


Application Review

Issue Date: September XY, 2021

Region: Washington Regional Office
County: Wayne
NC Facility ID: 9600280
Inspector's Name: Robert Bright
Date of Last Inspection: 08/31/2020
Compliance Code: 3 / Compliance - inspection

Facility Data			Permit Applicability (this application only)
<p>Applicant (Facility's Name): Flowers Timber Company, Inc.</p> <p>Facility Address: Flowers Timber Company, Inc. 140 Greenfield Cemetery Rd. Seven Springs, NC 28578</p> <p>SIC: 7342 /Disinfecting and Exterminating NAICS: 56171 / Exterminating and Pest Control Services</p> <p>Facility Classification: Before: Synthetic Minor After: Synthetic Minor Fee Classification: Before: Synthetic Minor After: Synthetic Minor</p>			<p>SIP: 02D. 0546 and 02D .1104 NSPS: N/A NESHAP: N/A PSD: N/A PSD Avoidance: N/A NC Toxics: methyl bromide and phosphine 112(r): N/A Other:</p>
Contact Data			Application Data
Facility Contact	Authorized Contact	Technical Contact	<p>Application Number: 9600280.20A Date Received: 12/02/2020 Application Type: Modification Application Schedule: State Existing Permit Data Existing Permit Number: 10549/R00 Existing Permit Issue Date: 09/20/2017 Existing Permit Expiration Date: 08/31/2025</p>
Jeremy Flowers President (919) 288-1770 140 Greenfield Cemetery Road Seven Springs, NC 28578	Jeremy Flowers President (919) 288-1770 140 Greenfield Cemetery Road Seven Springs, NC 28578	Jeremy Flowers President (919) 288-1770 140 Greenfield Cemetery Road Seven Springs, NC 28578	
<p>Review Engineer: Kurt Tidd</p> <p>Review Engineer's Signature:  Date: 07/29/2021</p>		<p>Comments / Recommendations: Issue 10549/R01 Permit Issue Date: September XY, 2021 Permit Expiration Date: August 30, 2025</p>	

1. Application Summary

Flowers Timber Company ("Flowers") submitted a permit modification application on 12/02/2020 to incorporate requirements of the recently promulgated rule 15A NCAC 02D .0546 for methyl bromide log fumigation and to incorporate the fumigation of other commodities with the use of phosphine. Flowers plans to contract with Ecolab Inc. to fumigate logs under tarpaulins and other commodities (such as tobacco) in sealed shipping containers with emissions exiting through a 40-foot tall, 2 feet equivalent diameter stack. An air pollutant dispersion modeling analysis was submitted with the application to demonstrate compliance with 02D .0546 and 02D .1104.

The facility is currently permitted under 10549/R00 issued on 09/20/2017. With this application the facility has requested to remain a synthetic minor (methyl bromide and phosphine are HAPs). No insignificant activities as defined by 15A NCAC 02Q .0102 were included in the application. No changes are being made to the equipment associated with the sawmill portion of the permit.

DAQ Wilmington Regional Office (WiRO) is also processing a permit application (ID No. 6500356.20A) submitted by Ecolab Inc. for methyl bromide and phosphine fumigation at 2202 Burnett Boulevard, Wilmington, NC. The Flowers permit for bulk log and other commodity fumigation located in Seven Springs, NC, will be issued consistent with the Ecolab permit format issued by WiRO.

2. Application Chronology

Application recvd	12/02/2020	
Add info request	01/08/2021	Recvd 1/19/2021
Add info request	01/21/2021	Recvd 2/05/2021
Add info request	02/11/2021	Recvd 4/29/2021
Add info request	05/14/2021	Recvd 7/14/2021

3. Process and Regulatory Review

Flowers is currently permitted to conduct bulk log fumigation. In June through July of 2018, Flowers used 3,994 pounds of methyl bromide and in February of 2019 they used 150 pounds. This is all that the facility has reported used for fumigation since permit 1054R/R00 was issued. The facility plans to contract with Ecolab Inc. to conduct pest fumigation of bulk log piles with methyl bromide and fumigation of other commodities in shipping containers using phosphine on their property. Methyl bromide is a volatile organic compound (VOC), a federal hazardous air pollutant (HAP), and a North Carolina toxic air pollutant (TAP). Phosphine is not a VOC, but is both a HAP and TAP.

