PREVENTION OF SIGNIFICANT DETERIORATION PERMIT APPLICATION

Interfor U.S. Inc. > Thomaston Mill

INTERFOR
Building Value™

Mill Modernization Project Permit Application

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1. EXECUTIVE SUMMARY

Interfor U.S. Inc. (Interfor) owns and operates a lumber mill in Thomaston, Upson County, Georgia (Thomaston Mill). The facility currently operates under Permit No. 2421-293-0007-V-04-0, effective May 29, 2017. The facility meets the definition of a major stationary source under the Georgia Environmental Protection Division's (EPD) air regulations and is therefore required to maintain a Title V operating permit. Interfor is proposing modifications to the Thomaston Mill that will increase its production capacity of kiln dried lumber. This application package contains the necessary state air construction permit application and Title V operating permit modification elements related to the proposed project.

The Mill is located in Upson County, which is currently designated as "attainment" or "unclassifiable" for all criteria pollutant's National Ambient Air Quality Standard (NAAQS). Therefore, the proposed project is not subject to Nonattainment New Source Review (NNSR) and is potentially subject to Prevention of Significant Deterioration (PSD) permitting, which is discussed in Section 4.1 of this application.

Lumber mills are not on the list of 28 named source categories. Therefore, the PSD major source threshold is 250 ton per year (tpy) of a criteria air pollutant. The Thomaston Mill is an existing major PSD source, since potential emissions of volatile organic compounds (VOC) exceed the 250 tpy threshold. Thus, the net emission increases from the project must be compared to the PSD Significant Emission Rates (SER) to determine if PSD permitting is required. Interfor has determined that net emissions increase from the project will exceed the SER for VOC. Additional information on the net emission increase calculations can be found in Section 3.

Air Dispersion Modeling is required for all pollutants that the net emissions increase from the project exceeds the SER and that have a NAAQS. VOC does not have a NAAQS to determine if the county is in "attainment" or "nonattainment," therefore, modeling for criteria pollutants was not completed for this PSD application. However, as the project involves the addition of a new lumber drying kiln, which produces certain toxic air pollutants (TAP) regulated by EPD, toxics modeling has been included as part of this application. VOC is a precursor to the formation of ozone. As the project emissions increase is less than the relevant modeled emission rate for precursors (MERPs), the project can be shown to not cause or contribute to an exceedance of the ozone NAAQS, as discussed in Section 7.6.

As required by the EPD, a complete permit application (Application No. 292241) has also been submitted online using the Georgia EPD Online System (GEOS).

1.1. PROPOSED PROJECT

Interfor is submitting this application to complete a modernization project at the Thomaston Mill, which will include the following changes:

- Installation of new equipment including:
  - A continuous, direct-fired lumber kiln rated at approximately 120 million board feet (MMBF) per year (MMBF/yr),
  - A fuel silo with cyclone associated with the new kiln,
  - A new debarker,
  - A bark hog,
  - Two (2) green wood chippers,
  - A chip bin with cyclone,
  - A sawdust cyclone to pneumatically convey sawdust to the boiler area at the mill,
  - A planer mill with associated planer mill shavings cyclone,

- A shavings cyclone to pneumatically convey sawdust to the boiler area at the mill, and
- A diesel fire pump engine;

- Upgrade of equipment in the Pine Sawmill;
- Permanent shutdown of the following existing emission units and control devices:
  - A debarker,
  - Two (2) green wood chippers,
  - Chip Bin Cyclone (EUID No. OC07),
  - Planer Mill (EUID No. OPLM),
  - Planer Mill Shavings Cyclone (APCD No. OC03),
  - Planer Mill Trim Blocks Cyclone (APCD No. OC04),
  - Planer Mill Shavings Truck Bin Cyclone (APCD No. OC05), and
  - Shavings Collection Cyclone for boiler area (APCD No. OC06).

As a result of the project, there will be an increased throughput for ancillary activities and emissions sources, including log sawing, material transfer, and truck traffic on the mill roads. Therefore, these operations will be treated as associated emission units in the PSD analysis. The project will not impact operation of Dual Path Kiln No. 1 (EUID No. OSK1), Dual Path Kiln No. 3 (EUID No. OSK3), Wood Waste Boiler 1 (EUID No. OB01), or Wood Waste Boiler 2 (EUID No. OB02) at the Thomaston Mill.

