

VERMONT AGENCY OF NATURAL RESOURCES
Department of Environmental Conservation
Air Pollution Control Division

**TECHNICAL SUPPORT DOCUMENT FOR PERMIT TO
CONSTRUCT AND OPERATE**

**#AOP-04-027
DEC#NS94-0007**

January 13, 2005

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APPLICANT: FiberMark North America, Inc.
P.O. Box 498
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SOURCE: Paperboard Manufacturing
FiberMark North America, Inc.
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1.0 INTRODUCTION

FiberMark, Inc. (hereinafter "FiberMark" and also referred to herein as "Owner/Operator") owns and operates a paperboard manufacturing facility at 161 Wellington Road in Brattleboro, Vermont (also referred to herein as "Facility").

The Facility currently operates under a combined construction and operating permit issued October 4, 2002 (#AOP-95-174). This permit required FiberMark to submit a hazardous most stringent emission rate (HMSER) analysis for the *Hazardous Air Contaminants* ("HACs") benzyl alcohol and formaldehyde. FiberMark submitted an application for renewal of their operating permit on August 5, 2004. This Technical Support Document details the Agency of Natural Resources, Department of Environmental Conservation, Air Pollution Control Division (hereinafter "Agency") review for renewal of the Facility's combined Air Pollution Control Permit to Construct and Operate and Title V permit modification resulting from incorporation of the Agency's HMSER determination.

The allowable emissions for the Facility are summarized below:

<i>PM/PM₁₀</i>	<i>SO₂</i>	<i>NO_x</i>	<i>CO</i>	<i>VOC</i>	<i>Total Criteria</i>	<i>Total HAPs²</i>
32.2	441.5	<100	7.6	<50	>10	<10/25

¹ PM/PM₁₀ - particulate matter and particulate matter of 10 micrometers in size or smaller; SO₂ - sulfur dioxide; NO_x - oxides of nitrogen measured as NO₂ equivalent; CO - carbon monoxide; VOCs - volatile organic compounds; HAPs - hazardous air pollutants as defined in §112 of the federal Clean Air Act.

² Emissions of individual HAPs each < 10 tpy and emissions of total HAPs combined <25 tpy. Actual total combined HAPs estimated at <1 tpy.

2.0 FACILITY DESCRIPTION AND LOCATION

2.1 Facility Locations and Surrounding Area

FiberMark owns and operates the paperboard manufacturing facility located at 161 Wellington Road in Brattleboro, Vermont. The area surrounding the Facility is primarily industrial and commercial with neighbors such as The Book Press, Fuller, and C&S Wholesale Warehouse. The Facility is located greater than 100 kilometers from the Great Gulf and Dry River Wilderness areas in New Hampshire and within 100 kilometer of the Lye Brook Wilderness Area in Manchester, Vermont. The Facility location and layout are depicted in Appendix A of this Technical Analysis.

2.2 Facility Description

The Facility is listed under the Standard Industrial Classification ("SIC") Code 2631 - Paperboard Mills. The regulated sources of air contaminant emissions at the Facility are the paper making processes, two (2) No. 6 fuel oil-fired Bigelow boilers rated at 38 million British Thermal Units per hour ("MMBTU/hr") each of heat input, and a temporary No. 2 fuel oil-fired supplemental boiler (hereinafter "supplemental boiler") rated at less than 15 MMBTU/hr of heat input. Specifications for emission sources are presented in Table 2-1.

Table 2-1: Equipment Specifications			
Equipment/Make/Model	capacity/size	fuel type	date of installation
Two (2) Bigelow boilers	38.2 (each) MMBTU/hr ¹	No. 6	1960
Cleaver Brooks Model 200-350 water tube boiler (rental)	14.8	No. 2	1997
Three (3) Safety-Kleen Model 16 parts cleaner	na	na	unknown
One (1) Safety-Kleen Model 81 parts cleaner	na	na	unknown
Paper Coating Line #1	na	na	1988
Paper Coating Line #2	na	na	1985
Two (2) Fuel Storage tanks	25,000 gallon	No. 6 (2% sulfur)	1989

¹ Mite/hr - Million British Thermal Units per hour maximum rated heat input.
na – not applicable

Boilers - The Boiler Room at the FiberMark facility contains two boilers. A third skid-mounted boiler is located outside the Boiler Room and feeds steam inside the boiler room to provide supplemental steam. The two boilers located in the boiler room are identical water tube boilers installed in 1960 and fire No. 6 fuel oil. The two boilers, manufactured by The Bigelow Company, are each equipped with one Model HT66 oil burner manufactured by Cone Company. Each Bigelow boiler has a heat input rating of 38.2 MMBTU/hr¹.

No. 6 fuel oil for the Bigelow boilers is delivered and stored in two underground storage tanks located outside the southeastern end of the facility building. Each underground storage tank has a capacity of 25,000 gallons. A fuel additive, Chemtreat BL-1544, is added to the fuel in the underground storage tanks at time of fuel delivery. The fuel oil is piped to the boiler room and preheated to a temperature of 210° F. A portion of the fuel oil piped to the boiler room is circulated back to the fuel storage tanks to keep the No. 6 fuel oil viscous in the storage tanks.

¹ There is a discrepancy between the heat input rating of 38.2 MMBTU/hr noted in the application, and the information which resides in the Agency's files and registration inventory. The Agency's files list a heat input of 37.5 MMBTU/hr for each unit, while the registration inventory lists 30 MMBTU/hr of heat input. For the purposes of this Technical Analysis, the Agency has utilized the heat input indicated in the operating permit application.