Ecolab provided Standard Operating Procedures (SOPs) for fumigating both bulk log piles using methyl bromide and for commodity shipping containers using phosphine. These SOPs were used to help develop the conditions in the permit and give the DAQ a greater understanding of both processes.

Bulk logs will be stacked on an impervious surface. Fans, monitoring lines, and gas lines will be placed amid the stacked logs. Three fumigant sampling lines will be used for monitoring fumigant concentrations. Two of the fumigant sampling lines will be placed inside the bulk enclosure at opposite ends, one at the top of the bulk pile and the other at the bottom of the bulk pile, and one will be located in the middle of the bulk pile. The logs will be covered by a plastic tarpaulin, and the tarpaulin will be secured with sand snakes and/or spray adhesives and impervious tape around the base. Methyl bromide pressurized cylinders will be used to inject the gas. The amount of gas that is used for each fumigation will be determined by weighing the cylinder on a scale before and after gas application.

After an exposure period dictated by the USDA (16 to 72 hours), the tarped bulk pile will be aerated. The tarp is lifted and draped over a blower and the sand snakes are placed on top of the blower extending down its sides. Additional sand snakes are placed along the floor and against the bottom edges of the blower creating a seal around the blower. The blower is turned on and once a suction is created on the pile, the opposite end of the tarp is lifted enough to facilitate an air intake to the pile which creates enough vacuum to minimize and/or prevent leaks. The fumigant exhausts through horizontal flexible ductwork connected to the blower to a vertical stack (40 feet high and 2 feet in “equivalent diameter” as indicated in the toxic emissions modeling). The concentrations of fumigant under the tarpaulin will be monitored with USDA approved equipment and methods. When the concentrations under the tarpaulins are at or below the acceptable level set by the USDA, the tarpaulin may be removed.

Monitoring device(s) will be used to check for methyl bromide concentrations outside of the tarped bulk logs (fugitive emissions) during application of fumigant and aeration. Any detection of fumigant requires corrective action and monitoring.

Commodity fumigation (such as tobacco) will take place in shipping containers using phosphine. Fumicells (solid phosphine tablets) and/or Eco2fume (gaseous phosphine in a cylinder) will be utilized. Fumicell packets will be opened at the start of the aeration and placed inside the containers. Solid phosphine does not immediately volatilize, leaving time for the operator to set the plastic aeration barrier and close the container door. Eco2Fume will be introduced into the container from a pressurized cylinder in a manner similar to the introduction of methyl bromide to a bulk pile. With one door closed, a plastic

“aeration barrier” will be affixed in the remaining door opening utilizing magnets. The aeration barrier will stop 8 inches down from the top of the opening leaving a space which will serve as the air intake during aeration which occurs later in the process. The doors of the containers will be closed and sealed utilizing existing door gaskets. Monitoring lines and gas introduction lines will penetrate between the gasketed door frame and the door. Three fumigant sampling lines will be used for monitoring phosphine concentrations. Two of the fumigant sampling lines will be placed inside the container at opposite ends, one at the top of the commodity at the front of the container, one at the bottom of the commodity near the rear and the third located in the middle of the container. Spray adhesive and plastic tape will be utilized to seal any potential sources of fugitive emissions from the containers.

After an exposure period dictated by the commodity and USDA, the container will be aerated. With the aeration blower turned on, a technician will then open the door where the aeration barrier was installed and lift the plastic, inserting the suction duct under the plastic barrier which will then be tucked around the duct to minimize any potential leaking. Air will enter the container thru the 8-inch opening left at the top of the aeration barrier. The containers will then be aerated using fans that pull the residual fumigant through horizontal flexible ductwork to the same vertical ventilation stack used for tarped bulk log fumigation. The concentrations of fumigant in the containers will be monitored with USDA approved equipment and methods. When the concentrations in the containers are at or below the acceptable level set by the USDA, the doors may be opened.

Monitoring device(s) will be used to check for phosphine concentrations outside the containers (fugitive emissions) during the activities described above. Any detection of fumigant requires immediate corrective action and monitoring.

The following sources will be described in the permit. No changes have been made to the sawmill sources or controls (ES-1, ES-2, -3, CD-1, CD-2 and CD-3).

