GEORGIA
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ENVIRONMENTAL PROTECTION DIVISION

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NARRATIVE

TO: Jeng-Hon Su

FROM: Eddie Gomez

DATE: February 6, 2024

Facility Name:	**Twin Mill Pallet and Shavings Plant**
AIRS No.:	157-00074
Location:	Maysville, GA (Jackson County)
Application #:	29036
Date of Application:	September 28, 2023

Background Information

Twin Mill Pallet and Shavings Plant (hereinafter "facility") is a greenfield synthetic minor facility located at 505 Twin Mill Drive, Maysville, Georgia 30558 (Jackson County). Jackson County is in attainment for all criteria pollutants. The facility plans on constructing and operating a pallet and shavings production facility.

The facility will initially receive pre-cut logs, called "stems" when they enter the facility, from forestry/logging operations. Thes stems will be brought onto the site and sorted in a deck/yard as needed before being transferred to the sawmill building, where the stems will be cut into boards in the enclosed building. Cut boards will then be assembled and nailed into pallets in the main mill building and can then either be transferred to one of two indirect-fired natural gas batch Pallet Kilns PK1 or PK2, for heat treatment or shipped to end users without first receiving heat treatment. The pallet kilns will be provided with heat via indirect-fired natural gas Burner PB. Heat-treated pallets will be removed from the batch kilns and readied for shipment offsite to end users.

Wood residuals (bark, sawdust, shavings, etc.) generated during the enclosed sawmilling process will be collected in various conveyors and transferred to a storage silo. These wood residuals will be combined with other residuals that will be generated by a designated auxiliary shaver located within a designated enclosure that produces wood residuals from whole logs/stems. The collected wood residuals will then be transferred to Shavings Dryer SD, where shavings will be heated to approximately 200ºF. Dried wood residuals are then baled or bagged in preparation for shipment offsite. The shavings dryer is heated by propane fired Duct Burner DB, which vents directly into the shavings dryer itself. Sawmill SM, Auxiliary Shaver AS, and Indoor Wood Residuals Handling System IWRS are all located indoors. Outdoor Wood Residuals Handling System OWRS is located outdoors. Both IWRS and OWRS are fugitive sources of particulate matter (PM) emissions. A pressurized propane tank is also located onsite.

Purpose of Application

On September 29, 2023, the facility submitted Application No. 29036 for the construction and operation of a pallet and shavings production facility.

Updated Equipment List

Emission Units			Associated Control Devices	
Source Code	**Description**	**Installation Date**	**Source Code**	**Description**
SD	Shavings Dryer	2024*	--	--
PK1	Pallet Kiln 1	2024*	--	--
PK2	Pallet Kiln 2	2024*	--	--
SM	Sawmill	2024*	--	--
AS	Auxiliary Shaver	2024*	--	--
IWRS	Indoor Wood Residuals Handling Systems	2024*	--	--
OWRS	Outdoor Wood Residuals Handling Systems	2024*	--	--

*Proposed within current application

Storage Tanks

Source Code	Capacity (gallons)	Contents	Installation Date	True Vapor Pressure (psia)
PROP	n/a	Propane (LPG)	2024*	122

*proposed within current application

Fuel Burning Equipment

Source Code	Input Heat Capacity (MMBtu/hr)	Description	Installation Date	Construction Date
PB	9.60	Pallet Kiln Burner	2024	2023

Fuel Burning Source

Source Code	Input Heat Capacity (MMBtu/hr)	Description	Installation Date	Construction Date
DB	25.7	Shavings Dryer Duct Burner	2024	2023

Emissions Summary

The facility requested throughput limits of 58,000 oven dried tons (ODT) of wood processed by Shavings Dryer SD annually and 19,000,000 board feet (19 MMbf) of dried pallets to be produced by both Pallet Kilns PK1 and PK2 annually. With the two throughput limits, the facility is able to cap the facility-wide VOC emissions below 100 tons per year (tpy); therefore, the facility will be a synthetic minor source to Title V of the 1990 Clean Air Act Amendments (CAAA).