Each Bigelow boiler generates approximately 35,000 pounds per hour of steam at a pressure of 230 psig to the Facility. Approximately ten (10) percent of the steam is utilized for space heating, while the remaining ninety (90) percent is utilized in the manufacturing of paperboard. Process steam is employed by the paper machine and coating dryers.

As stated previously, FiberMark has installed a third boiler to supplement the steam production at the Facility during the higher heat demand months (i.e., winter). This unit is located outside the boiler room and is skid mounted. This unit is a rental boiler and was first installed in 1997. The heat input rating for the boiler is restricted to less than 15 MMBTU/hr. The supplemental boiler only fires No. 2 fuel oil. Historically, this unit has been identified as a Cleaver Brooks Model 200-350 water tube boiler. Fuel oil for this boiler is stored in an above ground portable storage tank located in the spill containment area next to the boiler room. No fuel additives are added to the No. 2 fuel oil.

Paper Production and Coating - Raw materials, including recyclable paper and treatment chemicals, are conveyed to the Facility and stored in the Materials Storage Area. Paper is transferred to a pulper and then pumped as a slurry through piping (located under the floor) to the Stock Prep area. The paper is mixed and cleaned in the Stock Prep area. Cleaning involves the physical separation of impurities (e.g., envelope windows, rubber bans, paper clips, etc.). Dyes for the paper, if necessary, are added at this point. Boil-out and neutralization chemicals may also be added here for cleaning purposes.

The cleaned paper slurry exits the Stock Prep area and is pumped to the “wet end” of the paper machine (identified as Paper Machine No. 1 by FiberMark). The paper is formed and pressed into a thin, continuous, and cohesive sheet of paper. Boil-out and neutralization chemicals may be added here as well as felt washes. The sheet of paper is conveyed through steam heated dryers to remove moisture. The dried paper is passed through calendars which impart physical properties to the paper. The continuous sheet of paper is then wound into a roll at the “Winder.”

The roll of paper is either transported to the “Converting” area, the “Shipping” area, or to one of two coating lines.

Converting Area - The Converting Area includes cutting, slitting, winding, and packaging of the paper. The paper is packaged in stretch wrap and is loaded onto trucks for subsequent distribution.

Coating Lines - FiberMark employs two coating lines. Coating Line No. 1 (installed in 1988) consists of a roll coater that applies acrylic-based coatings. The applied coating is then dried using a steam heat dryer. Coating Line No. 2 (installed in 1985) utilizes a roll coater or rod coater to apply the acrylic-based coatings. Applied coatings on Coating Line No. 2 are also dried using a steam heated dryer.

Each coating line uses similar steps to process paper. The roll of paper exiting

the paper machine is unwound and passes through the coater which then applies an acrylic-based film to the surfaces of the paper sheeting. The paper then passes through an air flotation dryer and to an “embosser” which imprints and forms the paper sheeting into the desired format. The paper sheeting is finally rewound at the end of the coating line.

The acrylic-based film is mixed in batches of 60 gallons and consists of equal parts of Rhoplex HA-12 Dispersant and Tamol 165A Dispersant and transferred to the coating line. Dyes may also be mixed in with the coating film.

Parts Cleaning - FiberMark utilizes four (4) Safety-Kleen Parts Cleaning Systems (Three - Model #16 cleaners and one Model #81 cleaner) for cleaning various machine parts [referred to as cold cleaning in the *Regulations* - see §5-253.14(b)]. The units are serviced by Safety Kleen every twelve (12) weeks.

2.3 Description of Existing Air Pollution Control Equipment

This Facility is not equipped with air pollution control equipment.

2.4 Description of Compliance Monitoring Devices

This Facility is not equipped with devices to continuously monitor the emission of air contaminants to the ambient air.

2.5 Proposed Modifications to Facility

No modifications have been proposed for the Facility as part of the current permit renewal.

2.6 Proposed Limitations

The Facility presently operates under the limitations imposed by a Permit to Construct and Operate #AOP-95-174. Additional limitations were developed in order to implement the HMSEER determination for formaldehyde. Below are summarized the primary limitations on the operation of this Facility and contained in the current permit:

1. No. 2 fuel oil sulfur content restricted to 0.5 percent by weight or less, and annual No. 2 fuel oil usage in the supplemental boiler is limited to 280,000 gallons per year².
2. Annual emissions of formaldehyde shall not exceed 65 pounds per year.³
3. Annual emissions of NO_x from the Facility shall not exceed 100 tons per year.⁴

² The cap of 280,000 gallons per year on the use of No. 2 fuel oil in the supplemental boiler was imposed in Permit to Construct #AP-97-022b, issued on April 29, 1998. This cap was deleted from the Permit to Construct and Operate #AOP-95-174, issued on October 4, 2002, in error. The fuel cap of 280,000 gallons per year did not result in emissions of greater than 10 tons per year of any one pollutant, nor did the 80,000 gallon increase exceed 10 tons per year of all pollutants combined, as a result the Facility was not subject to modeling requirements prior to installation of the supplemental boiler.

³ Hazardous Most Stringent Emission Rate determination, 2004.

⁴ Emission cap implemented to avoid NO_x RACT.

2.7 Identification of Insignificant and Exempt Activities

Activities which qualify as an "insignificant activity" pursuant to §5-1002(h) of the *Regulations* need not be considered when determining the applicability of Subchapter X of the *Regulations* and must only be listed as such within the operating permit application. Additionally, guidance provided by the U.S. EPA (entitled "White Paper for Streamlined Development of Part 70 Permit Applications") lists activities which are considered as "trivial" sources of air contaminants, and may be presumptively omitted from operating permit applications.

