Permit Application to Construct Combustion Turbine and Heat Recovery Steam Generator
Packaging Corporation of America – Jackson Mill
Permit No. 102-0001

PACKAGING CORPORATION OF AMERICA

January 2026

Bragg, Michael

From: Don Spivey <donspivey@spiveyengineering.com>
Sent: Friday, January 30, 2026 3:50 PM
To: Bragg, Michael
Cc: Davis, Bill
Subject: Electronic Copy of PSD Permit Application for PCA-Jackson
Attachments: PCA-Jackson PSD Permit Application 1-30-2026.pdf

Michael,

I have attached an electronic copy of the complete PSD permit application including the Air Quality Impacts Analysis for your records. Earlier this afternoon, I dropped off two paper copies of the application with the ADEM receptionist. Please contact me if you have any questions. Have a great weekend!

Thanks
Don

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Application to Construct Combustion Turbine and Heat Recovery Steam Generator

Prepared for

Packaging Corporation of America
Jackson, Alabama

January 2026

Prepared by

Spivey Engineering Solutions, LLC

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SECTION 1

Introduction

Packaging Corporation of America (PCA) operates an integrated unbleached Kraft pulp and paperboard mill in Jackson, Alabama. The Jackson Mill produces unbleached Kraft and recycled pulp used as paper machine furnish to produce 2,200 tons per day of light-weight linerboard and corrugating medium.

PCA proposes to construct and operate an existing combined cycle combustion turbine system purchased from another facility to generate steam and electricity to support mill operations and to reduce the facility's reliance on purchased electricity. This report was prepared to accompany applications to the Alabama Department of Environmental Management (ADEM) for a permit to construct and operate new sources of air pollutant emissions. It describes the proposed new emission units and addresses all requirements for Prevention of Significant Deterioration (PSD) as set forth in the *Code of Federal Regulations* promulgated by the United States Environmental Protection Agency (EPA) and the ADEM Administrative Code.

This permit application was prepared by Spivey Engineering Solutions, with air quality modeling evaluation assistance provided by All4, Inc. Completed application forms are provided in Appendix B to this document. Questions regarding the participation of Spivey Engineering Solutions and All4, Inc. in this effort can be addressed to the individuals listed below at Spivey Engineering in Montgomery, Alabama, or All4, Inc.:

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SECTION 2

Facility Description

2.1 General

Facility Name:	Jackson Mill
Owner:	Packaging Corporation of America
Facility ID:	102-0001
Contact:	William N. Davis Senior Environmental Engineer Packaging Corporation of America 4585 Industrial Road Jackson, AL 36545 Telephone (251) 246-8242 FAX (251) 246-8361 E-mail: BillDavis@packagingcorp.com

2.2 Site Description

The Jackson Mill is located at 4585 Industrial Road, off U. S. Highway 43, in Jackson, Alabama. The areas surrounding the site include residential neighborhoods, rural agricultural activities, and light industrial activities. The manufacturing complex is located on 1,100 acres of land approximately 3 kilometers (2 miles) south of the Jackson city center, as shown in Figure 2-1. The site is located in Clarke County and is bordered to the north by Industrial Road, to the east by Depot Road and Bassett Creek, to the south by Bassett Creek, and to the west by the Tombigbee River. There are no major metropolitan areas within 75 kilometers of the mill. An aerial layout of the Jackson Mill is illustrated in Figure 2-2.

2.3 Project Description

PCA proposes to construct and operate an existing combined cycle combustion turbine system purchased from another manufacturing site. The following subsections describe the proposed equipment to be installed at PCA's Jackson Mill.

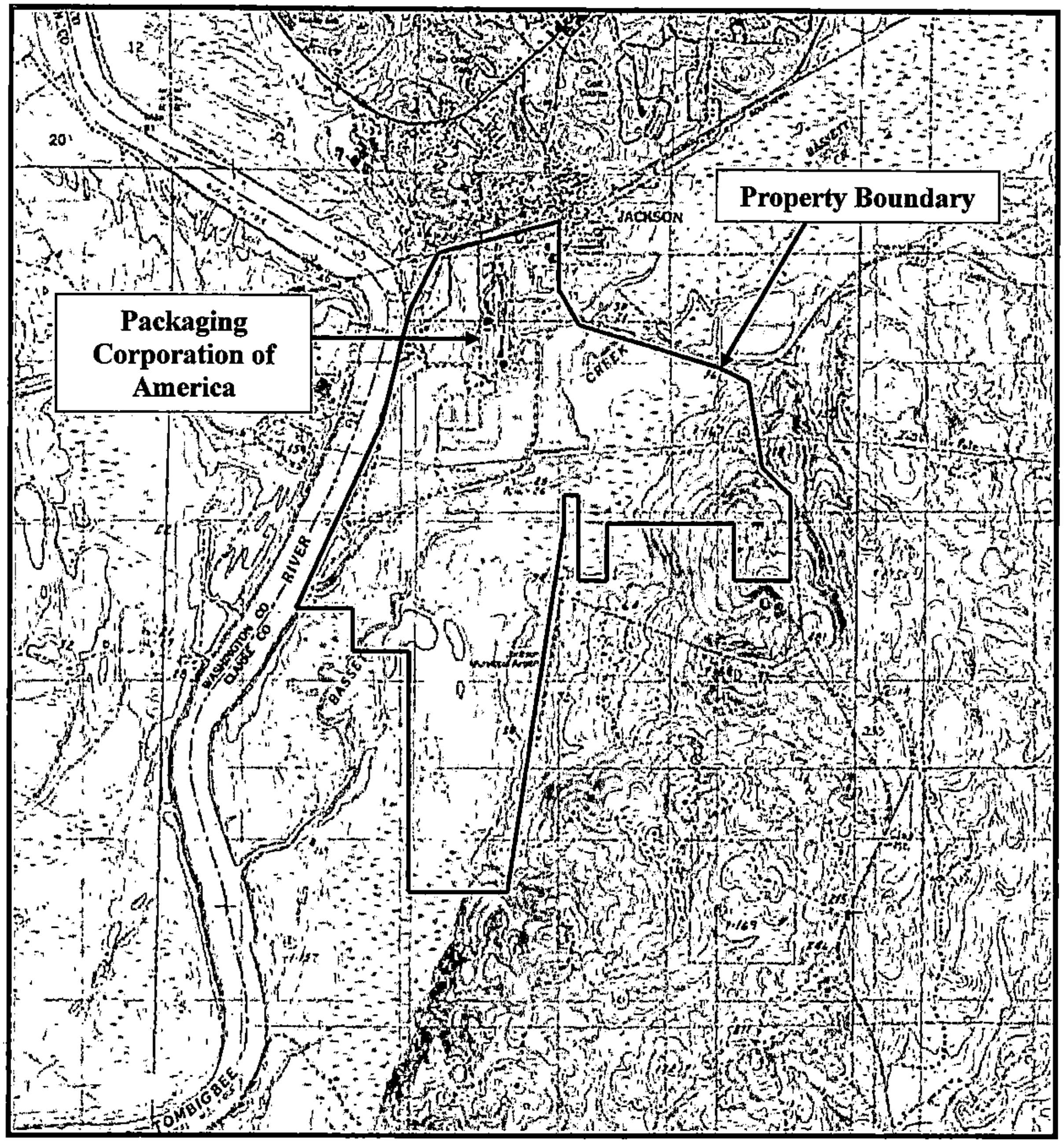

Figure 2-1. Site Map
Packaging Corporation of America – Jackson, Alabama

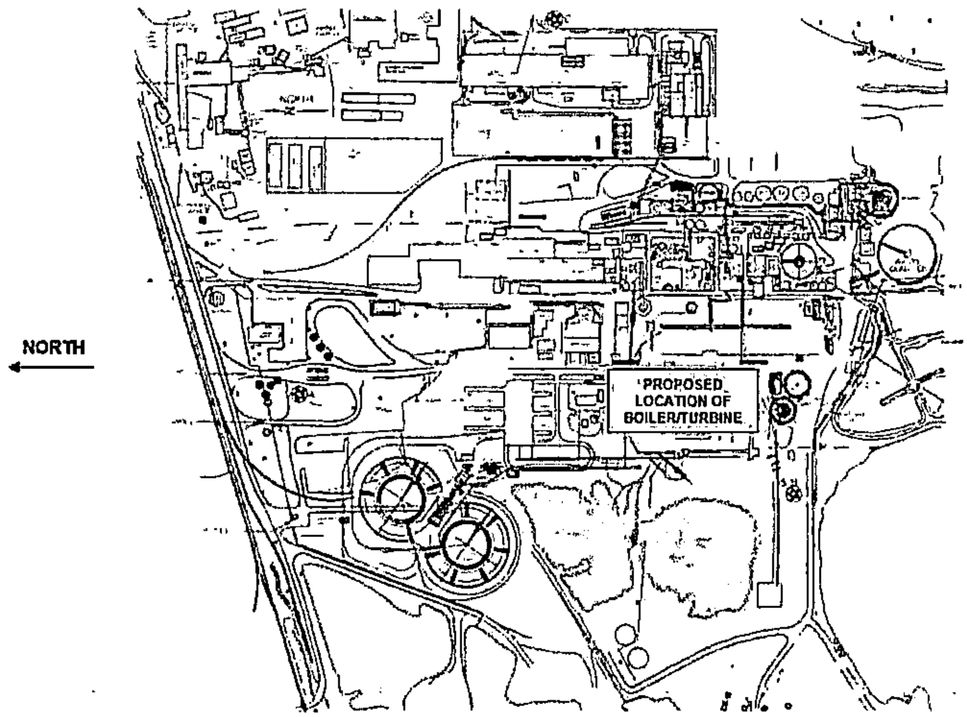

FIGURE 2-2. JACKSON MILL LAYOUT

2.3.1 Combustion Turbine

PCA proposes to construct and operate an existing Combustion Turbine generator rated at 50 megawatts (MW) electrical output and consisting of eight (8) burners with a combined maximum heat input of 675 million BTU per hour. The Combustion Turbine is a Westinghouse Model 251B12A unit manufactured in 1999 and relocated from Jay, Maine. All of the electricity generated by the Combustion Turbine will be consumed by PCA. PCA does not plan to sell any electricity to another entity.

Natural gas will be the only fuel permitted for the Combustion Turbine. Emissions of the oxides of nitrogen (NOx) will be controlled by dry low-NOx burners and a selective catalytic reduction (SCR) system using aqueous ammonia injection. Carbon monoxide (CO) emissions will be controlled by catalytic oxidation.

2.3.2 Heat Recovery Steam Generator

PCA proposes to construct an existing duct burner-fired heat recovery steam generator (HRSG) for the combustion gases exhausted from the Combustion Turbine. The HRSG produces steam from the residual energy in the turbine exhaust gases. Twelve (12) low-NOx duct burners rated for a combined 304 million BTU per hour heat input provide supplemental heat for the HRSG during periods of increased steam demand. The duct burner system was manufactured in 1999 and will burn only pipeline natural gas. The combined exhaust from the Combustion Turbine and HRSG will undergo catalytic oxidation and will be controlled by the SCR system to minimize CO and NOx emissions, respectively.

2.3.3 Additional Information

No existing boilers will be retired at PCA's Jackson Mill as part of this project. It is anticipated that operation of the three existing natural gas-fired package boilers will be significantly curtailed upon full commissioning of the Combustion Turbine and HRSG. The package boilers will be maintained for use in support of the Combustion Turbine and HRSG as needed. PCA is proposing a combined NOx emissions limit for the Combustion Turbine and HRSG, the No. 3 Power Boiler, the No. 4 Power Boiler, and the No. 5 Power Boiler of 116 tons per rolling 12-month period.

SECTION 3

Project Emissions Information

3.1 PSD Analysis

Construction of the proposed Combustion Turbine and HRSG will result in a significant increase in the air emissions for several criteria pollutants from PCA's Jackson (Alabama) Paper Mill with respect to ADEM Administrative Code Rule 335-3-14-.04 (Prevention of Significant Deterioration). The project emissions evaluation is based upon the actual-to-potential test for projects that only involve construction of new emission units. The projected increase in emissions of particulate matter less than 10 microns (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), and greenhouse gases (CO_2e) exceed the respective PSD significant emission rates. PCA is proposing federally enforceable emission limits for the Combustion Turbine and HRSG such that filterable particulate matter, NOx and CO will not exceed the respective PSD significant emission rates.

The table below summarizes the emissions for all pollutants following completion of the proposed project and provides the net emissions increase (in tons per year) for each pollutant emitted from the Combustion Turbine and HRSG. The emission estimates provided in the table are based on detailed spreadsheet-based calculations provided in Appendix A.

Regulated Pollutant	Maximum Expected Emissions Increase (tons/yr)	PSD Threshold for Major Modification (tons/yr)
PM	21.44	25
PM-10	30.02	15
PM-2.5	30.02	10
SO_2	10.84	40
NO_X	39.42	40
CO	98.62	100
CO_2e	502,141	75,000
VOC	16.89	40
Lead	0.0021	0.6
Sulfuric Acid Mist	1.66	7

The modifications proposed in this application are considered to be major as defined in ADEM Administrative Code R. 335-3-14-.04 for PM_{10}, $PM_{2.5}$, and CO_2e. As such, a PSD permit application is required, including a demonstration of best available control technology (BACT) and an air quality modeling evaluation to assess the impacts to ambient air quality for PM_{10} and $PM_{2.5}$.

3.2 Air Toxic Emissions

EPA's guidance on the assessment of non-regulated "air toxic" pollutants requires that permit applicants evaluate emissions for those toxic air pollutants which the facility could emit in amounts potentially of concern to the public. The proposed Combustion Turbine and HRSG will constitute a new source of air toxic emissions from the Jackson Mill. On March 5, 2004, EPA promulgated the NESHAP for Stationary Combustion Turbines as 40 CFR Part 63 Subpart YYYY. This NESHAP regulates air toxic emissions from stationary combustion turbines located at major sources of hazardous air pollutant emissions. Pursuant to 40 CFR 63.6090(b)(4), existing stationary combustion turbines do not have to meet the requirements of 40 CFR 63 Subpart YYYY.

On January 31, 2013, EPA promulgated the NESHAP for Industrial, Commercial, and Institutional Boilers and Process Heaters as 40 CFR Part 63 Subpart DDDDD. This NESHAP regulates air toxic emissions from industrial boilers and process heaters. According to §63.7575 of Subpart DDDDD, waste heat boilers (which, according to the rule, are also referred to as heat recovery steam generators) are excluded from the definition of "boiler". The proposed HRSG is therefore not subject to 40 CFR Part 63 Subpart DDDDD.

SECTION 4

Applicable Regulations

4.1 Federal Air Quality Requirements

4.1.1 New Source Review

The Jackson Mill is located in Clarke County, Alabama. Clarke County is considered to be an attainment area, or unclassifiable, with respect to the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants. Therefore, only the federal PSD permitting requirements apply to the proposed project, and non-attainment new source review (NNSR) has not been considered in this review.

The Jackson Mill is an existing major stationary source with respect to PSD. Project-related emissions from PCA's proposed construction of the Combustion Turbine and HRSG are provided in Section 3. The net increase in annual emissions from the facility for PM_{10}, $PM_{2.5}$, and CO_2e will exceed the applicable significant emission rates that trigger PSD review for these pollutants. Therefore, the facility modifications will constitute a major source of emissions under the regulations governing PSD (40 CFR 52.21). As a result, an ambient air quality impact analysis is required for PM_{10} and $PM_{2.5}$ and demonstration of BACT is required for PM_{10}, $PM_{2.5}$, and CO_2e.

4.1.2 New Source Performance Standards (NSPS)

The EPA has promulgated standards of performance for new, modified, and reconstructed sources of air pollution in 40 CFR Part 60. *Standards of Performance for Stationary Gas Turbines*, promulgated as 40 CFR Part 60 Subpart GG, applies to the Combustion Turbine. *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units*, promulgated as 40 CFR Part 60 Subpart Db, applies to the HRSG duct burner system.

4.1.2.1 40 CFR Part 60 Subpart A

All affected sources are subject to the general provisions of Subpart A unless specifically excluded by the source-specific NSPS. Subpart A requires initial notification and performance testing, recordkeeping, monitoring, provides reference methods, and mandates general control device requirements for all other subparts as applicable.

4.1.2.2 40 CFR Part 60 Subpart D

Standards of Performance for Fossil Fuel Fired Steam Generators for which Construction is Commenced after August 17, 1971 at 40 CFR 60 Subpart D provides standards of performance for fossil fuel-fired and wood-fired steam generating units for which construction commenced after August 17, 1971. This subpart applies to steam generating units having a maximum rated heat input capacity in excess of 250 MMBtu/hr from fossil fuel. Although the HRSG duct burner system has a maximum heat input capacity greater than 250 MMBtu/hr, can combust fossil fuel, and was constructed after 1971, it is not subject to Subpart D because 40 CFR 60 Subpart Db will apply to the duct burner system. 40 CFR 60 Subpart Db states in 40 CFR 60.40b(j) that any unit subject to Subpart Db that was constructed, modified, or reconstructed after June 19, 1986, is not subject to Subpart D.

4.1.2.3 40 CFR Part 60 Subpart Da

Standards of Performance for Electric Utility Steam Generating Units for which Construction is Commenced After September 18, 1978 at 40 CFR 60 Subpart Da applies to electric utility steam generating units with capacities greater than 250 MMBtu/hr of fossil fuel for which construction, modification, or reconstruction commenced after September 18, 1978. An electric utility steam generating unit (EUSGU) is defined at 40 CFR 60.41Da as "Constructed for the purpose of supplying more than one-third of its potential electric output capacity [PEOC] and more than 25 MW net electrical output [gross electric sales to the utility power distribution system minus purchased power] to any utility power distribution system for sale." Because PCA does not currently supply electricity to the grid and does not plan to supply electricity to the grid upon completion of the Project, Subpart Da is not applicable to any emission units at the Facility. PCA will reevaluate the applicability of this rule if the Facility decides to sell electricity to the grid.

4.1.2.4 40 CFR Part 60 Subpart Db

Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units at 40 CFR 60 Subpart Db, provides standards of performance for steam generating units with capacities greater than 100 MMBtu/hr for which construction, modification, or reconstruction commenced after June 19, 1984. The HRSG duct burner system was constructed after June 1984, has a heat input capacity greater than 100 MMBtu/hr, and will generate steam. The following requirements from Subpart Db apply to the HRSG duct burners:

- Filterable PM – No filterable PM emission limit is specified in 40 CFR 60.43b for affected units firing only natural gas.

- Sulfur Dioxide – Because the duct burner system fires only natural gas, it is exempt from the sulfur dioxide emission limits in 40 CFR Part 60 Subpart Db (40 CFR 60.42b(k)(2)).

- Nitrogen Oxides – The duct burner system is subject to an emission limit of 0.20 pound per million BTU for nitrogen oxides (40 CFR 60.44b(l)(1)). This NOx standard applies at all times, including periods of startup and shutdown. Pursuant to 40 CFR 60.48b(h), PCA is not required to install a NOx continuous emissions monitoring system (CEMS) for the duct burners. However, PCA proposes to install a NOx CEMS for the combined exhaust from the Combustion Turbine and HRSG in accordance with 40 CFR Part 60 Subpart GG.

4.1.2.5 40 CFR Part 60 Subpart GG

Standards of Performance for Stationary Gas Turbines at 40 CFR 60 Subpart GG provides performance standards for stationary gas turbines for which construction is commenced after October 3, 1977, and on or before February 18, 2005. The Combustion Turbine was originally constructed in 1999 at a manufacturing facility located in Jay, Maine and is therefore subject to Subpart GG. The following requirements from Subpart GG apply to the Combustion Turbine:

- Nitrogen Oxides – Because the Combustion Turbine does not meet the definition of "Electric Utility Stationary Gas Turbine" in 40 CFR 60.331(q), the turbine is subject to the NOx emission standard based upon the formula in 40 CFR 60.332(a)(2).

  $STD = 0.0150 \times (14.4 / Y) + F$

  Where STD is the allowable NOx emission concentration (percent by volume at 15% oxygen on a dry basis), Y is the manufacturer's rated heat rate at the manufacturer's rated load (kilojoules per watt hour) not to exceed 14.4 kilojoules per watt hour, and F is NOx emissions allowance for fuel bound nitrogen as defined in 40 CFR 60.332(a)(4). For the proposed Combustion Turbine, Y is 14.4 and F is 0 such that the NOx emission limit is 0.0150 percent by volume or 150 parts per million by volume dry basis corrected to 15% oxygen (4-hour rolling average). Because PCA is not claiming an allowance for fuel bound nitrogen to calculate the allowable emission limit in 40 CFR 60.332(a)(2), the monitoring requirement for nitrogen content in the natural gas in 40 CFR 60.334(h)(2) does not apply to the Combustion Turbine.

- Sulfur Dioxide – Because the Combustion Turbine will burn only pipeline natural gas, it satisfies the sulfur dioxide emission standard in 40 CFR 60.333(b) that limits fuel sulfur to less than 0.8 percent by weight (8000 ppmw). PCA is exempt from the fuel sulfur monitoring requirements of 40 CFR 60.334(h)(1) because the maximum total sulfur fuel content of natural gas will be limited to 20.0 grains per 100 standard cubic feet (scf) or less in the contract with the gas supplier.

The proposed Combustion Turbine will not use steam or water injection to control NOx emissions. The combined stack for the Combustion Turbine and HRSG will be equipped with a NOx CEMS that meets the requirements of 40 CFR 60.334(b) as provided in 40 CFR 60.334(c).

4.1.2.6 40 CFR Part 60 Subpart KKKK

Standards of Performance for Stationary Gas Turbines at 40 CFR 60 Subpart KKKK provides performance standards for stationary gas turbines for which construction is commenced after February 18, 2005. The proposed Combustion Turbine was originally constructed in 1999 at a manufacturing facility located in Jay, Maine and is not being modified or reconstructed. Therefore, the Combustion Turbine is subject to Subpart GG rather than Subpart KKKK.

4.1.3 National Emission Standards for Hazardous Air Pollutants (NESHAP)

The federal NESHAP regulations found in Title 40 Parts 61 and 63 of the CFR are emission standards for HAP and are generally only applicable to major sources of HAP (facilities that exceed the major source thresholds of 10 tpy of a single HAP and 25 tpy of any combination of HAP) or specifically designated area sources. NESHAP standards apply to sources in specifically regulated industrial source classifications (Clean Air Act Section 112(d)) or on a case-by-case basis (Clean Air Act Section 112(g)) for facilities not regulated as a specific industrial source type. Pollutant specific NESHAP may also be applicable.

4.1.3.1 40 CFR Part 61 Subpart A

40 CFR 61 Subpart A provides the general provisions for which each source subject to another Part 61 subpart must comply unless specifically excluded by the applicable subpart.

These provisions include initial notification and performance testing, recordkeeping, and monitoring requirements for all other subparts as applicable.

4.1.3.2 40 CFR Part 61 Subpart M

National Emission Standards for Asbestos at 40 CFR 61 Subpart M applies to various industrial facilities that handle, process, or manufacture asbestos. 40 CFR 61.145, the only Subpart M provision potentially applicable to the Facility, applies to the owner or operator of a demolition or renovation activity where asbestos may be disturbed. If the Facility engages in demolition or renovation activities involving asbestos, the activities will be completed in full compliance with the provisions of 40 CFR 61.145.

4.1.3.3 40 CFR Part 63 Subpart A

All affected sources are subject to the general provisions of 40 CFR Part 63 Subpart A unless specifically excluded by the source-specific NESHAP. Subpart A requires initial notification and performance testing, recordkeeping, monitoring, provides reference methods, and mandates general control device requirements for all other subparts as applicable.

4.1.3.4 40 CFR Part 63 Subpart B

Section 112(g) of the 1990 Clean Air Act Amendments (codified at 40 CFR 63 Subpart B, Requirements for Control Technology Determinations for Major Sources in Accordance with Clean Air Act Sections), is known as the case-by-case MACT. Case-by-case MACT applies to newly constructed major sources of HAP emissions that are not subject to a standard issued pursuant to section 112(d), section 112(h), or section 112(j) of the Clean Air Act and incorporated in another subpart of Part 63. The Combustion Turbine and HRSG will be affected sources under 40 CFR 63 Subparts YYYY and DDDDD, respectively; therefore, case-by-case MACT does not apply to the Project.

4.1.3.5 40 CFR Part 63 Subpart YYYY

National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines at 40 CFR 63 Subpart YYYY establishes emission limitations and operating limitations for HAP emissions from stationary combustion turbines located at major sources of HAP emissions. The Facility is a major source of HAP emissions, and therefore, the Combustion Turbine is an affected source under Subpart YYYY.

Subpart YYYY defines an "existing stationary combustion turbine" as a turbine that commenced construction or reconstruction on or before January 14, 2003 in 40 CFR 63.6090(a)(1). Subpart YYYY further states that "A change in ownership of an existing stationary combustion turbine does not make that stationary combustion turbine a new or reconstructed stationary combustion turbine." In 40 CFR 63.6090(b)(4), Subpart YYYY declares that existing stationary combustion turbines in all subcategories do not have to meet the requirements of 40 CFR Part 63 Subparts A and YYYY. The proposed Combustion Turbine commenced construction in 1999 and is included in the stationary combustion turbine subcategories with limited requirements. The proposed Combustion Turbine is therefore not subject to the emission limitations or monitoring, reporting, or record-keeping requirements of 40 CFR Part 63 Subpart YYYY.

4.1.3.6 40 CFR Part 63 Subpart DDDDD

National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters (Boiler MACT) at 40 CFR 63 Subpart DDDDD was finalized by EPA on December 20, 2012, and published in the Federal Register on January 31, 2013 (the "Industrial Boiler MACT Rule"). The rule was recently revised by EPA and published in the Federal Register on October 6, 2022.

In §63.7575 of Subpart DDDDD, waste heat boilers (which, according to the rule, are also referred to as heat recovery steam generators) are excluded from the definition of "boiler". The proposed HRSG is therefore not subject to the requirements of 40 CFR Part 63 Subpart DDDDD.

4.1.4 Compliance Assurance Monitoring

Pursuant to the Compliance Assurance Monitoring (CAM) Rule at 40 CFR Part 64, facilities are required to prepare and submit monitoring plans for certain emission units with the Title V application. The CAM plans provide an ongoing and reasonable assurance of compliance with applicable emission limits. Under the general applicability criteria, this regulation only applies to units that use a control device to achieve compliance with an emission limit and whose pre-controlled emission levels exceed the major source thresholds under the Title V permitting program unless such units meet a specified exemption.

For an emission unit with post-controlled emissions that are greater than the major source thresholds (referred to as large pollutant-specific emission units [PSEU] in the rule) at a facility that already has a Title V operating permit, a CAM plan is required to be submitted with the next Title V operating permit significant modification application for the subject large PSEU(s) or with the next Title V operating permit renewal application, whichever comes first. For emission units with post-controlled emissions that are less than the major source emission thresholds, a CAM plan is not required to be submitted until the next Title V operating permit renewal application. 40 CFR 64.2(b) lists several exemptions from CAM applicability.

Pre-controlled emissions from the Combustion Turbine and HRSG are greater than 100 tons per year for NOx and CO, and the proposed combined cycle combustion turbine system will be subject to emission limits for these pollutants. Selective catalytic reduction (SCR) will be used to control NOx emissions, and catalytic oxidation will be used to control CO emissions. The Combustion Turbine and HRSG would therefore require CAM plans specific to NOx and CO unless a specific exemption under 40 CFR 64.2(b) is met. None of the other NSR-regulated pollutants utilize a control device to meet an emission limit. Emission limits that are derived exclusively from post-November 15, 1990 NSPS or NESHAP limits are excluded from CAM applicability (i.e., 40 CFR 60 Subpart Db and Subpart GG limits for NOx). PCA will be utilizing CEMS to ensure compliance with the NOx and CO emission limits, also meeting the continuous compliance demonstration method exemption in 40 CFR 64.2(b)(1)(vi). Therefore, the proposed Combustion Turbine and HRSG will be exempt from CAM requirements for NOx and CO.

4.1.5 Risk Management Program (RMP)

Subpart B of 40 CFR Part 68 outlines requirements for risk management pursuant to Section 112(r) of the Clean Air Act. Applicability of 40 CFR Part 68 is determined based on the type and quantity of chemicals stored at the Facility. PCA has evaluated the amount of Section 112(r) substances currently stored at the Facility and proposed to be stored upon completion of the Project. PCA currently has no chemicals stored at the Jackson Mill in excess of the thresholds for which Risk Management planning would be required.

For the SCR system, PCA may store and use aqueous ammonia at a concentration of 19%. Pursuant to Table 1 to 40 CFR 68.130, aqueous ammonia having a concentration of 20% or greater stored in quantities exceeding 20,000 pounds is a listed substance subject to RMP requirements. At the current concentration planned for the Project, PCA will not be subject to any new RMP requirements.

4.1.6 Clean Air Markets Regulations

Starting with the Acid Rain Program mandated by the 1990 Clean Air Act Amendments, EPA has developed several market-based "cap and trade" regulatory programs. All market-based regulatory programs are overseen by EPA's Clean Air Markets Division (CAMD) and are referred to as CAMD regulations. Pursuant to 40 CFR 96.4(a)(2), fossil-fuel fired stationary combustion turbines and duct burners with maximum design heat input greater than 250 MMBTU/hr are potentially subject to NOx state budget trading programs. None of the CAMD regulations currently apply to the Jackson Mill, nor will the CAMD regulations be applicable following the construction of the Combustion Turbine and HRSG because the facility does not and will not produce electricity for sale.

4.2 State of Alabama Requirements

The proposed Combustion Turbine and HRSG are potentially subject to the following State of Alabama air regulations that are codified in Division 335-3 of the ADEM Administrative Code:

- Chapter 335-3-4 – Control of Particulate Emissions
- Chapter 335-3-5 – Control of Sulfur Compound Emissions
- Chapter 335-3-8 – Nitrogen Oxides Emissions
- Chapter 335-3-10 – Standards of Performance for New Stationary Sources
- Chapter 335-3-11 – National Emission Standards for Hazardous Air Pollutants
- Chapter 335-3-14 – Air Permits
- Chapter 335-3-16 – Major Source Operating Permits

4.2.1 Chapter 335-3-4 – Control of Particulate Emissions

The Combustion Turbine and HRSG will be subject to the visible emission limitations of Rule 335-3-4-.01 and to the filterable PM emission limitations for Fuel Burning Equipment in Rule 335-3-4-.03(4). In addition, the facility is generally subject to the process weight standards in Rule 335-3-4-.04. The Jackson Mill will continue to comply with the currently applicable provisions of Chapter 335-3-4 after completion of the proposed project.

4.2.2 Chapter 335-3-5 – Control of Sulfur Compound Emissions

PCA's Jackson Mill is located in Clarke County, which is categorized as a Category II county. The Combustion Turbine and HRSG will be subject to the sulfur dioxide emission limitation of Rule 335-3-5-.01(1)(b). PCA will comply with this limitation by burning only pipeline natural gas in the Combustion Turbine and HRSG.

4.2.3 Chapter 335-3-8 – Nitrogen Oxides Emissions

Rule 335-3-8-.06 prescribes a NOx emission limit for new combined-cycle electric generating units that commence operation on or after April 1, 2003. Because the emission limit prescribed in Rule 335-3-8-.06(3)(a) is more stringent than the limit prescribed by 40 CFR Part 60 Subpart GG, the Subpart GG emission limit supercedes the limit in Rule 335-3-8-.06(3)(a) per Rule 335-3-10-.01(2)(a).

4.2.4 Chapter 335-3-10 – Standards of Performance for New Stationary Sources

Chapter 335-3-10 adopts by reference the federal standards promulgated in 40 CFR Part 60 (see applicability discussion in Section 4.1.2). Rule 335-3-10-.01(2)(a) states that the emission standards in Chapter 335-3-10 shall supercede the emission standards in Chapters 335-3-3, -4, -5, -6, -7, and -8 provided that the following criteria are met: (1) the source category is subject to the regulations in Chapter 335-3-10 for the specific pollutants to which the emission standard under Chapter 335-3-10 applies, and (2) the emission standard under Chapters 335-3-3, -4, -5, -6, -7, and -8 is more stringent than the emission standard in Chapter 335-3-10 for the specific pollutants regulated.

4.2.5 Chapter 335-3-11 – National Emission Standards for Hazardous Air Pollutants

Chapter 335-3-11 adopts by reference the federal standards promulgated in 40 CFR Parts 61 and 63 (see applicability discussion in Section 4.1.3).

4.2.6 Chapter 335-3-14 – Air Permits

Chapter 335-3-14 describes the permitting requirements for new and modified sources of air emissions. Rule 335-3-14-.04 addresses Prevention of Significant Deterioration, or New Source Review, permitting requirements and closely resembles the federal New Source

Review program. This application has been prepared in accordance with the provisions of Rule 335-3-14-.04. The proposed project will be subject to BACT requirements for PM_{10}, $PM_{2.5}$, and CO_2e as discussed in Section 5. The required ADEM air permit application forms have been completed and are provided in Appendix B.

4.2.7 Chapter 335-3-16 – Major Source Operating Permits

Chapter 335-3-16 implements the federal Title V operating permit program. The Jackson Mill is a major stationary source with respect to Title V and operates in accordance with Permit No. 102-0001 effective October 16, 2025. The Jackson Mill will continue to comply with the provisions of Permit No. 102-0001 and will apply to incorporate the Combustion Turbine and HRSG as a new emission unit in the permit upon completion of construction.

4.3 Summary of Proposed Permit Limits

The proposed Combustion Turbine and HRSG will have multiple regulatory limits based upon requirements from NSPS Subparts Db and GG and PSD. The proposed permit limits have been summarized in Table 4-1 below.

Table 4-1. Summary of Proposed Combustion Turbine and HRSG Permit Limits

Pollutant	Limitation	Notes
Filterable PM	0.0050 lb/MMBTU	Based upon Rule 335-3-14-.04 (PSD avoidance)
PM10	0.0070 lb/MMBTU	Based upon proposed BACT emission limit
PM2.5	0.0070 lb/MMBTU	Based upon proposed BACT emission limit
Opacity	20% except for one six-minute period per hour of not more than 40%	Based upon Rule 335-3-4-.01(1)
SO_2	0.8% by weight fuel sulfur content	Based upon 40 CFR 60.333(b) – Turbine only
SO_2	Burn only pipeline natural gas	Based upon Rules 335-3-5-.01(1)(b) and -14-.04
NOx	150 ppmvd @ 15% O_2 (4-hour rolling average)	Based upon 40 CFR 60.332(a)(2) – Turbine only
NOx	0.20 lb/MMBTU (30-day rolling average)	Based upon 40 CFR 60.44b(l)(1) – Duct Burners only
NOx	6.0 ppmvd @ 15% O_2 and 24.37 pounds/hour (30-day rolling average)	Based upon Rule 335-3-14-.04 (PSD avoidance)
NOx	116.0 tons per year (12-month rolling total) combined with units X020, X025, and X029	Based upon Rule 335-3-14-.04 (PSD avoidance)
CO	0.023 lb/MMBTU and 22.5 pounds/hour (30-day rolling average)	Based upon Rule 335-3-14-.04 (PSD avoidance)
CO_2e	117.1 lb/MMBTU (12-month rolling average)	Based upon proposed BACT emission limit
CO_2e	502,141 tons/year (12-month rolling average)	Based upon proposed BACT emission limit

4.4 Ambient Air Quality Impact Analysis Requirements

The ambient limits with which the proposed project must comply are the national ambient air quality standards (NAAQS) for PM_{10} and $PM_{2.5}$ (40 CFR 50) and the PSD Class II and Class I increments for PM_{10} and $PM_{2.5}$ (40 CFR 52). These limits are summarized in Table 4-2. Analyses of the proposed increase in emissions from PCA's Jackson Mill (see Appendix C) demonstrate that the Project will be in compliance with all state and federal ambient air quality regulations.

