



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2881
Plant ID No.:	031-00047
Applicant:	Peacock Manufacturing Company, LLC
Facility Name:	Wardensville
Location:	Wardensville
NAICS Code:	321999
Application Type:	Construction
Received Date:	April 14, 2011
Engineer Assigned:	Edward S. Andrews, P.E.
Fee Amount:	\$1000.00
Date Received:	April 14, 2011
Completeness Date:	May 18, 2011
Due Date:	August 23, 2011
Newspaper:	<i>Moorefield Examiner</i>
Applicant Ad Date:	May 11, 2011
UTMs:	Easting: 708.9 km Northing: 4,329.0 km Zone: 17
Description:	This application is for the construction of manufacturing facility that includes wood working processes and coating operations.

DESCRIPTION OF PROCESS

Peacock Manufacturing Company, LLC manufactures custom designed cabinets. The Wardensville facility is setup to produce these products. There are two main structures at the facility. One houses the manufacturing operation and the other is used for storage. Overall, the facility is organized into five main areas, which are as follows:

Table # 1 Facility Equipment List by Area				
1S Woodworking Equipment	1S Woodworking Equipment	3S Sanders & Table Saw	4S Paint Booth Area	5S Lacquer Booth
Panel Saw	Timesaver	Belt Sander 2	Paint Booth	Lacquer Booth
Cassidy Saw	Sanding Dept.	Belt Sander 3	Paint Booth	
Morbidelli	Edge Bander	Sander		
Planner	Belt Sander			
Lathe	Hauncher			
Straight Line	Tiger Stop			
Molder	Shaper 3			
Shaper 1	Shaper 4			
Shaper 2	Shaper 5			
	Shaper 6			

Materials used in the manufacturing process are shipped to the facility. Lumber is sized and shaped into components that will meet the final dimensions of the product based on the customer's order. A variety of woodworking machines are used at the facility, which is listed in the above table. Once the individual parts of the components for the final product is produced, then the parts are assembled into complete components such doors, drawers, base cabinets, etc. Then these components are either assembled into the final product and finish coating applied or coated with protective coating either paint or lacquer depending on the customer's order and then assembled.

The facility collects the sawdust from the manufacturing operation and sends it to a sawdust silo to be stored to for an end user off site. The facility uses a propane-fired boiler to condition the air inside the structures at the facility. This unit is rated at 100,000 Btu/hr.

SITE INSPECTION

Mr. Glon Turner, P.E., an inspector of the Hazardous Waste Section of the DEP, referred this facility to Mr. Joseph Kreger, an inspector with the Compliance and Enforcement Section assigned to the Eastern Panhandle Region Office of the DAQ. Mr. Kreger visited the site in May 2009 and recommended that Peacock Manufacturing assess the potential emissions from the facility to determine if the facility meets the definition of a stationary source in accordance with 45CSR13. Upon request of Peacock Manufacturing, Mr. Coccari conducted a site assessment of the Wardensville manufacturing complex.

The facility is located north-northeast of Wardensville in the Wardensville Industrial Park. This writer visited the facility on July 14, 2011. During this visit, this writer went over the entire facility with the Diana Brill-Tharpe the facility's environmental contact. No issues were identified during this visit.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions generated at this facility are mainly from the coating activities and wood milling operations. The pollutants emitted are particulate matter and VOCs, which include hazardous air pollutants (HAPs). VOC estimates were determined using a mass balance approach by assuming that all of the VOCs in the coating were emitted. PM and PM-10 emissions from coating were estimated by applying a transfer efficiency of 30% and a control efficiency of 90% for the filter mat. The applicant estimated the PM emissions from coating activities to be just over 1.2 tons per year after controls. The applicant uses conventional sprayers and brushes to apply coatings to the substrates. It is the opinion of this writer; coatings applied with brushes do not have the potential to emit particulate matter (PM). Thus, this writer estimated the PM emissions from coatings applied with sprayers to be 0.46 tons per year. Actual emissions will be even less with the paint arrestor filters having a removal efficiency of over 98% for PM.

The applicant uses several different coatings. Based on a maximum projected production annual usage of nearly 5,500 gallons of coating, annual VOC emissions were estimated to be just less than 14 TPY, with about 1 ton being HAPs. Toluene, ethyl benzene and xylene are the main HAPs in the proposed coatings and solvents.

Other sources of particulate matter from the facility stem from the shaping of wood or wood products. The applicant estimated the PM and PM₁₀ emissions from the wood processing operations to be 2.7 TPY and 1.3 TPY respectively after controls. Woodworking Equipment Areas #1 and #2 are equipped with capture systems that routes the sawdust to a cyclone, which has a 75 % collection efficiency for PM, then to a fabric filter baghouse which has a collection efficiency of nearly 97%. The facility estimates that each area of Areas #1 and #2 can generated 75 pounds per hour of sawdust. Of these 75 pounds, it is assumed 20% or 15 pounds per hour of it is less than 30 microns or smaller, which is classified as particulate matter. Applying the control efficiencies for the cyclone and baghouse, each of the woodworking areas would have an hourly PM rate of 0.11 pounds per hour. The equipment in the sanders & table saws (3S) area is equipment with a collection system w/dust collected which has a removal efficiency of 96%. Based on a sawdust generation rate from sanding of 50 pounds per hour and assuming only 20 % is 30 microns or smaller, the PM rate from sanding and table saws is 10 pounds per hour before controls and after the dust collector, the PM rate would be 0.4 pounds per hour. Given the nature of this manufacturing facility, haul road emissions were considered insignificant and not evaluated for this action.

