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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-2571L
Plant ID No.: 031-00030
Applicant: American Woodmark Corporation (AWC)
Facility Name: South Branch
Location: Hardy County
NAICS Code: 337110
Application Type: Modification
Received Date: August 20, 2012
Engineer Assigned: Joe Kessler
Fee Amount: \$1,000
Date Received: August 22, 2012
Complete Date: September 25, 2012
Due Date: December 24, 2012
Applicant Ad Date: September 12, 2012
Newspaper: *The Moorefield Examiner*
UTM's: Easting: 677.73 km Northing: 4,327.129 km Zone: 17
Description: Installation of a new woodworking operation, consisting of twenty (20) woodworking machines and two (2) baghouses, and a waste-solvent recovery still.

AWC's South Branch facility has been the subject of many permitting actions. The following table provides a brief description of each of the previous actions:

Table 1: Previous Permitting Actions - South Branch

Permit #	Date Issued	Description
R13-2571	5/24/2004	Construction Permit for original cabinet component manufacturing facility.
R13-2571A	8/02/2004	Addition of surface coating operations, controlled by two (2) Regenerative Thermal Oxidizers and two (2) baghouses. This permit modification also established the facility as a Synthetic Minor Source for Volatile Organic Compound (VOC) emissions.
R13-2571B	11/15/2005	Class II Administrative Update (A/U) for the installation of a 1.22 mmBtu/hr natural gas-fired boiler.

Permit #	Date Issued	Description
R13-2571C	6/29/2006	Class II A/U for the installation of a fire pump, modification to boiler (B1) fuel usage, addition of storage tanks, and various administrative updates.
R13-2571D	11/08/2006	Class II A/U for an increase in size of Boiler B2 from 300 hp to 500 hp and making numerous changes to existing permit requirements.
R13-2571E	2/13/2007	Class I A/U to remove limits on insignificant emissions units and clarify language in other conditions.
R13-2571F	5/21/2007	Class II A/U for the installation of tanks in the pump room.
R13-2571G	8/23/2007	Class II A/U to for conversion of a test spray booth to a production booth.
R13-2571H	12/07/2007	Class II A/U for the installation of a sawdust hopper and auger.
R13-2571I	8/12/2008	Application Withdrawn.
R13-2571J	12/02/2008	Class II A/U for the installation of two spray paint booths and changes to the existing permit limits from the UV Ovens.
R13-2571K	2/18/2010	Class I A/U for wording changes in several requirements.

DESCRIPTION OF EXISTING PROCESS/MODIFICATIONS

Existing Facility

AWC's existing South Branch Plant is a cabinet component manufacturing facility. The facility manufactures and finishes wood doors and frames for shipment to other AWC facilities for final assembly into finished kitchen and vanity cabinets. The primary operations are the dimensioning of kiln-dried wood, assembly of parts to create either doors or frames, and finishing of doors, frames and miscellaneous parts. The existing facility consists of multiple woodworking operations controlled by baghouses, wood-fired and natural gas-fired boilers, surface coating operations, and other ancillary support operations.

Proposed Modifications

AWC is now proposing to add additional woodworking operations consisting of (20) woodworking machines and two (2) new 50,000 dcfm baghouses (BH7 and BH8). The woodworking units include grinders, sanders, drills, dowel machines, polishers, notchers, and various other machines. Saw dust produced from the new woodworking emissions shall be captured and directed to the two new baghouses for control. AWC has stated that the baghouses will have a maximum outlet grain loading not to exceed 0.01 gr/dscf (effectively a capture efficiency of over 99.00%).

Additionally, AWC is proposing to install a 1.71 gallon/hour waste-solvent recovery still that will recycle and recover solvents used to clean the spray booths and associated equipment. AWC estimates that 70% of the used solvent will be recovered and reused while 30% will be removed. The still is a closed system with fugitive emissions only resulting from opening the unit for cleaning purposes.

SITE INSPECTION

Due to the nature of the modification, the writer did not conduct a site inspection for this permitting action. According to information in the DAQ database, the last full on-site inspection occurred on May 31, 2012 by Mr. Karl Dettinger of the Compliance/Enforcement Section. The facility was given a status code of “30 - In Compliance” as a result of the inspection.

AIR EMISSIONS AND CALCULATION METHODOLOGIES

Woodworking Operations

As noted above, the potential emissions from the new woodworking operations are controlled by two new baghouses. Controlled emissions from the baghouses were based on a baghouse outlet grain loading of 0.01 grains/dscf and a maximum baghouse capacity of 50,000 dscf. The value used for particulate matter baghouse outlet loading is within the range described for “well-designed” baghouses as listed in the *Air Pollution Control Device Manual* (pp. 115): “Well-designed and operated baghouses have been shown to be capable of reducing overall particulate emissions to less than 0.010 gr/dscf.” Using the above methodology, AWC calculated a particulate matter (all emissions are considered to be PM_{2.5} or smaller) potential-to-emit (PTE) of 4.29 lbs/hr and 18.77 tons/year for each baghouse or an aggregate total of 8.58 lbs/hr and 37.54 tons/yr.