Table 4-2 also lists the "significant" impact levels for PM_{10} and $PM_{2.5}$. The impact area associated with the facility's increase in emissions is defined as the area from the source of emissions to the distance at which the emissions from the facility no longer produce a significant impact for each pollutant. When the ambient concentrations at a particular location attributable to the subject source are below the significant impact levels, the impact of the source at that location is considered to be insignificant.

TABLE 4-2. APPLICABLE AMBIENT AIR QUALITY LIMITS AND SIGNIFICANT IMPACT LEVELS
(Concentrations in $\mu g/m^3$ unless otherwise noted)

	National Ambient Air Quality Standards		PSD Increments		
Pollutant and Averaging Period	**Primary**	**Secondary**	**Class II**	**Class I**	**Significant Impact Level (Class II Areas)**
PM_{10}					
24-Hour	150	150	30	8	5
Annual			17	4	1
$PM_{2.5}$					
24-Hour	35	35	9	2	1.2
Annual	9.0	15.0	4	1	0.3

SECTION 5

Demonstration of BACT

5.1 Introduction

Under PSD regulations, a new or modified "major source" is required to apply Best Available Control Technology (BACT) for any pollutant emitted in "major" or "significant" amounts. As discussed in Section 3, the proposed Combustion Turbine with HRSG will have the potential to emit PM_{10}, $PM_{2.5}$, and Greenhouse Gases (CO_2e) in "significant" quantities. A BACT analysis is therefore required for these pollutants. The purpose of this review is to demonstrate that the air pollution control measures to be utilized for the proposed modification represent BACT as defined by Section 169 of the Clean Air Act:

> "An emission limitation (including a visible emissions standard) based on the maximum degree of reduction of each pollutant subject to regulations under the Act which would be emitted from any proposed major stationary source or major modification, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, economic impacts and other costs, determines is achievable for such source or modifications through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment of innovative fuel combination techniques for control of such pollutant. In no event shall application of best available control technology result in emissions of any pollutant which will exceed the emissions allowed by any applicable standard under 40 CFR Parts 60 and 61."

Both the U.S. Environmental Protection Agency (EPA) and ADEM have indicated that the demonstration of BACT described above should follow a pollutant-specific "top-down" approach. This approach will ensure that a BACT demonstration consider the most stringent level of control technology available. If it can be shown that this level of control is technically, economically, or environmentally infeasible, then the next most stringent level of control is determined and similarly evaluated. The process continues until the BACT level under consideration cannot be eliminated by any substantial or unique economic or environmental objectives. For this project, the only source of emissions for which BACT will apply will be the Combustion Turbine with HRSG.

The purpose of this section is to demonstrate that the proposed emission control systems and methods of operation will be representative of BACT. The following sections provide the control technology alternatives available and a demonstration of BACT for each pollutant.

5.2 Methodology

The requirement to conduct a BACT analysis and determination is set forth in section 165(a)(4) of the Clean Air Act and in federal regulations 40 CFR 52.21(j). EPA has developed a process for conducting BACT reviews. This method is referred to as the "top-down" method. The steps to conduct a "top-down" analysis are listed in EPA's "New Source Review Workshop Manual," Draft, October 1990.

Step 1. Identify all control technologies;

Step 2. Eliminate technically infeasible options;

Step 3. Rank remaining control technologies by control effectiveness;

Step 4. Evaluate the most effective controls and document results. A case-by-case evaluation of energy, environmental, and economic impacts is performed for each remaining control technology;

Step 5. Select BACT.

5.3 Combustion Turbine with HRSG

As discussed previously, PCA proposes to install and operate an existing combined cycle combustion turbine system with total heat input rating of 979 MMBTU/hr. Pipeline natural gas will serve as the only permitted fuel. The proposed Combustion Turbine with HRSG will generate electricity to reduce the facility's reliance on purchased electricity and will also generate steam to replace most of the steam currently provided by the existing natural gas-fired package boilers.

5.3.1 Greenhouse Gases

Greenhouse gases (GHGs) emitted due to the combustion of natural gas in a combined cycle unit include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Based on the emission calculations summarized in Section 3, CO_2 represents 99.9% of the GHG emissions from a combined cycle unit on a carbon dioxide-equivalent (CO_2e) basis.

5.3.1.1 Identification of Available Greenhouse Gas Control Technologies (Step 1)

The only post-combustion technology for controlling CO_2 emissions is carbon capture, utilization, and storage (CCUS). The CO_2 emission controls evaluated for potential availability for the combined cycle combustion turbine system are (1) energy efficiency, (2) use of low carbon fuels, and (3) CCUS. Each of these control alternatives are discussed in the following sections.

5.3.1.1.1 Energy Efficiency

CO_2 is a product of combustion of fuels containing carbon, which is inherent in any power generation technology using fossil fuel. The theoretical combustion equation for CH_4, for example, is:

$$CH_4 + 2\,O_2 \rightarrow CO_2 + 2\,H_2O$$

CO_2 emissions are the essential and intended product of the chemical reaction between the fuel and the oxygen in which it burns, not a byproduct caused by impurities or by imperfect combustion. As a result, the only effective means to minimize the amount of CO_2 generated by a fuel-burning unit is through maximization of efficient use of the combustion heat, thereby resulting in the lowest quantity of fuel used per product. For a combined cycle unit, fuel efficiency is expressed as heat rate (i.e., Btu/kWh), and high fuel efficiency corresponds to a low heat rate. Minimizing the amount of fuel required to produce a given amount of electrical power output results in the lowest amount of CO_2 generated during the combustion process. Efficiency in a combined cycle unit can be achieved through good engineering design and good combustion/operational practices.

Design

Combined-cycle units operate based on a combination of two thermodynamic cycles: the Brayton and the Rankine cycles. A combustion turbine (CT) operates on the Brayton cycle, and the HRSG and steam turbine operate on the Rankine cycle. The combination of the two thermodynamic cycles allows for the very high fuel efficiency that is associated with combined-cycle units.

The Westinghouse Model 251B12A is the natural gas CT technology proposed for the project. The high-efficiency primary components of the turbine result in high overall efficiency. In addition to efficient turbine components, CTs are designed with evaporative inlet air cooling or inlet fogging. These devices are used during higher ambient air temperature operating conditions in order to lower the temperature and increase the density of the inlet combustion air. Increasing air density reduces the power required to compress the air before it is used in combustion, thus increasing the overall energy efficiency of the CT on hot days.

One of the primary causes of efficiency loss for a combined cycle unit is CT compressor fouling. As a preventive measure, CTs are designed such that inlet air to the CT passes through a high efficiency filtration system, which reduces the contaminants that cause compressor fouling.

CTs have high operating temperatures. The high operating temperatures are a result of the heat of compression in the compressor along with the fuel combustion in the burners. To minimize heat loss from the CT and protect personnel and equipment around the machine, CTs are designed with insulation blankets applied to the CT casing. These blankets minimize heat loss through the CT shell and help improve overall efficiency of the machine.

Finally, CTs are designed with sophisticated instrumentation and controls to automatically manage operation of the CT. The control system is a digital-type, is supplied with the CT, and controls all aspects of the turbine's operation, including the fuel flow rate and burner operations to achieve high combustion efficiency. The control system monitors operation of the unit and modulates fuel flow and turbine operation to achieve optimal high-efficiency, low-emissions performance under all operating cases.

Likewise, the Rankine cycle HRSGs are efficient by design. These heat exchangers are designed to capture as much thermal energy as possible from CT exhaust gases and duct burners. HRSGs take the heat from the CT exhaust and use this heat to convert boiler feed water into steam, which is used to drive a steam turbine. Maximizing steam generation increases the steam turbine's power generation, which maximizes overall plant efficiency. One aspect of the HRSG design in maximizing this waste heat conversion is the use of insulation on all gas path surfaces exposed to ambient air. Insulation minimizes heat loss to the ambient air, thereby improving the overall efficiency of the HRSG. Insulation is applied to the HRSG panels that make up the shell of the unit, to the high-temperature steam and water lines, and typically to the bottom portion of the stack.

Good Combustion and Maintenance Practices

CTs have regularly scheduled maintenance programs. These maintenance programs are important for the reliable operation of the unit, as well as to maintain optimal efficiency. As the CT is operated, the unit experiences degradation and some loss in performance. The CT maintenance program helps restore the recoverable lost performance. The maintenance program schedule is determined by the number of hours of operation and/or turbine starts. There are three basic maintenance levels: combustion inspections, hot gas path inspections, and major overhauls. Combustion inspections are the most frequent of the maintenance cycles. As part of this maintenance activity, the combustors are tuned to maintain highly efficient operation. While compressor fouling is minimized by design, the compressor is cleaned periodically using online and offline water wash systems to address compressor fouling that does occur.

HRSG maintenance is also important. HRSGs are made up of a bundle of tubes within the shell of the unit that are used to generate steam from the high temperature CT exhaust gas. To maximize this heat transfer, the tubes and their extended surfaces need to be as clean as possible. Fouling of the tube surfaces impedes the transfer of heat. Fouling occurs from the constituents within the exhaust gas stream. Although filtration of the inlet air to the CT minimizes fouling, cleaning of the tubes is performed during periodic outages. By reducing the fouling, the heat transfer efficiency of the HRSG tubes is maximized.

Finally, minimizing the number and quantity of steam vents and the timely repair of steam leaks is important in maintaining the plant's efficiency. A combined-cycle unit has several locations where steam is vented from the process, including the deaerator vents, blowdown tank vents, and vacuum pumps/steam jet air ejectors. These steam vents are necessary to improve the overall heat transfer within the HRSG and condenser by removing solids and air that potentially reduce the efficiency of the heat transfer surfaces. Minimizing the number and quantity of steam vents and repairing steam leaks in a timely manner is important in maintaining the plant's efficiency.

5.3.1.1.2 Use of Low Carbon Fuels

The CAA includes clean fuels in the definition of BACT; therefore, clean or low carbon fuels should be considered as a potentially available control technology for GHG emissions – provided they would not redefine the proposed source. GHG emissions from fuel combustion depend on the carbon content of the fuel. On a heat input basis, combustion of natural gas results in much lower GHG emissions than the combustion of other fossil fuels.

5.3.1.1.3 Carbon Capture, Utilization, and Storage

The only potential post-combustion control technology for CO_2 emissions is CCUS. CCUS is an integrated combination of technologies that has the potential to work together to capture (separate and purify) CO_2 from stationary source emissions, compress and transport it to a suitable location, and then either use it or pump it into deep underground geologic formations for safe, secure, and permanent storage. Geologic storage refers specifically to the process by which CO_2 is pumped underground into rocks such that it is permanently trapped so that it cannot enter the atmosphere. Captured CO_2 can also be transported and pumped into oil fields and utilized for enhanced oil recovery (EOR).

5.3.1.2 Eliminate Technically Infeasible Options (Step 2)

The first two potentially available technologies identified above—energy efficiency and low carbon fuels—are technically feasible for the proposed units. However, for CCUS to be technically feasible, each individual step in the process must be technically feasible and the integrated group of components must also be technically feasible such that each component performs properly without interfering with the essential operation of the units. As such, any potential barriers to the successful integration of these components must be considered in determining whether CCUS is technically feasible for the proposed units.

To date, CCUS has not been demonstrated at commercial scale on a natural gas-fired combined cycle (NGCC) unit. In an effort to advance technology development, Research & Development (R&D) programs are currently being funded by the United States Department of Energy (DOE) in cooperation with technology and industry partners to develop options, reduce project uncertainty, and improve technology deployment costs and performance. According to DOE:

The successful development of advanced CO_2 capture technologies is critical to maintaining the cost-effectiveness of fossil fuel-based power generation. Today, there are commercially available First-Generation CO_2 capture technologies that are being used in various small-scale industrial applications. At their current state of development, these (CO_2 capture) technologies are not ready for widespread deployment on fossil fuel-based power plants for three primary reasons. DOE is focused on supporting research and development (R&D) of novel technology solutions that address the three major issues with existing commercial CO_2 capture technology.

- *Reducing the impact of CO_2 capture on power generating capacity;*
- *Scaling up novel CO_2 capture technologies to the necessary size for full-scale deployment at fossil energy power systems; and*
- *Improving the cost effectiveness of novel technologies for CO_2 capture so that fossil-based systems with carbon capture are cost competitive.*

...The Carbon Capture Program's approach to achieve these goals is to utilize a combination of developments in process chemistry, new chemical production methods, novel process equipment designs, new equipment manufacturing methods, and optimization of the process integration with other power plant systems (e.g., the steam cycle, cooling water system, carbon dioxide compression, etc.). Additionally, advances in boiler/gasifier technologies, materials of construction, process stream handling, heat integration, compression technologies, gas cleanup and separation, and power cycle technology under development within the Department's Clean Coal Research Program provide synergistic benefits that are also required to meet program goals.[1]

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[1] U.S. Department of Energy, Carbon Capture R&D, https://www.energy.gov/fe/science-innovation/carbon-capture-and-storage-research/carbon-capture-rd.

Notably, these technical challenges are perhaps more pronounced for gas-fired generation because of the unique issues associated with gas combustion at combined-cycle units and the previous focus on steam boilers. As stated by DOE:

> *Because of the many similarities between natural gas and coal-fired power systems, DOE's current CCUS program does address many natural gas issues. However, because natural gas CCUS faces some unique issues, more research, design, development, and demonstration (RDD&D) is needed to focus on natural gas CCUS at a relevant scale. DOE is prepared to support a demonstration program to evaluate the adoption of these technologies and to reduce the cost of carbon capture for natural gas power systems.*[2]

EPA has likewise recognized the differences between coal-fired and gas-fired units in questioning whether full or partial CCUS is technically feasible for NGCC units. In light of those concerns, EPA rejected CCUS in determining the best system of emission reduction for GHG emissions from NGCC units in 2015. Specifically, EPA stated the following:

> *[T]he CO_2 concentration in the flue gas of a natural gas combustion turbine is much lower (usually approximately 4 volume percent) than the CO_2 concentration in the flue gas stream of a typical coal-fired plant (which is approximately 16 volume percent for a supercritical pulverized coal or circulating fluidized bed unit) and of the syngas of an IGCC unit (in which CO_2 can be as high as 60 volume percent). Therefore, the overall amount of CO_2 that can be captured in a CCS project is likely lower. Finally, unlike Subpart Da affected facilities, where there are full-scale plants with CCS that are currently under construction or in advanced stages of development, the EPA is aware of only one demonstration project, which is an approximately 40 MW slip stream installation on a 320 MW NGCC unit.*[3]

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[2] U.S. Department of Energy, Carbon Capture Opportunities for Natural Gas Fired Power Systems, https://www.energy.gov/sites/prod/files/2017/01/f34/Carbon%20Capture%20Opportunities%20for%20Natural%20Gas%20Fired%20Power%20Systems_0.pdf

[3] 79 Fed. Reg. 1,430, 1,485 (Jan. 14, 2014).

In 2015, EPA promulgated 40 CFR Part 60 Subpart TTTT which applies to new fossil fuel fired electric generating units including natural gas-fired combustion turbines. In promulgating these standards, EPA rejected CCUS as the best system of emission reduction for natural gas-fired combustion turbines because there was insufficient information to determine whether implementing CCUS was technically feasible.[4] In addition, EPA noted that the DOE has not yet funded a CCUS demonstration project for a natural gas-fired combined cycle unit and no natural gas-fired combined cycle CCUS demonstration projects are operational or being constructed in the United States. EPA has also proposed to reverse its prior conclusion that partial capture and sequestration is the best system of emission reduction for new coal-fired power plants, and in that action EPA did not propose any changes to its prior determination regarding the technical feasibility of CCUS for new combustion turbine facilities.[5] As part of its proposal to amend 40 CFR Part 60 Subpart TTTT, EPA concluded "...that CCS is not adequately demonstrated in certain key respects..." including availability of geologic sequestration sites, the scarcity of water needed for CCUS in certain areas of the country, and ongoing issues with successful demonstration of carbon capture technologies. Accordingly, the Agency revised its previous conclusion that partial CCUS represented the best system of emission reduction (BSER) for control of GHG emissions from newly constructed EGUs.[6]

The technical feasibility of each component of a CCUS system is discussed further below.

CO_2 Capture

CO_2 capture is the first step in post-combustion control of CO_2 through CCUS. Capture is the engineered process of separating CO_2 from flue gas or upstream fuel sources. CO_2 gas separation technologies have been developed and employed in the industrial sector (e.g., petroleum refining and natural gas purification) for commercial purposes for more than 70 years.[7] CO_2 capture on a small scale has been achieved for many years in the petroleum, ethanol, and industrial chemical industries. While having been deployed for many years in

[4] 80 Fed. Reg. 64,510, 64,612 (Oct. 23, 2015).

[5] 83 Fed. Reg. 65,424, 65,424 (Dec. 20, 2018).

[6] 83 Fed. Reg. 65,424, 65,441 (Dec. 20, 2018).

[7] Report of the Interagency Task Force on Carbon Capture and Storage (Aug. 2010), https://www.epa.gov/sites/production/files/2016-08/documents/ccs-task-force-report-2010.pdf.

the industrial sector for commercial uses, the technology has not been deployed to date at commercial-scale as an environmental control technology. CO_2 capture is being evaluated for emissions reductions from industrial facilities such as cement and steel manufacturing, coal-fired power plants, and natural gas-fired power plants, but it has never been installed on a commercial-scale natural gas combined cycle (NGCC) power plant. NGCC power plants inherently emit less CO_2 than other fossil fuel generation sources such as coal or petroleum systems, so capture technologies for NGCC systems have not historically been used to generate a CO_2 stream for commercial purposes nor have they been the focus of R&D for CO_2 capture for GHG emission reductions.

Smaller-scale carbon capture systems have been demonstrated on several power generation facilities as shown in Table 5-1. All but one of these systems have been on coal-fired EGUs.

Table 5-1. Power Generation Units with CCS in North America at Commercial Scale

Project	Country	Fuel Type	Supplier/Technology	Tonnes CO_2 Captured per Day	Project Start Date
Bellingham	USA	Natural Gas CC (40 MW slipstream)	Fluor/Econamine FG PlusTM Solvent	330	1991-2005
Mountaineer	USA	Coal (20 MW slipstream)	Alstom/Ammonia (chilled)	300	2009-2011
Plant Barry	USA	Coal (25 MW slipstream)	MHI/KM CDR Process® and KS-1™ solvent	500	2011-2015
Trona	USA	Coal (108 MW)	McGee/ABB Lummus Crest/MEA solvent	800	1978-present
Boundary Dam	Canada	Coal (110 MW)	Shell Cansolv/DC-103 solvent	2,740	2014-present
Petra Nova	USA	Coal (240 MW slipstream)	MHI/KM CDR Process® and KS-1™ solvent	4,800	2016-present

The Bellingham NGCC project in Massachusetts operated from 1991-2005 to capture CO_2 for use in the food industry rather than as an environmental control system. Operating for this purpose allowed the carbon capture system to function essentially independently from the NGCC, diminishing the effects of power cycle fluctuations on carbon capture operations, and largely eliminating the impacts of outages in carbon capture equipment on power production.

Although the majority of post-combustion carbon capture R&D has been performed on coal-fired applications to date, the U.S. Department of Energy/National Energy Technology Laboratory (DOE/NETL) has been expanding its focus to all fossil fuel power generation and industrial carbon capture. Much of the CO_2 capture R&D is applicable to natural gas combined cycle units and to the industrial sector such as refineries, ethanol, cement, and steel plants. However, the lower CO_2 concentration in NGCC flue gas dictates that any solvent-based CO_2 absorber must be sized comparatively larger than the one used in a coal capture system; or for a membrane system, more energy and membrane area are required. NGCC flue gas also has higher oxygen content than other combustion source flue gases, which may cause faster rates of oxidative degradation to solvents.

Amine solvent is the most developed technology for post-combustion carbon capture. DOE is working on transformational technologies in all areas such as solvents, sorbents, membranes, hybrid, and cryogenic capture systems. As explained by the Fossil Energy Research and Development (FER&D) program, "FER&D will continue to focus on CCS and activities that increase the efficiency and availability of advanced power systems integrated with CCS."[8] This is evident from the recent DOE awarded projects and work in many fronts including (1) Front-End Engineering Design (FEED) studies, (2) expansion of the National Carbon Capture Center (NCCC) managed by Southern Company to include testing for natural gas power plants, and (3) large pilot-scale projects at Technology Centre Mongstad (TCM) to simulate NGCC gas conditions. These efforts include nine FEED studies for CO_2 capture systems on both coal and natural gas power plants, with four being performed for retrofit of NGCC power plants with CCS described below:

- Bechtel National will perform the FEED study for a retrofit 2x2x1 NGCC to Panda Energy Fund's plant in Texas with a non-proprietary solvent.
- Electric Power Research Institute will conduct a study for a retrofit on California Resources Corporation's 550 MWe Elk Hills Power Plant (NGCC unit) using Fluor's amine based Econamine FG Plus process to capture 75% of the CO_2 produced.
- Southern Company will complete a study for installation of a Linde-BASF solvent process on an existing NGCC plant in the Southern system.

[8] U.S. Dep't of Energy, Carbon Capture, Utilization, and Storage: Climate Change, Economic Competitiveness, and Energy Security (Aug. 2016), https://www.energy.gov/sites/prod/files/2016/09/f33/DOE%20-%20Carbon%20Capture%20Utilization%20and%20Storage_2016-09-07.pdf

- The University of Texas at Austin will conduct a FEED study with the Piperazine Advanced Stripper process at the Mustang Station of Golden Spread Electric Cooperative in Texas.

Based on the lack of commercial deployment at similar NGCC units and barriers to applying second generation research to similar commercial scale NGCC units, carbon capture is considered technically infeasible for PCA's proposed Combustion Turbine with HRSG.

CO_2 Compression and Transport

In order for captured CO_2 to be permanently sequestered or geologically stored, it must first be compressed "from near atmospheric pressure to a pressure between 1,500 and 2,200 psia . . . ."[9] While compressing CO_2 is feasible, it is extremely energy-intensive and expensive. To reduce the energy intensity related to compression, DOE is evaluating various compression concepts using computational fluid dynamics and laboratory testing that will lead to development of prototypes and field testing. Their research efforts include "development of intra-stage versus inter-stage cooling, fundamental thermodynamic studies to determine whether compression in a liquid or gaseous state is more cost-effective, and development of a novel method of compression based on supersonic shock wave technology."[10]

Some pipelines that transport compressed (dense-phase) CO_2 already exist. Since the 1970s, CO_2 has been transported in pipelines to oil fields for use in enhanced oil recovery (EOR) operations. The majority of this CO_2 has been sourced from naturally occurring underground geologic deposits because off-takers of CO_2 transported for use in EOR operations require steady-state production of CO_2.[11] Naturally occurring geologic deposits of CO_2 provide this steady delivery of CO_2. In contrast, the intermittent operation of power plants means that the transportation of CO_2 captured from those power plants is discontinuous and unpredictable. Additionally, existing CO_2 pipelines are not considered to be common carrier (open access) pipelines and are dedicated, with limited capacity, to accommodate private oil industry CO_2-

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[9] NETL, DOE/NETL Carbon Dioxide Capture and Storage RD&D Roadmap (Dec. 2010), https://www.netl.doe.gov/File%20Library/Research/Carbon%20Seq/Reference%20Shelf/CCSRoadmap.pdf

[10] U.S. Dep't of Energy, A Review of the CO2 Pipeline Infrastructure in the U.S. (Apr. 21, 2015), http://energy.gov/sites/prod/files/2015/04/f22/QER%20Analysis%20-%20A%20Review%20of%20the%20CO2%20Pipeline%20Infrastructure%20in%20the%20U.S_0.pdf.

[11] Melanie D. Jensen, et al., Operational Flexibility of CO2 Transport and Storage, 63 Energy Procedia 2715-2722 (2014), available at https://reader.elsevier.com/reader/sd/pii/S1876610214021092?token=70E82B8033A2B829AA2BFCC09057DCD9BA9342E54B9BAF82207EA43021E7A5E22AD99271091071189B0D6E325F938146.

EOR projects. As such, these existing pipelines were not designed to accommodate the intermittent flow of CO_2 from power plants. Consequently, for CO_2 compression and transport to be a technically-viable component of CCUS, new CO_2 pipelines for commercial-scale capture operation would be required to be developed.

Construction of a CO_2 pipeline would be like construction of a natural gas pipeline, with applicable regulations, requiring the same attention to design, monitoring for leaks, and protection against overpressure, especially in populated areas. The proposed NGCC unit at PCA's Jackson Mill would need to construct a CO_2 pipeline to a suitable location where injection for saline formation storage or CO_2-EOR would take place if it were to pursue CCUS as a CO_2 control option. While it may be technically feasible to construct a CO_2 pipeline, considerations regarding the land use and availability need to be made. Based on experiences in the CO_2-EOR industry, compression and transport of CO_2 is considered technically feasible.

CO_2 Geologic Storage Options

The pumping of CO_2 into deep geological formations or the utilization of the CO_2 for EOR are the last steps of the CCUS process. Both processes can lead to the long-term secure storage of CO_2. These storage operations can include pumping into a wide range of geologic formations including deep saline reservoirs, active and abandoned oil and gas fields, and other rock formations such as un-mineable coal seams and basalt formations. There are no un-mineable coal seams or basalt formations in proximity to the proposed NGCC unit at PCA's Jackson Mill, so these formations are not feasible as storage options in this case. While a few coal seams in North Alabama have been tested as potential storage sites, CO_2 storage in subsurface coal beds is not further considered in this analysis because of the greater distribution and storage capacity of CO_2 storage resources available in deep saline formations closer to Jackson, Alabama.

While active oil fields are present in South Alabama, no CO_2-EOR operations are currently active in the State of Alabama. The transition of an existing oil field to a CO_2-EOR operation requires significant capital expenditures[12] and permitting of the CO_2 pumping

[12] Armpriester, Anthony. W.A. Parish Post Combustion CO2 Capture and Sequestration Project Final Public Design Report. United States: N. p., 2017. Web.

operations. Moreover, not all oil fields are amenable to CO_2-EOR operations. Significant feasibility studies would need to be planned to determine if CO_2-EOR would be a cost-effective option for recovery of oil in each field being considered. The potential for an oil company to engage in an agreement to use CO_2 for EOR also largely depends on the price of oil. As such, using CO_2 for EOR operations is not currently feasible for this application.

Alternatively, deep saline formations are present in the geologic subsurface in South Alabama that have been assessed to be feasible for safe geologic storage of CO_2. Safe, secure, and permanent geologic storage in deep saline formations has been successfully performed throughout the world and in the United States but requires the presence of a sufficiently permeable rock formation (typically sandstone or carbonate) which is sealed by rocks on top that have a very low permeability. These formations need to be at least 1 kilometer (km) deep to ensure that the CO_2 is stored as a dense phase, also called a supercritical fluid. To protect underground drinking water aquifers, CO_2 storage is only permitted in saline formations that are saltier than 10,000 parts per million (ppm) total dissolved solids per the EPA Class VI Underground Injection Control (UIC) regulations. The geologic seal (typically a shale formation or chalk) must be continuous over the entire area where the CO_2 is stored and free of defects such as permeable faults, fractures, or leaky wellbore penetrations. Additional considerations include an assessment of the risks of induced seismicity and the potential for CO_2 or brine leakage through pre-existing boreholes. Brine is water containing dissolved salts that naturally exists in a rock formation. To evaluate formations for suitability, extensive drilling and site characterization must be performed to certify a site to be geologically suitable for long-term geologic storage.

The CO_2 storage capacity estimates for the United States have been assessed by both the United States Department of Energy (DOE) and the United States Geological Survey (USGS). Both assessments indicate a large potential for storage, with median estimates ranging from 3,000 to 8,600 billion metric tons of CO_2. The economic potential, often referred to as a "storage reserve" is likely to be significantly lower, but how much lower is not fully evaluated. Conservative estimates are large compared to the amount of CO_2 emitted in the United States each year[13] - suggesting that storage capacity is unlikely to be a limiting factor in the United States.

Since CO_2 capture technology has not been applied to a NGCC power plant to date, there are currently no CO_2 geologic storage projects related to CO_2 sourced from NGCC power plants. Saline formation injection demonstration projects in the United States include:

Plant Daniel Pilot Injection Project - This project was conducted by DOE's SECARB Partnership and the Electric Power Research Institute (EPRI) and involved drilling one injection well and one observation well into the Tuscaloosa Formation (a deep saline formation) at Mississippi Power's Plant Daniel. Approximately 3,000 tons of CO_2 were pumped into the injection well into a deep saline formation approximately 8,500 feet below ground surface (bgs) and monitored in the adjacent monitoring well. The pumping was completed in 2008, and monitoring was completed in 2010. The project included site characterization, permitting, CO_2 pumping operations, and monitoring of the small amount of CO_2 pumped into the subsurface.

Plant Barry Anthropogenic CCUS Demonstration/SECARB Phase 3 - Southern Company built and operated a 25 MW coal slipstream amine post-combustion capture plant at Plant Barry beginning in 2011. CO_2 subsurface pumping operations began in 2012 and the pumping operations concluded in 2014. The project was decommissioned in 2015. The injection wells have been plugged and abandoned. The capture project provided CO_2 for SECARB funded storage research. The project included drilling two injection wells and two observation wells into the Paluxy Formation (a deep saline formation) located in Citronelle Dome, geologically above the Citronelle Oil Field in South Alabama. The project pumped nearly 120,000 tonnes of CO_2 over three years. The project included construction and operation of a 12-mile pipeline that connected Plant Barry to the Citronelle Dome injection site. The project apprised DOE and industry how effective monitoring and verification protocols for geologic storage could be deployed in the field.

Kemper County Energy Facility/Phase II CarbonSAFE - In Kemper County Mississippi, a DOE project awarded to the Southern States Energy Board (SSEB) provided funding for the drilling of three deep saline geological characterization wells to evaluate the storage of CO_2

13 NETL, *FE/NETL CO2 Saline Storage Cost Model* (Sept. 30, 2017), https://www.netl.doe.gov/research/energy-analysis/search-publications/vuedetails?id=2403.

in three separate saline reservoirs under that site. The results were positive in that good rock properties existed for the pumping and long-term safe storage of CO_2 at that site. No CO_2 was pumped as a pilot demonstration with this project. DOE has announced additional funding opportunities to continue additional work at sites within the CarbonSAFE program.

Although geologic research storage projects involving Southern Company and other entities exist, there are no large commercial scale storage projects from NGCC plants that currently exist.

Other Feasibility Considerations

When CO_2 is pumped into a geologic formation, it occupies small voids within the geologic structure known as "pore space." Before pumping CO_2 into the subsurface for geologic storage, the storage operator must own the pore space, have permission from the owner, or otherwise have the right to use the pore space. The laws concerning property rights over pore space is a basic concern of state law rather than federal law and varies from state to state. The issue of pore space property rights is complicated by the fact that for a large CO_2 storage project, the CO_2 plume may extend over many square miles, and impacts to formations may extend over an even larger area. For large projects, multiple property or pore space owners are likely to be involved in the process of identifying and acquiring pore spaces rights. Addressing issues related to property rights and competing uses of the subsurface mineral rights could have an impact on the feasibility of CO_2 storage. Pore space ownership was clarified by the State of Alabama in House Bill 327 which passed on May 2, 2024.

In addition to pore space ownership, there are issues associated with CCUS related to long-term responsibility for the stored CO_2. Some states have enacted laws governing these issues, but they vary. This is a problem for projects that operate in states without such laws and for projects that cover multiple states. Some states are beginning to address these issues, and some of the issues were addressed by House Bill 327 for the State of Alabama.

The closest geologic structure suitable for large volume geologic storage sourced from PCA's Jackson Mill specifically, is the geologic structure named Citronelle Dome located approximately 40 miles from Jackson, Alabama. As described previously, CO_2 has been pumped into the Citronelle Dome for field testing. It has been demonstrated to be a suitable storage structure for large-volume CO_2 storage. Pumping operations ceased in September 2014, with post-project monitoring of the 120,000 metric tons of CO_2 pumped for storage. However, PCA has no legal rights to any pore space in the Citronelle Dome.

In light of the uncertainties regarding commercial scale CO_2 pumping and storage, including the long-term liabilities, the absence of EOR operations in the state, and the lack of legal access to pore space in the Citronelle Dome, CO_2 storage is not considered technically feasible for PCA's Combustion Turbine with HRSG.

CCUS Conclusions

As discussed above, CCUS has the potential to reduce CO_2 emissions as a post-combustion control alternative. However, the technology has only been employed at small commercial scale at two coal-fired facilities and the success of those two projects has been limited. To date, CCUS has never been applied at a commercial scale NGCC unit. While each of the individual components of CCUS, including post-combustion capture, compression, pipeline transportation, and injection for storage in geologic formations are under development and in practice in other industries, additional research and development is needed before all of the components can be reliably integrated into a commercial scale power plant that must function efficiently across a range of operating conditions.

As EPA states in its GHG BACT Guidance (2011), "CC[U]S may be eliminated from a BACT analysis in Step 2 if it can be shown that there are significant differences pertinent to the successful operation for each of these three main components from what has already been applied to a differing source type. ... Furthermore, CC[U]S may be eliminated from a BACT analysis in Step 2 if the three components working together are deemed technically infeasible for the proposed source, considering the integration of the CC[U]S components with the base facility and site-specific considerations."[14] Since significant challenges remain, for which technical solutions are not currently commercially available, CCUS is not technically feasible for the proposed NGCC unit.

[14] EPA, PSD and Title V Permitting Guidance for Greenhouse Gases (Mar. 2011), https://www.epa.gov/sites/production/files/2015-07/documents/ghgguid.pdf.

The elements of CCUS – capture, compression, transport, and storage/or utilization – have been technically demonstrated in various industries, but they have never been integrated and applied at commercial scale on NGCC units. More effort and research are required to advance CCUS for gas-fired power generation before it can be deemed sufficiently feasible to form the basis of a BACT determination.

Step 2 of the top-down BACT analysis is the elimination of technically infeasible options. EPA considers a technology to be technically feasible if it is available and applicable to the source type under review. A control technology should also be considered technically available or applicable if it has been demonstrated on an exhaust stream with similar physical and chemical characteristics. Based on the above discussion of CCUS, CCUS is eliminated as a technically feasible option as BACT consistent with EPA's regulations and guidance.

5.3.1.3 Rank of Remaining Control Technologies (Step 3)

The technically feasible options include (1) energy efficiency and (2) the use of low carbon fuels. Energy efficiency includes the high thermal efficiency design of the NGCC unit. Accordingly, efficient units and the use of low carbon natural gas fuel are considered the top-level available alternatives for control of GHG emissions from combined cycle units.

5.3.1.4 Economic, Energy, and Environmental Impacts (Step 4)

No adverse energy, environmental, or economic impacts are associated with energy efficient operating practices for reducing CO_2 emissions from Combustion Turbine and HRSG.