REGULATORY APPLICABILITY

State Rules

45CSR7 To Prevent and Control Particulate Matter Air Pollution From Manufacturing Processes and Associated Operations

The purpose of this rule is to prevent and control particulate matter air pollution from manufacturing process and associated operations. The affected processes in question are woodworking and coating activities.

Fact Sheet R13-2881
Peacock Manufacturing, LLC
Wardensville

The process activities involved with the woodworking is classified as a type “a” source operation. Based on a maximum hourly processing rate of 140 pounds of wood per hour, this operation would have an allowable particulate matter emission rate of 0.17 pounds per hour, which is greater than the proposed 0.11 pounds per hour. Area #3 –Sanding and Table Saw has a process rate of 560 lb per hour, which equates to an allowable rate of 0.67 lb per hour. This area has a potential after control emission rate of 0.4 lb per hour. All of these areas are subject to the visible emission limit of 20% opacity of 45 CSR §7-3.1. Using the proposed control technologies (Fabric Filters), it is expected that no visible emissions will be observed from the discharge points of these sources.

45CSR13 - Permits for Construction, Modification, Relocation and Operation of Stationary sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation

The purpose of this rule is to set forth the procedures for stationary source reporting, and the criteria for obtaining a permit to construct and operate a new stationary source which is not a major stationary source, to modify a non-major stationary source, to make modifications which are not major modifications to an existing major stationary source and to relocate non-major stationary sources within the State of West Virginia.

The facility has the potential to emit at least six pounds hours per hour and ten tons per year of VOCs from their coating activities. Thus, the facility should have obtained a permit to construct Wardensville prior to commencing construction. The applicant submitted a complete application, paid the permit application filling fee, and published a legal ad in the *Moorefield Examiner* on May 11, 2011. As result of this permitting action, the facility will be a minor source and classified as 9M in accordance with 45CSR22. Thus, the facility is not required to obtain an operating permit under 45CSR30.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

Ethyl benzene

Ethyl benzene is mainly used in the manufacture of styrene. Acute (short-term) exposure to ethyl benzene in humans results in respiratory effects, such as throat irritation and chest constriction, irritation of the eyes, and neurological effects such as dizziness. Chronic (long-term) exposure to ethyl benzene by inhalation in humans has shown conflicting results regarding its effects on the blood. Animal studies have reported effects on the blood, liver, and kidneys from chronic inhalation exposure to ethyl benzene. Limited information is available on the carcinogenic effects of ethyl benzene in humans. In a study by the National Toxicology Program (NTP), exposure to ethyl benzene by inhalation resulted in an increased incidence of kidney and testicular tumors in rats, and lung and liver tumors in mice. EPA has classified ethyl benzene as a Group D, not classifiable as to human carcinogenicity.

Toluene

Toluene is added to gasoline, used to produce benzene, and used as a solvent. Exposed to toluene may occur from breathing ambient or indoor air. The central nervous system (CNS) is the primary target organ for toluene toxicity in both humans and animals for acute (short-term) and chronic (long-term) exposures. CNS dysfunction and narcosis have been frequently observed in humans acutely exposed to toluene by inhalation; symptoms include fatigue, sleepiness, headaches, and nausea. CNS depression has been reported to occur in chronic abusers exposed to high levels of toluene. Chronic inhalation exposure of humans to toluene also causes irritation of the upper respiratory tract and eyes, sore throat, dizziness, and headache. Human studies have reported developmental effects, such as CNS dysfunction, attention deficits, and minor craniofacial and limb anomalies, in the children of pregnant women exposed to toluene or mixed solvents by inhalation. Reproductive effects, including an association between exposure to toluene and an increased incidence of spontaneous abortions, have also been noted. However, these studies are not conclusive due to many confounding variables. EPA has classified toluene as a Group D, not classifiable as to human carcinogenicity.

Xylene

Commercial or mixed xylene usually contains about 40-65% *m*-xylene and up to 20% each of *o*-xylene and *p*-xylene and ethyl benzene. Xylenes are released into the atmosphere as fugitive emissions from industrial sources, from auto exhaust, and through volatilization from their use as solvents. Acute (short-term) inhalation exposure to mixed xylenes in humans results in irritation of the eyes, nose, and throat, gastrointestinal effects, eye irritation, and neurological effects. Chronic (long-term) inhalation exposure of humans to mixed xylenes results primarily in central nervous system (CNS) effects, such as headache, dizziness, fatigue, tremors, and incoordination; respiratory, cardiovascular, and kidney effects have also been reported. EPA has classified mixed xylenes as a Group D, not classifiable as to human carcinogenicity.

AIR QUALITY IMPACTS ANALYSIS

This writer deemed that an air dispersion modeling study or analysis was not necessary, because the proposed modification does not meet the definition of a major source as defined in 45CSR14.

MONITORING OF OPERATIONS

For purposes of showing compliance with the established emission limits and other applicable requirements, the following parameters will be monitored:

- Coating usage
 - Monthly usage
 - VOC content of the coating
 - Total HAP content of the coating
- Monthly Visible Emission Observations
- Waste wood collected

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that Peacock Manufacturing, LLC proposed construction of a wood product manufacturing facility meets all the requirements of the applicable rules when operated according to the permit application. Therefore, this writer recommends granting Peacock Manufacturing, LLC a Rule 13 construction permit for their custom wood product manufacturing facility

Edward S. Andrews, P.E.
Engineer

Date: August 15, 2011

Fact Sheet R13-2881
Peacock Manufacturing, LLC
Wardensville