Although not required for determining applicability with Subchapter X, quantifiable emissions from "insignificant activities" must be included for the purposes of establishing whether or not a source is subject to other air pollution control requirements, including, but not limited to: reasonably available control technology, major source status, and Title V operating permit applicability.

In its application, FiberMark has not identified any equipment or activities as insignificant or trivial. However, the Agency is aware of the following activities or equipment at the Facility:

1. Forklifts;
2. Repair and maintenance shop activities;
3. Soldering and welding equipment;
4. Ventilating units used for human comfort;
5. Fuel oil and propane storage tanks [No. 6 oil - (2) 25,000 gallon storage capacity (installed post 1984)
6. Chemical storage tanks (<10,000 gallon storage capacity each);
7. Paper testing laboratory; and
8. Intermittent construction activities.

Emissions were not quantified from the above insignificant activities because they are considered negligible or not quantifiable. The exclusion of emissions produced by the insignificant and trivial activities does not alter the applicability status of the Facility under Subchapter X of the *Regulations*.

3.0 QUANTIFICATION OF POLLUTANTS

The quantification of emissions from a stationary source is necessary in order to establish the regulatory review process necessary for the operating permit application and to determine applicability with various air pollution control requirements. These determinations are normally based upon allowable emissions. Allowable emission is defined as the emission rate calculated using the maximum rated capacity of the source and, if applicable, either: (a) the applicable emission standard contained in the *Regulations*, if any, or (b) the emission rate or design, operational or equipment standard specified in any order or agreement issued under the *Regulations* that is state and federally enforceable. An applicant may impose in its application an emission rate or design, or an operational or equipment limitation which may be incorporated in the Permit to restrict operation to a lower level. Such limitations may include fuel restrictions or production limits.

3.1 Designation of the Facility for the Permit to Operate

The designation of the Facility for the Permit to Operate is determined by its allowable emissions following issuance of the permit, taking into account any limitations contained in the permit that restrict the Facility's allowable emissions. The proposed Facility has annual allowable emissions greater than 10 tpy. The air contaminant sources at the Facility are presented in Table 2-1. The calculated allowable emissions for each source are detailed in Table 3-1, Table 3-2, and Table 3-3. An emissions summary is presented in Table 3-4.

Emissions from Boilers – To estimate emissions from the boilers, the Agency used emission factors published by the U.S. EPA in the *Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources* (5th Edition including Supplements), estimated fuel consumption in the two Bigelow boilers, and the annual fuel cap imposed on the supplemental boiler.

The boilers are the only sources of NO_x at this Facility and are therefore the only emission units affected by the 100 tpy emission cap. As stated previously, the Agency has limited NO_x emissions from the Facility to less than 100 tpy. The Agency has included monitoring, record keeping, and reporting requirements in the Permit to assure compliance with this emission cap.

The supplemental boiler is subject to a fuel cap of 280,000 gallons of No. 2 fuel oil. This emission cap was approved by the Agency in the Permit to Construct #AP-97-022b issued on April 29, 1998, and was imposed in order to keep emissions from the boiler below modeling thresholds.

Although a fuel cap has not been imposed on the fuel burned in the Bigelow boilers, 2,749,000 gallons of No. 6 fuel oil was used to estimate annual emissions from the boilers. This is the estimated quantity of No. 6 fuel that could be burned in the Bigelow boilers without exceeding the NO_x emissions cap.

Emissions from Paper Making and Paper Coating -- FiberMark currently submits annual VOC emission inventories in accordance with Subchapter VIII of the *Regulations*. The inventories detail the emissions produced by the paper coating operations, the board machine, and the cold cleaners. For paper coatings, FiberMark calculates the VOC emission rates assuming that 100% of each volatile constituent is emitted to the atmosphere. For board machine emissions, FiberMark relies on guidance published in the *Federal Register* (Vol. 63, No. 72, p. 18526) to assume that only 20% of each VOC constituent is emitted to the atmosphere. For cold cleaning units, FiberMark uses a mass balance (based on manifest data) to assume that 25% of the solvent is emitted to the atmosphere. FiberMark uses Material Safety Data Sheets to determine the composition of each chemical product and usage records to determine the amount of each product used at the Facility. The Agency also assumes that 100% of the fuel treatment is emitted as VOC.

The emission inventories indicate that the Facility emitted 11.5 tons of VOC in the year 2002 and 11.3 tons of VOC in the year 2003. The Agency assumes that the average of the VOC emission rates from the previous two years is representative of expected actual emissions. Based on the emission inventories,

the average actual VOC emissions are 11.4 tons per year.

Using a multiplying factor, the Agency scales actual emissions to represent the allowable emissions. The Agency examines operating schedule and production capacity to develop the scaling factor. First, based on the information listed in the application, the Agency assumes that FiberMark operates 8,760 hours per year. Second, the Agency assumes that the Facility operates at 50% production capacity. Based on these assumptions, the Agency has concluded that a multiplying factor of 2 is appropriate to calculate allowable emissions. Therefore, the Agency estimates the allowable VOC emissions from the paper making and coating operations to be 22.8 tons per year.