Note that the facility used AP-42 emission factors found in U.S. EPA AP-42 Chapter 10.6.2 for calculating emissions from Shavings Dryer SD except VOC. A test was conducted by Dr. A. C. Bowles and the vendor in England using equipment similar to the piece to be utilized at the facility. The results of this test are shown on page 28 and 31 of Application No. 29036. These results demonstrate that the VOC emission rate will increase sharply at and above 150 degrees Celsius (150 * 9/5 + 32 = 302ºF). The Dryer to be installed is a mechanical conveyor type propane fired unit designed to operate at 257ºF. The test data took VOC emission rate readings at intervals of 10ºC. Therefore, the last pre-VOC emissions increase value of 140ºC (284ºF) was used to determine an emission rate of 0.97 g VOC / kg of dry wood chips. This is converted to lb. VOC per oven dried ton (ODT) as follows:

0.97 g VOC / kg of dry wood chips *0.0022 lb./g = 0.00213 lb. VOC/ kg of dry wood chips
0.002134 lb. VOC/kg of dry wood chips * 907 kg of dry wood chips/ ODT of dry wood chips = 1.94 lb. VOC /ODT.

Therefore, the facility proposed the 2 lb. VOC/ODT emissions factor for Shavings Dryer SD.

The facility used the National Council for Air and Stream Improvement (NCASI) emission factors for indirect-fired (steam) kilns for calculating emissions from Pallet Kilns PK1 and PK2. For natural gas and propane combustion in their burners (PB and DB), emission factors found in U.S. EPA AP-42 Chapters 1.4 and 1.5 were used to calculate emissions.

Facility-Wide Emissions
(in tons per year)

Pollutant	Potential Emissions			Actual Emissions		
	Before Mod.	After Mod.	Emissions Change	Before Mod.	After Mod.	Emissions Change
$PM/PM_{10}/PM_{2.5}$	0	19.92/15.99/ 14.47	19.92/15.99/ 14.47	0	19.92/15.99/ 14.47	19.92/15.99/ 14.47
NOx	0	20.28	20.28	0	20.28	20.28
SO_2	0	0.02	0.02	0	0.02	0.02
CO	0	11.4	11.4	0	11.4	11.4
VOC	0	96.9	96.9	0	96.9	96.9
Max. Individual HAP	0	3.03	3.03	0	3.03	3.03
Total HAP	0	4.7	4.7	0	4.7	4.7
Total GHG (if applicable)	0	14,100	14,100	0	14,100	14,100

Regulatory Applicability

Federal Rules:

40 CFR 60 Subpart Kb - *Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Liquid Storage Vessels) for which Construction Reconstruction or Modification Commenced After July 23, 1984.*

40 CFR 60.110b(d)(2) specifies that tanks which are designed to operate in excess of 204.9 kPa and without emissions to the atmosphere are not subject to 40 CFR 60 Subpart Kb. Because propane tank PROP is designed to operate in excess of 204.9 kPa and not generate emissions to the atmosphere, this rule does not apply.

40 CFR 63 Subpart DDDD - *National Emission Standards for Hazardous Air Pollutants (NESHAP) for Plywood and Composite Products.*

40 CFR 63 Subpart DDDD applies to facilities which are a major source of HAP emissions. Because the facility is an area source of HAP emissions, this rule does not apply.

Georgia State Rules

Georgia Rules for Air Quality Control (GRAQC) 391-3-1-.02(2)(b) – Visible Emissions

The process equipment (including Shavings Dryer Duct Burner DB) at the facility generates PM emissions and are subject to GA Rule (e). Thus, they are subject to the visible emission limit (40 percent opacity) specified in Georgia Rule (b). Nonetheless, the sawmill, pallet kilns, and related operations are enclosed, and the nature of wood residuals handling is expected to generate a minimal amount of visible emissions; therefore, the process equipment is expected to comply with Georgia Rule (b).

GRAQC 391-3-1-.02(2)(d) – Fuel Burning Equipment

Since the primary purpose of pallet kiln burner PB is production of thermal energy from the combustion of fuel (natural gas) with heat furnished indirectly, the pallet kiln burner meets the definition of "fuel-burning equipment" specified in GA Rule 391-3-1-.01(cc). Thus, pallet kiln burner PB is subject to GA Rule (d) for the visible emission limits and particulate matter (PM) emission standards. Since it burns natural gas, and natural gas is considered a clean fuel, compliance with the GA Rule (d) limits are expected.