1.2. PERMITTING AND REGULATORY REQUIREMENTS

Interfor is submitting this combined construction permit application and Title V permit significant modification application to EPD to request authorization to install and operate the proposed equipment under the provisions of EPD Rules for Air Quality Control, Chapter 391-3-1. Interfor anticipates initiating construction of the project during the 1st quarter of 2020.

The Thomaston Mill is located in Upson County, which is designated as "attainment" or "unclassifiable" for all pollutants, and is a major source under the PSD permitting program. Therefore, net emission increases from the proposed project and associated emission unit increases must be evaluated and compared to the SER for regulated pollutants for PSD permitting applicability. The pollutants evaluated for PSD applicability include carbon monoxide (CO), oxides of nitrogen (NO_X), sulfur dioxide (SO_2), VOC, particulate matter (PM), particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), lead (Pb), and greenhouse gases (GHGs) in the form of carbon dioxide equivalents (CO_2e) as shown in Table 1-1.[1]

[1] Note that PSD permitting for GHG can only be triggered if a project requires PSD permitting for another PSD-regulated pollutant.

Table 1-1. Proposed Project Net Emissions

Pollutant	A Potential Emissions of New Units (tpy)[1]	B Associated Units Emissions Increase (tpy)[2]	C Existing Shutdown Units Emissions (tpy)[3]	D = A + B - C Project Net Emissions Increases (tpy)[4]	E PSD SER Thresholds (tpy)[5]	Is D > E? PSD Permitting Triggered?
Filterable PM	22.26	4.40	4.03	22.63	25	No
Total PM_{10}	17.64	0.19	3.04	14.79	15	No
Total $PM_{2.5}$	9.34	0.09	0.89	8.54	10	No
SO_2	4.38	--	--	4.38	40	No
NO_X	17.56	--	--	17.56	40	No
VOC	240.8	--	--	240.8	40	Yes
CO	44.57	--	--	44.57	100	No
Lead	2.70E-03	--	--	2.70E-03	0.6	No
CO_2e	36,855	--	--	36,855	75000	No
Hydrogen Sulfide	--	--	--	--	10	No
Sulfuric Acid Mist	--	--	--	--	7	No
Total HAP	14.68	--	--	14.68	N/A	N/A

1. The proposed project will not modify any existing unit. Therefore, baseline actual emissions and potential emissions of modified units are not applicable. Potential emissions from new equipment are summarized in Table B-13.

2. Associated units emissions increases are summarized in Table B-18.

3. Baseline actual emissions for existing equipment being permanently shutdown are summarized in Table B-26.

4. Project Net Emissions Increases = Net Emissions Increase (Potential Emissions from New Units) + Associated Units Emissions Increase - Shutdown Units Baseline Emissions

5. For PSD permitting for CO_2 to be triggered, first PSD must be triggered for another regulated pollutant, then project emissions from both CO_2 (mass basis) and CO_2e must be greater than the SER.

As detailed in Section 3 and summarized in Table 1-1, net emission increases from the proposed project, will be below the PSD SER for all pollutants except VOC.

As a Title V major source, Interfor is required to submit a Title V permit significant modification application as part of the PSD permitting process in Georgia. Interfor is submitting this construction and operating application in accordance with all federal and state requirements. For VOC, a Best Available Control Technology (BACT) analysis is required as part of the PSD permit application submittal. Note that no PSD dispersion modeling analysis is included in this application, as emissions of all pollutants potentially requiring modeling are below the SERs from the proposed project. The proposed project will potentially be subject to National Emissions Standards for Hazardous Air Pollutants (NESHAP) and several state regulations.

1.3. BACT DETERMINATION

Interfor performed a BACT analysis for the only PSD-regulated pollutant that exceeded the SER, VOC, following the "top-down" approach suggested by U.S. EPA. The top-down process begins by identifying all potential control technologies for the pollutant in question, and making a determination if those control options are technically feasible for the process in question. The approach then involves ranking all potentially relevant control technologies in descending order of control effectiveness. The most stringent or "top" control option is BACT unless the applicant demonstrates, and the permitting authority in its informed opinion agrees, that energy, environmental, and/or economic impacts justify the conclusion that the most stringent control option does not meet the definition of BACT. Where the top option is not determined to be BACT, the next most stringent alternative is evaluated in the same manner. This process continues until BACT is determined.