5.3.1.5 Selection of GHG BACT (Step 5)

Step 5 of the top-down BACT analysis is the selection of BACT. PCA performed searches of the RBLC database in November 2025 to identify the emission control technologies and emission limits that were imposed on combined cycle combustion turbine systems rated for 25 megawatts or greater by permitting authorities within the past six years. The following categories of the RBLC were searched, as noted below:

- Large Combustion Turbines / Combined Cycle and Cogeneration rated for more than 25 megawatts burning natural gas in Process Code 15.210

The results of the search are summarized in Table 5-2 below.

Table 5-2. RBLC Listings of CO_2 Emissions from NGCC Units Since January 1, 2020

ID Number	Date	Unit Type	Company / Location	Control	Emission Limit
IN-0382	2/14/2025	NGCC	Duke Energy Indiana, Inc. Vermillion County, IN	GCP*	850 lb/MWh (as CO_2e)
IN-0365	6/19/2023	NGCC	Maple Creek Energy, LLC Sullivan County, IN	GCP*	726 lb/MWh (as CO_2e)
MI-0455	2/01/2023	NGCC	Midland Cogeneration. Midland County, MI	GCP*	1,000 lb/MWh (as CO_2e)
IL-0133	7/29/2022	NGCC	Lincoln Land Energy Center Sangamon County, IL	GCP*	850 lb/MWh (as CO_2e)
AK-0088	7/07/2022	NGCC	Alaska Gasline Development Corp Kenai Peninsula Borough, AK	GCP*	117.1 lb/MMBTU (as CO_2e)
MI-0451	6/23/2022	NGCC	Marshall Energy Center, LLC Calhoun County, MI	GCP*	806 lb/MWh (as CO_2e)
LA-0391	6/03/2022	NGCC	Magnolia Power LLC Iberville Parish, LA	GCP*	875 lb/MWh (as CO_2e)
FL-0371	6/07/2021	NGCC	Shady Hills Energy Center, LLC Pasco County, FL	LEF**	875 lb/MWh (as CO_2e)
MI-0447	1/07/2021	NGCC	Lansing Board of Water and Light Eaton County, MI	GCP*	1,000 lb/MWh (as CO_2e)
WI-0300	9/01/2020	NGCC	Nemadji Trail Energy Center Douglas County, WI	GCP*	850 lb/MWH (as CO_2e)
WI-0306	2/28/2020	NGCC	WPL - Riverside Energy Center Douglas County, WI	GCP*	118.0 lb/MMBTU (as CO_2e)
LA-0364	1/06/2020	NGCC	FG LA, LLC St. James Parish, LA	GCP*	117.1 lb/MMBTU (as CO_2e)

*GCP – Good Combustion Practices and Efficient Turbine Design **Low Emitting Fuel

The search returned 12 facilities for category 15.210 natural gas combined cycle combustion turbines with HRSG for which GHG BACT limits have been published. The control method described for most of the facilities was good combustion practices with efficient turbine design. Several facilities also identified pollution prevention through the use of low-carbon fuel (i.e., natural gas). Only two of the facilities (Alaska Gasline Development Corporation and FG LA, LLC) were industrial facilities rather than electricity generation facilities, and these facilities were assigned limits in units of pounds per million British thermal units (BTU) of heat input rather than pounds per megawatt-hour of power output.

PCA proposes the following as BACT for GHG for the proposed combined cycle unit:

- Use of combined-cycle technology,
- CT energy efficiency designs, practices, and procedures,
- HRSG energy efficiency designs, practices, and procedures, and
- Use of natural gas as fuel.

Proposed BACT Emissions Limits for the Combined Cycle Combustion Turbine/HRSG

PCA proposes 117.1 pounds per million BTU and 502,141 tons per year CO_2e emission limits as GHG BACT for all operating cases, including during periods of startup and shutdown, averaged on a 12-month rolling annual basis.

These numerical GHG BACT emission limits are based on the exclusive use of natural gas in the combined cycle unit. Compliance with these emission limits will be demonstrated by measuring and recording the total heat input to the combined cycle unit expressed in million BTU per year. CO_2 emissions will be calculated using the methodology for calculating CO_2 emissions in 40 CFR Part 98 Subpart C.

Annual methane and nitrous oxide emission rates will be calculated using emissions factors as defined in the Mandatory Greenhouse Gas Reporting Rule (40 CFR Part 98), Table C-2. CO_2e emissions will then be calculated using each GHG pollutant's respective Global Warming Potential (GWP) as defined in the Mandatory Greenhouse Gas Reporting Rule, Table A-1.

5.3.2 PM_{10} and $PM_{2.5}$

5.3.2.1 Formation

Particulate matter (PM) emissions from combined cycle units are a combination of filterable (front-half) and condensable (back-half) particles. Filterable PM is formed from impurities contained in the fuels and from incomplete combustion. Condensable PM, which is aggregated with filterable PM when quantifying total PM_{10} and $PM_{2.5}$ emission rates, is attributable primarily to the formation of sulfates and possibly organic compounds.

5.3.2.2 Availability, Technical Feasibility, and Control Alternatives Ranking (Steps 1-4)

When the original NSPS for Stationary Gas Turbines (40 CFR 60 Subpart GG) was promulgated in 1979, EPA recognized that "particulate emissions from stationary gas turbines are minimal." The Agency noted that PM control devices are not typically installed on combustion turbines and that the cost of installing a PM control device on this source type is prohibitive.[15] Consequently, performance standards for control of PM emissions from stationary combustion turbines were not proposed or promulgated as part of Subpart GG.

When the updated NSPS for stationary combustion turbines (40 CFR 60 Subpart KKKK) was proposed in 2005, EPA declined to establish emission limits on PM for this source type because "...particulate matter emissions are negligible with natural gas firing due to the low sulfur content of natural gas. Emissions of PM are only marginally significant with distillate oil firing because of the lower ash content..."[16] Additionally, at that time EPA determined that no combustion turbines permitted since 2003 utilized add-on controls.

The top-level PM control method demonstrated for natural gas-fired combined cycle units is the use of low-ash and low-sulfur fuel (i.e., natural gas). Proper combustion control and the firing of fuels with negligible or zero ash content and low sulfur content is the only PM control method listed in any of the combined-cycle unit listings in the RBLC (see Table 5-3 below).

Add-on controls, such as electrostatic precipitators (ESPs) or baghouses, have never been applied to commercial natural gas-fired combined cycle units. The use of ESPs and baghouses are considered technically infeasible and do not represent available control technology for PM emissions from natural gas-fired combined cycle units.

Proper combustion and the use of natural gas as fuel is considered technically feasible and the top level of particulate matter control for combined cycle units. According to the data provided in EPA's RBLC, the typical emission rates determined to represent BACT for total PM_{10} and $PM_{2.5}$ emissions from natural gas-fired combined cycle units are in the range of 0.0037 to 0.0090 pound per million BTU. However, it must be noted that a large degree of uncertainty exists with this range because the emission limits reported to the RBLC do not always clarify whether the emissions are filterable PM only or include filterable and condensable PM emissions. PM emissions vary with turbine make, model, heat input rate, sulfur content of natural gas, and post combustion control impacts to formation of condensable PM. Additionally, many of the RBLC listings do not describe the reported PM

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[15] 44 Fed. Reg. 52,792, 52,798 (Sept. 10, 1979); EPA, Standards Support and Envtl. Impact Statement Volume 1: Proposed Standards of Performance for Stationary Gas Turbines, at 8-6 (Sept. 1977).

Table 5-3. RBLC Listings of PM_{10} and $PM_{2.5}$ Emissions from NGCC Units Since January 1, 2020

ID Number	Date	Unit Type	Company / Location	Control	Emission Limit
IN-0382	2/14/2025	NGCC	Duke Energy Indiana, Inc. Vermillion County, IN	GCP*	0.0042 lb/MMBTU
WI-0326	9/19/2023	NGCC	Nemadji Trail Energy Center Douglas County, WI	GCP*	0.0078 lb/MMBTU
IN-0365	6/19/2023	NGCC	Maple Creek Energy, LLC Sullivan County, IN	GCP*	0.0049 lb/MMBTU
TX-0939	3/13/2023	NGCC	Entergy Texas, Inc. Orange County, TX	GCP*	0.0050 lb/MMBTU
MI-0455	2/01/2023	NGCC	Midland Cogeneration. Midland County, MI	GCP*	0.0082 lb/MMBTU
MI-0454	12/20/2022	NGCC	Lansing Board of Water and Light Eaton County, MI	GCP*	0.0090 lb/MMBTU
IL-0133	7/29/2022	NGCC	Lincoln Land Energy Center Sangamon County, IL	GCP*	0.0041 lb/MMBTU
AK-0088	7/07/2022	NGCC	Alaska Gasline Development Kenai Peninsula Borough, AK	GCP*	0.0070 lb/MMBTU
MI-0451	6/23/2022	NGCC	Marshall Energy Center, LLC Calhoun County, MI	GCP*	0.0062 lb/MMBTU
LA-0391	6/03/2022	NGCC	Magnolia Power LLC Iberville Parish, LA	GCP*	0.0080 lb/MMBTU
WV-0033	1/05/2022	NGCC	Mountain State Clean Energy, LLC Monongalia County, WV	GCP*	0.0060 lb/MMBTU
FL-0371	6/07/2021	NGCC	Shady Hills Energy Center, LLC Pasco County, FL	CF**	1.4 gr S / 100 scf natural gas
VA-0335	12/18/2020	NGCC	Panda Stonewall LLC Loudoun County, VA	GCP*	0.0037 lb/MMBTU
AL-0328	11/09/2020	NGCC	Alabama Power Company Barry Steam Plant	GCP*	0.0040 lb/MMBTU
LA-0364	1/06/2020	NGCC	FG LA, LLC St. James Parish, LA	GCP*	0.0058 lb/MMBTU

*Use of good combustion practices and combustion of pipeline-quality natural gas **Use of clean fuels

species (PM_{10} or $PM_{2.5}$), test method, or whether the emission rate has been achieved in practice.

[16] 70 Fed. Reg. 8,314, 8,321 (Feb. 18, 2005).

5.3.2.3 Selection of PM_{10} and $PM_{2.5}$ BACT (Step 5)

The use of good combustion practices and firing pipeline-quality natural gas are determined to be representative of BACT for PM_{10} and $PM_{2.5}$ emissions from combined-cycle units. PM emission rates from these units vary depending upon the manufacturer, turbine size, sulfur content of the fuel, and the resulting available vendor performance guarantees. During normal operating conditions, the proposed Combustion Turbine with HRSG will meet an emission limitation of 6.85 pounds per hour for PM_{10} and $PM_{2.5}$ which includes both filterable and condensable PM and is equivalent to 0.0070 pound per million BTU of natural gas fuel heat input. Therefore, the exclusive use of natural gas with an emission limit of 6.85 pounds per hour is proposed as the BACT limit for total PM_{10} and for total $PM_{2.5}$ emissions from the Combustion Turbine with HRSG.

APPENDIX A

Project Emissions Inventory

Table A-1. Project PSD Analysis Summary - Combustion Turbine with HRSG
Packaging Corporation of America - Jackson Mill

	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	NO_x (tpy)	CO (tpy)	VOC (tpy)	CO_2e (tpy)	Lead (tpy)	Sulfuric Acid (tpy)
Potential Emissions										
Combustion Turbine with HRSG	21.44	30.02	30.02	10.84	116.00	98.62	16.89	502,141	0.0021	1.66
TOTAL	**21.44**	**30.02**	**30.02**	**10.84**	**116.00**	**98.62**	**16.89**	**502,141**	**0.0021**	**1.66**
Baseline Actual Emissions										
No. 3, No. 4, and No. 5 Package Boilers (NOx Only)	N/A	N/A	N/A	N/A	76.58	N/A	N/A	N/A	N/A	N/A
TOTAL	**0.00**	**0.00**	**0.00**	**0.00**	**76.58**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Emission Increase [PE - BAE]	**21.44**	**30.02**	**30.02**	**10.84**	**39.42**	**98.62**	**16.89**	**502,141**	**0.0021**	**1.66**
PSD Significant Emission Rates	25	15	10	40	40	100	40	75,000	0.6	7
PSD Triggered?	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**Yes**	**No**	**No**

Emission Unit Description: Combustion Turbine with HRSG

EU ID No.: X038

Control Device Description:	Low NOx Burners, SCR, Oxidation Catalyst
Fuels Permitted for Processing/Firing:	Natural Gas
Hourly Natural Gas Turbine Heat Input (MMBTU/hr):	675
Hourly Natural Gas Duct Burner Heat Input (MMBTU/hr):	304
Hourly Natural Gas Heat Input (MMBtu/hr):	979
Annual Natural Gas Heat Input (MMBtu/yr):	8,576,040
Annual Operating Hours (hrs/yr):	8,760

Table A-2. Total Criteria/PSD Pollutant Emissions from the Combustion Turbine with HRSG

Compound	Emission Factor (lb/MMBtu) Natural Gas	Emission Factor Reference	Emission Rate [h, i] (lb/hr)	(tpy)
Filterable PM	5.00E-03	a	4.90	21.44
Total PM	7.00E-03	b	6.85	30.02
Total PM_{10}	7.00E-03	b	6.85	30.02
Total $PM_{2.5}$	7.00E-03	b	6.85	30.02
SO_2				
Gas Turbine	3.40E-03	c	2.30	10.05
Duct Burner	5.88E-04	d	0.18	0.78
Total			2.47	10.84
NO_X	2.49E-02	e	24.37	106.74
CO	2.30E-02	e	22.52	98.62
VOC				
Gas Turbine	2.10E-03	c	1.42	6.21
Duct Burner	8.02E-03	d	2.44	10.68
Total			3.86	16.89
CO_2e	117.10	f	114,644.03	502,140.86
Lead	4.90E-07	c	4.80E-04	2.10E-03
Sulfuric Acid	See Note Below	g	0.38	1.66

a. The filterable PM emission limit is based upon the proposed regulatory emission limit.
b. The total PM-10 and total PM-2.5 emission limits are based upon proposed BACT limits.
c. AP-42 Section 3.1, *Stationary Gas Turbines* (April 2000), Table 3.1-2a.
d. AP-42 Section 1.4, *Natural Gas Combustion* (July 1998), Tables 1.4-1, 1.4-2 and 1.4-3, converted from lb/MMscf to lb/MMBtu using 1,020 BTU/scf. VOC emission factor is based upon the sum of the individual compounds in Table 1.4-3.
e. NOx and CO emissions are based upon the proposed regulatory emission limits. The NOx limit is a combined limit for X020, X025, X029 and X038.
f. CO2e emission factor is based upon natural gas factors from Tables C-1 and C-2 of 40 CFR Part 98.
g. Sulfuric acid emissions are estimated assuming that 10% of sulfur dioxide emissions are oxidized to SO_3, and 100% of SO_3 is converted to sulfuric acid mist.
h. Emission Rate (lb/hr) = Emission Factor (lb/MMBtu) * Hourly Heat Input (MMBtu/hr)
i. Emission Rate (tpy) = Emission Factor (lb/MMBtu) * Annual Heat Input (MMBtu/yr) * (ton/2,000 lb)

Table A-3. Baseline NOx Emissions for No. 3, No. 4, and No. 5 Power Boilers

Month	Natural Gas HHV	PB3 scf	PB4 scf	PB5 scf	PB3 MMBTU	PB4 MMBTU	PB5 MMBTU	PB3 lb/MMBTU	PB4 lb/MMBTU	PB5 lb/MMBTU	PB3 tons NOx	PB4 tons NOx	PB5 tons NOx	Total tons NOx	24-Mo Rolling
Jan-23	1.0280	11,351,400	54,428,300	57,102,000	11,669	55,952	58,701	0.030	0.037	0.032	0.175	1.035	0.939	2.149	
Feb-23	1.0244	27,658,100	105,575,000	96,782,400	28,333	108,151	99,144	0.031	0.040	0.032	0.439	2.163	1.586	4.188	
Mar-23	1.0222	0	132,228,300	122,891,500	0	135,164	125,620	0.031	0.040	0.036	0.000	2.703	2.261	4.964	
Apr-23	1.0210	60,300,500	115,551,900	106,404,300	61,567	117,978	108,639	0.030	0.041	0.032	0.924	2.419	1.738	5.080	
May-23	1.0213	104,425,100	117,606,100	108,164,900	106,649	120,111	110,469	0.028	0.039	0.030	1.493	2.342	1.657	5.492	
Jun-23	1.0236	97,128,700	106,598,600	97,837,800	99,421	109,114	100,147	0.028	0.038	0.027	1.392	2.073	1.352	4.817	
Jul-23	1.0244	88,152,900	125,918,300	117,668,600	90,304	128,991	120,540	0.028	0.036	0.034	1.264	2.322	2.049	5.635	
Aug-23	1.0217	97,971,600	124,293,400	110,562,800	100,098	126,991	112,962	0.026	0.032	0.027	1.301	2.032	1.525	4.858	
Sep-23	1.0206	105,243,200	133,184,200	111,370,700	107,411	135,928	113,665	0.027	0.035	0.027	1.450	2.379	1.534	5.363	
Oct-23	1.0204	116,881,600	133,499,700	138,373,100	119,266	136,223	141,196	0.031	0.037	0.034	1.849	2.520	2.400	6.769	
Nov-23	1.0223	126,046,200	135,321,700	149,798,200	128,857	138,339	153,139	0.033	0.038	0.037	2.126	2.628	2.833	7.588	
Dec-23	1.0191	133,168,700	142,688,000	156,191,800	135,712	145,413	159,175	0.034	0.039	0.039	2.307	2.836	3.104	8.247	
Jan-24	1.0285	155,584,076	137,084,610	171,895,796	160,018	140,992	176,795	0.042	0.039	0.040	3.360	2.749	3.536	9.646	
Feb-24	1.0261	81,141,504	107,090,400	119,577,620	83,259	109,885	122,699	0.040	0.037	0.034	1.665	2.033	2.086	5.784	
Mar-24	1.0217	49,977,860	65,347,683	52,757,056	51,062	66,766	53,902	0.033	0.039	0.028	0.843	1.302	0.755	2.899	
Apr-24	1.0194	119,529,944	122,914,418	117,590,694	121,849	125,299	119,872	0.037	0.033	0.026	2.254	2.067	1.558	5.880	
May-24	1.0207	134,843,568	136,916,067	132,205,531	137,635	139,750	134,942	0.039	0.029	0.026	2.684	2.026	1.754	6.465	
Jun-24	1.0238	111,868,856	113,797,243	108,999,334	114,531	116,506	111,594	0.035	0.035	0.022	2.004	2.039	1.228	5.271	
Jul-24	1.0264	113,309,269	115,315,200	109,566,794	116,301	118,360	112,459	0.034	0.036	0.021	1.977	2.130	1.181	5.288	
Aug-24	1.0286	121,642,932	123,748,794	119,391,871	125,122	127,288	122,806	0.037	0.034	0.023	2.315	2.164	1.412	5.891	
Sep-24	1.0266	123,377,395	122,385,288	121,142,901	126,659	125,641	124,365	0.035	0.033	0.024	2.217	2.073	1.492	5.782	
Oct-24	1.0252	132,547,895	134,017,260	129,970,161	135,888	137,394	133,245	0.039	0.033	0.025	2.650	2.267	1.666	6.582	
Nov-24	1.0239	135,095,744	136,610,202	134,678,614	138,325	139,875	137,897	0.040	0.032	0.026	2.766	2.238	1.793	6.797	
Dec-24	1.0248	159,445,055	159,936,438	160,488,360	163,399	163,903	164,468	0.039	0.033	0.031	3.186	2.704	2.549	8.440	139.88
Jan-25	1.0265	159,599,246	164,690,852	166,660,139	163,829	169,055	171,077	0.041	0.035	0.033	3.358	2.958	2.823	9.140	146.87
Feb-25	1.0247	140,518,920	146,758,286	150,105,205	143,990	150,383	153,813	0.038	0.032	0.031	2.736	2.406	2.384	7.526	150.20
Mar-25	1.0242	88,170,663	140,654,091	143,895,579	90,304	144,058	147,378	0.037	0.031	0.028	1.671	2.233	2.063	5.967	151.21
Apr-25	1.0227	80,591,846	100,074,538	102,521,611	82,421	102,346	104,849	0.036	0.035	0.026	1.484	1.791	1.363	4.638	150.76
May-25	1.0238	122,468,718	128,660,623	133,089,254	125,383	131,723	136,257	0.032	0.032	0.028	2.006	2.108	1.908	6.021	151.29
Jun-25	0.9724	121,656,016	127,591,597	132,052,569	118,298	124,070	128,408	0.033	0.030	0.028	1.952	1.861	1.798	5.611	152.09
Jul-25	1.0228	130,684,785	135,948,775	115,847,640	133,664	139,048	118,489	0.032	0.030	0.026	2.139	2.086	1.540	5.765	152.22
Aug-25	1.0228	107,060,051	123,037,401	137,126,321	109,501	125,843	140,253	0.034	0.031	0.027	1.862	1.951	1.893	5.705	153.06
Sep-25	1.0221	113,592,172	119,680,860	121,306,674	116,103	122,326	123,988	0.038	0.028	0.025	2.206	1.713	1.550	5.468	153.17
Oct-25	1.0220	125,578,461	131,987,633	133,670,587	128,341	134,891	136,611	0.041	0.025	0.027	2.631	1.686	1.844	6.161	152.56

Calculation of Hourly NOx Emission Limit

Proposed NOx Concentration Limit = 6.0 ppmvd corrected to 15% oxygen (30-day rolling average)

Derivation of NOx concentration at stack conditions (C_s):

6.0 = C_s x (20.9 - 15) / (20.9 - 12) where 12% is the stack dry oxygen concentration

C_s = 9.05 ppmvd

Derivation of NOx hourly mass emission rate (M) from stack NOx concentration:

M = (46 lb/lb-mole) x (9.05 x 10^{-6} lb NOx / lb) x (375,800 scf/min) x (60 min/hr) / (385.23 scf / lb-mole)

M = 24.37 lb/hr NOx

APPENDIX B

Permit Application Forms

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION ADEM FORM 103

Do not Write in This Space

Facility Number [| |] - [| | |]

CONSTRUCTION/OPERATING PERMIT APPLICATION FACILITY IDENTIFICATION FORM

1. Name of Facility or Organization: Packaging Corporation of America

Plant Name: Jackson Mill

Facility Physical Location Address

Street & Number: 4585 Industrial Road

City: Jackson County: Clarke Zip: 36545

Facility Mailing Address (If different from above)

Mailing Contact: See Above Address

Address or PO Box:

City: State: Zip:

Facility Billing Address

2. Billing Contact: William N. Davis

Street & Number: 4585 Industrial Road

City: Jackson State: Alabama Zip: 36545

Telephone Number: (251) 246-8242 E-mail Address: BillDavis@packagingcorp.com

Responsible Official's Business Mailing Address

3. Responsible Official: David R. Powell Title: Mill Manager

Street & Number: 4585 Industrial Road

City: Jackson State: Alabama Zip: 36545

Telephone Number: (251) 246-4461 E-mail Address: RyanPowell@packagingcorp.com

RO under delegated authority? ☒ Yes ☐ No (if "yes", provide appropriate documentation)

Plant Contact Information

4. Plant Contact: William N. Davis Title: Senior Environmental Engineer

Telephone Number: (251) 246-8242 E-mail Address: BillDavis@packagingcorp.com

5. Location Coordinates:				
UTM:	414.595 km	E-W	3,484.733 km	N-S
Latitude/Longitude:	31.49417 deg	LAT	-087.89917 deg	LONG

6. Permit application is being made to obtain the following type permit:

- [x] Air permit
- [ ] Major source operating permit
- [ ] Synthetic minor source operating permit

7. Permit application is made for:

- [ ] Existing source (initial application)
- [ ] Existing source (permit renewal)
- [ ] Modification
- [x] New source (to be constructed)
- [ ] Change of ownership
- [ ] Other (specify) ____

Date construction/modification to begin: July 1, 2026 to be completed: June 30, 2027

8. Indicate the number of each of the following forms attached and made a part of this application (if a form does not apply to your operation, indicate "N/A" in the space provided). Multiple forms may be used as required.

4	ADEM 104 INDIRECT HEATING EQUIPMENT
N/A	ADEM 105 MANUFACTURING OR PROCESSING OPERATION
N/A	ADEM 106 REFUSE HANDLING, DISPOSAL, AND INCINERATION
1	ADEM 107 STATIONARY INTERNAL COMBUSTION ENGINES
N/A	ADEM 108 LOADING, STORAGE & DISPENSING LIQUID & GASEOUS ORGANIC COMPOUNDS
N/A	ADEM 109 VOLATILE ORGANIC COMPOUND SURFACE COATING EMISSION SOURCES
2	ADEM 110 AIR POLLUTION CONTROL DEVICE
N/A	ADEM 112 SOLVENT METAL CLEANING
N/A	ADEM 437 COMPLIANCE SCHEDULE
10	ADEM 438 CONTINUOUS EMISSION MONITORS

9. General nature of business: (describe and list appropriate standard industrial classification (SIC) and North American Industry Classification System (NAICS) (www.naics.com) code(s)):

SIC Code 2631 - Paperboard Mills

NAICS Code 322130 - Paperboard Mills

10. Summarize each pollutant emitted and the potential facility-wide annual emission rate for the pollutant. Indicate those pollutants for which the facility is major.

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
Not Applicable		Yes No
		Yes No
		Yes No
		Yes No
		Yes No
		Yes No
		Yes No
		Yes No
		Yes No
		Yes No
		Yes No
		Yes No
		Yes No
		Yes No
		Yes No
		Yes No
		Yes No
		Yes No
		Yes No
		Yes No
		Yes No

*Potential emissions are either the maximum allowed by the regulations or by permit, or, if there is no regulatory limit, it is the emissions that occur from continuous operation at maximum capacity.

11. Provide a scaled map which contains clearly marked emission points, building locations, property boundaries, and directions (North, etc.). Labeling of emission points should be consistent across all forms.

12. Indicate the compliance status by program for each emission unit or source and the method used to determine compliance. Also cite the specific applicable requirement.

Emission unit or source: Not Applicable

(description)

Emission Point No.	Pollutant[4]	Standard	Program[1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
					☐	☐
					☐	☐
					☐	☐
					☐	☐
					☐	☐
					☐	☐
					☐	☐
					☐	☐
					☐	☐
					☐	☐
					☐	☐

[1]PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)),SIP regulation, Title IV, Enhanced Monitoring, Title VI, Other (specify)

[2]Attach compliance plan

[3]Attach compliance schedule (ADEM Form-437)

[4]Fugitive emissions must be included as separate entries

13. For those applying for a major source operating permit, list all insignificant activities and the basis for listing them as such (i.e., less than the insignificant activity thresholds or on the list of insignificant activities). Attach any documentation needed, such as calculations. No unit subject to an NSPS, NESHAP or MACT standard can be listed as insignificant.

Insignificant Activity	Basis
Not Applicable	

14. List and explain any facility-wide exemptions from applicable requirements the facility is claiming:

a.
b.
c.
d.
e.
f.
g.
h.
i.

15. List below other attachments that are a part of this application(all supporting engineering calculations must be appended):

a. Supporting Emission Calculations
b. BACT Review
c. Air Quality Impacts Analysis
d. Delegation of Authority
e.
f.
g.
h.
i.

Name of person preparing application: Donald W. Spivey

Company of preparer: Spivey Engineering Solutions, LLC

Phone (334) 202-2344 Email: donspivey@spiveyengineering.com

Signature: Donald W. Spivey Date: 12/17/2025

I CERTIFY UNDER PENALTY OF LAW THAT, BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE STATEMENTS AND INFORMATION CONTAINED IN THIS APPLICATION ARE TRUE, ACCURATE AND COMPLETE.

I ALSO CERTIFY THAT THE SOURCE WILL CONTINUE TO COMPLY WITH APPLICABLE REQUIREMENTS FOR WHICH IT IS IN COMPLIANCE, AND THAT THE SOURCE WILL, IN A TIMELY MANNER, MEET ALL APPLICABLE REQUIREMENTS THAT WILL BECOME EFFECTIVE DURING THE PERMIT TERM AND SUBMIT A DETAILED SCHEDULE, IF NEEDED FOR MEETING THE REQUIREMENTS.

[signature]	Mill Manager	1/22/26
SIGNATURE OF RESPONSIBLE OFFICIAL	TITLE	DATE

PACKAGING CORPORATION OF AMERICA

April 10, 2025

Re: DELEGATION OF SIGNATORY AUTHORIZATION

The following people are authorized to sign as Official Agents (designated Responsible Official "RO") for Packaging Corporation of America, Jackson, Alabama Mill (Mill), whenever signatures and certifications are required for environmental reporting required by various state and federal agencies, including but not limited to the Alabama Department of Environmental Management, United States Environmental Protection Agency, U.S. Energy Information Administration, and/or trade associations relating to the Mill:

Mill Manager
Operations Manager
Environmental Manager
Environmental Engineer
Production Manager
Pulp & Power Manager
Project Engineer *(for Radioactive or Asbestos Containing Materials only)*

These signatory authorizations include correspondence and reports related to the following Mill permits and/or regulatory programs:

- Storm Water
- Land Application System
- TSCA Form U
- NPDES Reports
- Landfill Operation
- CAA
- CERCLA/EPCRA/SARA
- RCRA
- FERC
- Radioactive Materials
- Asbestos Containing Materials
- Electronic reporting submissions, where applicable or available (without a "designated or delegated RO" step required), including but not limited to e-GGRT (GHG Reporting), E-Plan (Tier II), EIA Annual Reports.
- Other reporting requirements or requests for information by state and/or federal agencies.

The following submissions will require the signature of the Mill Manager or Vice President & Area Mill Manager:

- U.S. EPA requests for information
- Title V Annual Compliance Certification and Reports
- Air Construction Permit Applications and Title V Permit Renewals
- Title V Quarterly Reports
- Title V and other air regulatory Semi-Annual reports
- Title V and other air regulatory Performance Test or Evaluation Reports
- NPDES Permit Applications or Renewals
- EPA/CDX CEDRI and TRI-Me WEB reports (RO electronic certification required in final step)

Jack Carter
Executive Vice President, Container Board Operations

4/10/25
Date

{180195:0000:02003986: }
4865-2399-5570, v. 1

ADEM

PERMIT APPLICATION FOR INDIRECT HEATING EQUIPMENT
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
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1. Name of facility or organization: Packaging Corporation of America - Jackson Mill

2. Unit Description (i.e. No. 1 Power Boiler): Heat Recovery Steam Generator with Duct Burners

   Source Classification Code(s): 1-02-006-01

   Equipment manufacturer's information

   Name of manufacturer: Nooter/Erikson (HRSG) and Coen (Duct Burners)

   Model number: 92780 (HRSG) and 40-D-11842-1 (Duct Burners)

   Rated capacity-input: 304 (MMBtu/hr.)

   Boiler type: ☐ Fire Tube ☒ Water Tube ☐ Other (specify): ______

   Manufactured date: 1999

   Proposed installation date: July 2026

   Original installation date (if existing): N/A

   Reconstruction/Modification date (if applicable): N/A

3. Type of fuel used:

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas	1,020	Btu/ft^3	0.6 gr/100 scf	N/A		
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

4. Purpose (if multipurpose, note percent in each use category):

- ☐ Space heat ______ %
- ☒ Power generation 90 %
- ☒ Process heat 10 %
- ☐ Other (specify) ______ % ______

5. Normal schedule of operation:

Hours per day: 24 Days per week: 7 Weeks per year: 52

6. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions:

N/A

7. Are you requesting a limitation for permitting? ☐Yes ☒No if "yes", specify the limit and affected unit(s):

8. Is there any emission control equipment on this emission source?

☒Yes ☐No (If "yes", ADEM Form 110 must be completed and attached)

9. Stack data (if a control device is installed, the information should be for the control device's stack exit; if multiple stacks associated, provide additional sheet):

Stack No. & Description: X038 - Combustion Turbine with Duct Burner Stack Type: V

Stack UTM Coordinate (E-W)	414.427	(km)	Stack UTM Coordinate (N-S)	3484.417	(km)
Latitude	31.49143	(LAT)	Longitude	-87.9010	(LONG)
Height above grade	212	(ft)	Gas temperature at exit	303	(ºF)
Inside diameter at exit (round)	12.75	(ft)	Gas Velocity	78.10	(ft/Sec)
Inside area at exit (not round)	N/A	(ft^2)	Volume of gas discharged	598,300	(ACFM)
Base Elevation	41	(ft)	GEP Stack Height	212	(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☑Yes ☐No :

Is this a merged stack (do multiple units use this release point)? ☑Yes ☐No

If yes, provide units: Combustion Turbine and HRSG

10. Is this item subject to the Transport Rule 335-3-8-.07 or NOX Budget Program under 335-3-8-.71?

☐ Yes ☑ No If "Yes", provide ORIS Plant and Unit ID:______

11. Is this item in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No if "No", a compliance schedule, ADEM Form 437, must be attached.)

12. Fugitive Emissions:

POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS lb/hr	UNCONTROLLED POTENTIAL EMISSIONS ton/yr	CONTROLLED POTENTIAL EMISSIONS lb/hr	CONTROLLED POTENTIAL EMISSIONS ton/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative Unit of Measure
Total Particulate						
PM-10 Filterable						
PM-2.5 Filterable						
PM-Condensible						
Sulfur dioxide						
Nitrogen oxides						
Carbon monoxide						
VOC's						

Attach calculation worksheets. Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

13. Point Emissions:

POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS lb/hr	UNCONTROLLED POTENTIAL EMISSIONS ton/yr	CONTROLLED POTENTIAL EMISSIONS lb/hr	CONTROLLED POTENTIAL EMISSIONS ton/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative Unit of Measure
Total Particulate	0.57	2.48			AP-42 Emission Factor	N/A
PM-10 Filterable	0.57	2.48			AP-42 Emission Factor	N/A
PM-2.5 Filterable	0.57	2.48			AP-42 Emission Factor	N/A
PM-Condensible	1.70	7.44			AP-42 Emission Factor	N/A
Sulfur dioxide	0.18	0.78			AP-42 Emission Factor	4.0 lb/MMBTU
Nitrogen oxides			24.37	106.74	Regulatory Limit	6.0 ppmvd @ 15% O2 (with combustion turbine)
Carbon monoxide			22.52	98.62	Regulatory Limit	0.023 lb/MMBTU (with combustion turbine)
VOC's	2.44	10.68			AP-42 Emission Factor	N/A
Greenhouse Gases	114,644	502,141			Regulatory Limit	117.10 lb/MMBTU (with combustion turbine)

Attach calculation worksheets. Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

Name of person preparing application: William N. Davis, Senior Environmental Engineer

Company of preparer: Packaging Corporation of America

Signature: [signature] Date: 12.17.25

ADEM

PERMIT APPLICATION FOR INDIRECT HEATING EQUIPMENT
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
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1. Name of facility or organization: Packaging Corporation of America - Jackson Mill

2. Unit Description (i.e. No. 1 Power Boiler): No. 3 Power Boiler

   Source Classification Code(s): 1-02-006-01

   Equipment manufacturer's information

   Name of manufacturer: Combustion Engineering, Inc.

   Model number: 124F40A16-54"

   Rated capacity-input: 343.4 (MMBtu/hr.)