Table 3-1 : Estimated Criteria Pollutant Emissions: Two (2) Main Boilers					
Pollutant	Emission Factor (lb/1000 gal)	Emission Rate (lbs/yr)	Emission Rate (tpy)	Source:	Calculation Base:
PM/PM10	23.1	63,501.9	31.8	AP-42, Fuel Oil Combustion, Tables 1.3-1 and 1.3-2, No. 6 oil-fired. 10-96	Estimated annual fuel usage of 2,749,000 gallons No. 6 fuel oil, 2% sulfur.
SO ₂	314	863,186.0	431.6		
NO _x ⁵	72.74	199,962.3	100.0		
CO	5	13,745.0	6.9		
NMTOC (VOCs)	0.76	2089.2	1.0	AP-42, Fuel Oil Combustion, Tables 1.3-3, 10-96	
HAPs	0.15	412.4	0.2	AP-42, Fuel Oil Combustion, Tables 1.3-9 and 1.3-11, 10-96	

⁵ The permit requires fuel certifications to state Nitrogen content of the No. 6 fuel oil. In the event that a fuel supplier does not state the nitrogen content of a specific delivery of No. 6 fuel oil, the Permittee shall assume that the No. 6 fuel oil contains 0.5% nitrogen, by weight. This value is a conservative estimate of the Nitrogen content of No. 6 fuel oil, as determined from a review of current (2000-2004) fuel certifications from regional fuel suppliers. This value should be reevaluated upon permit renewal. The emission factor of 72.74 pounds of NO_x per 1000 gallons of fuel burned is based on the following equation (AP-42 Table 1.3-2):

$$\frac{[20.54 + 104.39N]X}{[2 \times 10^6]} = NO_x, (tons)$$

where: X = total monthly No. 6 fuel oil consumption, in gallons, and
 N = monthly weighted average nitrogen content of the No. 6 fuel oil (e.g. if fuel contains 0.5% nitrogen by weight, N = 0.5).

Table 3-2 : Estimated Criteria Pollutant Emissions: Supplemental Boiler					
Pollutant	Emission Factor (lb/1000 gal)	Emission Rate (lbs/yr)	Emission Rate (tpy)	Source:	Calculation Base:
PM/PM10	3.2	896.0	0.45	AP-42, Fuel Oil Combustion, Tables 1.3-1 and 1.3-2, distillate fuel. 10-96	Annual fuel cap of 280,000 gallons No. 2 fuel oil, 0.5% sulfur.
SO ₂	71	19,880.0	9.94		
NO _x	20	5,600.0	2.80		
CO	5	1,400.0	0.70		
NMTOC (VOCs)	0.34	95.2	0.05	AP-42, Fuel Oil Combustion, Tables 1.3-3, 10-96	
HAPs	0.04	11.5	0.01	AP-42, Fuel Oil Combustion, Tables 1.3-9 and 1.3-11, 10-96	

Summarized in Table 3-3 below are the future allowable emissions for the Facility.

Table 3-3: Summary of Future Allowable Criteria Pollutant Emissions (tons/year)						
Source	PM/PM10	SO₂	CO	NO_x	VOCs	HAPs
Boilers [†]	32.2	441.5	7.6	<100	1.1	0.2
Paper Making and Coating	-	-	-	-	22.8	<0.01
Total:	32.2	441.5	7.6	<100	23.9	0.2

[†] Given that emission factors used to calculate emissions from the supplemental boiler burning No. 2 fuel oil are smaller than emission factors for the two Bigelow boilers firing No. 6 fuel oil, maximum allowable emissions from the Facility boilers were calculated assuming that the two Bigelow boilers consumed 2,749,000 gallons per year of No. 6 fuel, and that the supplemental boiler was not used.

3.2 Designation of Existing Stationary Source for the Permit to Construct

No modifications were proposed as part of the permit renewal application.

4.0 APPLICABLE REQUIREMENTS

The compliance analyses and determinations in this technical analysis rely on data and representations provided by the Owner/Operator. Any statements and conclusions regarding the compliance status contained herein are not binding against the state of Vermont in any future legal or administrative proceedings. The Agency will assess compliance with these standards during any inspections of the Facility. The inspections

will include confirmation of the proper operation and maintenance of equipment, visual observation of emission points, and review of written records required in the permit.

4.1 Vermont Air Pollution Control Regulations and Statutes

§5-201 and §5-202 - Open Burning Prohibited and Permissible Opening Burning

Open burning of materials is prohibited except in conformance with the requirements of this section. Based on the application submittal and information available to the Agency, the Facility is in compliance with this requirement.

§5-211(1) - Prohibition of Visible Air Contaminants - Installations constructed prior to April 30, 1970

This standard applies to the Bigelow boilers. FiberMark has stated that it complies with the standard based on their equipment maintenance.

To assure compliance with the particulate standard the Agency has included periodic monitoring and reporting requirements for the Bigelow boilers in the Permit. FiberMark must perform monthly testing to determine the CO and either CO₂ or O₂ concentrations in the exhaust gas streams of the Bigelow boilers. With these measurements, FiberMark must then compute boiler efficiency and make any operational or maintenance-related changes to assure that the boilers are running at peak efficiency. FiberMark is also required to file semi-annual reports to the Agency detailing the results of the boiler efficiency testing and any corrective measures taken.

§5-211(2) - Prohibition of Visible Air Contaminants - Installations constructed subsequent to April 30, 1970

This standard applies to the supplemental No. 2 oil-fired boiler and the paper making equipment. FiberMark has stated that it complies with the standard based on their equipment maintenance.

Due to the clean burning nature of No. 2 oil, the Agency expects this boiler to comply with the visible emission standard. For this reason, the Agency has concluded that it is unnecessary to apply periodic monitoring requirements to this boiler to assure compliance with the visible emission standard. Given the nature of operations, the paper making process is expected to produce negligible visible emissions.