Based on the BACT review, Interfor has determined that the technology presented in Table 1-2 are BACT for the proposed continuous kiln and diesel fire pump engine. A BACT analysis is not required for the debarker, green wood chippers, chip bin cyclone, sawdust cyclone, bark hog, fuel silo, planer mill with associated cyclone, and shavings bin cyclone as these units are not sources of VOC emissions. A detailed VOC BACT analysis is presented in Section 5.4 and Section 5.5 of this application.

Table 1-2. Proposed Primary BACT Limit Summary

Source	Selected BACT	Compliance Method
Continuous Kiln	Proper Maintenance and Operating Practices	Recordkeeping
Emergency Diesel-Fired Fire Pump	Proper Maintenance and Operating Practices / NSPS Subpart IIII	Certified Engine

1.4. APPLICATION ORGANIZATION

The following information is included as part of this application submittal:

- Section 2 describes the current facility and the proposed project;
- Section 3 summarizes the emissions calculation methodologies and assesses PSD applicability;
- Section 4 details the federal and state regulatory applicability analysis for the proposed project;
- Section 5 contains the required BACT assessment;
- Section 6 details the Class I area analysis;
- Section 7 details the additional impact analysis;
- Section 8 contains the toxics modeling assessment;
- Appendix A contains an area map and process flow diagram of the facility;
- Appendix B includes documentation of emissions calculations;
- Appendix C contains applicable state implementation plan (SIP) permit application forms;
- Appendix D contains BACT supporting calculations;
- Appendix E contains RACT/BACT/LAER Clearing House Database Reports;
- Appendix F includes toxics modeling information and an emission point layout;
- Appendix G includes electronic toxics modeling files; and
- Appendix H includes letters sent to the Federal Land Managers of surrounding Class I areas.

2. DESCRIPTION OF FACILITY

The Thomaston Mill produces planed lumber from logs and is classified under Standard Industrial Classification (SIC) code 2421. The raw material for planed lumber, the principle product, is southern yellow pine logs. Emission generating operations at the mill include log preparation/sawmill, drying kilns, wood-fired boilers, and the planer mill. A process flow diagram for the Thomaston Mill is provided in Appendix A.

2.1. CURRENT FACILITY DESCRIPTION

2.1.1. Log Preparation / Pine Sawmill

The basic function of the initial log preparation area is to prepare logs for further processing within the Pine Sawmill (EU ID No. OPSM). Tree length logs are delivered by truck to the mill and are then debarked by the debarker. Bark from the debarker is conveyed to the bark area, where it is sorted for sale.

After the debarking stage, logs are cut into rough boards using a series of sawing techniques in the Pine Sawmill. Wood chips produced from sawing are processed in chippers and screens to separate fines and larger chips. A cyclone (APCD ID No. OC07) is used to collect chips from one of the chippers. Larger chips are collected and sold off-site. Chip screening fines and sawdust from the chipper can be sold or used as fuel in one of the wood-fired boilers.

2.1.2. Existing Continuous, Indirect-Fired Kilns

The lumber cut in the Pine Sawmill is dried in one of the two (2) existing indirect-fired continuous kilns (EU ID No. OSK1 and OSK3) to reduce the moisture content from approximately 50 percent down to approximately 16 percent. The kilns have a permitted capacity of 174 MMBF/yr dried lumber.[2] Steam for the existing continuous lumber kilns is supplied by the wood-fired boilers at the Thomaston Mill.

2.1.3. Planer Mill

Dried rough lumber is sent from the lumber kilns to be finished in the planer mill. Each board is passed through a planer to grade the surface and finish the board to its final thickness and width. Planer shavings are collected by a cyclone (APCD ID No. OC03). The ends of the board are then trimmed to achieve the final board length. Trim blocks are conveyed to the planer hog and then collected by a cyclone (EU ID No. OC04). Shavings are pneumatically conveyed to the fuel house using a cyclone (APCD ID No. OC06) or to truck bin for sale using a cyclone (APCD ID No. OC05). After trimming, each board is stamped and stacked for shipping. The finished product is then loaded onto trucks and shipped off-site.

2.1.4. Wood-fired Boilers

The Thomaston Mill operates Wood Waste Boiler 1 (EU ID No. OB01) and Wood Waste Boiler 2 (EU ID No. OB02) to supply steam to the existing continuous indirect lumber kilns. Wood Waste Boiler 1 combusts planer shavings and emissions from the boiler are controlled by a primary and secondary multiclone (APCD ID No. OC10-P and OC10-S). Wood Waste Boiler 2 combusts green sawdust and chip fines and emissions from the boiler are controlled by a primary and secondary multiclone (APCD ID No. OC09-P and OC09S) and an electrostatic precipitator (APCD ID No. OEP1).