GRAQC 391-3-1-.02(2)(e) – Particulate Emissions from Manufacturing Processes

All the process equipment (including Shavings Dryer Duct Burner DB) is subject to PM emission limits specified in Georgia Air Quality Rule 391-3-1-.02(2)(e) "Particulate Emission from Manufacturing Processes." Because the equipment was constructed after July 2, 1968, its allowable PM emission rates are specified by Georgia Rule 391-3-1-.02(2)(e)1.(i), which is stated as follows:

$E = 4.1 * P^{0.67}$ for process input weight rate up to and including 30 tons per hour.
$E = 55 * P^{0.11} - 40$ for process input weight rate above 30 tons per hour.

Where E equals the allowable PM emission rate in pounds per hour and P equals process input weight rate in tons per hour.

Because the sawmill, pallet kilns, and related operations are enclosed, and the nature of wood residuals handling is expected to generate a minimal amount of PM emissions, the process equipment at this facility is expected to comply with this rule.

GRAQC 391-3-1-.02(2)(g) – Sulfur Dioxide

Pallet Kiln Burner PB and Shavings Dryer Duct Burner DB are subject to the fuel sulfur content limit specified in GA Rule (g). Since the burners fire exclusively on natural gas or propane, and both fuels contain minimum amounts of sulfur, compliance with the GA Rule (g) limit is expected for PB and DB.

GRAQC 391-3-1-.02(2)(rrr) – NO_x Emissions from small Fuel Burning Equipment

Georgia Rule 391-3-1-.02(2)(rrr) applies to facilities which are in select counties, this does not include Jackson County. Therefore Georgia Rule (rrr) does not apply.

GRAQC 391-3-1-.03(6)(c)4. – Storage Tanks

As a pressurized vessel designed to operate in excess of 30 psig, the propane tank (PROP) is exempt from permitting per Georgia Rule 391-3-1-.03(6)(c)4.

Permit Conditions

Condition 2.1 restricts the throughput of wood processed by Shavings Dryer SD to 58,000 oven dried tons per year (ODT/yr.). This is the first of two restrictions which allow the facility to be classified as a VOC synthetic minor source under Title V of the 1990 CAAA.

Condition 2.2 restricts the throughput of wood processed by Pallet Kilns PK1 and PK2, combined, to 19,000,000 board feet per year (19 MMbf/yr.) This is the second of two restrictions which allow the facility to be classified as a VOC synthetic minor source under Title V of the 1990 CAAA.

Condition 2.3 restricts visible emissions from process equipment to no more than 40 % opacity, per Georgia Rule (b).

Condition 2.4 restricts PM and visible emissions from Pallet Kiln Burner PB, per GA Rule (d) thresholds.

Condition 2.5 limits PM emissions from manufacturing equipment based on process input weight rate, per Georgia Rule (e).

Condition 2.6 restricts Pallet Kiln Burner PB to natural gas to comply with GA Rule (g).

Condition 2.7 restricts Shavings Dryer Duct Burner DB to propane to comply with GA Rule (g).

The Division has test data from other similar shavings dryers which show higher VOC emission factors, such as 5 lbs. VOC/ODT. As shown in the potential emission table above, the VOC PTE is already very close to 100 tpy. Shavings Dryer SD contributes more than half of the VOC PTE. Any increase to the proposed 2-lb VOC/ODT emission factor may push the VOC PTE over the Title V major source threshold of 100 tpy. The Division had discussed the possibility of testing and validating the VOC emission factor with the facility. However, a temporary stack would need to be fabricated for stack testing to be conducted. The dryer is a conveyor type dryer. Natural gas fired burners are distributed along the conveyor and provide upward heated air. The exhaust will leave the dryer through a penthouse vent running the length of the dryer. Stack testing would also require the dryer to be modified from its original design to divert emissions to the temporary stack instead of through the penthouse vent on the dryer. These modifications would alter the pressure differential across the dryer and would potentially require the installation of temporary fans and the alteration of material throughput rates to enable the system to function. These modifications would not only be costly but would also fundamentally alter the operation of the dryer, and as a result any emissions data obtained from the dryer in this modified state would not be representative of actual emissions from the dryer under normal operations. Therefore, stack testing the dryer in this manner is infeasible.