§5-221(1) - Prohibition of Potentially Polluting Materials in Fuel; Sulfur Limitation in Fuel

This subsection prohibits the use of any fuel, in stationary fuel burning equipment, with a sulfur content more than 2.0% by weight. This prohibition applies to all stationary fuel burning equipment used on-site. Compliance with this standard is based on fuel analyses following the procedures prescribed by the American Society for Testing and Materials.

FiberMark has stated that it complies with this standard based on their

contract with fuel suppliers.

To provide a reasonable assurance of compliance with this standard, the Agency has included periodic monitoring and reporting requirements in the Permit. The Permittee is required to obtain fuel supplier certifications detailing the sulfur content of fuel oil delivered to the Facility, and submit semi-annual reports containing the fuel supplier certifications.

§5-231(3)(a) - Prohibition of Particulate Matter; Combustion Contaminants

Based on the application submitted and information available to the Agency, this Facility currently has fuel burning equipment subject to this regulation. The allowable emissions of particulate matter from the subject equipment are shown in Table 4-1.

Table 4-1: Equipment Subject to §5-231(3)(a)			
Equipment ID	Size/Capacity	Emission Standard	Allowable Emissions
Bigelow – Boiler #1	38.2 MMBTU/hr	0.27 lb/MMBTU	10.3 lb/hr
Bigelow – Boiler #2	38.2 MMBTU/hr	0.27 lb/MMBTU	10.3 lb/hr
Supplemental boiler	<15 MMBTU/hr	0.43 lb/MMBTU	6.0 lb/hr

Compliance with the standard in §5-231(3)(a)(ii) of the *Regulations* is generally based on the use of Reference Method 5 (40 CFR Part 60, Appendix A).

FiberMark has stated that it complies with the standard based on their emission estimates, and the scheduled maintenance of the boilers.

The Agency has included periodic monitoring and reporting requirements for the Bigelow boilers in the Permit to assure compliance with the particulate standard. The Permittee must perform monthly testing to determine the CO and either CO₂ or O₂ concentrations in the exhaust gas streams of the Bigelow boilers. With these measurements, the Permittee must then compute boiler efficiency and make any operational or maintenance-related changes to assure that the boilers are running at peak efficiency. These requirements are premised on a correlation between boiler efficiency and particulate/visible emission rates. The Permittee is also required to file semi-annual reports to the Agency detailing the results of the boiler efficiency testing and any corrective measures taken.

Because of the clean burning nature of No. 2 oil, the Agency expects the No. 2 oil-fired supplemental boiler (Supplemental <15 MMBTU/hr) to comply with the particulate emission standard. For this reason, the Agency has concluded that it is unnecessary to apply periodic monitoring requirements to the supplemental boiler.

The Agency will also assess visible emissions from the fuel burning equipment during site inspections. If visible emissions are observed to be in excess of the respective standard, the Agency may require performance of stack testing.

§5-231(4) - Prohibition of Particulate Matter; Fugitive Particulate Matter

This section requires the use of fugitive PM control equipment on all process operations and the application of reasonable precautions to prevent PM from becoming airborne during the handling, transportation, and storage of materials, or use of roads. This requirement applies to the entire Facility, and the Facility is therefore expected to comply with the fugitive emission limitations of this section.

Based on the application submittal and information available to the Agency, the Facility currently is not considered a source of fugitive particulate matter subject to this regulation. The Facility is required to take reasonable precautions at all times to control and minimize emissions of fugitive particulate matter from the operations at the Facility.

The Agency will verify compliance with this standard in the future during any inspections of the Facility. The inspections will include confirmation of the proper operation of any fugitive particulate matter control measures and visual observations of any emission points.

§5-241(1) & (2) - Prohibition of Nuisance and Odor

This requirement applies to the entire Facility and prohibits the discharge of air contaminants that would be a nuisance to the public or the discharge of objectionable odors beyond the property-line of the Facility.

Based on the application submittal and information available to the Agency, the Facility currently is in compliance with this regulation. The Agency will verify compliance with this requirement in the future during any inspections of the Facility. Additionally, the Agency investigates all complaints that it receives in order to determine whether or not there is a violation of this requirement.

Section 5-251.3 – Control of Nitrogen Oxide Emissions

This regulation applies to stationary sources with NO_x emissions greater than 100 tons per year. NO_x emissions have been capped at 100 tons per year and the Facility is not required to comply with this regulation.

§5-253.10 - Control of Volatile Organic Compounds - Paper Coating.

This section regulates the release of VOCs from all paper coating units, except units within a paper coating source that have actual emissions without control devices from all paper coating units within the source of less than fifteen (15) pounds of VOCs per day ("lbs/day"). Once a source becomes subject to this subsection, it shall remain so even if emission levels subsequently fall below the applicable threshold.

Based on the registration data FiberMark submitted for the year 2001, the Agency estimates that VOC emissions resulting from the application of coatings and dyes totaled 8,745 pounds. Assuming that the Facility operates 365 days per year, the Agency estimates that the daily VOC emissions from the coating operations approach 24 pounds per day. Using this estimate, the Agency has determined that FiberMark is subject to §5-253.10 of the *Regulations*.

As a subject source, FiberMark shall not cause, allow or permit the daily-weighted average VOC content of paper coatings applied to exceed 2.9 pounds of VOCs per gallon (excluding water and exempt compounds).

To assure compliance with this standard, the Agency has included monitoring and record keeping requirements in the Permit. The Permittee is required to record the amount of each paper coating used monthly, as well as the density, the volatile organic compound content (expressed as a weight percentage and volume percentage), and the solids content (expressed as a weight percentage) of each paper coating. Additionally, the Permittee must submit a summary of the VOC and solids content for each coating used on a semi-annual basis.

