 percent by weight of water vapor during the baking process.**

Maximum hourly VOC emissions associated with bread off-gassing are estimated using the bread formula that results in the worst-case emission factors at the requested permit limits described above. Based upon these limits, the potential VOC emission rates for each oven has been calculated as shown below:

$$S-O-1: \frac{30{,}000{,}000\ lbs\ dough}{year} \times \frac{1\ ton\ dough}{2{,}000\ lbs\ dough} \times \frac{5.659\ lbs\ VOCs}{1\ ton\ dough} \times \frac{1\ ton VOCs}{2000\ lbs VOCs} = \frac{42.44\ tons\ VOCs}{year}$$

$$\frac{S-O-2}{(straight)}: \frac{15{,}000{,}000\ lbs\ dough}{year} \times \frac{1\ ton\ dough}{2{,}000\ lbs\ dough} \times \frac{12.2795\ lbs\ VOCs}{1 ton\ dough} \times \frac{1\ ton VOCs}{2000\ lbs VOCs} = \frac{46.05\ tons\ VOCs}{year}$$

$$\frac{S-O-2}{Other}: \frac{55{,}000{,}000\ lbs\ dough}{year} \times \frac{1\ ton\ dough}{2{,}000\ lbs\ dough} \times \frac{6.0195\ lbs\ VOCs}{1 ton\ dough} \times \frac{1\ ton VOCs}{2000\ lbs VOCs} = \frac{82.77\ tons\ VOCs}{year}$$

$$S-O-3: \frac{42{,}000{,}000\ lbs\ dough}{year} \times \frac{1\ ton\ dough}{2{,}000\ lbs\ dough} \times \frac{5.659\ lbs\ VOCs}{1\ ton\ dough} \times \frac{1\ ton VOCs}{2000\ lbs VOCs} = \frac{59.42\ tons\ VOCs}{year}$$

Parts Washer

Volatile organic compounds are less than 5 tons per year (use 4.99 tons per year maximum)

Label Printing Operation

Inkjet printers are used to label bread and bun packages with manufacturing information including "baked on" and "good through" dates. According to the material safety data sheet (MSDS) the ink contains two HAPs. For estimating purposes, the ink and the make-up solution will be considered to consist of 100 per cent VOCs. A review of the production data and printing material usage over recent years indicated that 2002 was the year for the highest ink usage (42.75 gallons) versus production (85,345,773 lbs of bread and buns), which translates into application rates of 1.00E-03 gallons of ink/ton of product. The year 2001 was the year for highest makeup solution usage versus production (86,549,349 lbs bread and buns) which translates into 6.66E-03 gallons makeup /ton of product

Potential emissions were determined using these worse case usage rates and the maximum bread/buns production limits proposed by the Franklin baking company (71,000 tons of bread & buns per year).

$$\frac{1.00 \times 10^{-3}\ gallons\ ink}{ton\ bread/buns} \times \frac{71{,}000\ tons\ bread/buns}{year} \times \frac{7.27\ lbs\ ink}{1 gallon\ ink} \times \frac{1\ ton\ ink}{2000\ lbs\ ink} = \frac{0.26\ tons\ ink}{year}$$

$$\frac{6.66 \times 10^{-3}\ gallons\ solution}{ton\ bread/buns} \times \frac{71{,}000\ tons\ bread/buns}{year} \times \frac{6.60\ lbs\ solution}{1 gallon\ solution} \times \frac{1\ ton\ solution}{2000 solution} = \frac{1.56\ tons\ solution}{year}$$

The ink and make up solution is considered to be 100% VOC, therefore, the total VOCs from the label printing operation will be: 0.26 tpy + 1.56 tpy = 1.82 tons VOCs/yr

Source	**Tons VOCs per year**	**Comments**
Four boilers (VOCs worse case fuel)	0.35 tpy	VOC emissions are less than 250 tons per year after taking bread/bun baking limits. Using maximum throughputs of bread/bun through the ovens would produce VOC emission greater than 250 tpy.
Three ovens (VOCs fuel combustion)	0.36 tpy	
Oven S-O-1 (VOCs from bread baking)	42.44 tpy	
Oven S-O-2 (VOCs from bread baking, straight dough)	46.05 tpy	
Oven S-O-2 (VOCs from bread baking, other dough)	82.77 tpy	
Oven S-O-3 (VOCs from bread baking)	59.42 tpy	
Parts washer (insignificant activity)	4.99 tpy	
Label Printing Operation	1.82 tpy	
Total	238.2 tpy	

Monitoring/Recordkeeping [15A NCAC 2Q .0508 (f)]

2. Calculations of VOC emissions per month shall 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. The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0530 if the amounts of VOC containing materials or the VOC emissions are not monitored and recorded.
3. Calculations and the total amount of VOC emissions shall be recorded monthly in a logbook (written or electronic format). The Permittee shall be deemed in noncompliance with 15A NCAC 2D .0530 if the VOC emissions exceed this limit.