Emission Source ID	Emission Source Description	Control System ID	Control System Description
ES-1	56" circle saw	CD-1	Panning, guards, water hose, barn sweep conveyor with shields for conveying the sawdust into a truck
ES-2	Two saw double-end trimmer	CD-2	Panning and guards with conveyor to the chipper and loading into a truck
ES-3	48" gang edger and two 8" blowers with chain drag conveyors	CD-3	Cyclone
ES-4	Bulk log fumigation under a tarpaulin using methyl bromide and commodities fumigation in shipping containers using phosphine; emissions exhaust to a single stationary stack 40 feet in height and 2 feet in equivalent diameter	N/A	N/A

The following are the applicable DAQ regulations for this facility:

02D .0202 “Registration of Air Pollution Sources”

This Rule gives the Director the authority to require the registration of air pollution sources, and to require the facility to submit information about the source. It is under this Rule that the Division is requiring facilities to submit an emissions inventory 90 days before a permit expires. Permits are effective for a period of 8 years, so Flowers will be required to submit a 2024 emissions inventory prior to the permit expiration date of August 30, 2025.

02D .0512 “Particulates from Wood Products Finishing Plants”

The facility is required to provide adequate ductwork and properly designed collectors to control emissions of particulate matter. The particulate controls at the facility were added as a result of complaints from a resident adjacent to the facility (see Section 5 of this review for the compliance history).

02D .0521 “Control of Visible Emissions”

Each emission source at the facility is subject to this regulation. It does not apply to visible emissions generated during startup, shut down, or malfunctions approved under 15A NCAC 02D .0535. Visible emissions are limited to 20% opacity or less when averaged over a six-minute period. One exceedance in an hour is acceptable (if less than 87%), up to four times in a 24-hour period. No visible emissions are expected from the fumigation operations.

02D .0535 "Excess Emissions Reporting and Malfunctions"

The facility is required to report excess emissions which last for more than four hours and result from a malfunction, a breakdown of process or control equipment or any other abnormal conditions. Any excess emissions that do not occur during start-up or shut-down are considered a violation of the applicable standard unless the facility demonstrates to the Director that the excess emissions are the result of a malfunction.

02D .0540 “Particulates from Fugitive Dust Emission Sources”

This rule requires the facility to prevent fugitive dust emissions from causing or contributing to substantive complaints or excess visible emissions beyond the property boundary. Fugitive dust is particulate from processes that do not pass through a stack or vent. Examples of fugitive dust are unloading areas, stockpiles, parking lots, and facility haul roads. If substantive complaints or excessive fugitive dust emissions are observed beyond the property boundaries for six minutes in any one hour (using Reference Method 22 in 40 CFR, Appendix A), the facility may be required to submit a fugitive dust plan as described in 02D .0540(f).

02D .0611 “Monitoring Emissions from Other Sources”

This regulation allows DAQ to create inspection and maintenance requirements for control devices in the permit. The facility will be required to inspect their control devices per the manufacturer’s recommendations, and at a minimum, perform an annual inspection of the cyclone and associated ductwork. The facility installed a cyclone to help with dust complaints. It is the main control device for sawdust management, but they have other controls including panning, guards, water hoses, and covered conveyors. All inspection and maintenance results must be recorded in a logbook (hard copy or electronic) and be readily made available to DAQ upon request.

02D .1806 "Control and Prohibition of Odorous Emissions"

This Rule states that the permittee shall not operate the facility without implementing management practices that prevent objectionable odors from going beyond the facility property boundaries. Methyl bromide and pure phosphine are reportedly odorless; however, “technical grade” phosphine is reported to have a strong fishy odor. No odors are anticipated and if ever present would be considered an indication of potential compliance issues with this and other permit requirements.

02D .0546 “Control of Emissions from Log Fumigation Operations”

This Rule applies to new, existing, and modified bulk, chamber, and container log fumigation operations that use a hazardous air pollutant or toxic air pollutant as a fumigant. Per paragraph (d) in the rule, Emission Control Requirements. The owner or operator of a log fumigation operation shall comply with the Toxic Air Pollutant Guidelines specified in 15A NCAC 02D .1104 and follow the procedures specified in 15A NCAC 02D .1106, 15A NCAC 02Q .0709, and .0710. This new regulation became effective on November 1, 2020 and required an application demonstrating compliance within 60 days of the effective date. Flowers submitted an application on December 2, 2020, but it had significant

deficiencies. After several additional information requests it was deemed complete on July 14, 2021. Flowers has not reported any fumigation conducted since February 2019, therefore a requirement for compliance with this rule upon start-up will be added to the permit.