The Division agrees with the facility that a test to validate the emission factor can be waived; however, the facility is required to maintain their dryer temperature at or below 140ºC (284ºF) to prevent the VOC emission factor spike that will generate more than 2 lbs. VOC/ODT. As a result, new Condition 2.8 requires that the facility maintain the dryer temperature at or below 284ºF.

The Division has determined that in order to maintain the temperature for which the 2 lb. VOC/ODT emission factor was found, continuous dryer temperature monitoring utilizing one temperature monitor over the middle burner is necessary. Therefore Condition 5.1 requires that the facility shall install, operate, maintain, and calibrate a device for the continuous measurement of the dryer temperature at the center of Shavings Dryer SD. Data shall be recorded continuously whenever Shavings Dryer SD is in operation.

Condition 7.1 requires the facility to notify the Division upon initial startup of the facility.

Conditions 7.2 and 7.3 require that wood throughput records for Shavings Dryer SD be kept to enforce the limit in Condition 2.1

Conditions 7.4 and 7.5 require that wood throughput records for Pallet Kilns PK1 and PK2, combined, be kept to enforce the limit in Condition 2.2.

Condition 7.6 requires excursion reporting for temperature readings from Condition 5.1 which are above 284ºF to enforce the limit in Condition 2.8.

Toxic Impact Assessment

The proposed sawmill, pallet kilns, auxiliary shaver, shavings dryer and wood residuals handling systems will emit five Toxic Air Pollutants (TAP) of concern: Acetaldehyde, Acrolein, Methanol, Phenol, and Formaldehyde. To demonstrate compliance with the Georgia Air Toxics Guidelines for Methanol and Phenol emissions, the facility used SCREEN 3 modeling in the table below.

Table 7: Screen 3 Results

Chemical Name	Long Term MGLC (µg/m^3)	Long Term AAC (µg/m^3)	Is Long Term MGCL > Long Term ACC	15-min MGLC (µg/m^3)	15-min AAC (µg/m^3)	Is 15-min MGCL > 15-min ACC
Methanol	130	20,000	No	2160	32,800	No
Phenol	29.9	45.2	No	99	6,000	No

Modeling was conducted via AERMOD to determine whether the maximum modeled concentrations of Acetaldehyde, Acrolein, and Formaldehyde were below the 15-minute and long-term averaging period acceptable ambient concentrations (AAC). The Division interpreted the results to indicate that the concentrations of Acetaldehyde, Acrolein, and Formaldehyde are below the ACC levels in the table below. Compliance with the Georgia Air Toxics Guidelines has been demonstrated.

Table 8: AERMOD Results

TAP	Averaging Period	AAC (µg/m^3)	Max Modeled Conc. (µg/m^3)	Receptor UTM Zone: 17	
				Easting (meter)	Northing (meter)
Acetaldehyde	15-min	4,500	62.7	266,128.94	3,792,255.72
	Annual	4.55	0.959	266,058.47	3,792,272.46
Acrolein	15-min	23	12.5	266,192.51	3,792,243.21
	Annual	0.35*	0.218	266,150.13	3,792,251.55
Formaldehyde	15-min	245	33.0	266,128.94	3,792,255.72
	Annual	1.10	0.632	266,058.47	3,792,272.46

*SSPP approved the applicant's case-by-case request to use a revised annual AAC of 0.35µg/m^3 for Acrolein.

Summary & Recommendations

I recommend that Permit No. 2448-157-0074-S-01-0 be issued to Twin Mill Pallet and Shavings Plant for the construction and operation of a pallet and shavings production facility. A Public Advisory was issued on October 4, 2023, and comments were due by November 3, 2023; no comments were received. The Stationary Source Compliance Program (SSCP) will be responsible for compliance and inspection of the facility.

Addendum to Narrative

The 30-day public review started on month day, year and ended on month day, year. Comments were/were not received by the Division.

//If comments were received, state the commenter, the date the comments were received in the above paragraph. All explanations of any changes should be addressed below.//