[2] Permit V-04-0 Condition 3.2.1

2.1.5. Pallet Mill

Lumber for making wood pallets could potentially be supplied to the Pallet Mill (EU ID No. OPTM). Two (2) cyclones (APCD No. OC01 and OC02) exist for collecting and conveying generated sawdust. The Pallet Mill has not operated in several years.

2.1.6. Miscellaneous Sources

Logs, lumber, chips, sawdust, bark, and shavings are all shipped into or out of the mill by truck. Utility vehicles such as forklifts and bobcats are used to transport/load/unload materials throughout the mill.[3] Fugitive emissions from travel on unpaved roads results in fugitive particulate emissions. The Thomaston Mill currently does not have any stationary emergency generator engines or fire pump engines.

2.2. PROJECT DESCRIPTION

Interfor proposes to complete modifications associated with the installation of a new continuous, direct-fired kiln with an associated fuel silo, replacement of a debarker, installation of a bark hog, replacement of green wood chippers, replacement of a chip bin cyclone, replacement of a sawdust cyclone, replacement of the planer mill and cyclone, installation of a planer shavings cyclone, and installation of a fire pump engine.

2.2.1. Continuous Kiln and Associated Fuel Silo Installation

Continuous lumber drying kilns (CDK) are an emerging technology that significantly improves productivity, lumber grade, and energy efficiency as compared to the operation of conventional batch-fed kilns. For example, much of the heat that is lost between batches in a traditional kiln when the doors open is retained within a continuous kiln. Since there is no downtime between batches, the continuous kiln remains at operating temperatures, which results in significant energy savings. Additional chambers are constructed on each end of the kiln heating chamber and a pusher system on each end conveys a continuous feed of lumber on one track into the kiln and on a second track in the opposite direction out of the kiln. The heat from the dried lumber coming out of the kiln preheats the green lumber entering the kiln on the second track, resulting in additional efficiency gains.

The operation is continuous and does not shut down except for unplanned malfunction events or planned maintenance outages. The continuous operating features result in improved energy efficiency and productivity of the lumber drying process. In addition, the moisture driven off the green lumber charge conditions the dried lumber exiting the kiln heating chamber resulting in improved product quality. The gasifier system will have an abort stack which will be closed and only used during periods of startup/shutdown, which will happen infrequently based on current system design. The kiln will have a capacity of 120 MMBF/yr and be equipped with a wood gasifier burner rated at approximately 40 million British thermal units (MMBtu) per hour (MMBTU/hr).

The new continuous kiln will be installed in the west side of the Thomaston Mill. Interfor is also planning to install a new fuel silo with associated cyclone for the continuous kiln. Sections 3.2.1.3 and 3.2.1.5 provides more information on emission increases from the new kiln and fuel silo; Appendix B details the emission calculations for each associated emission unit.

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[3] The Thomaston Mill houses diesel and gasoline dispensing stations for their mobile equipment.

2.2.2. Debarker, Bark Hog, Chippers, Chip Bin Cyclone, and Sawdust Cyclone Replacement

As part of the project, Interfor plans to install a bark hog and replace the existing debarker, chippers, and material transfer cyclones at the Thomaston Mill. The debarker will be used to remove bark from logs received at the Thomaston Mill. The purpose of the bark hog is to reduce the size of the bark generated from the debarking process. The green wood chippers are used to resize larger pieces of wood. Interfor also plans to install a new cyclone for collection of chips in the chip bin (chip bin cyclone) and a cyclone to pneumatically convey sawdust generated in the sawmill to the boiler area (sawdust cyclone). Information on potential emissions for the new debarker, chippers, chip bin cyclone, sawdust cyclone, and bark hog are discussed in Sections 3.2.1.1, 3.2.1.2, 3.2.1.3, and 3.2.1.4.

2.2.3. Planer Mill, Planer Mill Cyclone, and Shavings Cyclone Replacement

The current planer mill has a 174 MMBF/yr processing capacity. The proposed installation of a new CDK will expand the facilities potential throughput. To ensure the facility is able to operate at its optimum capacity, a new planer mill is proposed to be installed to accommodate the capacity of all three (3) kilns at the facility. The replacement planer mill will be installed on the west side of the Thomaston Mill. A new planer mill shavings cyclone will be installed to collect shavings at the Planer Mill and a new cyclone will be installed to pneumatically convey shavings to the boiler area at the Thomaston Mill. Section 3.2.1.6 provides more information on emission increases from the replacement planer mill, planer mill cyclone, and shavings cyclone.