Waste-Solvent Recovery Still

AWC calculated the potential fugitive emissions (the still is a closed system with no direct emissions to the atmosphere) based on a total a maximum Xylene solvent - the worst-case solvent used in the cleaning operations - throughput of 1.71 gallons/hour and operation of the still 8,760 hours/year. AWC further estimated that, although a closed system, the still would have the potential to emit fugitive emissions when opening the still for cleaning or maintenance purposes. They estimated that up to 5% of the solvent could be lost through fugitive emissions. Based on the above methodology and an Xylene solvent specific gravity of 0.86, AWC calculated an Xylene/VOC PTE from the use of the solvent still of 0.61 lb/hr and 2.69 tons/yr. Xylene is defined as a Hazardous Air Pollutant (HAP) under Section 112(b) of the Clean Air Act (CAA).

REGULATORY APPLICABILITY

The South Branch Plant is subject to a variety of substantive state and federal air quality rules and regulations. Only those rules applicable to the new woodworking machines and solvent still, and those with questionable applicability, will be discussed in detail below.

45CSR7: To Prevent and Control Particulate Air Pollution from Manufacturing Process Operations

45CSR7 has three substantive requirements applicable to the existing and proposed woodworking lines - defined as a “manufacturing process” pursuant to §45-7-2.20. These are the

opacity requirements under Section 3, the mass emission standards under Section 4, and the fugitive emission standards under Section 5. Each of these sections will be discussed below.

45CSR7 Opacity Standards - Section 3

Section 3.1 sets an opacity limit of 20% on all applicable “source operations” as defined under §45-7-2.38. As noted above, AWC has proposed the use of two new baghouses to control the particulate matter emissions from the new woodworking line. Proper use of the baghouses should easily allow for compliance with the opacity limit.

45CSR7 Weight Emission Standards - Section 4

Section 4.1 of 45CSR7 requires that each manufacturing process source operation or duplicate source operation meet a particulate matter limit based on the weight of material processed through the source operation. For the purpose of this evaluation, all facility-wide cabinet component woodworking operations are defined as the “source operation.” This broad grouping is required as there are many individual pieces of equipment venting to eight (8) different baghouses. As needs change, the equipment vented to a particulate baghouse also changes. Therefore, the compliance determination for this section shall be based on the total process weight rate of all the woodworking operations and the aggregate emission rate from all baghouses. This is considered the most appropriate method of determining compliance with Section 4 of 45CSR7 for this facility and the woodworking operations.

The woodworking operations are defined as a type ‘a’ source type operation under §45-7-2.38. Based on information provided to the writer, the aggregate maximum amount of material charged through all the woodworking operations is 59,508 pounds per hour (lb/hr). Based on Table 45-7A, the aggregate particulate matter limit for all woodworking lines would be 31.38 lb/hr (for a throughput between any two consecutive process weights stated in the table, the emission limitation is determined by linear interpolation). The maximum aggregate particulate matter emission rate from all baghouses is 12.88 lbs/hr, or 41.05% of the 45CSR7 limit.

45CSR7 Fugitive Emissions - Section 5

Section 5.1 of Rule 7 states that each manufacturing process must include a system to minimize the emissions of fugitive particulate matter. As the proposed woodworking line is fully controlled by baghouses, no substantive source of fugitive particulate matter is included in this modification.

45CSR13: Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation

The South Branch Plant is defined as an existing “stationary source” under §45-13-2.24. Based on the definition as given under Section 2.17, the emissions increase of particulate matter of 8.58 lbs/hr and 37.54 tons/year associated with this requested change define this permitting action

as a “modification.” Pursuant to §45-13-5.1, “[n]o person shall cause, suffer, allow or permit the modification . . . and operation of any stationary source to be commenced without . . . obtaining a permit to construct.” Therefore, AWC is required to obtain a permit under 45CSR13 for the modification evaluated herein.

As required under §45-13-8.3 (“Notice Level A”), AWC placed a Class I legal advertisement in a “newspaper of general circulation in the area where the source is . . . located.” The ad ran on September 12, 2012 in *The Moorefield Examiner* and the affidavit of publication for this legal advertisement was submitted on September 12, 2012.

45CSR14: Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration (non-applicability)

The South Branch Plant, according to the PTE given in the (R30-03100030-2011) Title V Fact Sheet, is an existing “minor stationary source” under 45CSR14 - i.e., PTE of each regulated pollutant is less than 250 TPY. The post-modification facility-wide PTE of each pollutant shall remain below 250 TPY and, therefore, the proposed change is not defined as a major modification under 45CSR14 and the provisions do not apply.

This determination is based on both the addition of the particulate matter emissions from the woodworking operations and the retainment of the facility-wide 249.4 tons/year VOC limit given under 4.1.26 of the existing permit. AWC shows compliance with this limit based on actual emission tracking as required under 4.2.3. of the existing permit. AWC will be required to track emissions of the waste-recovery solvent still and apply them toward compliance with this limit. Therefore, there will be no increase *in the PTE* of VOC by the addition of the recovery still.