   Boiler type: ☐ Fire Tube ■ Water Tube ☐ Other (specify): ______

   Manufactured date: 1991

   Proposed installation date: N/A

   Original installation date (if existing): 1991

   Reconstruction/Modification date (if applicable): N/A

3. Type of fuel used:

   Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas	1,026	Btu/ft^3	0.5 gr/100 scf	0.10		
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

   Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

4. Purpose (if multipurpose, note percent in each use category):

- ☐ Space heat ______ %
- ■ Power generation 27 %
- ■ Process heat 73 %
- ☐ Other (specify) ______ % ______

5. Normal schedule of operation:

Hours per day: 24 Days per week: 7 Weeks per year: 52

6. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions:
N/A

7. Are you requesting a limitation for permitting? ■Yes ☐No if "yes", specify the limit and affected unit(s):
The combined NOx emissions from the No. 3 Power Boiler, the No. 4 Power Boiler, the No. 5 Power Boiler, and the Combustion Turbine with Heat Recovery Steam Generator shall not exceed 116.0 tons per year on a 12-month rolling total basis.

8. Is there any emission control equipment on this emission source?

☐Yes ■No (If "yes", ADEM Form 110 must be completed and attached)

9. Stack data (if a control device is installed, the information should be for the control device's stack exit; if multiple stacks associated, provide additional sheet):

Stack No. & Description: X020 - No. 3 Power Boiler Stack Type: V

Stack UTM Coordinate (E-W)	414.646	(km)	Stack UTM Coordinate (N-S)	3484.228	(km)
Latitude	31.48972	(LAT)	Longitude	-87.89866	(LONG)
Height above grade	200	(ft)	Gas temperature at exit	310	(ºF)
Inside diameter at exit (round)	7.5	(ft)	Gas Velocity	39.0	(ft/Sec)
Inside area at exit (not round)	N/A	(ft^2)	Volume of gas discharged	103,250	(ACFM)
Base Elevation	45	(ft)	GEP Stack Height	200	(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☑Yes ☐No :

Is this a merged stack (do multiple units use this release point)? ☐Yes ■No

If yes, provide units:

10. Is this item subject to the Transport Rule 335-3-8-.07 or NOX Budget Program under 335-3-8-.71?

☐ Yes ☑ No If "Yes", provide ORIS Plant and Unit ID:______

11. Is this item in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No if "No", a compliance schedule, ADEM Form 437, must be attached.)

12. Fugitive Emissions:

POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT
	lb/hr	ton/yr	lb/hr	ton/yr		Provide in lb/hr or specify alternative Unit of Measure
Total Particulate						
PM-10 Filterable						
PM-2.5 Filterable						
PM-Condensible						
Sulfur dioxide						
Nitrogen oxides						
Carbon monoxide						
VOC's						

Attach calculation worksheets. Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

13. Point Emissions:

POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT
	lb/hr	ton/yr	lb/hr	ton/yr		Provide in lb/hr or specify alternative Unit of Measure
Total Particulate	0.64	2.78			AP-42 Emission Factor	1.64 lb/hr
PM-10 Filterable	0.64	2.78			AP-42 Emission Factor	N/A
PM-2.5 Filterable	0.64	2.78			AP-42 Emission Factor	N/A
PM-Condensible	1.91	8.36			AP-42 Emission Factor	N/A
Sulfur dioxide	0.20	0.88			Regulatory Limit	0.2 lb/hr
Nitrogen oxides	17.2	75.2			Regulatory Limit	0.05 lb/MMBTU and/or 17.2 lb/hr and 116.0 tons/yr combined source limit
Carbon monoxide	30.9	135.4			Regulatory Limit	0.09 lb/MMBTU
VOC's	3.43	15.0			Regulatory Limit	3.43 lb/hr
Greenhouse Gases	40,211	176,126			40 CFR Part 98 Tables C-1 and C-2	N/A

Attach calculation worksheets. Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

Name of person preparing application: William N. Davis, Senior Environmental Engineer

Company of preparer: Packaging Corporation of America

Signature: ______________ Date: 1/21/26

ADEM

PERMIT APPLICATION FOR INDIRECT HEATING EQUIPMENT
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
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1. Name of facility or organization: Packaging Corporation of America - Jackson Mill
2. Unit Description (i.e. No. 1 Power Boiler): No. 4 Power Boiler

   Source Classification Code(s): 1-02-006-01

   Equipment manufacturer's information

   Name of manufacturer: Combustion Engineering, Inc.

   Model number: 124F40A16-54"

   Rated capacity-input: 346.4 (MMBtu/hr.)

   Boiler type: ☐ Fire Tube ☒ Water Tube ☐ Other (specify):

   Manufactured date: 1995

   Proposed installation date: N/A

   Original installation date (if existing): 1995

   Reconstruction/Modification date (if applicable): N/A

3. Type of fuel used:

   Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas	1,026	Btu/ft^3	0.5 gr/100 scf	0.10		
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

4. Purpose (if multipurpose, note percent in each use category):

- ☐ Space heat ____ %
- ■ Power generation 27 %
- ■ Process heat 73 %
- ☐ Other (specify) ____ % ____

5. Normal schedule of operation:

Hours per day: 24 Days per week: 7 Weeks per year: 52

6. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions:
N/A

7. Are you requesting a limitation for permitting? ■Yes ☐No if "yes", specify the limit and affected unit(s):
The combined NOx emissions from the No. 3 Power Boiler, the No. 4 Power Boiler, the No. 5 Power Boiler, and the Combustion Turbine with Heat Recovery Steam Generator shall not exceed 116.0 tons per year on a 12-month rolling total basis.

8. Is there any emission control equipment on this emission source?

☐Yes ■No (If "yes", ADEM Form 110 must be completed and attached)

9. Stack data (if a control device is installed, the information should be for the control device's stack exit; if multiple stacks associated, provide additional sheet):

Stack No. & Description: X025 - No. 4 Power Boiler Stack Type: V

Stack UTM Coordinate (E-W)	414.587	(km)	Stack UTM Coordinate (N-S)	3484.157	(km)
Latitude	31.48908	(LAT)	Longitude	-87.89928	(LONG)
Height above grade	200	(ft)	Gas temperature at exit	306	(ºF)
Inside diameter at exit (round)	6.0	(ft)	Gas Velocity	62.1	(ft/Sec)
Inside area at exit (not round)	N/A	(ft^2)	Volume of gas discharged	105,392	(ACFM)
Base Elevation	45	(ft)	GEP Stack Height	200	(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☑Yes ☐No :

Is this a merged stack (do multiple units use this release point)? ☐Yes ■No

If yes, provide units:

10. Is this item subject to the Transport Rule 335-3-8-.07 or NOX Budget Program under 335-3-8-.71?

☐ Yes ☑ No If "Yes", provide ORIS Plant and Unit ID:____

11. Is this item in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No if "No", a compliance schedule, ADEM Form 437, must be attached.)

12. Fugitive Emissions:

POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS lb/hr	UNCONTROLLED POTENTIAL EMISSIONS ton/yr	CONTROLLED POTENTIAL EMISSIONS lb/hr	CONTROLLED POTENTIAL EMISSIONS ton/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative Unit of Measure
Total Particulate						
PM-10 Filterable						
PM-2.5 Filterable						
PM-Condensible						
Sulfur dioxide						
Nitrogen oxides						
Carbon monoxide						
VOC's						

Attach calculation worksheets. Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

13. Point Emissions:

POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS lb/hr	UNCONTROLLED POTENTIAL EMISSIONS ton/yr	CONTROLLED POTENTIAL EMISSIONS lb/hr	CONTROLLED POTENTIAL EMISSIONS ton/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative Unit of Measure
Total Particulate	0.64	2.81			AP-42 Emission Factor	0.005 lb/MMBTU
PM-10 Filterable	0.64	2.81			AP-42 Emission Factor	N/A
PM-2.5 Filterable	0.64	2.81			AP-42 Emission Factor	N/A
PM-Condensible	1.92	8.43			AP-42 Emission Factor	N/A
Sulfur dioxide	0.20	0.89			Regulatory Limit	0.6 lb/MMscf natural gas
Nitrogen oxides	17.32	75.9			Regulatory Limit	0.05 lb/MMBTU and/or 17.32 lb/hr and 116.0 tons/yr combined source limit
Carbon monoxide	31.2	136.6			Regulatory Limit	0.09 lb/MMBTU
VOC's	3.46	15.2			Regulatory Limit	0.01 lb/MMBTU
Greenhouse Gases	40,563	177,665			40 CFR Part 98 Tables C-1 and C-2	N/A

Attach calculation worksheets. Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

Name of person preparing application: William N. Davis, Senior Environmental Engineer

Company of preparer: Packaging Corporation of America

Signature: [signature] Date: 1/21/26

ADEM

PERMIT APPLICATION FOR INDIRECT HEATING EQUIPMENT
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
Do not write in this space

1. Name of facility or organization: Packaging Corporation of America - Jackson Mill

2. Unit Description (i.e. No. 1 Power Boiler): No. 5 Power Boiler

   Source Classification Code(s): 1-02-006-01

   Equipment manufacturer's information

   Name of manufacturer: Combustion Engineering, Inc.

   Model number: 124F40A16-54"

   Rated capacity-input: 346.4 (MMBtu/hr.)

   Boiler type: ☐ Fire Tube ☒ Water Tube ☐ Other (specify):

   Manufactured date: 1996

   Proposed installation date: N/A

   Original installation date (if existing): 1997

   Reconstruction/Modification date (if applicable): N/A

3. Type of fuel used:

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas	1,026	Btu/ft^3	0.5 gr/100 scf	0.10		
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

4. Purpose (if multipurpose, note percent in each use category):

- [ ] Space heat ______ %
- [x] Power generation 27 %
- [x] Process heat 73 %
- [ ] Other (specify) ______ % ______

5. Normal schedule of operation:

Hours per day: 24 Days per week: 7 Weeks per year: 52

6. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions:

N/A

7. Are you requesting a limitation for permitting? [x] Yes [ ] No if "yes", specify the limit and affected unit(s):

The combined NOx emissions from the No. 3 Power Boiler, the No. 4 Power Boiler, the No. 5 Power Boiler, and the Combustion Turbine with Heat Recovery Steam Generator shall not exceed 116.0 tons per year on a 12-month rolling total basis.

8. Is there any emission control equipment on this emission source?

[ ] Yes [x] No (If "yes", ADEM Form 110 must be completed and attached)

9. Stack data (if a control device is installed, the information should be for the control device's stack exit; if multiple stacks associated, provide additional sheet):

Stack No. & Description: X029 - No. 5 Power Boiler Stack Type: V

Stack UTM Coordinate (E-W)	414.549	(km)	Stack UTM Coordinate (N-S)	3484.157	(km)
Latitude	31.48908	(LAT)	Longitude	-87.89969	(LONG)
Height above grade	200	(ft)	Gas temperature at exit	306	(ºF)
Inside diameter at exit (round)	7.0	(ft)	Gas Velocity	45.6	(ft/Sec)
Inside area at exit (not round)	N/A	(ft^2)	Volume of gas discharged	105,392	(ACFM)
Base Elevation	45	(ft)	GEP Stack Height	200	(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) [x] Yes [ ] No :

Is this a merged stack (do multiple units use this release point)? [ ] Yes [x] No

If yes, provide units:

10. Is this item subject to the Transport Rule 335-3-8-.07 or NOX Budget Program under 335-3-8-.71?

[ ] Yes [x] No If "Yes", provide ORIS Plant and Unit ID: ______

11. Is this item in compliance with all applicable air pollution rules and regulations?

[x] Yes [ ] No if "No", a compliance schedule, ADEM Form 437, must be attached.)

12. Fugitive Emissions:

POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT
	lb/hr	ton/yr	lb/hr	ton/yr		Provide in lb/hr or specify alternative Unit of Measure
Total Particulate						
PM-10 Filterable						
PM-2.5 Filterable						
PM-Condensible						
Sulfur dioxide						
Nitrogen oxides						
Carbon monoxide						
VOC's						

Attach calculation worksheets. Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

13. Point Emissions:

POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT
	lb/hr	ton/yr	lb/hr	ton/yr		Provide in lb/hr or specify alternative Unit of Measure
Total Particulate	0.64	2.81			AP-42 Emission Factor	0.12 lb/MMBTU
PM-10 Filterable	0.64	2.81			AP-42 Emission Factor	N/A
PM-2.5 Filterable	0.64	2.81			AP-42 Emission Factor	N/A
PM-Condensible	1.92	8.43			AP-42 Emission Factor	N/A
Sulfur dioxide	0.20	0.89			AP-42 Emission Factor	N/A
Nitrogen oxides	17.32	75.9			Regulatory Limit	0 05 lb/MMBTU and/or 17.32 lb/hr and 116.0 tons/yr combined source limit
Carbon monoxide	31.2	136.6			Regulatory Limit	0.09 lb/MMBTU
VOC's	1.86	8.13			AP-42 Emission Factor	N/A
Greenhouse Gases	40,563	177,665			40 CFR Part 98 Tables C-1 and C-2	N/A

Attach calculation worksheets. Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

Name of person preparing application: William N. Davis, Senior Environmental Engineer

Company of preparer: Packaging Corporation of America

Signature:

Date: 1/21/26

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

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1. Name of facility or organization: Packaging Corporation of America - Jackson Mill

2. Purpose of Application:

- ☐ Initial installation of a new engine (i.e. engine that has never been in service at any location)
- ☑ Initial installation of a used engine (i.e. engine that has been in service at another location)
- ☐ Modification/Reconstruction of an engine currently installed at the facility
- ☐ Update information for an engine currently installed at the facility
- ☐ Title V Application
- ☐ Other, specify: ________

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: July 1, 2026

If this application is for an engine currently installed at this facility, please provide the date that the engine was initially installed at this facility: ________

3. Engine Identification:

A. Manufacturer Name: Westinghouse B. Model No.: 251B12A C. Model Year: 1999
D. Facility's Identification or Description: Combustion Turbine E. Serial No.: TBD

4. Engine Applicability Dates:

A. Date Ordered (New): N/A B. Date Manufactured: 1999 C. Date Modified/Reconstructed N/A
D. For a used engine, approximate date engine was first put in service at any location: 1999 (Jay, Maine)

5. Engine Function:

- ☐ Compression
- ☐ NFPA Certified
- ☐ Test Cell/Stand
- ☐ Research & Development
- ☑ Electrical Generation (Max Output): 50 MW
- ☐ Fire/Other Pump Driver
- ☐ Other, please describe: ________

6. Engine Operation:

- ☑ Non-Emergency (provide typical operating schedule in A-D):
- ☐ Emergency Only
- ☐ Limited Use (<100 hr/yr)

A. Hours/day: 24
B. Days/week: 7
C. Weeks/year: 52
D. Peak Season (if any): ________

7. Engine Specifications:

A. Max Brake Horsepower (bhp): ____ B. Max Engine Power (kWm): ____ C. Max Heat Input (MMBtu/hr): 675

D. Type:	E. Piston Movement:	F. Air/Fuel Mix:	G. Ignition Type
☐ Simple Cycle Turbine	☐ 2-Stroke RICE	☐ Rich Burn Rice	☐ Spark
☑ Combined Cycle Turbine	☐ 4-Stroke RICE	☐ Lean Burn RICE	☐ Compression
☐ Regenerative Cycle Turbine	☑ N/A	☐ Diffusion Flame Turbine	☑ N/A
☐ Reciprocating Engine	☐ Other: ____	☐ Lean Premix Turbine	
		☑ Other: Dry Low-NOx	

H. Cylinder Displacement: ____ (Liters/cylinder)

8. Compressor Specifications:

A. Compressor Type ____________ B. Compressor Mfg. Date ________ C. Location on well? ☐ Yes ☐ No

D. Compressor Instal. Date: ________ E. Compressor Serial No.: ________ F. Compressor Brake Horsepower (bhp):

9. Fuel Information:

	Fuel Type/ Desc.	Heat Content	Sulfur Content (% by weight or ppm)	Fuel-Bound Nitrogen Content (% by weight or ppm)	% of Gross Heat Input	Max Ash %	Used Oil Supplier
Primary	Natural Gas	1,020 BTU/scf	0.6 gr/100 scf	< 3.0%	100		
Secondary/ Backup							

10. Point Source Emissions:

POLLUTANT	UNCONTROLLED[1] POTENTIAL EMISSIONS		CONTROLLED[2] POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT
	lb/hr	ton/yr	lb/hr	ton/yr		Provide in lb/hr or specify alternative Unit of Measure
Total Particulate	1.28	5.62			AP-42 Emission Factor	0.005 lb/MMBTU
PM-10 Filterable	1.28	5.62			AP-42 Emission Factor	N/A
PM-2.5 Filterable	1.28	5.62			AP-42 Emission Factor	N/A
PM-Condensible	3.17	13.90			AP-42 Emission Factor	N/A
Sulfur dioxide	2.30	10.05			AP-42 Emission Factor	N/A
Nitrogen oxides			24.37	106.74	Regulatory Limit	6.0 ppmvd @ 15% O2 (with duct burner)
Carbon monoxide			22.52	98.62	Regulatory Limit	0.023 lb/MMBTU (with duct burner)
VOC's	1.42	6.21			AP-42 Emission Factor	N/A
Greenhouse Gases	114,644	502,141			40 CFR 98 Tables C-1/C-2	117.1 lb/MMBTU (with duct burner)
Total PM-10	6.85	30.02			Regulatory Limit	0.007 lb/MMBTU (with duct burner)
Total PM-2.5	6.85	30.02			Regulatory Limit	0.007 lb/MMBTU (with duct burner)

Attach calculation worksheets. Manufacturer specification sheets should be provided if used as the basis for emission estimates. Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensible. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

11. Applicable Regulations:

☑ 40 CFR 63, Subpart YYYY, NESHAP for Stat. Combustion Turbines
☑ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
☐ 40 CFR 60, Subpart KKKK, NSPS for Stat. Combustion. Turbines
☐ 40 CFR 60, Subpart OOOO/OOOOa
☐ 40 CFR 63, Subpart ZZZZ, NESHAP for Stat. RICE
☐ 40 CFR 60, Subpart IIII, NSPS for Stat. Compression Ignition ICE
☐ 40 CFR 60, Subpart JJJJ, NSPS for Stat. Spark Ignition ICE
☑ Other: ADEM Rule 335-3-4-.01(1) and -.03
ADEM Rule 335-3-5-.01(1)(b)

Does this unit have an EPA Certificate of Conformity? ☐ Yes ☐ No if yes, please provide: ________

12. Regulatory Standards, Limitations, and Requirements:

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
Example: NOx + NMHC	*6.4*	*g/kW-hr*	*NSPS, Subpart IIII*	*4.95 g/kW-hr*
Example: Annual Operation	*6,000*	*hr/yr*	*SMS-PSD*	*NA*
NOx (with duct burner)	6.0	ppmvd @ 15% O2	SMS-PSD	6.0 ppmvd @ 15% O2
NOx (with duct burner)	24.37	lb/hr	SMS-PSD	24.37 lb/hr
SO2	20	gr/100 scf	40 CFR 60.334(h)(3)	0.6 gr/100 scf
CO (with duct burner)	0.023	lb/MMBTU	SMS-PSD	0.023 lb/MMBTU
PM-10 Total	0.007	lb/MMBTU	ADEM R. 335-3-14-.04	0.007 lb/MMBTU
PM-2.5 Total	0.007	lb/MMBTU	ADEM R. 335-3-14-.04	0.007 lb/MMBTU
Greenhouse Gases (CO2e)	117.10	lb/MMBTU	ADEM R. 335-3-14-.04	117.10 lb/MMBTU

3. for federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit, specify either SMS-PSD or SMS- Title V

B. For engines subject to emission standards under NSPS, Subpart IIII or NSPS, Subpart JJJJ, is this engine certified by the manufacturer pursuant to the applicable regulation to meet the applicable emission standards? ■ N/A ☐ Yes ☐ No
(if yes, provide a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? ☐ Yes ☐ No

13. Pollution Control Information:

A. Device/Technology Type(s)

- ☐ No Controls
- ☐ Air-to-Fuel Ratio Controller
- ☐ Water or Steam Injection
- ☑ Low NOX Burners
- ☑ Oxidation Catalyst
- ☐ Selective Non-catalytic Reduction(SNCR)
- ☐ Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- ☑ Selective Catalytic Reduction (SCR)
- ☐ Diesel Particulate Filter
- ☐ Other ____________
- ☐ Other ____________

B. Control Efficiencies

Pollutant	% Reduction
NO_x	81
CO	72
VOC	
Formaldehyde	

C. Operational Parameters (if any):

14. Compliance Status:

Is this item in compliance with all applicable air pollution rules and regulations?

■ Yes ☐ No (if "no", a compliance schedule, ADEM Form 437, must be attached.

15. Stack Parameters (if a control device is installed, the information should be for the control device's stack exit)

Emission Point & Description: X038 - Combustion Turbine with HRSG   Stack Type: V

Stack UTM Coordinate (E-W)	414.427	(km)	Stack UTM Coordinate (N-S)	3484.417	(km)
Latitude	31.49143	(LAT)	Longitude	-87.9010	(LONG)
Height above grade	212	(ft)	Gas temperature at exit	303	(ºF)
Inside diameter at exit (round)	12.75	(ft)	Gas Velocity	78.10	(ft/Sec)
Inside area at exit (not round)	N/A	(ft^2)	Volume of gas discharged	598,300	(ACFM)
Base Elevation	41	(ft)	GEP Stack Height	212	(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☒ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☒ Yes ☐ No

If yes, provide units: Combustion Turbine and HRSG (with Duct Burners)

16. Clarifying/Supplemental Information (Optional):

Name of person preparing application: William N. Davis, Senior Environmental Engineer

Company of preparer Packaging Corporation of America

Signature: [signature] Date: 12.17.25

ADEM

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]

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1. Name of facility or organization: Packaging Corporation of America - Jackson Mill

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Electrostatic precipitator
- ☐ Afterburner
- ☐ Baghouse
- ☐ Cyclone
- ☐ Multiclone
- ☐ Absorber
- ☐ Adsorber
- ☐ Condenser
- ☐ Wet Suppression
- ☐ Thermal Oxidizer
- ☐ Wet scrubber (kind): ____
- ☒ Other (describe): Selective Catalytic Reduction System

3. Control device manufacturer's information:

Name of manufacturer: Mitsubishi Model No.: Honeycomb Ceramic/Monolith

4. Emission source(s) to which device is installed or is to be installed:

Combustion Turbine with Heat Recovery Steam Generator

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	NOx		
Mass emission rate (#/hr)			
Uncontrolled	96.98		
Designed	18.28		
Manufacturer's guaranteed	N/A		
Mass emission rate (Expressed as units of standard)			
Required by regulation	6.0 ppmvd @ 15% O2		
Manufacturer's guaranteed	N/A		
Removal efficiency (%)			
Designed	81		
Manufacturer's guaranteed	N/A		

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			375,800
(ACFM, existing conditions)			598,300
Temperature (ºF)			303
Velocity (ft/sec)			78.10
Percent moisture			9.2

Pressure drop across device: 3 - 5 (inches H_2O)

7. Stack dimensions:

Stack No. & Description: Stack 038 - Combustion Turbine with HRSG Stack Type: V

Stack UTM Coordinate (E-W)	414.427	(km)	Stack UTM Coordinate (N-S)	3484.417	(km)
Latitude	31.49143	(LAT)	Longitude	-87.9010	(LONG)
Height above grade	212	(ft)	Gas temperature at exit	303	(ºF)
Inside diameter at exit (round)	12.75	(ft)	Gas Velocity	78.10	(ft/Sec)
Inside area at exit (not round)	N/A	(ft^2)	Volume of gas discharged	598,300	(ACFM)
Base Elevation	41	(ft)	GEP Stack Height	212	(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☒ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☒ Yes ☐ No

If yes, provide units: Combustion Turbine and HRSG (includes duct burners)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

☐ Blueprints
☐ Particle size distribution report
☐ Manufacturer's literature
☐ Size efficiency- curves
☐ Emissions test of existing installation
☐ Fan curves
☒ Other ______________________

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

NOx CEMS (ppmvd corrected to 15% oxygen) and aqueous ammonia injection flow rate

12. By-pass (if any) is to be used and when:

Combustion turbine is shut down.

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	N/A	N/A	N/A	N/A
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Not Applicable

Name of person preparing application: William N. Davis

Company of preparer: Packaging Corporation of America

Signature: [signature]   Date: 12.17.25

ADEM

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

Do not write in this space

1. Name of facility or organization: Packaging Corporation of America - Jackson Mill

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- ☐ Settling chamber
- ☐ Electrostatic precipitator
- ☐ Afterburner
- ☐ Baghouse
- ☐ Cyclone
- ☐ Multiclone
- ☐ Absorber
- ☐ Adsorber
- ☐ Condenser
- ☐ Wet Suppression
- ☐ Thermal Oxidizer
- ☐ Wet scrubber (kind):
- ☒ Other (describe): Catalytic Oxidation System

3. Control device manufacturer's information:

Name of manufacturer: Engelhard Model No.: Camet CO Catalytic Converter

4. Emission source(s) to which device is installed or is to be installed:

Combustion Turbine with Heat Recovery Steam Generator

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	CO		
Mass emission rate (#/hr)			
Uncontrolled	80.4		
Designed	22.5		
Manufacturer's guaranteed	N/A		
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.023 lb/MMBTU		
Manufacturer's guaranteed	N/A		
Removal efficiency (%)			
Designed	72		
Manufacturer's guaranteed	N/A		

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			375,800
(ACFM, existing conditions)			598,300
Temperature (ºF)			303
Velocity (ft/sec)			78.10
Percent moisture			9.2

Pressure drop across device: 3 - 5 (inches H_2O)

7. Stack dimensions:

Stack No. & Description: Stack 038 - Combustion Turbine with HRSG Stack Type: V

Stack UTM Coordinate (E-W)	414.427 (km)	Stack UTM Coordinate (N-S)	3484.417 (km)
Latitude	31.49143 (LAT)	Longitude	-87.9010 (LONG)
Height above grade	212 (ft)	Gas temperature at exit	303 (ºF)
Inside diameter at exit (round)	12.75 (ft)	Gas Velocity	78.10 (ft/Sec)
Inside area at exit (not round)	N/A (ft²)	Volume of gas discharged	598,300 (ACFM)
Base Elevation	41 (ft)	GEP Stack Height	212 (ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☒ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☒ Yes ☐ No

If yes, provide units: Combustion Turbine and HRSG (with Duct Burners)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

☐ Blueprints ☐ Particle size distribution report

☐ Manufacturer's literature ☐ Size efficiency- curves

☐ Emissions test of existing installation ☐ Fan curves

☒ Other ______

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

CO CEMS (30-day rolling average lb/MMBTU)

12. By-pass (if any) is to be used and when:

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	N/A	N/A	N/A	N/A
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Not Applicable

Name of person preparing application: William N. Davis

Company of preparer Packaging Corporation of America

Signature: Date: 12.17.25

ADEM

PERMIT APPLICATION FOR CONTINUOUS EMISSION MONITORING SYSTEMS
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

Do not write in this space

1. Name of facility or organization: Packaging Corporation of America - Jackson Mill

2. List pollutant or parameter the continuous emission monitoring system is measuring:
   - ☐ Sulfur dioxide
   - ☒ Nitrogen oxides
   - ☐ PM 10
   - ☐ Oxygen
   - ☐ Pressure
   - ☐ Carbon dioxide
   - ☐ Total reduced sulfides
   - ☐ Hydrogen sulfide
   - ☐ Other (explain):
   - ☐ Carbon monoxide
   - ☐ Particulates
   - ☐ Exhaust temperature
   - ☐ Hydrogen chloride
   - ☐ Opacity
   - ☐ Temperature
     - ☐ Exhaust gas
     - ☐ Primary Chamber
     - ☐ Secondary Chamber
   - ☐ Flow Rate
   - ☐ VOCs

3. CEMS Manufacturer's Information:

   Name of manufacturer: Teledyne API

   Model number: T200

   Serial number: To Be Determined

4. Data acquisition system to be used (data logger, strip chart, software, etc):

   Name of manufacturer/software: Automated Control Systems, Inc./CemMaster PC 2.0

   Serial number: 01088C - DAS

5. Indicate emission source to be monitored and the location of the specific CEM:
   Exhaust stack for Combustion Turbine and HRSG (with Duct Burners)

6. Briefly describe the calibration and operational procedures to be used in operating the CEM (indicate estimate of time lost in calibrating, maintaining, repairing, etc.):

   Automatic injection of dry nitrogen occurs once every 24 hours to check zero calibration. Automatic injection of known value calibration gas occurs once every 24 hours to check span calibration. Approximately 10 minutes are lost during each daily calibration event.

7. Indicate CEM calibration/maintenance schedule:

   Daily automatic calibration and system checks are performed. Preventive maintenance activities are performed monthly, quarterly, and annually.

8. Check which program(s) apply to the unit with the monitor:

   - [x] NSPS
   - [x] SIP
   - [x] PSD
   - [ ] BIF
   - [x] NESHAPS
   - [ ] Acid Rain
   - [ ] RCRA
   - [ ] Enhanced Monitoring

9. Monitor span: From: 0 ppm To: To Be Determined

10. Performance protocol (from Appendix B in 40 CFR Part 60): Performance Specification 2

11. Insitu/dilution extractive/extractive? (type): Extractive

12. If dilution extractive, give approximate dilution rate: N/A

13. Conditioning system? [x] YES [ ] NO

    If yes, what type? Thermo-Electric Cooling System - Dry

14. Does Appendix F in 40 CFR Part 60 apply? [x] YES [ ] NO

Name of person preparing application: William N. Davis

Company of preparer: Packaging Corporation of America

Signature: [signature] Date: 12.17.25

ADEM

PERMIT APPLICATION FOR CONTINUOUS EMISSION MONITORING SYSTEMS
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

Do not write in this space

1. Name of facility or organization: Packaging Corporation of America - Jackson Mill

2. List pollutant or parameter the continuous emission monitoring system is measuring:

- ☐ Sulfur dioxide
- ☐ Nitrogen oxides
- ☐ PM 10
- ☐ Oxygen
- ☐ Pressure
- ☐ Carbon dioxide
- ☒ Carbon monoxide
- ☐ Particulates
- ☐ Exhaust temperature
- ☐ Hydrogen chloride
- ☐ Opacity
- ☐ Temperature
  - ☐ Exhaust gas
  - ☐ Primary Chamber
  - ☐ Secondary Chamber
- ☐ Total reduced sulfides
- ☐ Hydrogen sulfide
- ☐ Flow Rate
- ☐ VOCs
- ☐ Other (explain):

3. CEMS Manufacturer's Information:

   Name of manufacturer: Teledyne API

   Model number: T300

   Serial number: To Be Determined

4. Data acquisition system to be used (data logger, strip chart, software, etc):

   Name of manufacturer/software: Automated Control Systems, Inc./CemMaster PC 2.0

   Serial number: 01088C - DAS

5. Indicate emission source to be monitored and the location of the specific CEM:

   Exhaust stack for Combustion Turbine and HRSG (with duct burners)

6. Briefly describe the calibration and operational procedures to be used in operating the CEM (indicate estimate of time lost in calibrating, maintaining, repairing, etc.):

   Automatic injection of dry nitrogen occurs once every 24 hours to check zero calibration. Automatic injection of known value calibration gas occurs once every 24 hours to check span calibration. Approximately 10 minutes are lost during each daily calibration event.

7. Indicate CEM calibration/maintenance schedule:

   Daily automatic calibration and system checks are performed. Preventive maintenance activities are performed monthly, quarterly, and annually.

8. Check which program(s) apply to the unit with the monitor:

■ NSPS	■ SIP	■ PSD	☐ BIF
■ NESHAPS	☐ Acid Rain	☐ RCRA	☐ Enhanced Monitoring

9. Monitor span: From: 0 ppm To: To Be Determined

10. Performance protocol (from Appendix B in 40 CFR Part 60): Performance Specification 4

11. Insitu/dilution extractive/extractive? (type): Extractive

12. If dilution extractive, give approximate dilution rate: N/A

13. Conditioning system? ☑ YES ☐ NO

    If yes, what type? Thermo-Electric Cooling System - Dry

14. Does Appendix F in 40 CFR Part 60 apply? ☑ YES ☐ NO

Name of person preparing application: William N. Davis

Company of preparer: Packaging Corporation of America

Signature: [signature] Date: 12.17.25

ADEM

PERMIT APPLICATION FOR CONTINUOUS EMISSION MONITORING SYSTEMS
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
Do not write in this space

1. Name of facility or organization: Packaging Corporation of America

2. List pollutant or parameter the continuous emission monitoring system is measuring:

- ☐ Sulfur dioxide
- ☒ Nitrogen oxides
- ☐ PM 10
- ☐ Oxygen
- ☐ Pressure
- ☐ Carbon dioxide
- ☐ Total reduced sulfides
- ☐ Hydrogen sulfide
- ☐ Other (explain):
- ☐ Carbon monoxide
- ☐ Particulates
- ☐ Exhaust temperature
- ☐ Hydrogen chloride
- ☐ Opacity
- ☐ Temperature
  - ☐ Exhaust gas
  - ☐ Primary Chamber
  - ☐ Secondary Chamber
- ☐ Flow Rate
- ☐ VOCs

3. CEMS Manufacturer's Information:

   Name of manufacturer: Teledyne API

   Model number: T200

   Serial number: 1663

4. Data acquisition system to be used (data logger, strip chart, software, etc):

   Name of manufacturer/software: Automated Control Systems, Inc./CemMaster PC 2.0

   Serial number: 01088C - DAS

5. Indicate emission source to be monitored and the location of the specific CEM:

   Exhaust stack for No. 3 Power Boiler

6. Briefly describe the calibration and operational procedures to be used in operating the CEM (indicate estimate of time lost in calibrating, maintaining, repairing, etc.):

   Automatic injection of dry air occurs once every 24 hours to check zero calibration. Automatic injection of known value calibration gas occurs once every 24 hours to check span calibration. Approximately 10 minutes are lost during each daily calibration event.

7. Indicate CEM calibration/maintenance schedule:

   Daily automatic calibration and system checks are performed. Preventive maintenance activities are performed monthly, quarterly, and annually.

8. Check which program(s) apply to the unit with the monitor:

■ NSPS	■ SIP	■ PSD	☐ BIF
☐ NESHAPS	☐ Acid Rain	☐ RCRA	☐ Enhanced Monitoring

9. Monitor span: From: 0 ppm To: 200 ppm

10. Performance protocol (from Appendix B in 40 CFR Part 60): Performance Specification 2

11. Insitu/dilution extractive/extractive? (type): Extractive

12. If dilution extractive, give approximate dilution rate: N/A

13. Conditioning system? ☑ YES ☐ NO

    If yes, what type? Vortex Cooling System - Dry

14. Does Appendix F in 40 CFR Part 60 apply? ☑ YES ☐ NO

Name of person preparing application: William N. Davis

Company of preparer: Packaging Corporation of America

Signature: [signature] Date: 1/21/26

ADEM

PERMIT APPLICATION FOR CONTINUOUS EMISSION MONITORING SYSTEMS
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

[| |] - [| | |] - [| | |]
Do not write in this space

1. Name of facility or organization: Packaging Corporation of America

2. List pollutant or parameter the continuous emission monitoring system is measuring:

- ☐ Sulfur dioxide
- ☐ Nitrogen oxides
- ☐ PM 10
- ☒ Oxygen
- ☐ Pressure
- ☐ Carbon dioxide
- ☐ Carbon monoxide
- ☐ Particulates
- ☐ Exhaust temperature
- ☐ Hydrogen chloride
- ☐ Opacity
- ☐ Temperature
  - ☐ Exhaust gas
  - ☐ Primary Chamber
  - ☐ Secondary Chamber
- ☐ Total reduced sulfides
- ☐ Hydrogen sulfide
- ☐ Other (explain):
- ☐ Flow Rate
- ☐ VOCs

3. CEMS Manufacturer's Information:

   Name of manufacturer: City Technologies

   Model number: CitiCel

   Serial number: 06.34236753 108

4. Data acquisition system to be used (data logger, strip chart, software, etc):

   Name of manufacturer/software: Automated Control Systems, Inc./CemMaster PC 2.0

   Serial number: 01088C - DAS

5. Indicate emission source to be monitored and the location of the specific CEM:

   Exhaust stack for No. 3 Power Boiler

6. Briefly describe the calibration and operational procedures to be used in operating the CEM (indicate estimate of time lost in calibrating, maintaining, repairing, etc.):

Automatic injection of dry air occurs once every 24 hours to check zero calibration. Automatic injection of known value calibration gas occurs once every 24 hours to check span calibration. Approximately 10 minutes are lost during each daily calibration event.