Below is the text of the newly promulgated rule:

- (a) Purpose. The purpose of this Rule is to establish emission control requirements for hazardous air pollutants and toxic air pollutants from log fumigation operations.
- (b) Definitions. For the purpose of this Rule, the following definitions and definitions in this Subchapter or 15A NCAC 02Q apply:
 - (1) "Bulk or tarpaulin log fumigation" means the fumigation of logs that are placed in piles on an impermeable surface and covered with a weighted-down tarpaulin.
 - (2) "Chamber log fumigation" means the fumigation of logs inside a sealed building or structure that is specifically used for fumigation. Chambers used for fumigation may be either atmospheric or vacuum type.
 - (3) "Container log fumigation" means the fumigation of logs inside a container where the doors of the container are closed and sealed.
 - (4) "Fumigant" means the hazardous air pollutant or toxic air pollutant that is used to eliminate the pests within the logs.
 - (5) "Fumigation operation" means the period of time that the fumigant is injected and retained in the container, chamber, or bulk piles for the purposes of treating the logs for insects and other pests to prevent the transfer of exotic organisms.
 - (6) "Hazardous air pollutant" means any pollutant listed under Section 112(b) of the federal Clean Air Act in 42 U.S.C. 7412(b).
 - (7) "Public right-of-way" means an access area where people can reasonably be expected to be present for any or all parts of a 24-hour period.
 - (8) "Toxic air pollutant" means any of the carcinogens, chronic toxicants, acute systemic toxicants, or acute irritants that are listed in 15A NCAC 02D .1104.
- (c) Applicability. This Rule applies to new, existing, and modified bulk, chamber, and container log fumigation operations that use a hazardous air pollutant or toxic air pollutant as a fumigant.
- (d) Emission Control Requirements. The owner or operator of a log fumigation operation shall comply with the Toxic Air Pollutant Guidelines specified in 15A NCAC 02D .1104 and follow the procedures specified in 15A NCAC 02D .1106, 15A NCAC 02Q .0709, and .0710.
- (e) The owner or operator shall post signs notifying the public of fumigation operations. The signs shall be visible and legible to the public at the fence or property line closest to any public right-of-way. The signs shall remain in place at all times and shall conform to the format for placards mandated by the federally approved fumigant label.
- (f) Monitoring, Recordkeeping and Reporting. The owner or operator of a bulk, chamber, or container log fumigation operation shall comply with the requirements pursuant to 15A NCAC 02D .0600:

- (1) The owner or operator shall send an initial notification of commencement of operations to the appropriate Division of Air Quality regional office within 15 days of initial fumigation start-up.
- (2) The owner or operator shall submit a quarterly summary report, with the original signature of the permittee or the authorized responsible official, of the monitoring and recordkeeping activities postmarked no later than 30 days after the end of each calendar year quarter. The report shall contain the following:
 - (A) the company name, address, and facility ID number;
 - (B) the calendar year quarter represented by the report;
 - (C) the daily and total fumigant usage in pounds for each quarter;
 - (D) a summary of the monitoring data required by the permit that was collected during the quarter; and
 - (E) a summary of exceedances from the levels established in the permit that occurred during the quarter of any monitoring parameters.
- (g) Compliance Schedule. The owner or operator of an existing log fumigation operation subject to this Rule shall achieve compliance within 60 days after the Rule is effective or in accordance with an alternate compliance schedule approved by the Director. In establishing an alternate compliance schedule, the Director shall consider whether the compliance approach chosen by the facility involves the purchase and installation of a control device. New and modified facilities shall achieve compliance with this Rule upon start-up.

Per the above stated rule, a 02D .0535 permit condition will be added to the permit to include the requirement to comply with 15A NCAC 02D .1104, requirement for initial notification, sign requirements, and the quarterly reporting requirement.