2.2.4. Fire Pump Engine

As part of the project, Interfor is also upgrading the fire water system at the Thomaston Mill. As part of this upgrade, Interfor plans to install a new diesel fire pump engine. The design parameters for the engine have not been finalized; however, Interfor assumes that the engine will be approximately 460 HP. The final engine capacity will be based on the fire water system being installed at the mill. Information on potential emissions for the new engine is in Section 3.2.1.7.

2.2.5. Associated Ancillary Emission Units

In addition to the installation of new equipment, the Thomaston Mill will also reroute how truck traffic arrives and departs the mill. Associated emissions increases from haul roads are accounted for in the application. There will also be an emissions increase from ancillary equipment at the mill because the potential kiln production will be increasing, thus more material will be processed through associated units. The associated ancillary emission units include sawing and material handling/transfer sources.

Section 3.2.2 provides more information on emission increases from associated ancillary emission unit (including the sources for the appropriate emission factors); Appendix B details the emission calculations for each associated emission unit.

3. EMISSION CALCULATION METHODOLOGY

This section addresses the methodology used to quantify the emissions from the proposed project and assesses federal PSD permitting applicability. Emissions from the proposed project will include CO, NO_X, SO_2, VOC, PM, PM_{10}, $PM_{2.5}$, lead, and GHGs in the form of CO_2e, and hazardous air pollutants (HAP). These emissions occur as a result of combustion in the kiln, drying of lumber, and other process operations at the facility. Detailed emission calculations are presented in Appendix B.

3.1. NSR PERMITTING EVALUATION METHODOLOGY

The New Source Review (NSR) permitting program generally requires that a source obtain a permit prior to construction of any project at an industrial facility if the proposed project results in the potential to emit air pollution in excess of certain threshold levels. The NSR program is comprised of two elements: NNSR and PSD. The NNSR program potentially applies to new construction or modifications that result in emission increases of a particular pollutant for which the area the facility is located in is classified as “nonattainment” for that pollutant. The PSD program applies to project increases of those pollutants for which the area the facility is located in is classified as “attainment” or “unclassifiable”. The Thomaston Mill is located in Upson County, which is presently designated as “attainment” or “unclassifiable” for all criteria pollutants.[4] Therefore, PSD permitting is potentially applicable. As the Thomaston Mill is a major PSD source, emission increases from proposed projects must be compared to the PSD SER to determine if PSD permitting is required.

The following sections discuss the methodology used in the project emissions increase evaluation conducted to assess PSD applicability under the NSR program. For all PSD-regulated pollutants other than CO_2e, PSD permitting is required if the emissions increase of a specific pollutant exceeds that pollutant’s PSD SER. For CO_2e, PSD permitting is only required if the emissions increase exceeds the SER for CO_2e and the project is already undergoing PSD permitting for at least one other PSD-regulated pollutant.

3.1.1. Defining Existing versus New Emission Units

Different calculation methodologies are used for existing and new units; therefore, it is important to clarify whether a source affected by the proposed project is considered a new or existing emission unit.

40 CFR 52.21(b)(7)(i) and (ii) define new unit and existing units, and are incorporated by reference in the Georgia Rules for Air Quality Control (GRAQC):

> *(i) A new emissions unit is any emissions unit that is (or will be) newly constructed and that has existed for less than 2 years from the date such emissions unit first operated.*
>
> *(ii) An existing emissions unit is any unit that does not meet the requirements in paragraph (b)(7)(i) of this section. A replacement unit, as defined in paragraph (b)(33) of this section, is an existing emissions unit.*

Based on these definitions, the proposed direct-fired continuous wood drying kiln, fuel silo, debarker, bark hog, green wood chippers, chip bin cyclone, sawdust cyclone, planer mill and cyclone, shavings cyclone, and fire pump engine will be classified as new units. Existing units impacted by the proposed project include the existing debarker, green wood chippers, chip bin cyclone, planer mill, planer mill shavings cyclone, planer mill trim blocks cyclone, planer mill shavings truck bin cyclone, and shavings collection cyclone, which will be permanently shutdown.

[4] 40 CFR 81.311

3.1.2. Annual Emission Increase Calculation Methodology

As the mill is classified as a major source for PSD, if the proposed project were classified as a *major modification*, then the full PSD permitting requirements would apply. Project increases were evaluated to determine if the proposed project is a major modification using the current NSR Reform methodology.