7. Indicate CEM calibration/maintenance schedule:

Daily automatic calibration and system checks are performed. Preventive maintenance activities are performed monthly, quarterly, and annually.

8. Check which program(s) apply to the unit with the monitor:

- ☒ NSPS
- ☒ SIP
- ☒ PSD
- ☐ BIF
- ☐ NESHAPS
- ☐ Acid Rain
- ☐ RCRA
- ☐ Enhanced Monitoring

9. Monitor span: From: 0 % To: 25 %

10. Performance protocol (from Appendix B in 40 CFR Part 60): Performance Specification 3

11. Insitu/dilution extractive/extractive? (type): Extractive

12. If dilution extractive, give approximate dilution rate: N/A

13. Conditioning system? ☑ YES ☐ NO

If yes, what type? Vortex Cooling System - Dry

14. Does Appendix F in 40 CFR Part 60 apply? ☑ YES ☐ NO

Name of person preparing application: William N. Davis

Company of preparer: Packaging Corporation of America

Signature: [signature] Date: 1/21/26

ADEM

PERMIT APPLICATION FOR CONTINUOUS EMISSION MONITORING SYSTEMS
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

			-					-				

Do not write in this space

1. Name of facility or organization: Packaging Corporation of America

2. List pollutant or parameter the continuous emission monitoring system is measuring:

- ☐ Sulfur dioxide
- ☒ Nitrogen oxides
- ☐ PM 10
- ☐ Oxygen
- ☐ Pressure
- ☐ Carbon dioxide
- ☐ Total reduced sulfides
- ☐ Hydrogen sulfide
- ☐ Other (explain):
- ☐ Carbon monoxide
- ☐ Particulates
- ☐ Exhaust temperature
- ☐ Hydrogen chloride
- ☐ Opacity
- ☐ Temperature
  - ☐ Exhaust gas
  - ☐ Primary Chamber
  - ☐ Secondary Chamber
- ☐ Flow Rate
- ☐ VOCs

3. CEMS Manufacturer's Information:

   Name of manufacturer: Teledyne API

   Model number: T200

   Serial number: 1664

4. Data acquisition system to be used (data logger, strip chart, software, etc):

   Name of manufacturer/software: Automated Control Systems, Inc./CemMaster PC 2.0

   Serial number: 01088C - DAS

5. Indicate emission source to be monitored and the location of the specific CEM:

   Exhaust stack for No. 4 Power Boiler

6. Briefly describe the calibration and operational procedures to be used in operating the CEM (indicate estimate of time lost in calibrating, maintaining, repairing, etc.):

Automatic injection of dry air occurs once every 24 hours to check zero calibration. Automatic injection of known value calibration gas occurs once every 24 hours to check span calibration. Approximately 10 minutes are lost during each daily calibration event.

7. Indicate CEM calibration/maintenance schedule:

Daily automatic calibration and system checks are performed. Preventive maintenance activities are performed monthly, quarterly, and annually.

8. Check which program(s) apply to the unit with the monitor:

- [x] NSPS
- [x] SIP
- [x] PSD
- [ ] BIF
- [ ] NESHAPS
- [ ] Acid Rain
- [ ] RCRA
- [ ] Enhanced Monitoring

9. Monitor span: From: 0 ppm To: 100 ppm

10. Performance protocol (from Appendix B in 40 CFR Part 60): Performance Specification 2

11. Insitu/dilution extractive/extractive? (type): Extractive

12. If dilution extractive, give approximate dilution rate: N/A

13. Conditioning system? [x] YES [ ] NO

If yes, what type? Vortex Cooling System - Dry

14. Does Appendix F in 40 CFR Part 60 apply? [x] YES [ ] NO

Name of person preparing application: William N. Davis

Company of preparer Packaging Corporation of America

Signature: [signature] Date: 1/21/26

ADEM

PERMIT APPLICATION FOR CONTINUOUS EMISSION MONITORING SYSTEMS
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
Do not write in this space

1. Name of facility or organization: Packaging Corporation of America

2. List pollutant or parameter the continuous emission monitoring system is measuring:

- ☐ Sulfur dioxide
- ☐ Nitrogen oxides
- ☐ PM 10
- ☐ Oxygen
- ☐ Pressure
- ☐ Carbon dioxide
- ☐ Total reduced sulfides
- ☐ Hydrogen sulfide
- ☐ Other (explain):
- ☒ Carbon monoxide
- ☐ Particulates
- ☐ Exhaust temperature
- ☐ Hydrogen chloride
- ☐ Opacity
- ☐ Temperature
    - ☐ Exhaust gas
    - ☐ Primary Chamber
    - ☐ Secondary Chamber
- ☐ Flow Rate
- ☐ VOCs

3. CEMS Manufacturer's Information:

   Name of manufacturer: Teledyne API

   Model number: T300

   Serial number: 2981

4. Data acquisition system to be used (data logger, strip chart, software, etc):

   Name of manufacturer/software: Automated Control Systems, Inc./CemMaster PC 2.0

   Serial number: 01088C - DAS

5. Indicate emission source to be monitored and the location of the specific CEM:

   Exhaust stack for No. 4 Power Boiler

6. Briefly describe the calibration and operational procedures to be used in operating the CEM (indicate estimate of time lost in calibrating, maintaining, repairing, etc.):

   Automatic injection of dry air occurs once every 24 hours to check zero calibration. Automatic injection of known value calibration gas occurs once every 24 hours to check span calibration. Approximately 10 minutes are lost during each daily calibration event.

7. Indicate CEM calibration/maintenance schedule:

   Daily automatic calibration and system checks are performed. Preventive maintenance activities are performed monthly, quarterly, and annually.

8. Check which program(s) apply to the unit with the monitor:

   ☐ NSPS ☐ SIP ■ PSD ☐ BIF

   ☐ NESHAPS ☐ Acid Rain ☐ RCRA ☐ Enhanced Monitoring

9. Monitor span: From: 0 ppm To: 380 ppm

10. Performance protocol (from Appendix B in 40 CFR Part 60): Performance Specification 4

11. Insitu/dilution extractive/extractive? (type): Extractive

12. If dilution extractive, give approximate dilution rate: N/A

13. Conditioning system? ☑ YES ☐ NO

    If yes, what type? Vortex Cooling System - Dry

14. Does Appendix F in 40 CFR Part 60 apply? ☐ YES ☑ NO

Name of person preparing application: William N. Davis

Company of preparer: Packaging Corporation of America

Signature: [signature] Date: 1/21/26

ADEM

PERMIT APPLICATION FOR CONTINUOUS EMISSION MONITORING SYSTEMS
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
Do not write in this space

1. Name of facility or organization: Packaging Corporation of America

2. List pollutant or parameter the continuous emission monitoring system is measuring:

- ☐ Sulfur dioxide
- ☐ Nitrogen oxides
- ☐ PM 10
- ☒ Oxygen
- ☐ Pressure
- ☐ Carbon dioxide
- ☐ Carbon monoxide
- ☐ Particulates
- ☐ Exhaust temperature
- ☐ Hydrogen chloride
- ☐ Opacity
- ☐ Temperature
  - ☐ Exhaust gas
  - ☐ Primary Chamber
  - ☐ Secondary Chamber
- ☐ Total reduced sulfides
- ☐ Hydrogen sulfide
- ☐ Flow Rate
- ☐ VOCs
- ☐ Other (explain):

3. CEMS Manufacturer's Information:

Name of manufacturer: City Technologies

Model number: CitiCel

Serial number: 06.32407371 116

4. Data acquisition system to be used (data logger, strip chart, software, etc):

Name of manufacturer/software: Automated Control Systems, Inc./CemMaster PC 2.0

Serial number: 01088C - DAS

5. Indicate emission source to be monitored and the location of the specific CEM:

Exhaust stack for No. 4 Power Boiler

6. Briefly describe the calibration and operational procedures to be used in operating the CEM (indicate estimate of time lost in calibrating, maintaining, repairing, etc.):

   Automatic injection of dry air occurs once every 24 hours to check zero calibration. Automatic injection of known value calibration gas occurs once every 24 hours to check span calibration. Approximately 10 minutes are lost during each daily calibration event.

7. Indicate CEM calibration/maintenance schedule:

   Daily automatic calibration and system checks are performed. Preventive maintenance activities are performed monthly, quarterly, and annually.

8. Check which program(s) apply to the unit with the monitor:

   - [x] NSPS
   - [x] SIP
   - [x] PSD
   - [ ] BIF
   - [ ] NESHAPS
   - [ ] Acid Rain
   - [ ] RCRA
   - [ ] Enhanced Monitoring

9. Monitor span: From: 0 % To: 25 %

10. Performance protocol (from Appendix B in 40 CFR Part 60): Performance Specification 3

11. Insitu/dilution extractive/extractive? (type): Extractive

12. If dilution extractive, give approximate dilution rate: N/A

13. Conditioning system? ☑ YES ☐ NO

    If yes, what type? Vortex Cooling System - Dry

14. Does Appendix F in 40 CFR Part 60 apply? ☑ YES ☐ NO

Name of person preparing application: William N. Davis

Company of preparer: Packaging Corporation of America

Signature: [signature] Date: 1/21/26

ADEM

PERMIT APPLICATION FOR CONTINUOUS EMISSION MONITORING SYSTEMS
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
Do not write in this space

1. Name of facility or organization: Packaging Corporation of America

2. List pollutant or parameter the continuous emission monitoring system is measuring:

- ☐ Sulfur dioxide
- ■ Nitrogen oxides
- ☐ PM 10
- ☐ Oxygen
- ☐ Pressure
- ☐ Carbon dioxide
- ☐ Carbon monoxide
- ☐ Particulates
- ☐ Exhaust temperature
- ☐ Hydrogen chloride
- ☐ Opacity
- ☐ Temperature
  - ☐ Exhaust gas
  - ☐ Primary Chamber
  - ☐ Secondary Chamber
- ☐ Total reduced sulfides
- ☐ Hydrogen sulfide
- ☐ Flow Rate
- ☐ VOCs
- ☐ Other (explain):

3. CEMS Manufacturer's Information:

Name of manufacturer: Teledyne API

Model number: T200

Serial number: 1666

4. Data acquisition system to be used (data logger, strip chart, software, etc):

Name of manufacturer/software: Automated Control Systems, Inc./CemMaster PC 2.0

Serial number: 01088C - DAS

5. Indicate emission source to be monitored and the location of the specific CEM:

Exhaust stack for No. 5 Power Boiler

6. Briefly describe the calibration and operational procedures to be used in operating the CEM (indicate estimate of time lost in calibrating, maintaining, repairing, etc.):

   Automatic injection of dry air occurs once every 24 hours to check zero calibration. Automatic injection of known value calibration gas occurs once every 24 hours to check span calibration. Approximately 10 minutes are lost during each daily calibration event.

7. Indicate CEM calibration/maintenance schedule:

   Daily automatic calibration and system checks are performed. Preventive maintenance activities are performed monthly, quarterly, and annually.

8. Check which program(s) apply to the unit with the monitor:

   ■ NSPS ■ SIP ■ PSD ☐ BIF

   ☐ NESHAPS ☐ Acid Rain ☐ RCRA ☐ Enhanced Monitoring

9. Monitor span: From: 0 ppm To: 100 ppm

10. Performance protocol (from Appendix B in 40 CFR Part 60): Performance Specification 2

11. Insitu/dilution extractive/extractive? (type): Extractive

12. If dilution extractive, give approximate dilution rate: N/A

13. Conditioning system? ☑ YES ☐ NO

    If yes, what type? Vortex Cooling System - Dry

14. Does Appendix F in 40 CFR Part 60 apply? ☑ YES ☐ NO

Name of person preparing application: William N. Davis

Company of preparer Packaging Corporation of America

Signature: [signature] Date: 1/21/26

ADEM

PERMIT APPLICATION FOR CONTINUOUS EMISSION MONITORING SYSTEMS
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
Do not write in this space

1. Name of facility or organization: Packaging Corporation of America

2. List pollutant or parameter the continuous emission monitoring system is measuring:

- ☐ Sulfur dioxide
- ☐ Nitrogen oxides
- ☐ PM 10
- ☐ Oxygen
- ☐ Pressure
- ☐ Carbon dioxide
- ☐ Total reduced sulfides
- ☐ Hydrogen sulfide
- ☐ Other (explain):
- ☒ Carbon monoxide
- ☐ Particulates
- ☐ Exhaust temperature
- ☐ Hydrogen chloride
- ☐ Opacity
- ☐ Temperature
  - ☐ Exhaust gas
  - ☐ Primary Chamber
  - ☐ Secondary Chamber
- ☐ Flow Rate
- ☐ VOCs

3. CEMS Manufacturer's Information:

   Name of manufacturer: Teledyne API

   Model number: 300E

   Serial number: 287

4. Data acquisition system to be used (data logger, strip chart, software, etc):

   Name of manufacturer/software: Automated Control Systems, Inc./CemMaster PC 2.0

   Serial number: 01088C - DAS

5. Indicate emission source to be monitored and the location of the specific CEM:

   Exhaust stack for No. 5 Power Boiler

6. Briefly describe the calibration and operational procedures to be used in operating the CEM (indicate estimate of time lost in calibrating, maintaining, repairing, etc.):

   Automatic injection of dry air occurs once every 24 hours to check zero calibration. Automatic injection of known value calibration gas occurs once every 24 hours to check span calibration. Approximately 10 minutes are lost during each daily calibration event.

7. Indicate CEM calibration/maintenance schedule:

   Daily automatic calibration and system checks are performed. Preventive maintenance activities are performed monthly, quarterly, and annually.

8. Check which program(s) apply to the unit with the monitor:

   ☐ NSPS ☐ SIP ■ PSD ☐ BIF

   ☐ NESHAPS ☐ Acid Rain ☐ RCRA ☐ Enhanced Monitoring

9. Monitor span: From: 0 ppm To: 380 ppm

10. Performance protocol (from Appendix B in 40 CFR Part 60): Performance Specification 4

11. Insitu/dilution extractive/extractive? (type): Extractive

12. If dilution extractive, give approximate dilution rate: N/A

13. Conditioning system? ☑ YES ☐ NO

    If yes, what type? Vortex Cooling System - Dry

14. Does Appendix F in 40 CFR Part 60 apply? ☐ YES ☑ NO

Name of person preparing application: William N. Davis

Company of preparer Packaging Corporation of America

Signature: [signature] Date: 1/21/26

ADEM

PERMIT APPLICATION FOR CONTINUOUS EMISSION MONITORING SYSTEMS
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

			-					-				

Do not write in this space

1. Name of facility or organization: Packaging Corporation of America

2. List pollutant or parameter the continuous emission monitoring system is measuring:

- ☐ Sulfur dioxide
- ☐ Nitrogen oxides
- ☐ PM 10
- ☒ Oxygen
- ☐ Pressure
- ☐ Carbon dioxide
- ☐ Carbon monoxide
- ☐ Particulates
- ☐ Exhaust temperature
- ☐ Hydrogen chloride
- ☐ Opacity
- ☐ Temperature
  - ☐ Exhaust gas
  - ☐ Primary Chamber
  - ☐ Secondary Chamber
- ☐ Total reduced sulfides
- ☐ Hydrogen sulfide
- ☐ Other (explain):
- ☐ Flow Rate
- ☐ VOCs

3. CEMS Manufacturer's Information:

   Name of manufacturer: City Technologies

   Model number: CitiCel

   Serial number: 06.34236438 127

4. Data acquisition system to be used (data logger, strip chart, software, etc):

   Name of manufacturer/software: Automated Control Systems, Inc./CemMaster PC 2.0

   Serial number: 01088C - DAS

5. Indicate emission source to be monitored and the location of the specific CEM:

   Exhaust stack for No. 5 Power Boiler

6. Briefly describe the calibration and operational procedures to be used in operating the CEM (indicate estimate of time lost in calibrating, maintaining, repairing, etc.):

   Automatic injection of dry air occurs once every 24 hours to check zero calibration. Automatic injection of known value calibration gas occurs once every 24 hours to check span calibration. Approximately 10 minutes are lost during each daily calibration event.

7. Indicate CEM calibration/maintenance schedule:

   Daily automatic calibration and system checks are performed. Preventive maintenance activities are performed monthly, quarterly, and annually.

8. Check which program(s) apply to the unit with the monitor:

   ■ NSPS ■ SIP ■ PSD ☐ BIF

   ☐ NESHAPS ☐ Acid Rain ☐ RCRA ☐ Enhanced Monitoring

9. Monitor span: From: 0 % To: 25 %

10. Performance protocol (from Appendix B in 40 CFR Part 60): Performance Specification 3

11. Insitu/dilution extractive/extractive? (type): Extractive

12. If dilution extractive, give approximate dilution rate: N/A

13. Conditioning system? ☑ YES ☐ NO

    If yes, what type? Vortex Cooling System - Dry

14. Does Appendix F in 40 CFR Part 60 apply? ☑ YES ☐ NO

Name of person preparing application: William N. Davis

Company of preparer: Packaging Corporation of America

Signature: [signature] Date: 1/21/26

APPENDIX C

Air Quality Impact Analysis

AMBIENT AIR QUALITY ASSESSMENT REPORT

COMBUSTION TURBINE INSTALLATION PROJECT

PACKAGING CORPORATION OF AMERICA – JACKSON MILL

FEBRUARY 2026

SUBMITTED BY:

PACKAGING CORPORATION OF AMERICA

Packaging Corporation of America
Jackson Mill
4585 Industrial Road
Jackson, Alabama 36545

SUBMITTED TO:

Alabama Department of Environmental Management

Alabama Department of Environmental Management
Air Division
1400 Coliseum Boulevard
P.O. Box 301463
Montgomery, Alabama 36110

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1. INTRODUCTION

Packaging Corporation of America (PCA) owns and operates a Kraft pulp and paper mill in Jackson, Alabama (Jackson Mill or Mill). The Mill is a major source as defined by the Federal operating permit program (40 CFR Part 70) and the Federal New Source Review (NSR) program (40 CFR Part 52). In addition, the Mill is subject to the Alabama Department of Environmental Management (ADEM) Title V Operating Permit (TVOP) regulations and NSR regulations per Alabama Administrative Code (AAC) 335-3-16 and AAC 335-3-14, respectively.

PCA is proposing to install a combined cycle power block in a "one-by-one" (1 x 1) configuration consisting of a 675 million British Thermal Units per hour (MMBtu/hr) natural gas-fired combined cycle combustion turbine (CT), as well as a heat recovery steam generator (HRSG) with a 304 MMBtu/hr duct burner and reduce the operation of the No. 3, No. 4, and No. 5 Package Boilers at the Mill (Project). The CT will be controlled with low nitrogen oxides (NO_X) burners (LNB) and a selective catalytic reduction (SCR) system. The Project will result in net significant emissions rate (SER) increases in particulate matter less than 10 microns (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), and carbon dioxide equivalent (CO_2e), as determined under ADEM's Prevention of Significant Deterioration (PSD) permitting regulations, Chapter 335-3-14-.04.

When a net significant emissions increase is projected to occur, ADEM's PSD regulations require an applicant to perform an ambient impact assessment to demonstrate that the proposed project will not:

- Exceed any National Ambient Air Quality Standard (NAAQS) at any location during any time; and
- Cause any allowable PSD increment to be exceeded.

As Project emissions are expected to exceed SERs, an air quality modeling analysis is required. In addition, an evaluation of impacts of secondary formation of $PM_{2.5}$ from NO_X and sulfur dioxide (SO_2) precursors is required. PCA submitted an ambient air quality assessment protocol (Protocol) (Appendix A), which was approved by ADEM on January 6, 2026, in accordance with the ADEM *"PSD Air Quality Analysis Modeling Guidelines"* (ADEM, 2025) modeling guidance and the requirements presented in the November 24, 2024 revisions to the United States Environmental Protection Agency (U.S. EPA) *"Guideline on Air Quality Models"* in 40 CFR Part 51, Appendix W (Appendix W) (U.S. EPA, 2024). The procedures and technical information presented in the Protocol have been incorporated into the air quality modeling analysis presented in this report (Report).

2. MILL AND PROJECT OVERVIEW

The following subsections include background information on the Mill and the proposed Project.

2.1 MILL LOCATION

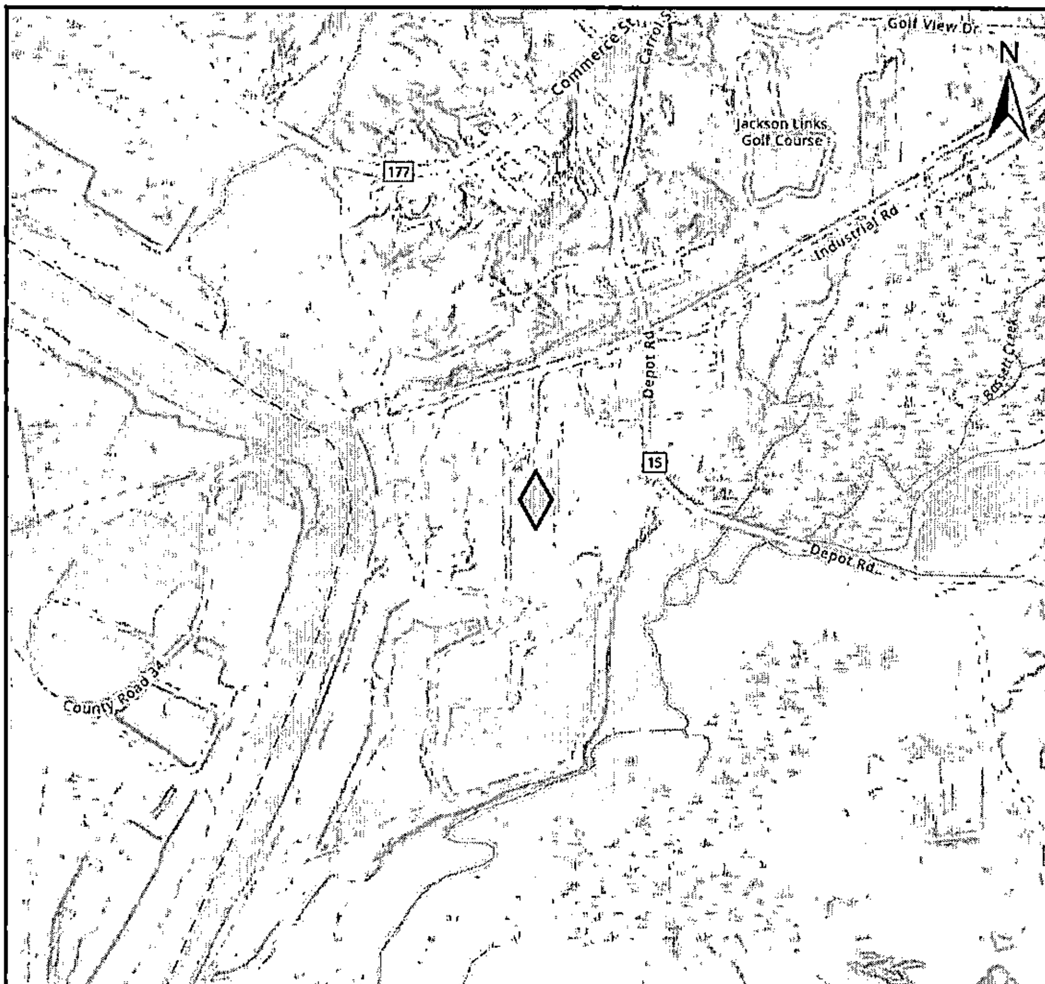
The Mill is located south of the City of Jackson in Clarke County, Alabama. A Mill location map is provided in Figure 2-1. The geographical coordinates for the approximate center of the processing area of the Mill are:

- Universal Transverse Mercator (UTM) Easting: 414,616 meters (m)
- UTM Northing: 3,484,510 m
- UTM Zone: 16
- North American Datum (NAD): 1983
- Longitude (degrees, minutes, seconds): 87° 53′ 56″ W
- Latitude (degrees, minutes, seconds): 31° 29′ 32″ N

The Mill is located approximately one mile south of the city of Jackson Alabama, adjacent to the Tombigbee River, in the Alabama and Tombigbee Rivers Intrastate Air Quality Control Region (AQCR) (as designated in 40 CFR §81.266). Within this AQCR, Clarke County is designated as in attainment or unclassifiable with respect to the NAAQS for all NAAQS pollutants (as designated in 40 CFR §81.301) as of the date of Protocol submittal.

The Mill is located in the Southern Coastal Plain topographical region, characterized by moderately variable terrain consisting of flatlands and rolling hills. The Mill has an elevation of approximately 14 m above mean sea level (amsl). Terrain within five km of the Mill ranges from 9 m amsl along the Tombigbee River to approximately 91 m amsl to the southeast.

Figure 2-1
Facility Location Map



Legend

Facility Location - PCA Jackson

0 500 1,000 m

Locator Map - AL

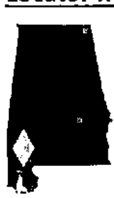


Figure 2-1
Facility Location Map

Boise White Paper, LLC dba PCA Jackson
Jackson, Alabama

DRAWN BY: N.C.	CHECKED BY: D.D.	ALL4
DATE: December 2025	PROJECT NO: 000697-0010.00	

2.2 MILL PROCESS DESCRIPTION

The Mill consists of a woodyard, pulp mill, old corrugated container (OCC) recycle plant, paper machines, recausticizing operations, utilities, tall oil plant, and other miscellaneous support operations. The papermaking process begins in the woodyard where logs are debarked and chipped. The wood chips are reclaimed from chip storage piles and fed into batch digesters to produce pulp. The pulp slurry from the digesters is screened and washed prior to being sent to high density storage tanks. The plant also employs use of OCC recycling to make recycled brown pulp for the paper machines. Pulp is transferred to the two paper machines where it is further processed into multiple unbleached linerboard or medium for sale in rolls.

2.3 PROPOSED PROJECT DESCRIPTION

The proposed Project includes installation of a natural gas-fired CT and HRSG with a combined heat input of 979 MMBtu/hr. Table 2-1 summarizes the Project-related emissions increases associated with the CT Project compared to the PSD SER thresholds. As discussed in Section 1, the Project triggers PSD for PM_{10}, $PM_{2.5}$, and CO_2e. There are no fugitive emissions sources associated with the Project.

Table 2-1
Project PSD Analysis Summary – Gas Turbine with Duct Burner

	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	NO_x (tpy)	CO (tpy)	VOC (tpy)	CO_2e (tpy)	Lead (tpy)	Sulfuric Acid (tpy)
Potential Emissions										
Gas Turbine with Duct Burner	21.44	30.02	30.02	10.84	116.00	98.62	16.89	502,141	0.0021	1.66
TOTAL	**21.44**	**30.02**	**30.02**	**10.84**	**116.00**	**98.62**	**16.89**	**502,141**	**0.0021**	**1.66**
Baseline Actual Emissions										
Combined NOx Emissions - No. 3, No. 4, and No. 5 Package Boilers	N/A	N/A	N/A	N/A	76.73	N/A	N/A	N/A	N/A	N/A
TOTAL	**0.00**	**0.00**	**0.00**	**0.00**	**76.73**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Emission Increase [PE - BAE]	**21.44**	30.02	30.02	10.84	39.28	**98.62**	16.89	**502,141**	0.0021	**1.66**
PSD Significant Emission Rates	25	15	10	40	40	100	40	75,000	0.6	7
PSD Triggered?	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**Yes**	**No**	**No**

3. EMISSIONS INVENTORY SUMMARY

To complete a PSD evaluation, an initial inventory of Project-related emissions was developed. PM_{10} and $PM_{2.5}$ were modeled because potential Project-related emissions exceed the PSD SER thresholds for these pollutants. Pollutants with modeled concentrations exceeding PSD Class II Significant Impact Levels (SILs) require a NAAQS and PSD increment analysis with local source emissions included.

3.1 SIGNIFICANT IMPACT ANALYSIS EMISSIONS INVENTORY

An initial Significant Impact Analysis (SIA) was conducted to evaluate ambient impacts from Project-related emissions, with modeled concentrations compared to Class II SILs. The SIA evaluated PM_{10} and $PM_{2.5}$ emissions from the proposed CT (Table 3-1). Project emissions rates were developed using proposed best available control technology (BACT) limits. Project emissions do not result in ambient concentrations that exceed the respective Class II SILs for 24-hour and annual PM_{10} and 24-hour and annual $PM_{2.5}$. Therefore, a NAAQS and PSD increment analysis was not conducted.

3.2 PHYSICAL STACK CHARACTERISTICS

The physical stack characteristics for the modeled emissions unit are provided in Table 3-2. Information related to the physical stack characteristics includes unit location, base elevation, release height, stack temperature, stack diameter, and stack exit velocity.

Table 3-1
Significant Impact Analysis – Emissions Inventory

Point Source Description	AERMOD ID	PM_{10} Emissions Rate			$PM_{2.5}$ Emissions Rate		
		Short-Term	Annual		Short-Term	Annual	
		(lb/hr)	(tpy)	(lb/hr)	(lb/hr)	(tpy)	(lb/hr)
New Turbine	TURB_1	6.85	30.00	6.85	6.85	30.00	6.85

Table 3-2
Summary of Project Physical Stack Characteristics and $PM_{10}/PM_{2.5}$ Emissions Rates

Point Source Description	AERMOD ID	$PM_{10}/PM_{2.5}$ Emissions Rate		Stack Location (UTM Coordinates NAD 83 Zone 16)		Stack Elevation		Stack Height		Stack Exit Velocity		Stack Volumetric Flowrate	Stack Temperature		Stack Diameter	
		(lb/hr)	(g/s)	(X)	(Y)	(m)	(ft)	(m)	(ft)	(m/s)	(ft/s)	(ACFM)	(K)	(F)	(m)	(ft)
New Turbine	TURB1	6.85	0.863	414,427.00	3,484,417.00	12.50	41.00	64.62	212.0	23.80	78.10	598,300	423.71	303.00	3.89	12.75

4. AIR QUALITY MODELING APPROACH

This section of the Protocol presents the technical approach that was used to demonstrate compliance with the NAAQS. The air dispersion model selection is described as well as the proposed options that were used in the model. Supporting information, such as land use determinations, building downwash analyses, meteorological data, and terrain data, is also presented in this section. The guidance provided in 40 CFR Part 51 Appendix W "*Guideline on Air Quality Models*" (U.S. EPA, 2024) was used to conduct the air quality modeling analyses. Additional guidance provided by ADEM in the "*PSD Air Quality Analysis Modeling Guidelines*" (March 2024) was incorporated as necessary.

4.1 AIR DISPERSION MODEL SELECTION

The air quality modeling analysis used the American Meteorological Society/Environmental Protection Agency (AMS/EPA) modeling system (AERMOD) to evaluate ambient air concentrations from the Mill. AERMOD is the U.S. EPA's preferred model for refined regulatory air quality modeling analyses (Appendix W). PCA utilized the U.S. EPA regulatory version of AERMOD and did not use a proprietary version of AERMOD.

AERMOD (current version 24142) consists of two pre-processors and a dispersion model. AERMAP (version 24142) is the terrain pre-processor and AERMET (version 23132) is the meteorological pre-processor. AERMAP characterizes the surrounding terrain and can generate elevations for sources, structures, and receptors within the air quality modeling domain. AERMET is used to generate an hourly profile of meteorological conditions and boundary layer characteristics. The air quality modeling analysis utilized the most recent versions of the AERMOD system, current at the time of this Report submittal, except for the programs used by ADEM to develop the meteorological inputs.

AERMOD has user-selectable options that may be chosen to configure the dispersion model for regulatory and non-regulatory applications. In this case, the air quality modeling was performed for a regulatory application; therefore, regulatory default options were used for the air quality modeling, including the following:

- Stack-tip Downwash

- Accounting of Elevated Terrain Effects
- Calms Processing Routine
- Missing Data Processing Routine
- No Exponential Decay for Rural Mode

4.2 LAND USE ANALYSIS

Appendix W specifies a procedure, based on the land use classification scheme developed by Auer (Auer, 1978), to determine whether land usage surrounding the modeled source is primarily urban or rural. Two methods can be used for performing this procedure: a land use classification or a population density evaluation. The land use classification procedure is considered the more definitive methodology (Appendix W) and is proposed for the air quality modeling analysis.

The land use classification determination involves quantifying the percentage of each Auer land use categories within a three km radius of the Mill. Urban dispersion coefficients should be selected if greater than 50 percent of the area evaluated consists of urban land use types (industrial, commercial, compact residential); otherwise, rural dispersion coefficients should be used. United States Geological Survey (USGS) 2024 National Land Cover Data (NLCD) was obtained to identify and correlate land cover classifications using the Auer methodology. USGS land cover categories 23 (Developed, Medium Intensity) and 24 (Developed, High Intensity) correlate to Auer land use types classified as urban: R2 (Compact Residential – Single), R3 (Compact Residential – Old Multi-Family), I1 (Heavy Industrial), I2 (Light-Moderate Industrial), and C1 (Commercial).

To perform the land use analysis, geographical information system (GIS) software was used to review the various land use types contained in the electronic land use dataset. Based on the GIS summary, 93.3% land use within a 3-km radius of the Mill is rural (Figure 4-1 and Table 4-1). Therefore, the urban option was not selected in the AERMOD air dispersion modeling analysis.

