

ENGINEERING ANALYSIS

Kimberly-Clark Corporation – Mobile Mill

Facility No. 503-2012

Foam Laid Manufacturing Line

INTRODUCTION

Kimberly-Clark Corporation (the Mill), located in Mobile, Alabama (Mobile County), owns and operates a tissue manufacturing facility. The Mill is a major source of air emissions under the Title V Major Source Operating Permit (MSOP) program and operates under Title V MSOP No. 503-2012. The Mill is also a major source under the Prevention of Significant Deterioration (PSD) program. On August 14, 2025, the Department electronically received an application to install a new Foam Laid Manufacturing Line (FL01) that is unrelated to existing operations.

BACKGROUND/PROJECT DESCRIPTION

The Mill proposes to construct FL01 to produce Adult Feminine Care (AFC) and Moist Wipes (MW) products in two distinct operating scenarios. The manufacturing process is similar to a traditional tissue machine with fiber pulping, wet-end paper forming, drying with through air dryers (TADs), and parent roll winding. Three Venturi wet scrubbers will be installed to control particulate matter (PM) emissions. This project is completely independent of existing operations and will not affect other air emission units at the Mill. Power will be supplied via purchased power. Construction on FL01 and a new building to house the line is anticipated to begin in January 2026.

EMISSIONS

The Mill is subject to PSD major modification thresholds for regulated pollutants. Emissions for this project were calculated using the “actual-to-potential test” for new emission units from ADEM Admin. Code R. 335-3-14-.04(1)(g). Since this project involves only new emission units and is unrelated to existing operations, baseline actual emissions and additional associated emissions are zero. Potential to emit (PTE) emissions were calculated for raw material handling operations, TAD combustion, process PM generation, process chemical usage, and spooling operations.

Raw material handling emissions of PM were based on presumed air flow through the conveyance system filter and exit grain loading. TAD combustion emissions were calculated with emission factors from AP-42 Section 1.4, vendor data, and EPA’s *EIAG Factor for External Combustion Process Heaters* (2002). Process PM emissions were based on emission factors developed from the worst-case stack testing scenario of a pilot line using Methods 5, 201A, and 202. It is noted that the pilot plant operates on a batch basis with no PM control devices. Process chemical usage emissions were based on the worst-case volatile organic compound (VOC) and hazardous air pollutant (HAP) emissions from the two operating scenarios. Process chemicals usage also accounts for VOC emissions for tank emissions, which were considered insignificant, under the assumption of 100% volatilization. PM emissions from spooler operations were calculated using a reduced emission factor based on existing tissue converting operations at the Mill. The total PTE emissions are included in **Table 1**.

Table 1: Potential Emissions in Tons per Year (TPY)

Pollutant	Total Emissions Increase	Significant Emission Rate	PSD Review?
NO _x	32.0	40	No
CO	17.0	100	No
VOC	55.4	40	Requesting Limit
SO ₂	0.12	40	No
PT	5.94	25	Requesting Limit
PM ₁₀	4.66	15	Requesting Limit
PM _{2.5}	3.63	10	Requesting Limit
CO _{2e}	24,763	75,000	No
Pb	0.0001	0.6	No
Total HAPs	0.63	--	--

PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

The Mill is considered a major stationary source with respect to PSD. In order for a major stationary source to be required to undergo a PSD review, it would have to undergo a major modification. The definition of a “major modification” is found in ADEM Admin. Code R. 335-3-14-.04(2)(b) and states: A Major Modification “shall mean any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any regulated NSR pollutant.”

As shown in **Table 1**, the proposed project would exceed the VOC significant emissions threshold. The Mill has therefore requested a facility-wide synthetic minor limit of 39 TPY to keep VOC emissions below the PSD significance threshold of 40 TPY. Compliance will be demonstrated by estimating emissions from natural gas combustion and chemical usage assuming 100% volatilization. Records shall be maintained of VOC containing materials used and VOCs emissions each month.