02D .1104 “Toxic Air Pollutant Guidelines”

Emission limits in the toxics table below shall not be exceeded. Ecolab, Inc. submitted a complete toxic air pollutant dispersion modeling analysis for Flowers on July 8, 2021. The modeling analysis was reviewed and approved by the DAQ Air Quality Analysis Branch (AQAB) on July 23, 2021. Placement of the emission sources, configuration of the emission points, and operation of the sources shall be in accordance with the approved dispersion modeling analysis and should reflect any changes from the original analysis submittal as outlined in the AQAB review memo. Flowers has proposed in the modeling to only actively aerate between the hours of 8:00 AM to 5:00 PM. Further discussion of this is included in the “Emissions Review” section of this permit application review.

Below are the methyl bromide log fumigation emissions limits established via modeling which demonstrate compliance with 02D .0546 and 02D .1104. In addition, modeling was submitted for the commodity fumigation to demonstrate compliance with the phosphine hourly AAL established in 15A NCAC 02D .1104. More detail regarding how stack emissions were modeled and what fugitive emissions were assumed is presented in Section 6 of this review “Emissions Review”

Affected Source	Toxic Air Pollutant	Emission Limit	2D .1104 AAL	% of the AAL
ES-4	Methyl Bromide (logs)	1,584 lb/day	1.0 mg/m ³	98%
	Methyl Bromide (logs)	19,999 lbs/yr*	0.005 mg/m ³	58%
	Phosphine (Other Commodities)	1.15 lb/hr*	0.13 mg/m ³	97%

The draft permit condition (A.9. for 02D .1104) is 17 pages long in the permit document and covers the main topics described below. The main purpose of the following permit conditions is to achieve consistency between assumptions used in the dispersion modeling analysis and actual operations with a focus on limiting fugitive emissions and insuring stack parameters in the model are met:

- | | |
|--|--|
| 1. <u>Fumigation Preparation for Bulk Piles</u> | 1. <u>Fumigation for Containers</u> |
| 2. <u>Bulk Pile Fumigation</u> | 2. <u>Container Fumigation</u> |
| 3. <u>Leak Detection and Repair Program (LDAR)</u> | 3. <u>LDAR</u> |
| 4. <u>Exhaust Stack for Bulk Piles</u> | 4. <u>Exhaust Stack for Containers</u> |
| 5. <u>Aeration</u> | 5. <u>Aeration</u> |
| 6. <u>Removing the Tarpaulins</u> | 6. <u>Opening Containers</u> |

02Q .0315 “Synthetic Minor Facilities”

Methyl bromide and phosphine are listed as federal Hazardous Air Pollutants (HAP). The facility has requested to retain synthetic minor status, so permit condition (No. A.10. in the draft permit) is edited to include phosphine. This condition will mirror the synthetic minor condition in the Ecolab Inc. permit (No. 10313R03) to be issued by the Wilmington Regional Office.

Since there is no physical bottle-neck other than available acreage on the property, Flowers could fumigate enough material to potentially exceed 10 tons per year of methyl bromide or phosphine emissions. It is unlikely phosphine emissions would approach this limit due to the NC toxics hourly limit; however, in an abundance of caution, tracking and reporting of phosphine is included in this federally enforceable limit. The applicant has requested a synthetic minor limit of 10 tons per year for each fumigant to avoid having to submit an application for a Title V permit.

02Q .0501 “Limitation to Avoid”

"Synthetic Minor Facilities," to avoid the applicability of 15A NCAC 2Q .0501 "Purpose of Section and Requirement for a TV Permit," as requested by the Permittee, facility-wide emissions shall be less than the following: Flowers has taken an emissions cap for both methyl bromide and phosphine to avoid being subject to Title V permitting.

4. NSPS, NESHAPS, PSD, Attainment Status, and 112r

- **NSPS** – No NSPS Subpart is applicable to the permitted sources.
- **NESHAPS** – No NESHAP subpart is applicable to the permitted sources.
- **PSD** - This facility is minor for PSD. Wayne County has been triggered for increment tracking for NO_x (NO₂), PM₁₀, and SO₂. Actual PM₁₀ emissions were conservatively estimated at 7.0 lbs/hr, and NO_x and SO₂ are 0.0 lbs/hr (based on 2,080 hrs./yr operation) with issuance of the initial permit to Flowers. No NO_x, PM₁₀ or SO₂ emission increases are associated with this permit application.
- **Attainment Status** - This facility is in an attainment area.
- **112r** - The facility has not indicated it handles, stores, or uses any 112r pollutants in sufficient quantities to be subject to this regulation.
- **NC Toxics**- Methyl bromide and phosphine are North Carolina toxics as defined in 02Q .0711 and 02D .1104.