4.3 RECEPTOR NETWORK

The AERMOD terrain pre-processor AERMAP was used to process 1/3 arc-second (approximately 10 m) United States Geological Survey (USGS) National Elevation Dataset (NED) files, in Georeferenced Tagged Image File Format (GeoTIFF), to create ground elevation and hill height scales for each receptor in a 40-

Figure 4-1
Three Kilometer Land Use

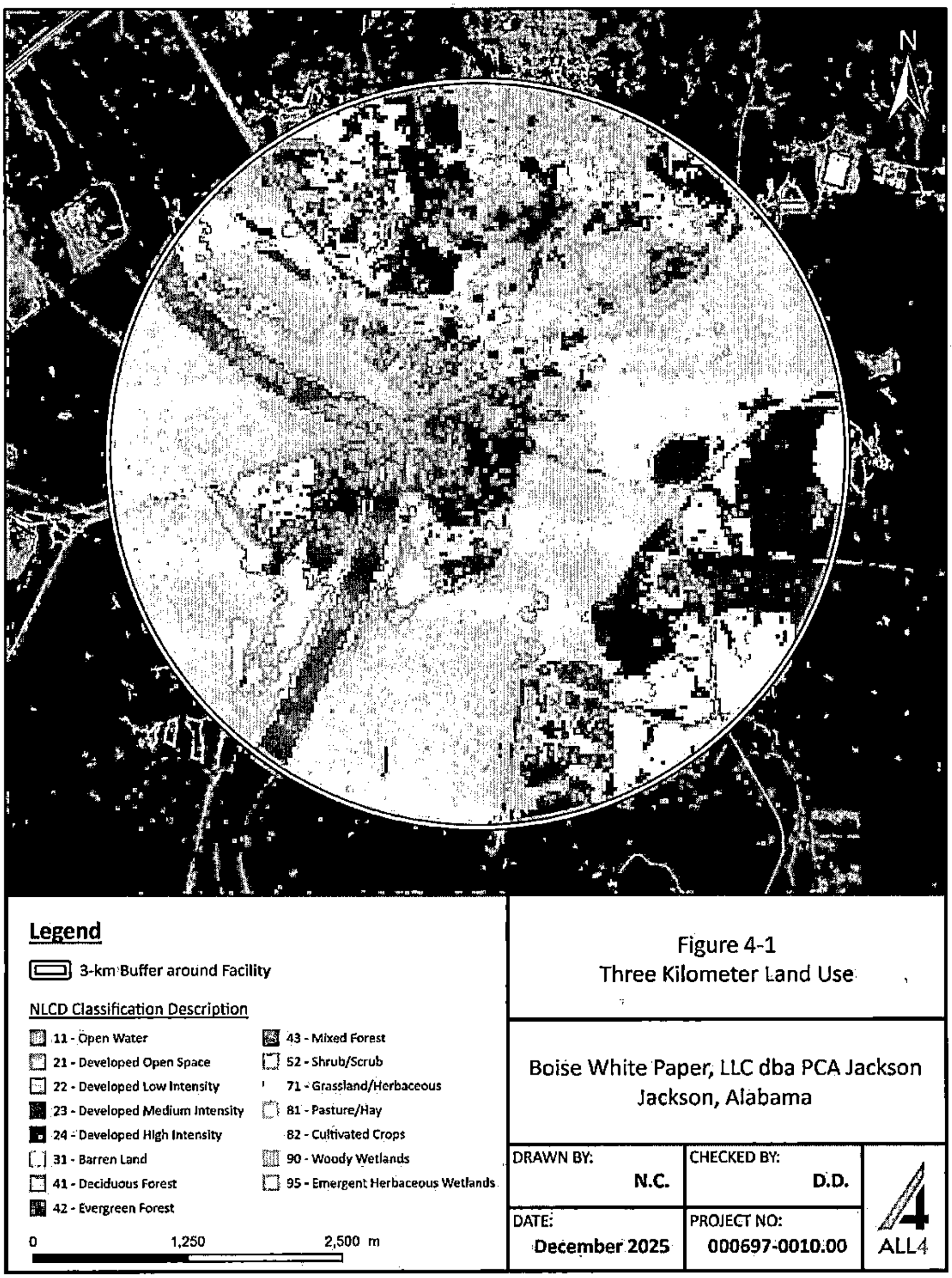


Table 4-1
Three Kilometer Land Use Percentages

NLCD Classification Code	NLCD Classification Description	Urban/Rural Classification	Area (m^2)	Land Use Percentage (%)
11	Open Water	Rural	1,509,300	5%
21	Developed Open Space	Rural	2,870,100	10%
22	Developed Low Intensity	Rural	2,639,700	9%
23	Developed Medium Intensity	Urban	1,395,900	5%
24	Developed High Intensity	Urban	510,300	2%
31	Barren Land	Rural	1,089,000	4%
41	Deciduous Forest	Rural	5,400	0.02%
42	Evergreen Forest	Rural	3,446,100	12%
43	Mixed Forest	Rural	740,700	3%
52	Shrub/Scrub	Rural	484,200	2%
71	Grassland/Herbaceous	Rural	1,297,800	5%
81	Pasture/Hay	Rural	449,100	2%
82	Cultivated Crops	Rural	3,600	0.01%
90	Woody Wetlands	Rural	11,595,600	41%
95	Emergent Herbaceous Wetlands	Rural	234,900	1%

km by 40-km domain (i.e., the area that is modeled), centered at the Facility. Air quality modeling incorporated NAD83 horizontal datum.

A Cartesian receptor network (Figure 4-2), centered on the approximate Mill center was incorporated for the Class II SIL and Significant Monitoring Concentration (SMC) air quality modeling analyses. Receptors were placed in publicly accessible locations (i.e., ambient air) extending outward from the Mill within the modeling domain. Beyond the property boundary, receptors were placed at:

- 100 m intervals out to 5,000 m,
- 250 m intervals from 5,000 m to 8,000 m, and
- 500 m intervals from 8,000 m to 20,000 m.

In addition to the main rectangular coordinate receptor network, discrete receptors were placed along the property boundary at 25 m intervals which has been established as the ambient air boundary. The ambient air boundary has been updated since the last air quality modeling demonstration at the Mill to include the sawmill property that PCA has reacquired at the northeast of the facility and minor revisions to the property boundary near the Jackson Municipal Airport. The northern property boundary is fenced. The PCA Landfill on the eastern property boundary is fenced and the gate is locked after normal working hours. A small portion of the eastern boundary is controlled by the Wood Procurement Department and has locked gates at access roads to the wooded areas. The wooded areas in the Wood Procurement Department area on the eastern property boundary, southeastern property boundary, and on southwest property boundary are densely forested and swamp land which restrict public access to the Mill. The Tombigbee River borders the Mill on the west and southwestern edges. The river's bank is steep and heavily vegetated along the Mill's property boundary. In addition, security staff are on duty at all entrance gates and conduct security patrols of the complete property boundary. Figure 4-2 includes identification of each type of ambient air boundary described above.

4.4 METEOROLOGICAL DATA

U.S. EPA recommends that AERMOD be run with a minimum of five years of off-site data or one year of site-specific or five years of representative meteorological data to *"acquire enough meteorological data to ensure worst-case meteorological conditions are adequately represented in the model results"* (U.S. EPA, 2024). Inclusion of site-specific data is not proposed for this air quality modeling analysis.

Figure 4-2
Receptor Network

Legend

- Fenced Boundary Receptor
- River Boundary Receptor
- Wooded Boundary Receptor
- Receptor

0 500 1,000 m

Figure 4-2
Receptor Network

Boise White Paper, LLC dba PCA Jackson
Jackson, Alabama

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N.C.	D.D.	ALL4
DATE: December 2025	PROJECT NO: 000697-0010.00	

The five-year (2018-2022) Evergreen (KGZH) meteorological dataset, considered representative National Weather Service (NWS) data for Clarke County, was purchased from, and processed by, ADEM for PCA's 2024 Bark Boiler Project air quality modeling analysis and was included in this air quality modeling analysis. The dataset consists of surface meteorological data from the Evergreen Regional Airport in Evergreen, Alabama [Weather Bureau Army Navy (WBAN) identifier 53820] and upper air data from the Shelby County Airport (KEET) (WBAN identifier 53823) near Alabaster, Alabama. The meteorological dataset includes the application of the ADJ_U* option and was processed with a one-minute threshold of 0.50 meters/second.

4.5 GOOD ENGINEERING PRACTICE (GEP) STACK HEIGHT ANALYSIS

A GEP stack height analysis was conducted to evaluate if stack emissions are subject to building wake effects and aerodynamic downwash caused by structures included in the air quality modeling, in accordance with the *"Guideline for Determination of Good Engineering Practice Stack Height"* (U.S. EPA, 1985). If a stack is sufficiently close to a building, or if located adjacent to or on a building, the plume from the stack can be entrained in the building's wake, diminishing plume rise that can result in increased ground level ambient concentrations. Facilities with stack heights below their corresponding GEP formula heights must account for potential building wake effects within the air quality modeling.

There are two definitions of GEP stack height: formula GEP stack height and regulatory GEP stack height. U.S. EPA requires building downwash effects to be evaluated for nearby structures when a stack is less than formula GEP stack height. Regulatory GEP stack height is the greater of 65 m or formula GEP stack height. Formula GEP stack height is defined as:

$$H_{GEP} = H_B + 1.5L_B$$

where:

H_{GEP} = formula GEP stack height,
H_B = the building's height above stack base, and
L_B = the lesser of the building's height or maximum projected width.

The current version of U.S. EPA's Building Profile Input Program for PRIME (BPIPPRM) was used to calculate wind direction-specific downwash parameters to evaluate stacks considered close enough to a structure to be affected by downwash, defined as the lesser of 0.8 km or $5L_B$ of the structure in any wind direction. Due to the use of BPIPPRM and associated cavity algorithms, a separate cavity analysis was not conducted. The source and structures included in the air quality modeling and downwash analysis are presented in Figure 4-3 and Figure 4-4 and a summary of the building dimensions and coordinates is provided in Appendix A. Buildings related to the proposed Bark Boiler Project have been removed from this analysis and replaced with the CT and HRSG structure. The proposed stack for the CT is not above GEP and therefore no adjustment for modeling purposes were necessary.

4.6 SECONDARY POLLUTANT FORMATION

The 2017 amendments to 40 CFR Part 51 Appendix W require an evaluation of the potential for secondary O_3 and $PM_{2.5}$ formation based on the Project emissions rates of precursor pollutants (NO_X and VOC for O_3; NO_X and SO_2 for $PM_{2.5}$). U.S. EPA recently published guidance (U.S. EPA, 2022) clarifying that if any precursor emissions of O_3 or $PM_{2.5}$ are emitted by the source in a significant amount, then all precursor pollutants be included in a precursor analysis. As Project $PM_{2.5}$ emissions are greater than the SER, a precursor analysis is required to evaluate the contribution of secondary $PM_{2.5}$ from precursor pollutants to total $PM_{2.5}$ concentration levels.

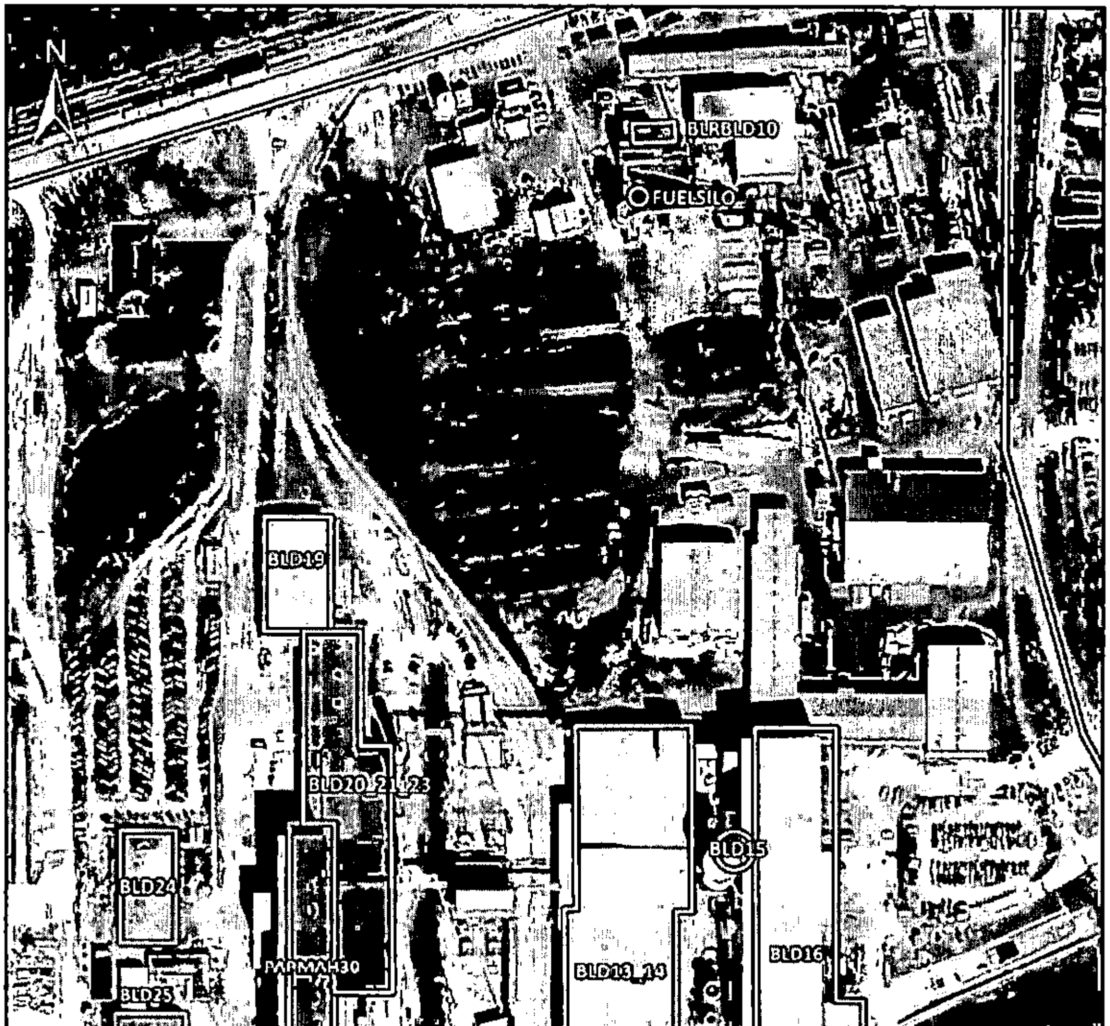
U. S. EPA provides a two-tiered approach for assessing the impacts of emissions for these pollutants:

- Tier 1 involves using known relationships between precursor emissions and a source's impacts to qualitatively assess the potential secondary $PM_{2.5}$ formation.
- Tier 2 involves a more detailed analysis and could involve application of a photochemical grid model to determine the secondary $PM_{2.5}$ impacts.

U.S. EPA has published guidance to establish SILs for $PM_{2.5}$ and Modeled Emission Rates for Precursors (MERP) as a Tier-1 demonstration tool. A MERP represents a level of precursor emissions that is not expected to contribute significantly to concentrations of secondarily formed $PM_{2.5}$. Emissions in excess of the MERPs would require an alternative Tier-1 approach or potentially a Tier-2 analysis.

The MERPs guidance "*EPA's Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier-1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program*", finalized April 30, 2019 (U.S. EPA, 2019), contains photochemical model results generated by U.S. EPA representing maximum downwind $PM_{2.5}$ concentrations due to emissions of hypothetical sources of precursor

Figure 4-3
Downwash Analysis – Facility North



Legend

- Point Source
- Structure
- Approximate Property Boundary

0 100 200 m

Figure 4-3
Downwash Analysis - Facility North

Packaging Corporation of America
Jackson, Alabama

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N.C.	D.D.
DATE: February 2026	PROJECT NO: 000697-0010.00

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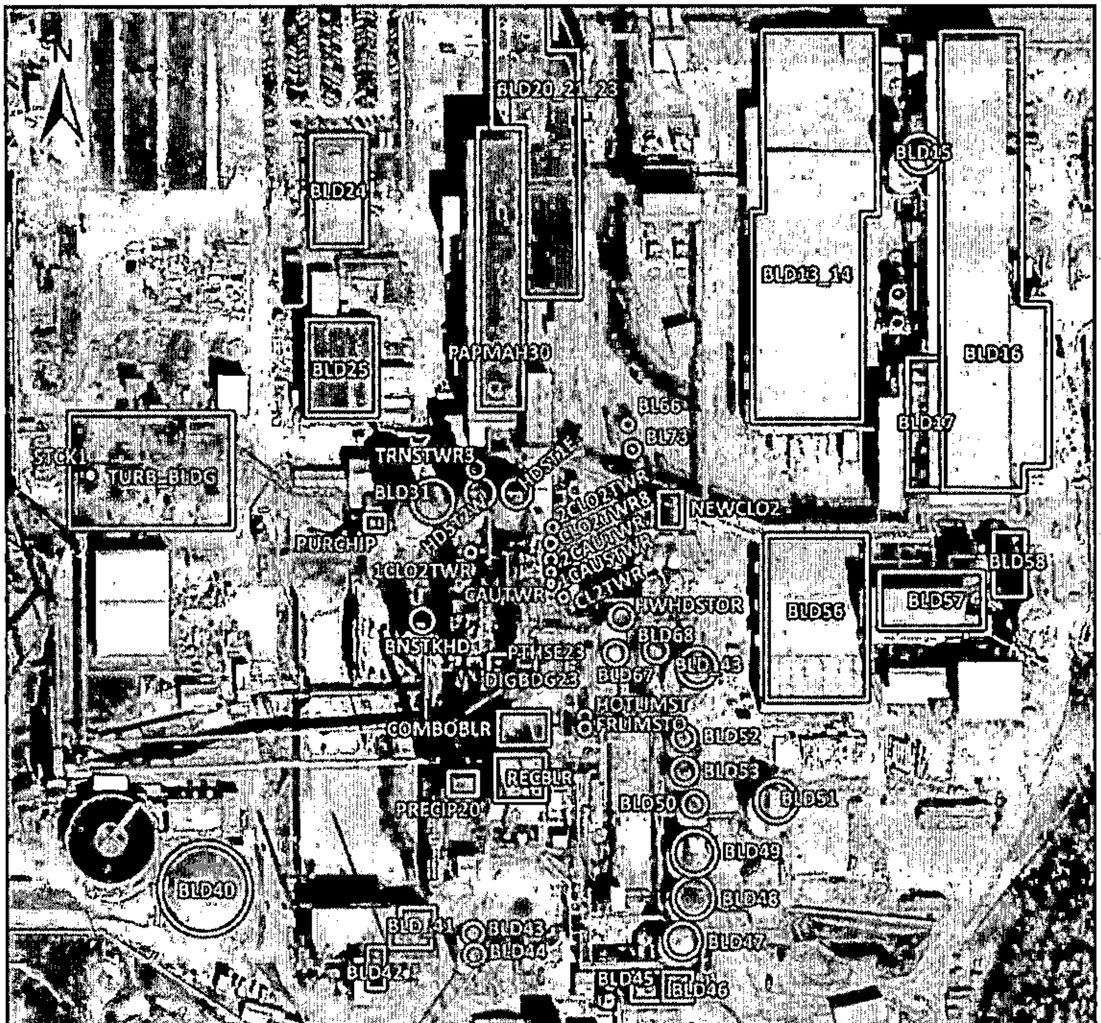
Figure 4-4
Downwash Analysis – Facility Central



Legend ○ Point Source ▭ Structure 0 100 200 m	Figure 4-4 Downwash Analysis - Facility Central Packaging Corporation of America Jackson, Alabama

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DATE: **February 2026**	PROJECT NO: **000697-0010.00**	

emissions. The MERPs guidance contains a procedure to calculate applicable precursor emissions that would be assumed to result in significant concentrations of $PM_{2.5}$.

The Mill conducted a Tier-1 demonstration using the MERP values developed for Smith County, Mississippi (with a 500 tpy SO_2 and NO_X emissions rates and 90 m stack) to determine the potential for project emissions to significantly contribute to ambient $PM_{2.5}$ concentration levels. The 90 meter stack MERP was selected as most representative of the proposed 64.6 meter stack height for the proposed CT. The Smith County MERP values are the closest hypothetical source to the project site and Smith County is located in a similar rural setting, with a 2.3% maximum nearby urban percentage (U.S. EPA, 2019), as the Project. Table 4-2 summarizes the MERP calculations utilizing Project-related NO_X and SO_2 emissions. The calculated $PM_{2.5}$ precursor impacts were added to the direct $PM_{2.5}$ modeled results.

4.7 ADDITIONAL IMPACTS ANALYSIS

A discussion of the additional impacts of the proposed Project on the Class II area surrounding the Mill is provided in this section. As part of this discussion, the potential growth resulting from the Project, acidification of rainfall and impacts on vegetation and soil, and endangered species are qualitatively addressed. The Project is not anticipated to be responsible for visibility impairment.

4.7.1 Potential Growth

In general, it is anticipated that the Project will have insignificant impacts on secondary source growth in the area of Clarke County with respect to air quality related impacts. Although there will be construction activities associated with installation of the CT and HRSG, the construction activities will be limited to new construction and construction of the CT and HRSG. Also, the Mill is unaware of any industrial growth that will occur as a result of the Project at the Mill. As a result, any additional support jobs are not expected to generate significant commercial growth. Therefore, no significant and permanent air quality impacts due to secondary source growth are anticipated as a result of the Project.

4.7.2 Adverse Impacts on Vegetation and Soils

Particulate matter is not likely to cause adverse effects on vegetation. Investigation of the effect that particulate emissions have on plants has generally shown no damage, although some interference with

Table 4-2
Evaluation of Secondary Formation of $PM_{2.5}$

24-Hour $PM_{2.5}$ Precursor Calculation [a]

$$\left[NO_X\ Project\ Emission\ Rate\ (tpy)\ x\left(\frac{NO_X\ Modeled\ Air\ Quality\ Impact\ from\ Hypothetical\ Souce\ (tpy)}{NO_X\ Emisssion\ Rate\ from\ Hypothetical\ Source\ \left(\frac{ug}{m^3}\right)}\right)+SO_2\ Project\ Emission\ Rate(tpy)\ x\left(\frac{SO_2\ Modeled\ Air\ Quality\ Impact\ from\ Hypothetical\ Souce\ (tpy)}{SO_2\ Emission\ Rate\ from\ Hypothetical\ Source\ \left(\frac{ug}{m^3}\right)}\right)\right]=24\ hr\ PM_{2.5}\ Precursor\ Concentration$$

39.275	x	0.046 / 500	+	10.835	x	0.192 / 500	=	7.79E-03	μg/m³

Annual $PM_{2.5}$ Precursor Calculation [a]

$$\left[NO_X\ Project\ Emission\ Rate\ (tpy)\ x\left(\frac{NO_X\ Modeled\ Air\ Quality\ Impact\ from\ Hypothetical\ Souce\ (tpy)}{NO_X\ Emisssion\ Rate\ from\ Hypothetical\ Source\ \left(\frac{ug}{m^3}\right)}\right)+SO_2\ Project\ Emission\ Rate(tpy)\ x\left(\frac{SO_2\ Modeled\ Air\ Quality\ Impact\ from\ Hypothetical\ Souce\ (tpy)}{SO_2\ Emission\ Rate\ from\ Hypothetical\ Source\ \left(\frac{ug}{m^3}\right)}\right)\right]=Annual\ PM_{2.5}\ Precursor\ Concentration$$

39.275	x	0.002 / 500	+	10.835	x	0.008 / 500	=	3.14E-04	μg/m³

[a] MERP values from Smith County, Mississippi for 500 tpy 90 meter stack hypothetical source utilized.

respiration and photosynthesis might occur if heavy crusts of dust accumulate on moist plant tissue (Prajapati, 2012). This level of accumulation is more likely to be associated with heavy agricultural or construction activities than with highly controlled industrial particulate emissions. Furthermore, natural weather conditions tend to remove dust and particulates from plant surfaces before heavy accumulations can build up. Consequently, no adverse effects on vegetation are expected to result from PM/PM_{10}/$PM_{2.5}$ emissions due to the Project.

The emissions from the Project are well controlled and will be unlikely to result in adverse effects to the local soil. The Mill utilizes good operating/combustion practices on all of its emissions units that emit sulfur and nitrogen. Therefore, the Mill is not expected to be significant local contributor to sulfur or nitrogen deposition that could impact soil pH.

4.8 PRE-OPERATION AND POST-OPERATION MONITORING

Per ADEM modeling guidance, the Mill modeled Project emissions to compare concentrations to de minimis monitoring levels to determine if pre-operation or post-operation monitoring is required. De minimis levels are based on U.S. EPA SMC thresholds and indicate minimum concentrations that may require monitoring. As results of the air quality modeling analysis determined that ambient concentrations are below the de minimis levels for all pollutants, monitoring will not be performed.

Given that the DC Circuit Court of Appeals vacated the 24-hour $PM_{2.5}$ SMC on January 22, 2013, pre-operation or post-operation monitoring for $PM_{2.5}$ may be considered if it is determined as necessary to evaluate the impact the Project may have on air quality in any area. As the proposed Project is considered a major modification for $PM_{2.5}$, the Mill is potentially subject to the pre-operation or post-operation monitoring requirements for $PM_{2.5}$. However, the Mill proposes that pre-operation or post-operation monitoring for $PM_{2.5}$ will not be necessary for the proposed Project based on 2022-2024 8.2 microgram per cubic meter ($\mu g/m^3$) $PM_{2.5}$ design value concentration from the Chickasaw, Alabama $PM_{2.5}$ ambient monitoring station, obtained from ADEM by request from the Mill. A copy of the $PM_{2.5}$ design value Air Quality System (AQS) report is included in Appendix A.

5. CLASS I AIR QUALITY RELATE VALUE (AQRV) ANALYSIS

One Federal Class I Area is located within 300 km of the Mill. The Breton Wildlife Refuge, a series of low islands serving as a breeding habitat for multiple species of seabirds, is located approximately 188 km to the southwest of the Mill. Per ADEM modeling guidelines, ambient impacts on Federal Class I Areas within 100 km of a proposed source must be evaluated, but proposed sources beyond 100 km should be discussed with ADEM to determine modeling options (ADEM, 2025). Per the ADEM comments, received January 6, 2026, ADEM will not require a Class I Increment analysis for the Project.

PCA utilized the "Q/d" approach to evaluate whether a full Class I AQRV evaluation was required for the Project. Using this approach, "Q" is equal to the annualized maximum 24-hour emissions rate of NO_X, SO_2, PM_{10}, and H_2SO_4 in tpy, and "d" is the distance from the facility to the Class I area in km. The Q/d evaluation (Table 5-1) was completed utilizing annual project emissions to assess impacts of deposition which are evaluated on an annual basis. As the Q/d ratio is less than the screening threshold of 10, which was set by the FLMs in the October 2010 FLM AQRV Workgroup (FLAG) document (NPS, 2010), no Class I AQRV evaluation is required as part of the Project air permitting. However, as recommended by ADEM, PCA submitted an AQRV Applicability Request Form via email (Appendix A) to the United States Fish and Wildlife Service, the appropriate Federal Land Manager for Breton Wildlife Refuge.

Table 5-1
Class I Air Quality Related Values Evaluation – Q/d Analysis

Total Project Emissions			
NO_X	**SO_2**	**PM_{10}**	**H_2SO_4**
39.3	10.8	30.0	1.7
Total NO_X, SO_2, PM_{10}, and H_2SO_4 Project Emissions (Q):			81.8
Class I Area	**Distance to Class I Area (d, km)**	**Q/d[a]** Annual	**Q/d <10? (b)**
Breton National Wildlife Refuge	188.0	0.4	Yes

[a] Federal Land Manager's (FLM) Air Quality Related Values Work Group (FLAG) guidance, suggests that agencies will consider a source located greater than 50 km from a Class I area to have negligible impacts with respect to Class I AQRVs if its total NO_X, SO_2, PM_{10}, and H_2SO_4 annual emissions (in tons per year, based on 24-hour maximum allowable emissions), divided by the distance (in km) from the Class I area (Q/d) is less than 10.

6. PRESENTATION OF AIR QUALITY MODELING RESULTS

This section of the Report summarizes the results from the air quality modeling analyses, including the worst-case load analysis and Class II SILs. The air quality modeling analyses were conducted using conservative air quality modeling techniques that demonstrated that the Project will not result in any adverse air quality impacts for applicable PSD pollutants.

6.1 CLASS II SIGNIFICANT IMPACTS ANALYSIS AND SIGNIFICANT MONITORING CONCENTRATIONS

A modeling analysis was performed to determine if Project related emissions resulted in predicted concentrations above the Class II PM_{10} and $PM_{2.5}$ SILs and SMCs. Modeled direct $PM_{2.5}$ concentrations were combined with $PM_{2.5}$ precursor concentrations calculated as part of the MERP analysis discussed in Section 4.6. The results from the Class II SIL and SMC analyses are provided in Table 6-1. The locations of the maximum modeled concentrations for $PM_{2.5}$ and PM_{10} for each averaging period are shown in Figure 6-1 and Figure 6-2, respectively. As Project related emissions resulted in modeled concentrations less than the Class II SILs and SMC for all pollutants and averaging periods and therefore, no NAAQS or Class II PSD increment modeling analysis is required, and no pre-operation and post-operation monitoring is required.

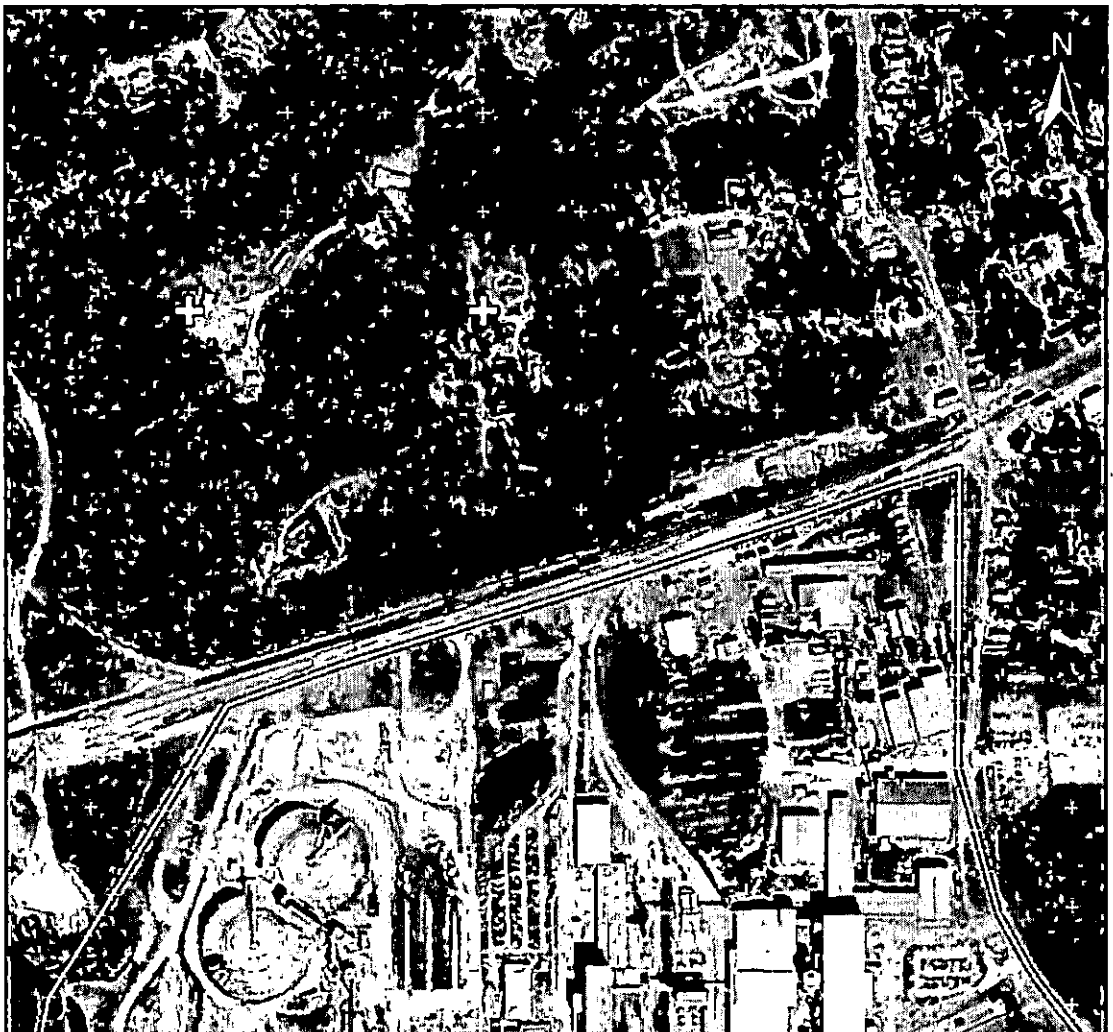
6.2 SUBMITTAL OF MODELING FILES

An electronic copy of the air quality modeling input and output files, as well as supporting files, such as meteorological data, building downwash, and terrain files, will be submitted as part of this Report.

Table 6-1
Results of the Class II Significant Impact Level Modeling Analysis

Pollutant	Averaging Period	Form	Class II SIL (µg/m³)	Modeled Concentration (µg/m³)	Secondary $PM_{2.5}$ Contribution (µg/m³)	Modeled + Secondary Concentration (µg/m³)	Modeled Concentration Less Than Class II SIL (Y/N)	SMC (µg/m³)	Modeled Concentration Less Than SMC (Y/N)
$PM_{2.5}$	Annual	5-year average	0.13	0.01	3.14E-04	0.01	Y	-	-
	24-Hour		1.2	0.18	7.79E-03	0.19	Y	-	-
PM_{10}	Annual	1st highest	1	0.02	N/A		Y	-	-
	24-Hour		5	0.29			Y	10	Y

Figure 6-1
Locations of Maximum Modeled $PM_{2.5}$ Concentrations



Legend
- Location of Maximum Modeled Concentration - 24 Hour
- Location of Maximum Modeled Concentration - Annual
- Receptor
- Facility Boundary

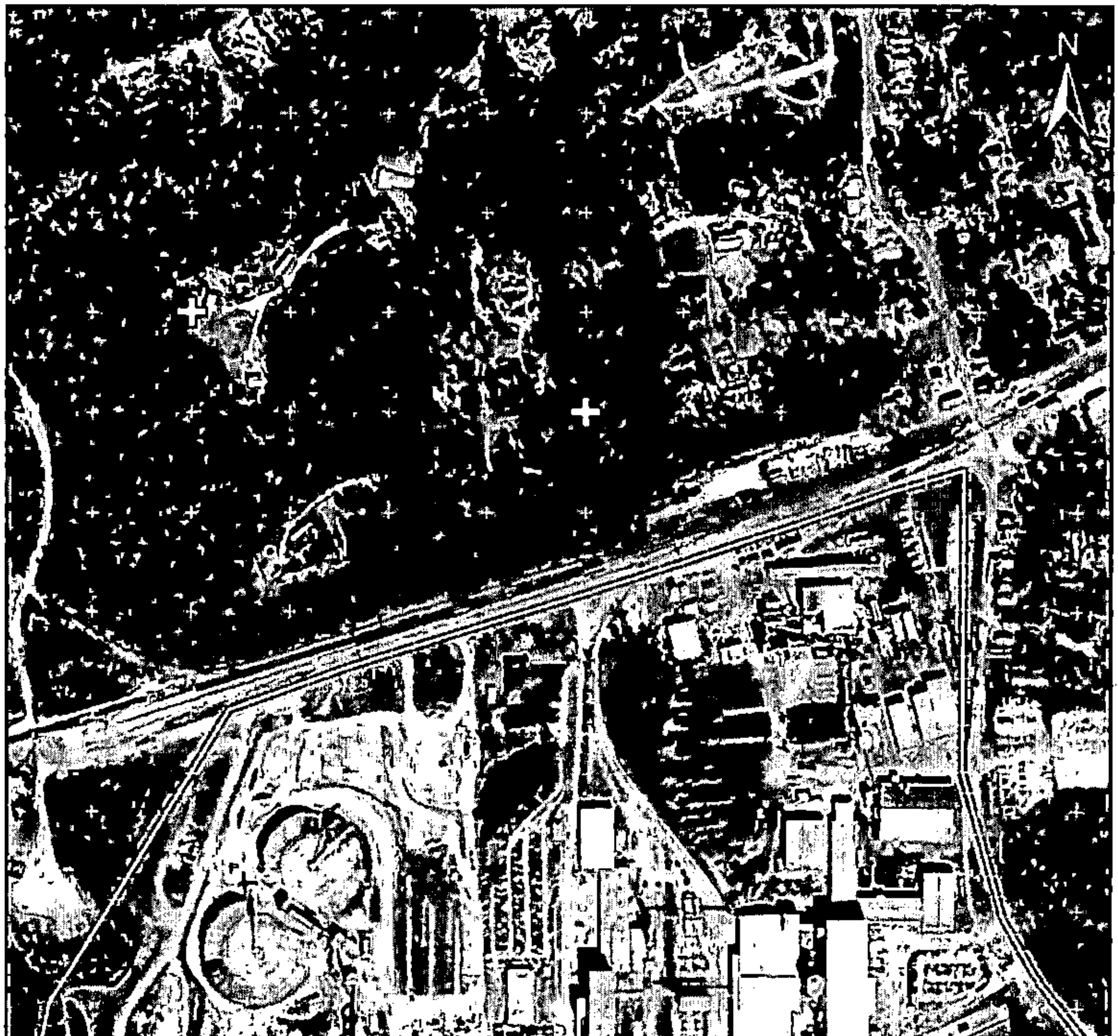
0 100 200 m

Figure 6-1
Locations of Maximum
Modeled Concentrations - $PM_{2.5}$

Packaging Corporation of America
Jackson, Alabama

DRAWN BY:	CHECKED BY:	
N.C.	D.D.	ALL4
DATE: February 2026	PROJECT NO: 000697-0010.00	

Figure 6-2
Locations of Maximum Modeled PM_{10} Concentrations



Legend

- Location of Maximum Modeled Concentration - 24 Hour
- Location of Maximum Modeled Concentration - Annual
- Receptor
- Facility Boundary

0 100 200 m

Figure 6-2
Locations of Maximum
Modeled Concentrations - PM_{10}

Packaging Corporation of America
Jackson, Alabama

DRAWN BY: N.C.	CHECKED BY: D.D.	ALL4
DATE: February 2026	PROJECT NO: 000697-0010.00	

7. REFERENCES

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U.S. EPA 2024 – 40 CFR Part 51 Appendix W "Guideline on Air Quality Models (Revised)", November 2024.