The Mill has also requested a limit for filterable PM, PM₁₀, and PM_{2.5} below the PSD significance threshold due to limited test data available to derive the respective PTE emission factors. The requested limits will be 0.1 TPY less than the respective significant emissions thresholds and converted to pounds per hour. Water droplets from the three wet scrubbers are expected to be present in the emissions, making Reference Method 201A from Appendix M of 40 CFR 51 to be unfeasible. The Mill will therefore demonstrate compliance with the total PM₁₀ and PM_{2.5} emissions limits by conducting Reference Method 202 for condensable PM from Appendix M of 40 CFR 51 and assuming all emissions are PM_{2.5}. Reference Method 5 from Appendix A of 40 CFR 60 will be used to demonstrate compliance with the filterable PM limit.

NEW SOURCE PERFORMANCE STANDARDS (NSPS) / NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP)

Implementation of this project will potentially make the following NSPS applicable for the new source at the mill:

- 40 CFR 60, Subpart D – Standards of Performance for Fossil Fuel Fired Steam Generators

- 40 CFR 60, Subpart Da – Standards of Performance for Electric Utility Steam Generating Units
- 40 CFR 60, Subpart Db – Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units
- 40 CFR 60, Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units
- 40 CFR 60, Subpart K – Standards of Performance for Storage Vessels for Petroleum Liquids
- 40 CFR 60, Subpart Ka – Standards of Performance for Storage Vessels for Petroleum Liquids
- 40 CFR 60, Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels)
- 40 CFR 60, Subpart Kc – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels)

The TADs are potentially subject to Subparts D through Dc. These regulations apply to steam generating units, which are generally defined as a furnace or boiler that burns fuel for the purpose of generating steam either directly or through heat transfer (40 CFR 60.41, 60.41Da, 60.41b, and 60.41c). The TADs do not meet these criteria as they do not burn fuel for the purpose of generating steam or for heat transfer. They therefore do not meet the definition of a steam generating unit and are not subject to these NSPS.

The storage and mixing tanks are potentially subject to Subparts K through Kc. Subparts K and Ka apply to petroleum storage vessels with a capacity of at least 40,000 gallons which commenced construction, reconstruction, or modification after June 11, 1973, and before May 19, 1978, or after May 18, 1978, and before July 23, 1978, respectively. Subpart Kb applies to volatile organic liquid (VOL) storage vessels with a capacity of at least 75 cubic meters which commenced construction, reconstruction, or modification after July 23, 1978, and before October 4, 2023. The proposed tanks would not be subject to Subparts K, Ka, or Kb as the project is set to begin after the applicable date ranges.

Subpart Kc applies to VOL storage vessels with a capacity of at least 20,000 gallons which commenced construction, reconstruction, or modification after October 4, 2023. Storage vessels that meet these criteria will be classified as new sources anytime they store VOLs with a maximum true vapor pressure (MTVP) of at least 1.5 psia or 0.5 psia if the vessel is at least 40,000 gallons. The tanks for this project will be smaller than 40,000 gallons and will not store any process chemicals, water, or wastewater with a maximum true vapor pressure greater than 1.5 psia. The vessels will therefore not be subject to the standards or requirements of Subpart Kc according to 40 CFR 60.110c(c)(2).

Implementation of this project will potentially make the following NESHAP applicable for the new source at the mill:

- 40 CFR 63, Subpart JJJJ – NESHAP for Paper and Other Web Coating
- 40 CFR 63, Subpart DDDDD – NESHAP for Industrial, Commercial, and Institutional Boilers and Process Heaters

- 40 CFR 63, Subpart JJJJJ – NESHAP for Industrial, Commercial, and Institutional Boilers at Area Sources

Subpart JJJJ applies to facilities that are major sources of HAPs at which web coating lines are operated. The Mill is an area source of HAPs and is therefore not subject to this Subpart.

Subpart DDDDD applies to owners and operators of industrial, commercial, or institutional boilers or process heaters at major sources of HAPs. The Mill is an area source of HAPs, and TADs do not meet the definition of a boiler under 40 CFR 63.7575. Therefore, the Mill is not subject to Subpart DDDDD.

Subpart JJJJJ applies to owners and operators of industrial, commercial, or institutional boilers at area sources of HAPs. TADs do not meet the definition of a boiler under 40 CFR 63.11237. Therefore, the Mill is not subject to Subpart JJJJJ.