Emission factors to be used in the monthly calculations:

Density of make up solution = 6.6 lbs solution/gallon of solution
Density of ink = 7.27 lbs ink/gallon of ink
VOC factor for ink = 1.0×10^{-3} gallons ink/ton of bread & buns
VOC factor for make up solution = 6.66×10^{-3} gallons solution/ ton bread & buns

To ensure compliance with the limits selected in the calculations, the following restrictions shall apply:

- Oven S-O-1 (all doughs) – 30,000,000 pounds per year * (with a maximum emission factor of 5.659 lbs VOCs/ton)
- Oven S-O-2 (all doughs) – 70,000,000 pounds per year *
  - Of the 70,000,000 lbs, no more than 15,000,000 lbs per year will be straight dough.
  - The production of "other doughs" will be limited to 70,000,000 lbs per year.
    - For potential emissions calculation purposes, a maximum emission factor of 12.2795 lb VOC per ton will be applied to 15,000,000 lbs per year of straight dough, and a maximum emission factor of 6.1095 lbs VOC per ton will be applied to 55,000,000 lbs per year of "other" dough.
- Oven S-O-3(all doughs with highest emission factor of 5.659 lbs VOC per ton) – 42,000,000 pounds per year *

***Note: Production values represent "as-baked" weights. "Pre-backed" dough loses approximately 10 percent by weight of water vapor during the baking process.**

Reporting [15A NCAC 2Q .0508(f)]

d. The Permittee shall submit a summary report of monitoring and recordkeeping activities within 30 days after each 6 months, due and postmarked on or before January 30 of each calendar year for the preceding six -month period between July and December and July 30 of each six-month period between January and June. The report shall contain the following:
   i. The monthly VOC emissions for the previous 17 months. The emissions shall be calculated for each of the 12-month periods over the previous 17 months.

VIII. MACT Standards: 15A NCAC 2D .1111, 40 CFR Part 63

This facility is not currently subject to any National Emission Standards for Hazardous Air Pollutants (NESHAP).

IX. Compliance Assurance Monitoring (CAM) 15A NCAC 2D .0614

The five flour storage silos (ID Nos. ES-S5 through ES-9) **are not subject** to CAM in accordance with 15A NCAC 2D .0614 (a)(3) because pre-control emissions are less than 100 tons of PM_{10} for each silo.

Calculation of PM_{10} emissions from the silos were done using AP-42 factors, Section 11.12 – Concrete Batching, table 11.12-2 "Cement unloading to elevated storage silo (pneumatic)".

Emission Factor: 0.46 lbs pollutant/ton of material
Maximum through put capacity of each silo = 90,000 lbs/hour (45 tons per hour)

$$\frac{0.46\ lbs\ PM_{10}}{ton\ material\ (flour)} \times \frac{45.0\ tons\ flour}{hour} \times \frac{8760\ hours}{year} \times \frac{1\ ton\ PM_{10}}{2000\ lbs\ PM_{10}} = \frac{90.7\ tons\ PM_{10}}{year}\ (uncontrolled, each\ silo)$$

X. Other Requirements:

A. A Professional Engineers Seal was included with the application from Mr. James Brent Sasser, who is a professional engineer registered in the State of North Carolina.

B. A consistency determination **is not** required for this renewal application.

C. Section 112(r): This facility **is not subject** to Section 112(r) of the Clean Air Act requirements because it does not store any of the regulated substances in quantities above the thresholds in the Rule.

D. PSD: This facility is currently a minor source for PSD. The changes requested in this application (9600235.04A) do not trigger PSD. This facility is located in Wayne County which is currently in an attainment area. The major source baseline for PM_{10} was triggered on October 2, 1979 by Georgia-Pacific. No PM_{10} increment needs to be added to the permit because the actual emission increases from the new silos (ID Nos. ES-8 and ES-9) and the existing silos (ID Nos. ES-S5, S6, and S7) are less than 1.0 lbs per hour. Also, a PSD Avoidance Condition will be added to the permit for facility-wide VOC emissions.

E. New Source Performance Standards **do not apply** to this facility.

XI. An application fee **is not** required for this renewal application.

XII. The appropriate number of copies of the application were received by the DAQ on January 29, 2004.

XIII. The application contained the Reduction and Recycling Form.

XIV. The application was signed by an authorized official as defined by 15A NCAC 2Q .0304(j).

XV. Air toxics do not apply to this renewal/modification application.

XVI. Public Notice

A thirty-day public notice **is required** for this renewal application. The notice will run in a newspaper of general circulation in this area called the _____.

Public notice period:

Public comments:

EPA comment period:

EPA comments:

XVII. Recommendations:

A copy of this review, the permit, and other pertinent documents were sent via email to Mr. Robert L. Bright of the Washington Regional Office. _____ concurs with the issuance of this permit.

This renewal for the Franklin Baking Company, located in Goldsboro, Wayne County, North Carolina, has been reviewed by the DAQ to determine compliance with all procedures and requirements. The DAQ has determined that this facility is complying or will achieve compliance as specified in the permit with all applicable requirements.

ISSUE PERMIT No. 07844T05.