APPENDIX A -
AIR QUALITY MODELING INFORMATION

Table A-1
Summary of Building Dimensions and Coordinates
Packaging Corporation of America - Jackson, AL

Model ID	Description	Height (m)	UTM Easting (m)	UTM Northing (m)
BLRBLD10	-	15.8	414,811.3	3,484,949.1
			414,832.6	3,484,949.4
			414,831.9	3,484,959.8
			414,809.8	3,484,958.4
RECBLR	-	43.58	414,639.5	3,484,247.6
			414,639.5	3,484,271.5
			414,666.2	3,484,271.5
			414,666.2	3,484,247.6
PTHSE23	-	40.41	414,659.0	3,484,322.0
			414,659.0	3,484,317.7
			414,651.4	3,484,317.7
			414,651.4	3,484,322.0
2CL02TWR	-	38.84	414,669.8	3,484,392.2
			414,667.9	3,484,391.4
			414,667.1	3,484,389.5
			414,667.9	3,484,387.5
			414,669.8	3,484,386.7
			414,671.8	3,484,387.5
			414,672.6	3,484,389.5
			414,671.8	3,484,391.4
1CLO2TWR	-	36.19	414,626.7	3,484,379.6
			414,624.8	3,484,378.8
			414,624.0	3,484,376.8
			414,624.8	3,484,374.9
			414,626.7	3,484,374.1
			414,628.6	3,484,374.9
			414,629.4	3,484,376.8
			414,628.6	3,484,378.8
DIGBDG23	-	35.36	414,660.7	3,484,324.1
			414,660.7	3,484,313.4
			414,636.3	3,484,313.4
			414,636.3	3,484,324.1
HDST1E	-	34.29	414,655.4	3,484,413.6
			414,658.2	3,484,409.8
			414,658.2	3,484,405.1
			414,655.4	3,484,401.3
			414,650.9	3,484,399.8
			414,646.5	3,484,401.3
			414,643.7	3,484,405.1
			414,643.7	3,484,409.8
			414,646.5	3,484,413.6
			414,650.9	3,484,414.6
HDST2W	-	34.29	414,631.6	3,484,415.1
			414,626.2	3,484,412.8
			414,624.0	3,484,407.5
			414,626.2	3,484,402.1
			414,631.6	3,484,399.8
			414,637.0	3,484,402.1
			414,639.2	3,484,407.5
			414,637.0	3,484,412.8

Table A-1
Summary of Building Dimensions and Coordinates
Packaging Corporation of America - Jackson, AL

Model ID	Description	Height (m)	UTM Easting (m)	UTM Northing (m)
TRNSTWR3	-	34.29	414,629.3	3,484,424.1
			414,626.2	3,484,422.9
			414,624.9	3,484,419.8
			414,626.2	3,484,416.7
			414,629.3	3,484,415.4
			414,632.4	3,484,416.7
			414,633.6	3,484,419.8
			414,632.4	3,484,422.9
COMBOBLR	-	31.93	414,667.7	3,484,294.1
			414,667.7	3,484,276.4
			414,640.9	3,484,276.4
			414,640.9	3,484,294.1
PRECIP20	-	31.70	414,630.2	3,484,262.8
			414,630.2	3,484,250.3
			414,615.0	3,484,250.3
			414,615.0	3,484,262.8
NEWCLO2	-	22.45	414,738.0	3,484,407.9
			414,738.0	3,484,389.6
			414,725.8	3,484,389.6
			414,725.8	3,484,407.9
HWHDSTOR	-	22.00	414,706.1	3,484,349.6
			414,701.7	3,484,347.8
			414,700.0	3,484,343.5
			414,701.7	3,484,339.2
			414,706.1	3,484,337.4
			414,710.4	3,484,339.2
			414,712.1	3,484,343.5
			414,710.4	3,484,347.8
BNSTKHD	-	22.00	414,601.1	3,484,347.9
			414,596.8	3,484,346.1
			414,595.0	3,484,341.8
			414,596.8	3,484,337.5
			414,601.1	3,484,335.7
			414,605.4	3,484,337.5
			414,607.2	3,484,341.8
			414,605.4	3,484,346.1
PAPMAH30	-	20.42	414,654.6	3,484,597.2
			414,654.6	3,484,450.9
			414,630.8	3,484,450.9
			414,630.8	3,484,597.2

Table A-1
Summary of Building Dimensions and Coordinates
Packaging Corporation of America - Jackson, AL

Model ID	Description	Height (m)	UTM Easting (m)	UTM Northing (m)
CL2TWR	-	20.42	414,675.6	3,484,355.9
			414,674.0	3,484,355.3
			414,673.3	3,484,353.7
			414,674.0	3,484,352.0
			414,675.6	3,484,351.4
			414,677.2	3,484,352.0
			414,677.9	3,484,353.7
			414,677.2	3,484,355.3
2CAUTWR	-	18.82	414,669.0	3,484,376.1
			414,666.8	3,484,375.2
			414,665.9	3,484,373.0
			414,666.8	3,484,370.9
			414,669.0	3,484,370.0
			414,671.1	3,484,370.9
			414,672.0	3,484,373.0
			414,671.1	3,484,375.2
CLO2TWR8	-	18.82	414,669.0	3,484,384.4
			414,666.8	3,484,383.5
			414,665.9	3,484,381.4
			414,666.8	3,484,379.2
			414,669.0	3,484,378.3
			414,671.1	3,484,379.2
			414,672.0	3,484,381.4
			414,671.1	3,484,383.5
1CAUSTWR	-	18.80	414,669.0	3,484,368.9
			414,667.3	3,484,368.2
			414,666.7	3,484,366.6
			414,667.3	3,484,365.0
			414,669.0	3,484,364.3
			414,670.6	3,484,365.0
			414,671.2	3,484,366.6
			414,670.6	3,484,368.2
CAUTWR	-	18.80	414,669.0	3,484,362.2
			414,667.8	3,484,361.7
			414,667.3	3,484,360.5
			414,667.8	3,484,359.3
			414,669.0	3,484,358.8
			414,670.1	3,484,359.3
			414,670.6	3,484,360.5
			414,670.1	3,484,361.7
HOTLIMST	-	21.03	414,686.9	3,484,294.4
			414,684.8	3,484,293.5
			414,683.9	3,484,291.3
			414,684.8	3,484,289.2
			414,686.9	3,484,288.3
			414,689.1	3,484,289.2
			414,690.0	3,484,291.3
			414,689.1	3,484,293.5

Table A-1
Summary of Building Dimensions and Coordinates
Packaging Corporation of America - Jackson, AL

Model ID	Description	Height (m)	UTM Easting (m)	UTM Northing (m)
FRLIMSTO	-	21.03	414,686.9	3,484,288.1
			414,684.8	3,484,287.2
			414,683.9	3,484,285.1
			414,684.8	3,484,282.9
			414,686.9	3,484,282.0
			414,689.1	3,484,282.9
			414,690.0	3,484,285.1
			414,689.1	3,484,287.2
PURCHIP	-	12.19	414,581.8	3,484,396.4
			414,581.8	3,484,387.8
			414,570.9	3,484,387.8
			414,570.9	3,484,396.4
TURB_BLDG	New Turbine Building	25.30	414,416.0	3,484,449.0
			414,501.3	3,484,449.0
			414,501.3	3,484,389.6
			414,416.0	3;484,389.6
FUELSILO	-	20.20	414,812.9	3,484,926.0
			414,809.6	3,484,924.6
			414,808.3	3,484,921.4
			414,809.6	3,484,918.2
			414,812.9	3,484,916.8
			414,816.1	3,484,918.2
			414,817.4	3,484,921.4
			414,816.1	3,484,924.6
BL66	R-8 Sulfuric Acid Tank	6.10	414,709.6	3,484,445.4
			414,707.6	3,484,444.6
			414,706.8	3,484,442.6
			414,707.6	3,484,440.7
			414,709.6	3,484,439.9
			414,711.5	3,484,440.7
			414,712.3	3,484,442.6
			414,711.5	3,484,444.6
BL73	R-8 Methanol Tank	7.62	414,712.0	3,484,433.7
			414,709.3	3,484,432.6
			414,708.2	3,484,429.9
			414,709.3	3,484,427.2
			414,712.0	3,484,426.1
			414,714.7	3,484,427.2
			414,715.8	3,484,429.9
			414,714.7	3,484,432.6
BLD42	Deaerator Building	23.77	414,572.5	3,484,149.5
			414,572.5	3,484,171.7
			414,581.1	3,484,171.7
			414,581.1	3,484,149.5
BLD40	-	6.10	414,486.8	3,484,225.8
			414,470.1	3,484,218.9
			414,463.1	3,484,202.1
			414,470.1	3,484,185.4
			414,486.8	3,484,178.5
			414,503.5	3,484,185.4
			414,510.4	3,484,202.1
			414,503.5	3,484,218.9

Table A-1
Summary of Building Dimensions and Coordinates
Packaging Corporation of America - Jackson, AL

Model ID	Description	Height (m)	UTM Easting (m)	UTM Northing (m)
BLD43	North Demin Water Tank	12.19	414,627.8	3,484,184.2
			414,624.0	3,484,182.7
			414,622.4	3,484,178.9
			414,624.0	3,484,175.1
			414,627.8	3,484,173.6
			414,631.6	3,484,175.1
			414,633.1	3,484,178.9
			414,631.6	3,484,182.7
BLD44	South Demin Water Tank	12.19	414,628.6	3,484,172.7
			414,624.8	3,484,171.2
			414,623.2	3,484,167.4
			414,624.8	3,484,163.6
			414,628.6	3,484,162.1
			414,632.3	3,484,163.6
			414,633.9	3,484,167.4
			414,632.3	3,484,171.2
BLD_41	STG Building	13.41	414,607.5	3,484,192.3
			414,589.3	3,484,192.3
			414,589.3	3,484,180.9
			414,584.0	3,484,180.9
			414,583.9	3,484,171.3
			414,605.9	3,484,171.2
			414,605.9	3,484,180.9
			414,607.5	3,484,180.9
BLD45	Effluent West Cooling Tower	10.67	414,711.3	3,484,142.5
			414,711.3	3,484,157.7
			414,726.5	3,484,157.7
			414,726.5	3,484,142.5
BLD46	Effluent East Cooling Tower	10.67	414,727.9	3,484,142.5
			414,727.9	3,484,157.7
			414,743.1	3,484,157.7
			414,743.1	3,484,142.5
BLD47	#2 Weak Liquor Tank	12.80	414,737.9	3,484,183.8
			414,731.5	3,484,181.1
			414,728.8	3,484,174.7
			414,731.5	3,484,168.2
			414,737.9	3,484,165.5
			414,744.4	3,484,168.2
			414,747.1	3,484,174.7
			414,744.4	3,484,181.1
BLD48	Heavy Black Liquor Tank	15.85	414,743.8	3,484,207.6
			414,736.3	3,484,204.4
			414,733.1	3,484,196.9
			414,736.3	3,484,189.4
			414,743.8	3,484,186.2
			414,751.3	3,484,189.4
			414,754.5	3,484,196.9
			414,751.3	3,484,204.4

Table A-1
Summary of Building Dimensions and Coordinates
Packaging Corporation of America - Jackson, AL

Model ID	Description	Height (m)	UTM Easting (m)	UTM Northing (m)
BLD49	-	12.19	414,744.3	3,484,231.5
			414,736.3	3,484,228.2
			414,732.9	3,484,220.1
			414,736.3	3,484,212.0
			414,744.3	3,484,208.6
			414,752.4	3,484,212.0
			414,755.8	3,484,220.1
			414,752.4	3,484,228.2
BLD50	-	12.80	414,744.4	3,484,251.6
			414,740.0	3,484,249.8
			414,738.3	3,484,245.5
			414,740.0	3,484,241.2
			414,744.4	3,484,239.4
			414,748.7	3,484,241.2
			414,750.5	3,484,245.5
			414,748.7	3,484,249.8
BLD53	-	12.19	414,739.2	3,484,269.2
			414,734.6	3,484,267.2
			414,732.7	3,484,262.6
			414,734.6	3,484,258.0
			414,739.2	3,484,256.1
			414,743.9	3,484,258.0
			414,745.8	3,484,262.6
			414,743.9	3,484,267.2
BLD52	-	12.19	414,738.9	3,484,285.8
			414,734.6	3,484,284.0
			414,732.9	3,484,279.8
			414,734.6	3,484,275.5
			414,738.9	3,484,273.8
			414,743.2	3,484,275.5
			414,744.9	3,484,279.8
			414,743.2	3,484,284.0
BLD51	-	12.19	414,787.5	3,484,257.7
			414,780.0	3,484,254.6
			414,776.8	3,484,247.1
			414,780.0	3,484,239.5
			414,787.5	3,484,236.4
			414,795.0	3,484,239.5
			414,798.2	3,484,247.1
			414,795.0	3,484,254.6
BLD_43	HD Tower	21.95	414,746.0	3,484,326.7
			414,739.0	3,484,323.8
			414,736.1	3,484,316.8
			414,739.0	3,484,309.8
			414,746.0	3,484,306.9
			414,753.0	3,484,309.8
			414,755.9	3,484,316.8
			414,753.0	3,484,323.8

Table A-1
Summary of Building Dimensions and Coordinates
Packaging Corporation of America - Jackson, AL

Model ID	Description	Height (m)	UTM Easting (m)	UTM Northing (m)
BLD67	-	12.19	414,703.0	3,484,330.3
			414,698.8	3,484,328.5
			414,697.1	3,484,324.4
			414,698.8	3,484,320.2
			414,703.0	3,484,318.5
			414,707.2	3,484,320.2
			414,708.9	3,484,324.4
			414,707.2	3,484,328.5
BLD68	-	12.19	414,724.5	3,484,331.9
			414,720.2	3,484,330.1
			414,718.4	3,484,325.8
			414,720.2	3,484,321.5
			414,724.5	3,484,319.7
			414,728.8	3,484,321.5
			414,730.6	3,484,325.8
			414,728.8	3,484,330.1
BLD56	Recycle Bale Storage Warehouse	13.11	414,782.2	3,484,299.6
			414,782.2	3,484,385.3
			414,835.5	3,484,385.3
			414,835.5	3,484,299.6
BLD57	Recycle	24.69	414,842.2	3,484,337.2
			414,842.2	3,484,366.2
			414,896.6	3,484,366.2
			414,896.6	3,484,337.2
BLD58	Recycle Office Building	4.57	414,902.1	3,484,353.7
			414,902.1	3,484,386.8
			414,918.5	3,484,386.8
			414,918.5	3,484,353.7
BLD25	Pump Rebuild Shop	14.94	414,540.2	3,484,447.8
			414,540.2	3,484,498.0
			414,577.1	3,484,498.0
			414,577.1	3,484,447.8
BLD31	Broke Storage Chest	24.99	414,606.8	3,484,414.2
			414,599.1	3,484,411.0
			414,596.0	3,484,403.4
			414,599.1	3,484,395.7
			414,606.8	3,484,392.6
			414,614.5	3,484,395.7
			414,617.6	3,484,403.4
			414,614.5	3,484,411.0
BLD24	Administration Building	5.18	414,542.9	3,484,535.6
			414,542.9	3,484,593.4
			414,571.8	3,484,593.4
			414,571.8	3,484,535.6

Table A-1
Summary of Building Dimensions and Coordinates
Packaging Corporation of America - Jackson, AL

Model ID	Description	Height (m)	UTM Easting (m)	UTM Northing (m)
BLD15	Broke Storage Chest J3	24.99	414,863.6	3,484,593.3
			414,856.6	3,484,590.4
			414,853.7	3,484,583.4
			414,856.6	3,484,576.4
			414,863.6	3,484,573.5
			414,870.6	3,484,576.4
			414,873.5	3,484,583.4
			414,870.6	3,484,590.4
BLD19	Storeroom	10.67	414,617.6	3,484,696.3
			414,617.6	3,484,755.3
			414,652.3	3,484,755.3
			414,652.3	3,484,696.3
BLD13_14	J3 Finishing/Shipping Building	13.72	414,780.0	3,484,647.5
			414,780.9	3,484,553.5
			414,774.6	3,484,553.5
			414,774.9	3,484,444.0
			414,833.2	3,484,444.0
			414,833.2	3,484,552.1
			414,841.5	3,484,552.1
			414,840.9	3,484,647.9
BLD16	J3 Paper Machine	23.47	414,874.3	3,484,646.8
			414,875.4	3,484,408.5
			414,918.1	3,484,408.2
			414,918.1	3,484,420.8
			414,930.6	3,484,420.8
			414,930.8	3,484,505.4
			414,916.6	3,484,505.4
			414,916.6	3,484,647.0
BLD17	J3 Paper Machine West Side	16.15	414,856.9	3,484,408.4
			414,856.9	3,484,477.3
			414,875.4	3,484,477.3
			414,875.4	3,484,408.4
BLD20_21_23	J1 Shipping Finising & Pulp Dryer	8.53	414,638.1	3,484,696.2
			414,667.8	3,484,696.3
			414,668.0	3,484,637.2
			414,683.8	3,484,637.3
			414,684.8	3,484,509.4
			414,654.6	3,484,509.5
			414,654.6	3,484,597.2
			414,638.1	3,484,597.1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
PRELIMINARY DESIGN VALUE REPORT

Report Date: Sep. 14, 2025

Pollutant: Site-LevelPM2.5 - Local Conditions(88101)
Standard Units: Micrograms/cubic meter (LC)(105)
NAAQS Standard: PM25 24-hour 2024 / PM25 Annual 2024
Statistic: Annual Weighted Mean **Level:** 9
Statistic: Annual 98th Percentile **Level:** 35

Design Value Year: 2024

REPORT EXCLUDES MEASUREMENTS WITH REGIONALLY CONCURRED EVENT FLAGS.

State Name: Alabama

Site ID / STREET ADDRESS	2024 Cred. Days	2024 Comp. Qtrs	2024 98th Percentil	2024 Wtd. Mean	2024 Cert& Eval	2023 Cred. Days	2023 Comp. Qtrs	2023 98th Percentil	2023 Wtd. Mean	2023 Cert& Eval	2022 Cred. Days	2022 Comp. Qtrs	2022 98th Percentil	2022 Wtd. Mean	2022 Cert& Eval	24-Hour Design Value	24-Hour Valid Ind.	Annual Design Value	Annual Valid Ind.
01-097-0003 Iroquois and Azalea, CHICKASAW, MOBILE CO., ALABAMA	342	4	17.1	8.0	Y	342	4	19.2	8.7	Y	109	3	14.8*	7.9*	Y	17	N	8.2	N

Notes: 1. Computed design values are a snapshot of the data at the time the report was run (may not be all data for year).
2. Some PM2.5 24-hour DVs for incomplete data that are marked invalid here may be marked valid in the Official report due to additional analysis.
3. Annual Values not meeting completeness criteria are marked with an asterisk ('*').

From:	Dan Dix
To:	"tim_allen@fws.gov"
Cc:	"michael.bragg@adem.alabama.gov"; Don Spivey; "Davis, Bill"
Subject:	Packaging Corporation of America, Jackson, AL Mill - Request for Applicability of Class I Area AQRV Modeling Analysis - Breton National Wildlife Refuge
Date:	Thursday, January 29, 2026 8:20:00 AM
Attachments:	image001.png Class I Request for Determination - PCA Jackson 012926.pdf

Mr. Allen - Please find the attached Class I Request for Determination for Packaging Corporation of America (PCA), for a proposed project to install a combined cycle power block in a "one-by-one" (1 x 1) configuration consisting of a 675 million British Thermal Units per hour (MMBtu/hr) natural gas-fired combined cycle combustion turbine (CT), as well as a heat recovery steam generator (HRSG) with a 304 MMBtu/hr duct burner and reduce the operation of the No. 3, No. 4, and No. 5 Package Boilers at the

PCA Mill located in Jackson, Clarke County, Alabama. Please review and let us know if you have any interest in the project as it relates to analyses for Breton National Wildlife Refuge.

The attached document provides a summary of relevant project information, including proposed project description, location, applicant and consultant contacts, proposed project emissions increases and the nearest Class I Area within 300 km. The Q/d analysis shows that the emissions calculated a maximum Q/D well below the FLAG guideline Q/D of 10 TPY/km. Therefore, the project is assumed to have negligible impacts with respect to the Class I AQRVs and no further AQRV analyses are warranted. With this email, I am requesting your concurrence with this finding with respect to the Breton National Wildlife Refuge Class I area identified in the attachment.

Thanks for your help,

ALL4

Dan Dix / Technical Director
610.422.1118 (o) 484.467.1249 (m) / Profile / LinkedIn

www.all4inc.com / Locations / Articles / Podcast / Training
ALL4 // STRATEGY WITH SOLUTION. PARTNERSHIP WITH A PURPOSE.

From: Allen, Tim <tim_allen@fws.gov>
Sent: Thursday, January 29, 2026 10:53 AM
To: Dan Dix <ddix@all4inc.com>
Cc: michael.bragg@adem.alabama.gov; Don Spivey <donspivey@spiveyengineering.com>; 'Davis, Bill' <billdavis@packagingcorp.com>
Subject: Re: [EXTERNAL] Packaging Corporation of America, Jackson, AL Mill - Request for Applicability of Class I Area AQRV Modeling Analysis - Breton National Wildlife Refuge

Hi Dan,

I agree with your assessment. The USFWS is not requesting additional Class I AQRV analysis for this project. If there is a significant change to the proposal, please resubmit for further review.

Thank you,
Tim Allen

ALL4

AMBIENT AIR QUALITY ASSESSMENT PROTOCOL

COMBUSTION TURBINE INSTALLATION PROJECT

PACKAGING CORPORATION OF AMERICA – JACKSON MILL

DECEMBER 2025

SUBMITTED BY:

PACKAGING CORPORATION OF AMERICA

Packaging Corporation of America
Jackson Mill
4585 Industrial Road
Jackson, Alabama 36545

SUBMITTED TO:

Alabama Department of Environmental Management

Alabama Department of Environmental Management
Air Division
1400 Coliseum Boulevard
P.O. Box 301463
Montgomery, Alabama 36110

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1. INTRODUCTION

Packaging Corporation of America (PCA) owns and operates a Kraft pulp and paper mill in Jackson, Alabama (Jackson Mill or Mill). The Mill is a major source as defined by the Federal operating permit program (40 CFR Part 70) and the Federal New Source Review (NSR) program (40 CFR Part 52). In addition, the Mill is subject to the Alabama Department of Environmental Management (ADEM) Title V Operating Permit (TVOP) regulations and NSR regulations per Alabama Administrative Code (AAC) 335-3-16 and AAC 335-3-14, respectively.

PCA is proposing to install a combined cycle power block in a "one-by-one" (1 x 1) configuration consisting of a 675 million British Thermal Units per hour (MMBtu/hr) natural gas-fired combined cycle combustion turbine (CT), as well as a heat recovery steam generator (HRSG) with a 304 MMBtu/hr duct burner and reduce the operation of the No. 3, No. 4, and No. 5 Package Boilers at the Mill (Project). The CT will be controlled with low nitrogen oxides (NO_X) burners (LNB) and a selective catalytic reduction (SCR) system. The Project will result in net significant emissions rate (SER) increases in particulate matter less than 10 microns (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), and carbon dioxide equivalent (CO_2e), as determined under ADEM's Prevention of Significant Deterioration (PSD) permitting regulations, Chapter 335-3-14-.04.

When a net significant emissions increase is projected to occur, ADEM's PSD regulations require an applicant to perform an ambient impact assessment to demonstrate that the proposed project will not:

- Exceed any National Ambient Air Quality Standard (NAAQS) at any location during any time; and
- Cause any allowable PSD increment to be exceeded.

As Project emissions are expected to exceed SERs, an air quality modeling analysis is required. In addition, an evaluation of impacts of secondary formation of $PM_{2.5}$ from NO_X and sulfur dioxide (SO_2) precursors is required. PCA has prepared this ambient air quality assessment protocol (Protocol) in accordance with the ADEM *"PSD Air Quality Analysis Modeling Guidelines"* (ADEM, 2025) modeling guidance and the requirements presented in the November 24, 2024 revisions to the United States Environmental Protection Agency (U.S. EPA) *"Guideline on Air Quality Models"* in 40 CFR Part 51, Appendix W (Appendix

W) (U.S. EPA, 2024). The Protocol outlines procedures and technical information that are proposed for incorporation in the air quality modeling analysis.

2. MILL AND PROJECT OVERVIEW

The following subsections include background information on the Mill and the proposed Project.

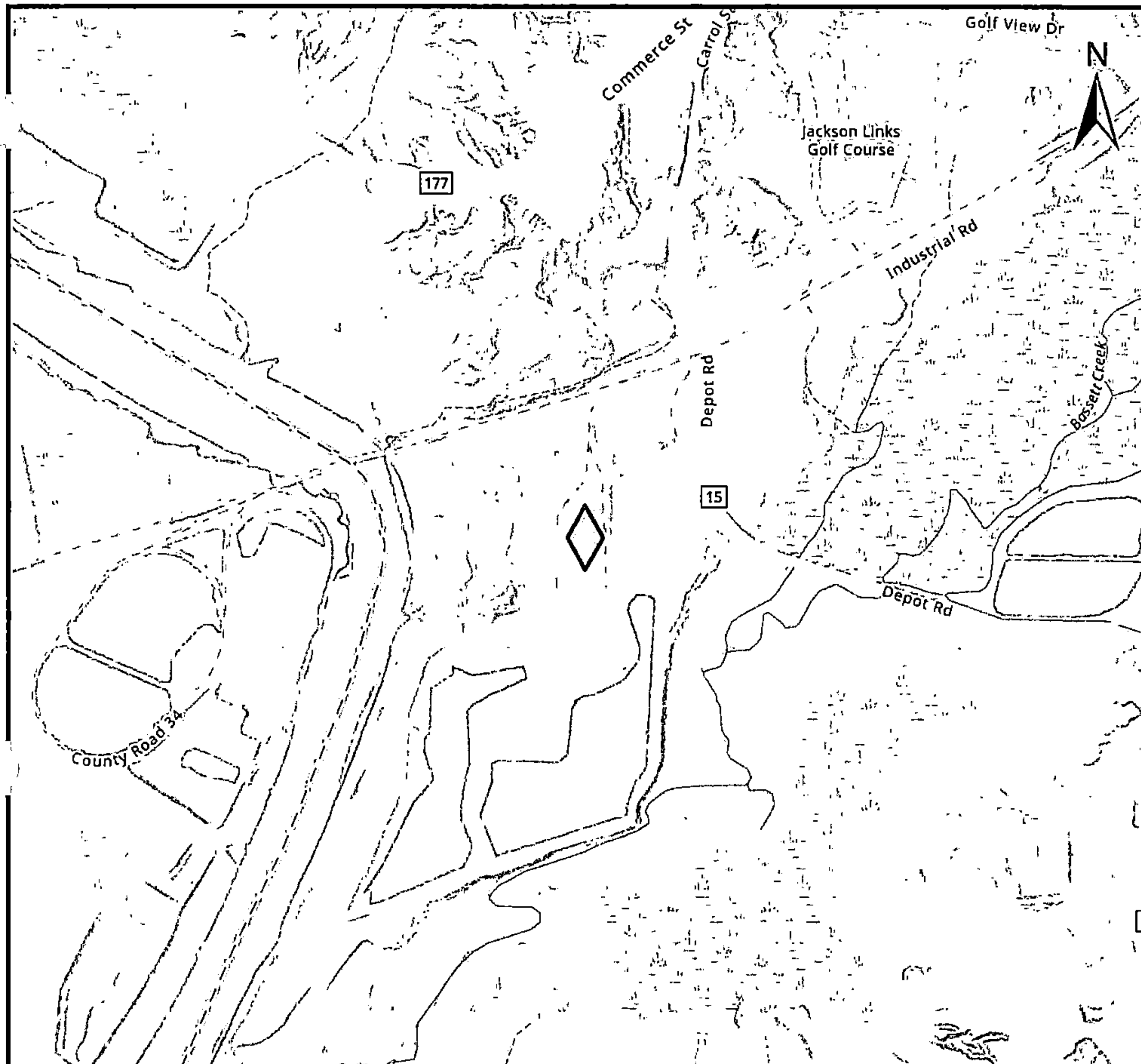
2.1 MILL LOCATION

The Mill is located south of the City of Jackson in Clarke County, Alabama. A Mill location map is provided in Figure 2-1. The geographical coordinates for the approximate center of the processing area of the Mill are:

- Universal Transverse Mercator (UTM) Easting: 414,616 meters (m)
- UTM Northing: 3,484,510 m
- UTM Zone: 16
- North American Datum (NAD): 1983
- Longitude (degrees, minutes, seconds): 87° 53′ 56″ W
- Latitude (degrees, minutes, seconds): 31° 29′ 32″ N

The Mill is located approximately one mile south of the city of Jackson Alabama, adjacent to the Tombigbee River, in the Alabama and Tombigbee Rivers Intrastate Air Quality Control Region (AQCR) (as designated in 40 CFR §81.266). Within this AQCR, Clarke County is designated as in attainment or unclassifiable with respect to the NAAQS for all NAAQS pollutants (as designated in 40 CFR §81.301) as of the date of Protocol submittal.

The Mill is located in the Southern Coastal Plain topographical region, characterized by moderately variable terrain consisting of flatlands and rolling hills. The Mill has an elevation of approximately 14 m above mean sea level (amsl). Terrain within five km of the Mill ranges from 9 m amsl along the Tombigbee River to approximately 91 m amsl to the southeast.



Legend

Facility Location - PCA Jackson

0 500 1,000 m

Locator Map - AL

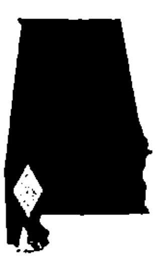


Figure 2-1
Facility Location Map

Packaging Corporation of America
Jackson, Alabama

DRAWN BY:	CHECKED BY:	
N.C.	D.D.	ALL4
DATE: December 2025	PROJECT NO: 000697-0010.00	

Map Data Courtesy of Esri Topographic Basemap

2.2 MILL PROCESS DESCRIPTION

The Mill consists of a woodyard, pulp mill, old corrugated container (OCC) recycle plant, paper machines, recausticizing operations, utilities, tall oil plant, and other miscellaneous support operations. The papermaking process begins in the woodyard where logs are debarked and chipped. The wood chips are reclaimed from chip storage piles and fed into batch digesters to produce pulp. The pulp slurry from the digesters is screened and washed prior to being sent to high density storage tanks. The plant also employs use of OCC recycling to make recycled brown pulp for the paper machines. Pulp is transferred to the two paper machines where it is further processed into multiple unbleached linerboard or medium for sale in rolls.

2.3 PROPOSED PROJECT DESCRIPTION

The proposed Project includes installation of a natural gas-fired CT and HRSG with a combined heat input of 979 MMBtu/hr. Table 2-1 summarizes the Project-related emissions increases associated with the CT Project compared to the PSD SER thresholds. As discussed in Section 1, the Project triggers PSD for PM_{10}, $PM_{2.5}$, and CO_2e.

Table 2-1
Project PSD Analysis Summary - Gas Turbine with Duct Burner
Packaging Corporation of America - Jackson, AL

	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	NO_x (tpy)	CO (tpy)	VOC (tpy)	CO_2e (tpy)	Lead (tpy)	Sulfuric Acid (tpy)
Potential Emissions										
Gas Turbine with Duct Burner	21.44	30.02	30.02	10.84	116.00	98.62	16.89	502,141	0.0021	1.66
TOTAL	**21.44**	**30.02**	**30.02**	**10.84**	**116.00**	**98.62**	**16.89**	**502,141**	**0.0021**	**1.66**
Baseline Actual Emissions										
Combined NOx Emissions - No. 3, No. 4, and No. 5 Package Boilers	N/A	N/A	N/A	N/A	76.58	N/A	N/A	N/A	N/A	N/A
TOTAL	**0.00**	**0.00**	**0.00**	**0.00**	**76.58**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Emission Increase [PE - BAE]	**21.44**	**30.02**	**30.02**	**10.84**	**39.42**	**98.62**	**16.89**	**502,141**	**0.0021**	**1.66**
PSD Significant Emission Rates	25	15	10	40	40	100	40	75,000	0.6	7
PSD Triggered?	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**Yes**	**No**	**No**

3. EMISSIONS INVENTORY SUMMARY

To complete a PSD evaluation, an initial inventory of Project-related emissions was developed. PM_{10} and $PM_{2.5}$ will be modeled because potential Project-related emissions exceed the PSD SER thresholds for these pollutants. Pollutants with modeled concentrations exceeding PSD Class II Significant Impact Levels (SILs) require a NAAQS and PSD increment analysis with local source emissions included. It should be noted that emissions rates have not been finalized for the Project, therefore, a preliminary summary of the pollutants emitted from the proposed source is provided in this Protocol.