45CSR30: Requirements for Operating Permits (non-applicability)

45CSR30 provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act. The South Branch Plant, defined under Title V as a “major source,” was last issued a Title V permit on November 1, 2011. Proposed changes evaluated herein must also be incorporated into the facility's Title V operating permit. Commencement of the operations authorized by this permit shall be determined by the appropriate timing limitations associated with Title V permit revisions per 45CSR30.

40 CFR 63, Subpart JJ: National Emission Standards for Wood Furniture Manufacturing Operations (non-applicability)

Based on the PTE given in the (R30-03100030-2011) Title V Fact Sheet, the South Branch Plant is an existing major stationary source of HAPs under 40 CFR 63, Subpart A, §63.2. Therefore, pursuant to §63.800, any “affected source” under Subpart JJ is subject to the applicable requirements therein. There are no requirements for woodworking operations, as these operations have no potential to emit HAPs. However, concerning the waste-recovery solvent still, §63.803(f) states:

Spray booth cleaning. Each owner or operator of an affected source shall not use compounds containing more than 8.0 percent by weight of VOC for cleaning spray booth components other than

conveyors, continuous coaters and their enclosures, or metal filters, or plastic filters unless the spray booth is being refurbished. If the spray booth is being refurbished, that is the spray booth coating or other protective material used to cover the booth is being replaced, the affected source shall use no more than 1.0 gallon of organic HAP solvent per booth to prepare the surface of the booth prior to applying the booth coating.

AWC has stated that the use of the Xylene solvent (100% VOC solvent by-weight) to clean spray booth components (and subsequently cleaned in the recovery still) shall only be used to clean “conveyors, continuous coaters and their enclosures, or metal filters, or plastic filters” and, therefore, the solvents used in the cleaning operations and subsequently recovered in the still are not subject to this section.

TOXICITY ANALYSIS OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the proposed modification and that are not classified as “criteria pollutants.” Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NO_x), Ozone, Particulate Matter (PM), Particulate Matter less than 10 microns (PM₁₀), Particulate Matter less than 2.5 microns (PM_{2.5}), and Sulfur Dioxide (SO₂). These pollutants have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect the public health and welfare. Other pollutants of concern, although designated as non-criteria and without national concentration standards, are regulated through various federal and programs designed to limit their emissions and public exposure. These programs include federal source-specific HAP limits promulgated under 40 CFR 61 (NESHAPS) and 40 CFR 63 (MACT). Any potential applicability to these programs were discussed under REGULATORY APPLICABILITY above.

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. As noted above, AWC has identified Xylene as a potential HAP emitted from the modification evaluated herein. The following table lists xylene’s carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

Table 2: Potential HAPs - Carcinogenic Risk

HAPs	Type	Known/Suspected Carcinogen	Classification
Xylene	VOC	No	Inadequate Data

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health affects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals*. For a complete discussion of the known health effects of each compound refer to the IRIS database located at www.epa.gov/iris.

AIR QUALITY IMPACT ANALYSIS

The proposed modification does not meet the definition of a “major modification” pursuant to 45CSR14 and, therefore, an air quality impact (computer modeling) analysis was not required. Additionally, based on the nature of the proposed modification, modeling was not required under 45CSR13, Section 7.

MONITORING, COMPLIANCE DEMONSTRATIONS, RECORD-KEEPING, AND REPORTING REQUIREMENTS

The monitoring, compliance demonstration, and record-keeping requirements for the new woodworking operations (including the baghouses) and the waste-solvent recovery still shall be folded into the existing applicable permit requirements. This includes pressure drop and visible emissions monitoring of the baghouses and actual emissions recording of the waste-solvent recovery still.

PERFORMANCE TESTING OF OPERATIONS

Due to the nature of the modification, the known reliability of properly operated baghouses, and the pressure drop and visible emissions monitoring of the baghouses, no new post-issuance performance testing was required as a result of this modification.

CHANGES TO PERMIT R13-2571K

Substantive changes to Permit Number R13-2571K are limited to the following:

- New woodworking equipment and waste-solvent recovery still were added to Table 1.0 Emission Units;
- Emission limits for new baghouses were added to existing requirement 4.1.11. of the draft permit;
- New baghouses were added to existing minimum capture efficiency requirement 4.1.12. and to existing pressure drop range requirement 4.1.13. of the draft permit;
- Addition of new waste-solvent recovery still requirements under 4.1.60. of the draft permit.
- New baghouses were added to existing pressure drop monitoring requirement 4.2.2. of the draft permit; and
- Waste-solvent recovery still were added to actual emission reporting requirement 4.2.3. of the draft permit.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that compliance with all applicable regulations will be achieved. Therefore, I recommend to the Director the issuance of a Permit Number R13-2571L to American Woodmark Corporation for the above discussed modification of the South Branch Plant located in Moorefield, Hardy County, WV.

Joe Kessler, PE
Engineer

Date