§5-253.14 - Control of Volatile Organic Compounds - Solvent Metal Cleaning.

This subsection applies to all cold cleaning operations, open-top vapor degreasing operations with an open area of 10.8 square feet or greater, and conveyorized degreasing operations with an air/solvent interface 21.5 square feet or greater. The cold cleaning standards require the units to be designed and equipped with a cover easily operated with one hand if the vapor pressure of the solvent exceeds 0.3 psi and an internal drainage area and additional control measures if the vapor pressure of the solvent exceeds 0.6 psi. All cold cleaning operations regardless of solvent vapor pressure must:

- (i) Provide a permanent, legible, conspicuous label, summarizing the operating requirements;
- (ii) Store waste solvent in covered containers;
- (iii) Close the cover whenever parts are not being handled in the cleaner;
- (iv) Drain the cleaned parts until dripping ceases;
- (v) Supply a solvent spray, if used, that ensures a solid fluid stream at a pressure that does not exceed 10 pounds per square inch gauge;
- (vi) Degrease only materials that are neither porous nor absorbent; and
- (vii) Cease operation of the unit upon the detection of any visible solvent leak until such solvent leak is repaired."

That applicant has stated that the Safety-Kleen cold cleaning unit and solvent used at the Facility has a vapor pressure (0.008 psi) less than the

applicable levels requiring controls other than the requirements of parts (iv) through (x) above and that the unit is designed and operated in accordance with those provisions.

The Agency will assess compliance with this regulation in the future during any inspections of the Facility. The inspections will include confirmation of the solvent used and the proper design and operation of the unit.

§5-261 - Control of Hazardous Air Contaminants

See Section 5.0 below.

§5-402 - Written Reports When Required

This section gives the Agency authority to require the Facility to submit reports summarizing records required to be maintained by the Agency.

§5-403 – Circumvention

This section prohibits the dilution or concealment of an air discharge in order to avoid air pollution control requirements. The Agency will assess compliance with this regulation in the future during any inspections of the Facility.

4.2 Federal Air Pollution Control Regulations and the Clean Air Act

Clean Air Act, Title I - Air Pollution Prevention and Control, Part A - Air Quality and Emission Limitations, §111 - Standards of Performance for New Stationary Sources. FiberMark is subject to one applicable federal new source performance standard (“NSPS”) and subject to a record keeping requirement in another NSPS established under §111 of the federal *Clean Air Act* and promulgated within 40 *CFR* Part 60.

40 C.F.R. Part 60 Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

The supplemental boiler is considered an affected facility subject to 40 *CFR* Part 60 Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. Subpart Dc specifies emission limitations for PM/PM₁₀, SO₂, and opacity, as well as monitoring, record keeping, notification and reporting requirements. Applicability of Subpart Dc also subjects FiberMark to the general notification, record keeping, and other requirements of 40 *CFR* Part 60 Subpart A.

FiberMark has stated that it complies with these requirements.

Permit conditions require FiberMark to monitor fuel consumption in the supplemental boiler, to obtain fuel supplier certifications stating the sulfur content of the fuel oil fired in the boiler, and to submit semi-annual reports detailing these records. These requirements provide a reasonable assurance of compliance with Subpart Dc.

40 C.F.R. Part 60 Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984

"(a) Except as provided in paragraphs (b), (c), and (d) of this section, the affected facility to which this Subpart applies is each storage vessel with a capacity greater than or equal to 40 cubic meters (10,562 gallons) that is used to store volatile organic liquids for which construction, reconstruction, or modification is commenced after July 23, 1984."

For all storage vessels with a design capacity less than 75 m³ (19,084 gallons) the only requirements of this regulations is to keep readily accessible records showing the dimension of the storage vessel and an analysis showing the capacity of the storage vessel. For storage vessels greater than 75 m³ (19084 gallons) and storing a volatile organic liquid with a maximum true vapor pressure less than 15.0 kPa (2.18 psi), the only additional requirement of the regulation is notify the EPA Administrator within 30 days when the vapor pressure exceeds the respective value.

The record keeping requirements specified by Subpart Kb apply to the two 25,000 gallon storage tanks that FiberMark uses to store No. 6 fuel oil.

Section 112 of the Clean Air Act - National Emission Standards for Hazardous Air Pollutants (NESHAPs).

NESHAPs are promulgated under 40 C.F.R. Part 61 and 63. No NESHAPs currently apply to the Facility. Total HAP emissions are estimated to be less than one (1) tpy.

40 C.F.R. Part 64 – Compliance Assurance Monitoring

Pursuant to requirements concerning enhanced monitoring and compliance certification under the *Clean Air Act* ("CAA"), EPA promulgated new regulation on October 22, 1997 and revised regulation on January 12, 2001. These new requirements implemented compliance assurance monitoring ("CAM") for major stationary sources of air pollution that are required to obtain operating permits under Title V of the CAA. Subject to certain exemptions, the new regulations require owners or operators of such sources to conduct monitoring that satisfies particular criteria established in the rule to provide a reasonable assurance of compliance with applicable requirements under the CAA. Monitoring is proposed to focus on emissions units that rely on pollution control device equipment to achieve compliance with the applicable standards. The regulations also provide procedures for coordinating these requirements with the operating permits program regulations.

Section 64.2 of 40 C.F.R. specifies that each pollutant specific emission unit at a facility that meets a three-part test is subject to the requirements for CAM. An emission unit must:

- (1) be subject to an emission limit or standard;

- (2) use a control device to achieve compliance;
- (3) have **pre-control** emissions that exceed or are equivalent to the major source threshold in 40 *CFR* Part 70 (i.e., 10 tpy individual HAP, 25 tpy total HAP, 50 tpy VOCs, or 100 tpy for any other air contaminant).