3.1 SIGNIFICANT IMPACT ANALYSIS EMISSIONS INVENTORY

An initial Significant Impact Analysis (SIA) will be conducted to evaluate ambient impacts from Project-related emissions, with modeled concentrations compared to Class II SILs. The SIA will evaluate PM_{10} and $PM_{2.5}$, emissions from the proposed CT (Table 3-1). Project emissions rates were developed using proposed best available control technology (BACT) limits. Project emissions are not expected to result in ambient concentrations that exceed the respective Class II SILs for 24-hour and annual PM_{10} and 24-hour and annual $PM_{2.5}$. Therefore, a NAAQS and PSD increment analysis is not expected to be required or performed for the compliance demonstration. PCA will notify ADEM in the event any changes to this assumption are encountered.

3.2 PHYSICAL STACK CHARACTERISTICS

The physical stack characteristics for the emissions unit that will be modeled are provided in Table 3-2. Information related to the physical stack characteristics includes unit location, base elevation, release height, stack temperature, stack diameter, and stack exit velocity.

Table 3-1
Significant Impact Analysis - Emissions Inventory
Packaging Corporation of America - Jackson, AL

Point Source Description	AERMOD ID	PM_{10} Emissions Rate			$PM_{2.5}$ Emissions Rate		
		Short-Term	Annual		Short-Term	Annual	
		(lb/hr)	(tpy)	(lb/hr)	(lb/hr)	(tpy)	(lb/hr)
New Turbine	TURB_1	6.85	30.00	6.85	6.85	30.00	6.85

Table 3-2
Summary of Project Stack Characteristics and $PM_{10}/PM_{2.5}$ Emissions Rates
Packaging Corporation of America - Jackson, AL

Point Source Description	AERMOD ID	$PM_{10}/PM_{2.5}$ Emissions Rate		Stack Location (UTM Coordinates NAD 83 Zone 16)		Stack Elevation		Stack Height		Stack Exit Velocity		Stack Volumetric Flowrate	Stack Temperature		Stack Diameter	
		(lb/hr)	(g/s)	(X)	(Y)	(m)	(ft)	(m)	(ft)	(m/s)	(ft/s)	(ACFM)	(K)	(F)	(m)	(ft)
New Turbine	TURB1	6.85	0.863	414,416.00	3,484,449.00	12.50	41.00	64.62	212.0	23.80	78.10	598,300	423.71	303.00	3.89	12.75

4. AIR QUALITY MODELING APPROACH

This section of the Protocol presents the technical approach that will be used to demonstrate compliance with the NAAQS. The air dispersion model selection is described as well as the proposed options that will be used in the model. Supporting information, such as land use determinations, building downwash analyses, meteorological data, and terrain data, is also presented in this section. The guidance provided in 40 CFR Part 51 Appendix W "*Guideline on Air Quality Models*" (U.S. EPA, 2024) will be used to conduct the air quality modeling analyses. Additional guidance provided by ADEM in the "*PSD Air Quality Analysis Modeling Guidelines*" (March 2024) will be incorporated as necessary.

4.1 AIR DISPERSION MODEL SELECTION

The air quality modeling analysis will use the American Meteorological Society/Environmental Protection Agency (AMS/EPA) modeling system (AERMOD) to evaluate ambient air concentrations from the Mill. AERMOD is the U.S. EPA's preferred model for refined regulatory air quality modeling analyses (Appendix W). PCA will utilize the U.S. EPA regulatory version of AERMOD and will not use a proprietary version of AERMOD.

AERMOD (current version 24142) consists of two pre-processors and a dispersion model. AERMAP (version 24142) is the terrain pre-processor and AERMET (version 24142) is the meteorological pre-processor. AERMAP characterizes the surrounding terrain and can generate elevations for sources, structures, and receptors within the air quality modeling domain. AERMET is used to generate an hourly profile of meteorological conditions and boundary layer characteristics. The air quality modeling analysis will utilize the most recent versions of the AERMOD system, current at the time of Protocol submittal, except for the programs used by ADEM to develop the meteorological inputs.

AERMOD has user-selectable options that may be chosen to configure the dispersion model for regulatory and non-regulatory applications. In this case, the air quality modeling will be performed for a regulatory application, therefore, regulatory default options will be used for the air quality modeling, including the following:

- Stack-tip Downwash

- Accounting of Elevated Terrain Effects
- Calms Processing Routine
- Missing Data Processing Routine
- No Exponential Decay for Rural Mode

4.2 *LAND USE ANALYSIS*

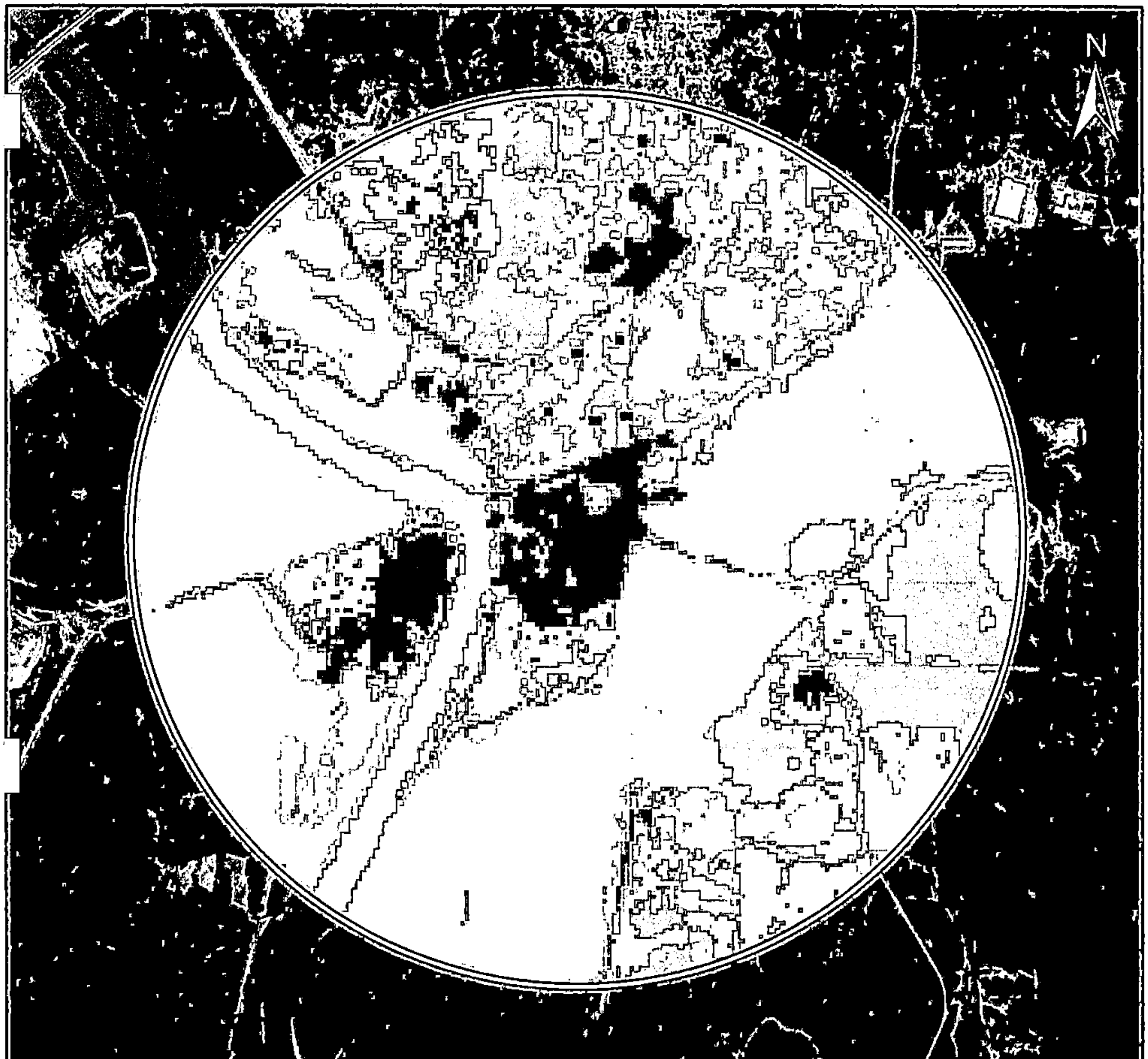
Appendix W specifies a procedure, based on the land use classification scheme developed by Auer (Auer, 1978), to determine whether land usage surrounding the modeled source is primarily urban or rural. Two methods can be used for performing this procedure: a land use classification or a population density evaluation. The land use classification procedure is considered the more definitive methodology (Appendix W) and is proposed for the air quality modeling analysis.

The land use classification determination involves quantifying the percentage of each Auer land use categories within a three km radius of the Mill. Urban dispersion coefficients should be selected if greater than 50 percent of the area evaluated consists of urban land use types (industrial, commercial, compact residential); otherwise, rural dispersion coefficients should be used. United States Geological Survey (USGS) 2024 National Land Cover Data (NLCD) was obtained to identify and correlate land cover classifications using the Auer methodology. USGS land cover categories 23 (Developed, Medium Intensity) and 24 (Developed, High Intensity) correlate to Auer land use types classified as urban: R2 (Compact Residential – Single), R3 (Compact Residential – Old Multi-Family), I1 (Heavy Industrial), I2 (Light-Moderate Industrial), and C1 (Commercial).

To perform the land use analysis, geographical information system (GIS) software was used to review the various land use types contained in the electronic land use dataset. Based on the GIS summary, 93.3% land use within a 3-km radius of the Mill is rural (Figure 4-1 and Table 4-1). Therefore, the urban option is not proposed for incorporation in the AERMOD air dispersion modeling analysis.

4.3 *RECEPTOR NETWORK*

The AERMOD terrain pre-processor AERMAP will be used to process 1/3 arc-second (approximately 10 m) United States Geological Survey (USGS) National Elevation Dataset (NED) files, in Georeferenced Tagged Image File Format (GeoTIFF), to create ground elevation and hill height scales for each receptor in a 40-



Legend

3-km Buffer around Facility

NLCD Classification Description

- 11 - Open Water
- 21 - Developed Open Space
- 22 - Developed Low Intensity
- 23 - Developed Medium Intensity
- 24 - Developed High Intensity
- 31 - Barren Land
- 41 - Deciduous Forest
- 42 - Evergreen Forest
- 43 - Mixed Forest
- 52 - Shrub/Scrub
- 71 - Grassland/Herbaceous
- 81 - Pasture/Hay
- 82 - Cultivated Crops
- 90 - Woody Wetlands
- 95 - Emergent Herbaceous Wetlands

0 1,250 2,500 m

Figure 4-1
Three Kilometer Land Use

Packaging Corporation of America
Jackson, Alabama

DRAWN BY:	CHECKED BY:	
N.C.	D.D.	
DATE:	PROJECT NO:	
December 2025	000697-0010.00	ALL4

Table 4-1
Summary of Land Use within 3 km
Packaging Corporation of America - Jackson, AL

NLCD Classification Code	NLCD Classification Description	Urban/Rural Classification	Area (m^2)	Land Use Percentage (%)
11	Open Water	Rural	1,509,300	5%
21	Developed Open Space	Rural	2,870,100	10%
22	Developed Low Intensity	Rural	2,639,700	9%
23	Developed Medium Intensity	Urban	1,395,900	5%
24	Developed High Intensity	Urban	510,300	2%
31	Barren Land	Rural	1,089,000	4%
41	Deciduous Forest	Rural	5,400	0.02%
42	Evergreen Forest	Rural	3,446,100	12%
43	Mixed Forest	Rural	740,700	3%
52	Shrub/Scrub	Rural	484,200	2%
71	Grassland/Herbaceous	Rural	1,297,800	5%
81	Pasture/Hay	Rural	449,100	2%
82	Cultivated Crops	Rural	3,600	0.01%
90	Woody Wetlands	Rural	11,595,600	41%
95	Emergent Herbaceous Wetlands	Rural	234,900	1%

km by 40-km domain (i.e., the area that is modeled), centered at the Facility. Air quality modeling will incorporate NAD83 horizontal datum.

A Cartesian receptor network (Figure 4-2) is proposed, to be centered on the approximate Mill center. Receptors will be placed in publicly accessible locations (i.e., ambient air) extending outward from the Mill within the modeling domain. Beyond the property boundary, receptors will be placed at:

- 100 m intervals out to 5,000 m,
- 250 m intervals from 5,000 m to 8,000 m, and
- 500 m intervals from 8,000 m to 20,000 m.

In addition to the main rectangular coordinate receptor network, discrete receptors will be placed along the property boundary at 25 m intervals which has been established as the ambient air boundary. The ambient air boundary has been updated since the last air quality modeling demonstration at the Mill to include the sawmill property that PCA has reacquired at the northeast of the facility and minor revisions to the property boundary near the Jackson Municipal Airport. The northern property boundary is fenced. The PCA Landfill on the eastern property boundary is fenced and the gate is locked after normal working hours. A small portion of the eastern boundary is controlled by the Wood Procurement Department and has locked gates at access roads to the wooded areas. The wooded areas in the Wood Procurement Department area on the eastern property boundary, southeastern property boundary, and on southwest property boundary are densely forested and swamp land which restrict public access to the Mill. The Tombigbee River borders the Mill on the west and southwestern edges. The river's bank is steep and heavily vegetated along the Mill's property boundary. In addition, security staff are on duty at all entrance gates and conduct security patrols of the complete property boundary. Figure 4-2 includes identification of each type of ambient air boundary described above.

4.4 METEOROLOGICAL DATA

U.S. EPA recommends that AERMOD be run with a minimum of five years of off-site data or one year of site-specific or five years of representative meteorological data to *"acquire enough meteorological data to ensure worst-case meteorological conditions are adequately represented in the model results"* (U.S. EPA, 2024). Inclusion of site-specific data is not proposed for this air quality modeling analysis. As an

Legend

- + Fenced Boundary Receptor
- + River Boundary Receptor
- + Wooded Boundary Receptor

Receptor

0 500 1,000 m

Figure 4-2
Receptor Network

Packaging Corporation of America
Jackson, Alabama

DRAWN BY:	CHECKED BY:	
N.C.	D.D.	ALL4
DATE:	PROJECT NO:	
December 2025	000697-0010.00	

Map Data Courtesy of Esri Imagery Basemap

alternative, it is proposed to use five years (2018-2022) of representative National Weather Service (NWS) data that was purchased from, and processed by, ADEM for PCA's 2024 Bark Boiler Project air quality modeling analysis. Per ADEM guidance, the Evergreen (KGZH) meteorological dataset is most representative of conditions within Clarke County, and is therefore proposed for incorporation in the air quality modeling analysis. The proposed dataset will consist of five years of surface meteorological data from the Evergreen Regional Airport in Evergreen, Alabama (Weather Bureau Army Navy (WBAN) identifier 53820) and upper air data from the Shelby County Airport (KEET) (WBAN identifier 53823) near Alabaster, Alabama. The meteorological dataset will include the application of the ADJ_U* option.

4.5 GOOD ENGINEERING PRACTICE (GEP) STACK HEIGHT ANALYSIS

A GEP stack height analysis will be conducted to evaluate if stack emissions are subject to building wake effects and aerodynamic downwash caused by structures included in the air quality modeling, in accordance with the "*Guideline for Determination of Good Engineering Practice Stack Height*" (U.S. EPA, 1985). If a stack is sufficiently close to a building, or if located adjacent to or on a building, the plume from the stack can be entrained in the building's wake, diminishing plume rise that can result in increased ground level ambient concentrations. Facilities with stack heights below their corresponding GEP formula heights must account for potential building wake effects within the air quality modeling.

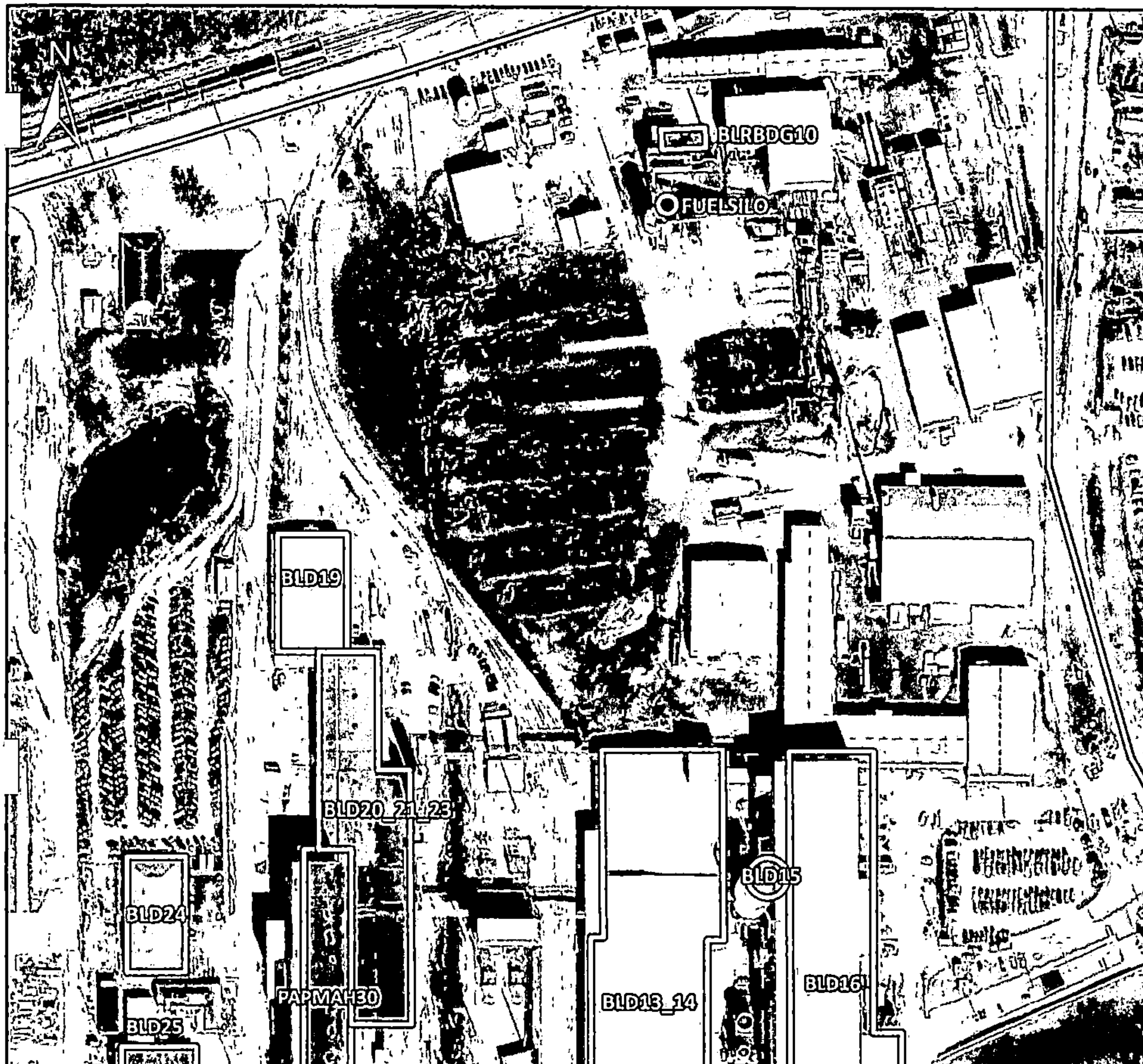
There are two definitions of GEP stack height: formula GEP stack height and regulatory GEP stack height. U.S. EPA requires building downwash effects to be evaluated for nearby structures when a stack is less than formula GEP stack height. Regulatory GEP stack height is the greater of 65 m or formula GEP stack height. Formula GEP stack height is defined as:

$$H_{GEP} = H_B + 1.5L_B$$

where:

H_{GEP} = formula GEP stack height,
H_B = the building's height above stack base, and
L_B = the lesser of the building's height or maximum projected width.

The current version of U.S. EPA's Building Profile Input Program for PRIME (BPIPPRM) will be used to calculate wind direction-specific downwash parameters to evaluate stacks considered close enough to a structure to be affected by downwash, defined as the lesser of 0.8 km or $5L_B$ of the structure in any wind direction. Due to the use of BPIPPRM and associated cavity algorithms, a separate cavity analysis is not



Legend

- Point Source
- Structure
- Approximate Property Boundary

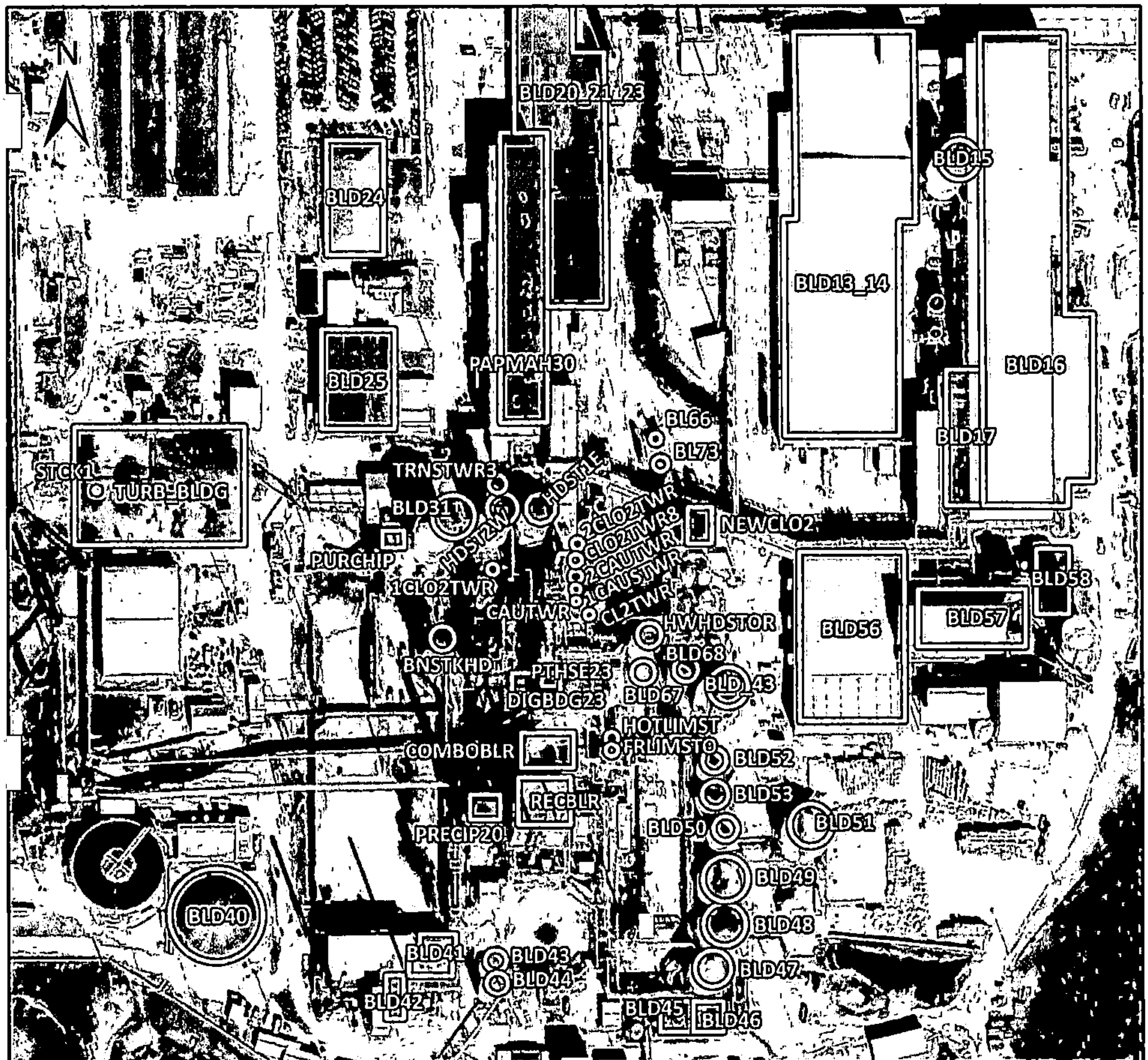
0 100 200 m

Figure 4-3
Downwash Analysis - Facility North

Packaging Corporation of America
Jackson, Alabama

DRAWN BY:	CHECKED BY:	
N.C.	D.D.	ALL4
DATE: December 2025	PROJECT NO: 000697-0010.00	

Map Data Courtesy of Esri Imagery Basemap



Legend

- Point Source
- Structure

0 100 200 m

Figure 4-4
Downwash Analysis - Facility Central

Packaging Corporation of America
Jackson, Alabama

DRAWN BY:	CHECKED BY:	
N.C.	**D.D.**	ALL4
DATE: **December 2025**	PROJECT NO: **000697-0010.00**	

Map Data Courtesy of Esri Imagery Basemap

proposed. The source and structures proposed for inclusion in the air quality modeling and downwash analysis are presented in Figure 4-3 and Figure 4-4. Buildings related to the proposed Bark Boiler Project have been removed from this analysis and replaced with the CT and HRSG structure. The proposed stack for the CT is not above GEP and therefore no adjustment for modeling purposes is necessary.

4.6 SECONDARY POLLUTANT FORMATION

The 2017 amendments to 40 CFR Part 51 Appendix W require an evaluation of the potential for secondary O_3 and $PM_{2.5}$ formation based on the Project emissions rates of precursor pollutants (NO_X and VOC for O_3; NO_X and SO_2 for $PM_{2.5}$). U.S. EPA recently published guidance (U.S. EPA, 2022) clarifying that if any precursor emissions of O_3 or $PM_{2.5}$ are emitted by the source in a significant amount, then all precursor pollutants be included in a precursor analysis. As Project $PM_{2.5}$ emissions are greater than the SER, a precursor analysis is required to evaluate the contribution of secondary $PM_{2.5}$ from precursor pollutants to total $PM_{2.5}$ concentration levels.

U. S. EPA provides a two-tiered approach for assessing the impacts of emissions for these pollutants:

- Tier 1 involves using known relationships between precursor emissions and a source's impacts to qualitatively assess the potential secondary $PM_{2.5}$ formation.
- Tier 2 involves a more detailed analysis and could involve application of a photochemical grid model to determine the secondary $PM_{2.5}$ impacts.

U.S. EPA has published guidance to establish SILs for $PM_{2.5}$ and Modeled Emission Rates for Precursors (MERP) as a Tier-1 demonstration tool. A MERP represents a level of precursor emissions that is not expected to contribute significantly to concentrations of secondarily formed $PM_{2.5}$. Emissions in excess of the MERPs would require an alternative Tier-1 approach or potentially a Tier-2 analysis.

The MERPs guidance *"EPA's Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier-1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program"*, finalized April 30, 2019 (U.S. EPA, 2019), contains photochemical model results generated by U.S. EPA representing maximum downwind $PM_{2.5}$ concentrations due to emissions of hypothetical sources of precursor emissions. The MERPs guidance contains a procedure to calculate applicable precursor emissions that would be assumed to result in significant concentrations of $PM_{2.5}$.

The Mill proposes to conduct a Tier-1 demonstration using the MERP values developed for Smith County, Mississippi (with a 500 tpy emissions rate and 90 m stack) to determine the potential for project emissions to significantly contribute to ambient $PM_{2.5}$ concentration levels. The 90 meter stack MERP was selected as most representative of the proposed 64.6 meter stack height for the proposed CT. The Smith County MERP values are the closest hypothetical source to the project site and Smith County is located in a similar rural setting, with a 2.3% maximum nearby urban percentage (U.S. EPA, 2019), as the Project. Table 4-2 summarizes the proposed MERP calculations utilizing preliminary Project-related NO_X, and SO_2 emissions. The calculated $PM_{2.5}$ precursor impacts will be added to the direct $PM_{2.5}$ modeled results.

4.7 ADDITIONAL IMPACTS ANALYSIS

A discussion of the additional impacts of the proposed Project on the Class II area surrounding the Mill will be provided for each pollutant with emissions greater than its respective PSD Significant Emissions Rate threshold. As part of this discussion, the potential growth resulting from the Project will be qualitatively assessed. Additionally, acidification of rainfall, and impacts on soil and vegetation will be addressed. The additional impacts analysis will also address the U.S. Endangered Species Act (ESA) established in 1973, which presents the federal government with the responsibility to protect plant and animal species that "are likely to become extinct or endangered in all or a significant part of their range". The additional impacts analysis will follow Federal New Source Review Workshop Manual, Chapter D (U.S. EPA, 1990).

Table 4-2
Evaluation of Secondary Formation of $PM_{2.5}$
Packaging Corporation of America - Jackson, AL

24-Hour $PM_{2.5}$ Precursor Calculation [a]									
$\left[24hr\ Nitrates\ hypothetical\ concentration\ x \left(\frac{NO_X\ project\ emissions}{NO_X\ hypothetical\ emissions}\right) + 24hr\ Sulfates\ hypothetical\ concentration\ x \left(\frac{SO_2\ project\ emissions}{SO_2\ hypothetical\ emissions}\right)\right] = 24hr\ PM_{2.5}\ Precursor\ Concentration$									
0.112	x	$\frac{39.28}{1,000}$	+	0.192	x	$\frac{10.8}{500}$	=	8.56E-03	µg/m^3
Annual $PM_{2.5}$ Precursor Calculation [a]									
$\left[Ann\ Nitrates\ hypothetical\ concentration\ x \left(\frac{NO_X\ project\ emissions}{NO_X\ hypothetical\ emissions}\right) + Ann\ Sulfates\ hypothetical\ concentration\ x \left(\frac{SO_2\ project\ emissions}{SO_2\ hypothetical\ emissions}\right)\right] = Ann\ PM_{2.5}\ Precursor\ Concentration$									
0.005	x	$\frac{39.28}{1,000}$	+	0.008	x	$\frac{10.8}{500}$	=	3.53E-04	µg/m^3

[a] MERP values from Smith County, Mississippi for 500 tpy 10 meter stack hypothetical source utilized.

4.8 PRE-OPERATION AND POST-OPERATION MONITORING

Per ADEM modeling guidance, the Mill will model Project emissions to compare concentrations to de minimis monitoring levels to determine if pre-operation or post-operation monitoring is required. De minimis levels are based on U.S. EPA Significant Monitoring Concentration (SMC) thresholds and indicate minimum concentrations that may require monitoring. If modeling determines that ambient concentrations are below the de minimis levels for a pollutant, monitoring for that pollutant will not be performed. If the Project cannot be exempted from pre-operation and post-operation monitoring based on air quality modeling results, the Mill will propose the use of existing ambient air monitoring data from a representative monitor. PCA expects that modeling for all pollutants will not exceed SMC thresholds and monitoring will not be required.

Given that the DC Circuit Court of Appeals vacated the 24-hour $PM_{2.5}$ SMC on January 22, 2013, pre-operation or post-operation monitoring for $PM_{2.5}$ may be considered if it is determined as necessary to evaluate the impact the Project may have on air quality in any area. As the proposed Project is considered a major modification for $PM_{2.5}$, the Mill is potentially subject to the pre-operation or post-operation monitoring requirements for $PM_{2.5}$. However, the Mill proposes that pre-operation or post-operation monitoring for $PM_{2.5}$ will not be necessary for the proposed Project based on 2022-2024 8.2 microgram per cubic meter ($\mu g/m^3$) $PM_{2.5}$ design value concentration from the Chickasaw, Alabama $PM_{2.5}$ ambient monitoring station, obtained from ADEM by request from the Mill. A copy of the $PM_{2.5}$ design value Air Quality System (AQS) report will be included in the final modeling report.

5. CLASS I AIR QUALITY RELATE VALUE (AQRV) ANALYSIS

One Federal Class I Area is located within 300 km of the Mill. The Breton Wildlife Refuge, a series of low islands serving as a breeding habitat for multiple species of seabirds, is located approximately 188 km to the southwest of the Mill. Per ADEM modeling guidelines, ambient impacts on Federal Class I Areas within 100 km of a proposed source must be evaluated, but proposed sources beyond 100 km should be discussed with ADEM to determine modeling options (ADEM, 2025). Given the proximity of the Breton Wildlife Refuge to the Mill, PCA will conservatively submit an AQRV Applicability Request Form to the United States Fish and Wildlife Service, the appropriate Federal Land Manager for this Class I Area.

6. SUBMITTAL OF AIR QUALITY MODELING RESULTS

This section of the Protocol discusses how the results from the air quality modeling analyses, including the Class II SILs and SMCs will be evaluated.

6.1 CLASS II SIGNIFICANT IMPACTS ANALYSIS AND SIGNIFICANT MONITORING CONCENTRATIONS

The air quality modeling analysis will initially determine if emissions from the proposed project result in PM_{10} and $PM_{2.5}$ concentrations that are greater than the Class II SILs and SMCs summarized in Table 6-1. The modeled concentrations for the five years of meteorological data will be reviewed. Modeled direct $PM_{2.5}$ concentrations will be combined with $PM_{2.5}$ precursor concentrations calculated as part of the MERP analysis discussed in Section 4.6. If the significant analyses determine that the modeled concentrations are less than the Class II SILs, then no further air quality modeling analyses will be performed. If the modeled concentrations are above the Class II SILs, then a SIA will be defined, and additional air quality modeling analyses will be performed. As stated previously, it is not anticipated that Project emissions will result in modeled concentrations that exceed the Class II SILs for PM_{10} and $PM_{2.5}$. Therefore, a multi-source air quality modeling analysis is not anticipated to be conducted to demonstrate compliance with the NAAQS.

6.2 SUBMITTAL OF MODELING RESULTS

A detailed air quality modeling report will be submitted as part of the proposed Project air permit application. The air quality modeling report will review the procedures in the approved modeling Protocol and will be followed in the air quality modeling analysis. An electronic copy of the air quality modeling input and output files, as well as supporting files (e.g., meteorological data, building downwash analysis, etc.), will be included as an appendix to the air permit application.

Table 6-1
Class II Significant Impact Levels and Significant Monitoring Concentrations
Packaging Corporation of America - Jackson, AL

Pollutant	Averaging Period	Class II Form	Class II SIL[a] ($\mu g/m^3$)	SMC[a] ($\mu g/m^3$)
$PM_{2.5}$	Annual	1st highest	0.13	-
	24-Hour		1.2	-
PM_{10}	Annual		1	-
	24-Hour		5	10

7. REFERENCES

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U.S. EPA 1980 – "A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals", EPA-450/2-81-078, December 12, 1980.

U.S. EPA 1985 – "Guideline for Determination of Good Engineering Practice (GEP) Stack Height (Technical Support Document for Stack Height Regulations) Revised", EPA-450:4-80-023R, June 1985.

U.S. EPA 1990 – "New Source Review Workshop Manual Prevention of Significant Deterioration and Nonattainment Area Permitting", United States Environmental Protection Agency, Office of Air Quality Planning and Standards, Air Quality Assessment Division, Research Triangle Park, NC, October 1990.

U.S. EPA 1992 – "Workbook For Plume Visual Impact Screening and Analysis (Revised)". EPA-450/R-92-023 United States Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC, October 1992.

U.S. EPA 2019 – "Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program", United States Environmental Protection Agency, Office of Air Quality Planning and Standards, Air Quality Assessment Division, Research Triangle Park, NC, April 2019.

U.S. EPA 2020 – "User's Guide for AERSURFACE Tool", EPA-454/B-20-008, United States Environmental Protection Agency, Office of Air Quality Planning and Standards, Air Quality Assessment Division, Research Triangle Park, NC, February 2020.

U.S. EPA 2022 – "Guidance for Ozone and Fine Particulate Matter Permit Modeling", July 2022.

U.S. EPA 2024 – 40 CFR Part 51 Appendix W "Guideline on Air Quality Models (Revised)", November 2024.