5. Facility Compliance Status

The facility was most recently inspected on 08/31/2020 by Robert Bright at which time “The facility appeared to operate in compliance with all applicable air quality regulations and permit conditions at the time of inspection.” There were two complaints for dust on an adjacent property in 2016 which Flowers addressed. A NOD was issued on January 26, 2016, and a NOV was issued on August 31, 2016 for

violation of 02D .0512 and 02D .0540. There have been no other complaints logged into the DAQ I-Beam database in the last five years.

6. Emissions Review

15A NCAC 02D .0546 requires Flowers to demonstrate compliance with the Toxic Air Pollutant (TAP) Acceptable Ambient Levels (AAL) for log fumigation. Phosphine is also a TAP, so compliance must be demonstrated with its AAL. The fumigation monitoring, recordkeeping and reporting conditions created in this permit revision are based on requirements of the 02D .0546 rule and work practices provided by the United States Department of Agriculture’s Animal and Plant Health Inspection Service (USDA APHIS) fumigation treatment manual. Ecolab Inc. also provided Standard Operating Procedures (SOP) on April 14, 2021, which were considered as part of the application and were used to help inform the permit conditions. The permit conditions were drafted to ensure compliance with 02D .0546 and 02D .1104.

Flowers submitted a toxic air pollutant dispersion modeling analysis dated 12/02/2020. Methyl bromide and phosphine are emitted to atmosphere through a single 40-foot stack with a 2-foot equivalent diameter. The modeled stack velocity is 57.6 feet per second. The modeling did not include consideration of fugitive loss during fumigation and aeration. Fugitive emissions can occur from leaks around tarp and container seals, ductwork, connections, and when the tarpaulins and containers are disturbed to begin the aeration process. Ecolab resubmitted the modeling analysis to include fugitive loss on 07/08/2021. The modeling assumes 1% by weight of the total amount of fumigant used is fugitive during fumigation (active application and exposure period). The modeling assumes that 5% by weight of the total amount of fumigant used is fugitive during aeration. Flowers will only actively aerate between 8 a.m. and 5 p.m. daily; fugitive loss during these hours is addressed in the modeling. The permit will limit Flowers to these aeration hours. Permit conditions have been created to require Flowers to establish a Leak Detection and Repair (LDAR) program to minimize potential of fugitive emissions from leaks around the bulk piles and from the containers.

The modeling analysis was reviewed and approved by the DAQ Air Quality Analysis Branch (AQAB) on 07/23/2021. Placement of the emission sources, configuration of the emission points, and operation of the sources shall be in accordance with the approved dispersion modeling analysis and should reflect any changes from the original analysis submittal as outlined in the AQAB review memo.

Based on the modeling results the permit will include a daily limit of 1,584 lb/day and an annual limit of 19,999 lbs/year for methyl bromide. Phosphine will be limited to 1.15 lbs/hr. Flowers is also limited to 10 tons/year, on a 12 month rolling total basis, for each fumigant in order to remain a synthetic minor. Flowers will be required to record fumigant usage for each pile/container and report usages quarterly to DAQ. Minimum stack velocity and flow limits will be in the permit, along with parametric monitoring requirements to demonstrate compliance with these limits (duct pressure).

Particulate emissions from the facility were previously evaluated with a registration issued to Flowers on 5/23/2017. The facility-wide particulate estimates were completed using CY2016 production (board feet) and DAQ’s “Woodwork” emissions spreadsheet (available to download on DAQ’s website).

Wood Processed (BF)	PM Emissions (tpy)	PM ₁₀ Emission (tpy)
1,103,842	17.2	7.2

7. Comments and Recommendations

- The draft permit will be going to public notice and a virtual public hearing will occur to ensure that all interested parties have a chance to comment on the draft.

- I recommend issuance of Permit 10549R01 to Flowers Timber Company, Inc., located in Seven Springs, NC.