Equipment at the Facility that meets the first criteria are the boilers. The Facility does have emissions of SO₂ in excess of major source thresholds. However, none of the equipment in use at the Facility, including the boilers, utilizes a control device, and therefore are not subject to CAM. As none of the equipment at the Facility meet the three criteria listed above the Facility is currently not subject to CAM.

4.3 Non-Applicable Requirements For Which a Permit Shield Provision Has Been Requested

Pursuant to §5-1015(a)(14) of the Regulations, an owner/operator may request to be shielded from potentially applicable state or federal requirements. The Facility has not requested a permit shield from any specific, potentially applicable requirement. Accordingly, the Agency has not granted any permit shields for the Facility.

5.0 CONTROL TECHNOLOGY REVIEW FOR MAJOR SOURCES AND MAJOR MODIFICATIONS

Pursuant to §5-261 of the Regulations each new major source and major modification must apply control technology adequate to achieve the Most Stringent Emission Rate (“MSER”) with respect to those air contaminants for which there would be a major or significant emission increase, respectively. The Facility is not undergoing changes subject to new source review, therefore this section is not applicable.

6.0 AMBIENT AIR QUALITY IMPACT EVALUATION

An ambient air quality impact evaluation is performed to demonstrate whether or not a proposed project will cause or contribute to violations of the ambient air quality standards and/or significantly deteriorate existing air quality. The Agency's implementation procedures concerning the need for an ambient air quality impact evaluation under §5-406(1) of the Regulations, specifies that such analyses may be required when a project results in an allowable emissions increase of ten (10) tons per year or more of any air contaminant, excluding VOCs. Additionally, the Agency may require an air quality impact evaluation where the short-term allowable emission rates will significantly increase as a result of a project.

The Facility is not undergoing changes subject to new source review, therefore this section is not applicable.

7.0 HAZARDOUS AIR CONTAMINANTS

The emissions of hazardous air contaminants (“HACs”) are regulated under to §5-261 of the Regulations. The Owner/Operator of a source must quantify its emissions of HACs regulated by this rule. Any Facility whose emission rate of a HAC exceeds its respective Action Level (“AL”) is subject to the rule for the HAC, and the Owner/Operator must then demonstrate that the emissions of the HAC are minimized to the greatest extent practicable by achieving the Hazardous Most Stringent Emission Rate (“HMSER”) for

that HAC. If the emission rate of any HAC after achieving HMSER is still estimated to exceed its action level after achieving HMSER, an air quality impact evaluation may be required to further assess the ambient impacts for compliance with the Hazardous Ambient Air Standard ("HAAS") or Stationary Source Hazardous Air Impact Standard ("SSHAIS"). The emission of hazardous air pollutants ("HAPs") may also be regulated separately under to §112 of the Federal Clean Air Act. Any applicable HAP regulations are discussed under Section 4 above.

7.1 Quantification of HAC Emissions

Solid fuel burning equipment (not including incinerators) installed or constructed prior to January 1, 1993, and all fuel burning equipment which combusts virgin liquid or gaseous fuel is exempted from review pursuant to §5-261(1)(b)(ii) of the *Regulations*. Additionally, fuel burning equipment burning waste oil that comply with the requirements of §5-221(2) of the *Regulations* are also not subject to the requirements of §5-261 of the *Regulations*. Consequently, no fuel burning equipment used at the Facility qualified for review of HAC emissions under §5-261 of the *Regulations*.

The production of paper products does result in the discharge of HACs at the Facility. The Agency has quantified and compared the HAC emissions to the respective Action Levels (found in Appendix C of the *Regulations*) in order to determine if §5-261 of the *Regulations* is applicable to the Facility.

As described in the Technical Analysis prepared for AOP-95-174 the Agency evaluated HAC emissions and determined that FiberMark's emissions of formaldehyde and benzyl alcohol were in excess of the respective ALs. As a result, FiberMark was subject to §5-261 of the *Regulations*, and was required to submit a HMSER determination to the Agency for formaldehyde and benzyl alcohol.

7.2 HMSER Selection

Pursuant to §5-261 of the *Vermont Air Pollution Control Regulations (Regulations)* any stationary source whose current or proposed actual emission rate of a hazardous air contaminant ("HAC") is equal to or greater than the respective Action Level shall achieve the HMSER for the respective HAC. FiberMark submitted an HMSER report to the Agency in March 2003, pursuant to a requirement of the Initial Operating Permit (#AOP-95-174) issued October 4, 2002. The permit required that FiberMark develop HMSER for two compounds, formaldehyde and benzyl alcohol, that were being emitted from the Facility at levels exceeding their respective Action Levels.

The Agency's review of the HMSER report indicated that subsequent to issuance of AOP-95-174, FiberMark discontinued the use of products containing benzyl alcohol. As a result, submittal of an HMSER determination for benzyl alcohol was not required.

Various control strategies for controlling formaldehyde were explored in FiberMark's HMSER report. Two compounds containing formaldehyde (Rhoplex HA-12 and Michem) are used in FiberMark's standard clear coating and standard pigment coating. As part of their research FiberMark reviewed the chemistry

associated with these products, and tested the hypothesis that formaldehyde scavenging occurs during the paper-coating process.