STATE IMPLEMENTATION PLAN (SIP)

Implementation of this project will potentially make the following state regulations applicable for the new source at the mill:

- ADEM Admin. Code R. 335-3-4-.01 – Visible Emissions
- ADEM Admin. Code R. 335-3-4-.02 – Fugitive Dust and Fugitive Emissions
- ADEM Admin. Code R. 335-3-4-.03 – Particulate Emissions from Fuel Burning Equipment
- ADEM Admin. Code R. 335-3-4-.04 – Particulate Emissions from Process Industries – General
- ADEM Admin. Code R. 335-3-5-.01 – Sulfur Compound Emissions from Fuel Combustion
- ADEM Admin. Code R. 335-3-5-.05 – Sulfur Compound Emissions from Process Industries – General
- ADEM Admin. Code R. 335-3-6-.01 – Control of Organic Emissions Applicability
- ADEM Admin. Code R. 335-3-6-.03 – Loading and Storage of VOCs
- ADEM Admin. Code R. 335-3-6-.04 – Fixed-Roof Petroleum Liquid Storage Vessels

The Mill may be subject to state regulations on PM emissions. Pursuant to ADEM Admin. Code R. 335-3-4-.01, visible emissions from the Mill must not exceed 20 percent as determined by a six-minute average, except for one six-minute period in any sixty-minute period during which opacity must not exceed 40%. The Mill is already subject to and demonstrates compliance with ADEM Admin. Code R. 335-3-4-.02. The Mill must continue taking reasonable precautions to prevent fugitive dust from becoming airborne and crossing property lines. The proposed TADs do not meet the definition of fuel burning equipment under ADEM Admin. Code R. 335-3-1-.02(ee) as they will provide direct contact heating. Therefore, the TADs will not be subject to ADEM Admin. Code R. 335-3-4-.03. The Mill is located in a Class 1 County for PM emissions and FL01 will have a process weight less than 30 tons per hour. Pursuant to the “Process Weight Rule” of ADEM Admin. Code R. 335-3-4-.04, the Mill must limit hourly PM emissions according to the equation:

$$\text{Emissions (lb/hr)} = 3.59 \times (\text{Process Weight (tons/hr)})^{0.62}$$

It is noted that the proposed synthetic minor PM limit would be more stringent than the process weight rule calculated emission limit. Therefore, compliance with the synthetic minor limit will be sufficient to determine compliance with ADEM Admin. Code R. 335-3-4-.04.

The Mill may be subject to state regulations on sulfur compound emissions. The Mill is located in a Category I county for sulfur dioxide (SO₂). As previously indicated, the TADs do not meet the criteria for fuel burning equipment and will therefore not be subject to ADEM Admin. Code R. 335-3-5-.01. Since the Mill will also not be subject to ADEM Admin. Code R. 335-3-5-.02 through -.04, ADEM Admin. Code R. 335-3-5-.05 applies to this project. The Mill will be required to meet applicable NSPS standards and utilize the best available control technology (BACT) to control SO₂ emissions. The Mill will only burn pipeline quality natural gas in the TADs and be required to maintain records of fuel usage to demonstrate compliance.

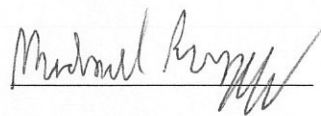
The Mill may be subject to state regulations on VOC emissions pursuant to ADEM Admin. Code R. 335-3-6-.01 as the Mill is located in Mobile County and has a potential VOC emission rate greater than 100 TPY. ADEM Admin. Code R. 335-3-6-.03 applies to the storage of VOCs with a true vapor pressure (TVP) of at least 1.5 psia in vessels with a capacity of at least 1,000 gallons or the transport of such VOCs from a loading terminal. ADEM Admin. Code R. 335-3-6-.04 applies to fixed roof storage vessels which have a capacity of at least 40,000 gallons and store petroleum liquids with a TVP greater than 1.52 psia. These sections do not apply because the proposed tanks will only store VOCs with a TVP less than 1.5 psia and be smaller than 40,000 gallons. The Mill also does not have a terminal or bulk storage facility.

TITLE V

The Mill is currently operating under MSOP No. 503-2012, issued on November 9, 2022. FL01 will be permitted to operate under an Air Permit until it is incorporated into the Mill's Title V MSOP.

RECOMMENDATION

Since it appears that the project would be capable of meeting all State and Federal Regulations, I recommend that Air Permit 503-2012-X056 be issued for the Foam Laid Manufacturing Line following a 15-day public notice period.



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September 15, 2025
Date