Scavenging reactions are based on the assumption that certain materials may react with (or scavenge) free formaldehyde to reduce formaldehyde emissions. Common formaldehyde scavengers include ammonia and urea. Approximately 95% of FiberMark's coating process utilizes the two formaldehyde-containing products (Rhoplex HA-12 and Michem) in combination with a product containing ammonia (Tamol). To test the hypothesis that formaldehyde scavenging was occurring in the coating processes, FiberMark had their vendor, RhomNova, perform analytical tests that conservatively replicated the dwell times and oven temperatures of their coating processes.

The two coatings of interest were the standard clear coating and the standard pigment coating. Approximately 95% of the coating used at FiberMark is the standard clear coating, the remainder is pigment coating. The general composition of each coating is shown in Table 7-1:

Coating	Percent Rhoplex HA-12 (% by weight)	Percent Michem (% by weight)	Percent Tamol 165A (% by weight)
Standard Coating (SC)	49.4%	1.1% (maximum)	49.4%
Pigment Coating (PC)	23.5%	na	na
Compound of Interest	formaldehyde	formaldehyde	ammonia

Two headspace analyses of each of the coatings of interest were analyzed by GC/MS using a full evaporation technique. The testing parameters and results, as well as the operating temperatures used in FiberMark's coating process, are compared in Table 7-2.

Based on the analytical results it was assumed that the maximum concentration of formaldehyde emitted from the standard coating is equal to the method detection limit of 5 parts per million (ppm). Formaldehyde emissions from the pigment coating were estimated to be 43 ppm, the maximum concentration measured by analytical testing.

	Oven Temperature	Dwell Time (minutes)	Formaldehyde Emissions (ppm)	Method Detection Limit (ppm)
Standard Coating				
Headspace Test 1	302 °F	4	Non-detect	5
Headspace Test 2	302 °F	30	Non-detect	5
Pigment Coating				
Headspace Test 1	250 °F	2	36	5
Headspace Test 2	250 °F	2	43	5

Actual Facility operating conditions are 180 to 220 °F for 6-18 seconds.

In 2002 FiberMark used approximately 805,887 pounds of standard coating and 46,729 pounds of pigment coating; yielding approximately 4 and 2 pounds per year of formaldehyde emissions from each coating, respectively. Table 7-3 compares the annual formaldehyde emissions calculated assuming that all of the formaldehyde present in the coatings is being released (mass balance), to the laboratory test results which measured actual formaldehyde emissions from the coatings.

**Table 7-3:
Comparison of Formaldehyde Emissions from Coatings**

Coating Type	Annual Emission Estimates, lb/yr (based on 2002 annual usages)		Testing Results Emission Rate, lb/8-hr	Formaldehyde Action Level, lb/8-hr
	Mass Balance	Laboratory Testing		
Standard Coating	194.75	4.03	0.0037	
Pigment Coating	10.25	2.01	0.0018	
Total	205	6.04	0.0055	0.0066

Because the analytical results demonstrate that formaldehyde emissions from the standard and pigment coatings are significantly lower than emissions estimated using a mass balance approach, annual formaldehyde emissions should be calculated and reported using the formulas below:

Standard Coating:

$$Fa_{sc} = \frac{5 \times C_s}{1 \times 10^6} \quad \text{Where:}$$

Fa_{sc} = Annual Formaldehyde Emissions, in lbs/year, from the standard clear coating.

C_s = Annual Standard Coating Usage, in lbs/year

Pigment Coating:

$$Fa_{pc} = \frac{43 \times C_p}{1 \times 10^6} \quad \text{Where:}$$

Fa_{pc} = Annual Formaldehyde Emissions, in lbs/year, from the standard pigment coating.

C_p = Annual Pigment Coating Usage, in lbs/year

Despite the reduction in emissions resulting from scavenging reactions, formaldehyde emissions from the Facility remain in excess of the current Action Level of 0.0064 pounds per 8 hour period. According to 2003 registration information, formaldehyde emissions for the year were 17.7 pounds, or 0.016 pounds per 8 hour period. To account for future increases in coating usage, the Permittee has requested an annual cap on formaldehyde emissions of 65 pounds

per year.

Based on these results the Agency has determined HMSER for formaldehyde to be 65 pounds per year, which correlates to an emission rate of 0.059 pounds per 8 hour period.

If any of the formaldehyde-containing products utilized in these coatings are changed (unless that change involves only the reduction of formaldehyde) FiberMark is required to notify the Agency in writing of the change. Use of any new products shall not begin until the Permittee receives written approval from the Agency. Additional analysis of any new products may be required prior to use of any new product. Additional analysis of any new products may be required before an adjusted emission factor (such as those presented above) may be used for any new product.

If in the future FiberMark resumes the use of products containing benzyl alcohol, the Facility shall report (through annual registration) actual benzyl alcohol emissions. Benzyl alcohol emissions shall be based using mass balance methods, with the assumption that all benzyl alcohol contained in said products is emitted, unless an alternative method of calculating emissions is submitted by the Facility and approved by the Agency prior to submission of the annual registration report.

This HMSER evaluation shall be subject to re-evaluation five (5) years from the date of its determination and shall remain in effect until revised by the Agency.

8.0 REASONABLY AVAILABLE CONTROL TECHNOLOGY

At this time, the Agency has not established a Reasonably Available Control Technology ("RACT") requirement applicable to this Facility. Therefore, the source is currently in compliance with this requirement. The Agency will notify the source if any applicable RACT requirement applies to this Facility in the future. If such RACT should apply to the source in the future, the Agency will ensure that the source complies with such requirement at that time.

9.0 COMPLIANCE PLAN

Not applicable to this Facility.

Appendix A

Facility Location Map