For projects that involve existing emission units, PSD applicability using the actual-to-projected applicability test is defined at 40 CFR 52.21(a)(2)(iv)(c) and is incorporated by reference into GRAQC:

> *(c) <u>Actual-to-projected-actual applicability test for projects that only involve existing emissions units.</u> A significant emissions increase of a regulated NSR pollutant is projected to occur if the sum of the difference between the <u>projected actual emissions</u>… and the <u>baseline actual emissions</u>… for each existing emissions unit, equals or exceeds the significant amount for that pollutant…*

For projects that involve installing new emission units, PSD applicability using the actual-to-potential applicability test is defined at 40 CFR 52.21(a)(2)(iv)(d) and is incorporated by reference into GRAQC:

> *(d) <u>Actual-to-potential test for projects that only involve construction of a new emissions unit(s).</u> A significant emissions increase of a regulated NSR pollutant is projected to occur if the sum of the difference between the <u>potential to emit</u>… from each new emissions unit… and the <u>baseline actual emissions</u>… equals or exceeds the significant rate for that pollutant….*

For projects that involve multiple types of emission units, PSD applicability using the hybrid applicability test is defined at 40 CFR 52.21(a)(2)(iv)(f) and is incorporated by reference into GRAQC:

> *<u>Hybrid test for projects that involve multiple types of emissions units</u>. A significant emissions increase of a regulated NSR pollutant is projected to occur if the sum of the emissions increases for each emissions unit, using the method specified in paragraphs (a)(2)(iv)(c) through (d) of this section as applicable with respect to each emissions unit, for each type of emissions unit equals or exceeds the significant amount for that pollutant...*

Major modification is defined by 40 CFR 52.21(b)(2)(i) and is incorporated by reference into GRAQC:

> *"Major Modification" means any physical change in or change in the method of operation of a major stationary source that would result in a significant emission increase … of a regulated NSR pollutant … and a significant net emissions increase of that pollutant …*

As the project is classified as a physical change, the project needs to be analyzed to determine if a significant net emissions increase will occur.

Net emissions increase (NEI) is defined by 40 CFR 52.21(b)(3)(i) and is adopted with changes into GRAQC 391-3-1-.02(7)(a)2.(xi):

> *"Net Emissions Increase" means, with respect to any regulated NSR pollutant … the amount by which the sum of the following exceeds zero:*
>
>> *(a) The increase in emissions … as calculated pursuant to paragraph (a)(2)(iv) [for existing units, calculated by actual-to-projected actual or actual-to-potential; for new units, calculated by actual-to-potential] of this section; and*
>>
>> *(b) Any other increases or decreases in actual emissions…that are contemporaneous with the particular change and are otherwise creditable. Baseline emissions for calculating increases and decreases…shall be determined as provided…*

The first step is commonly referred to as the "project emission increases" as it accounts only for emissions related to the proposed project itself. U.S. EPA guidance had formerly indicated that decreases from emission units being shutdown as a result of a project could not be included in the calculation of "project emissions increases." On March 13, 2018, a memorandum entitled *Project Emissions Accounting Under the New Source Review Preconstruction Permitting Program* was issued by the EPA Administrator. The memorandum clarifies that emissions decreases from a proposed project can be included in the calculation of "project emissions increase."

If the emission increases estimated per the first exceed the major modification thresholds, then the applicant may move to the second step, commonly referred to as the netting analysis. The netting analysis includes all projects for which emission increases or decreases (i.e., equipment shutdown) occurred. If the resulting net emission increases exceed the major modification threshold, then NSR permitting is required. Netting analysis were not performed as part of this application.

Interfor evaluated project increases to determine if the project is a major modification using the current NSR Reform methodology, which may including the following components:

- Potential emissions (A)
- Baseline actual emissions (B)
- Projected actual emissions (C)
- "Could have accommodated" emissions exclusion (D) (commonly called the demand growth exclusion) [Not applicable to project]
- Additional Associated Emission Unit Increases

For new equipment, development of project emission increases for comparing to the PSD SER is relatively straightforward. Potential emission estimates for the proposed project must be evaluated. *Potential-to-emit* is defined by 40 CFR 52.21(b)(4) and is adopted with changes into GRAQC 391-3-1-.02(7)(a)2.(v):

> *means the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable or enforceable as a practical matter…*

For new equipment, the estimate of baseline actual emissions is not necessary (i.e., baseline emissions for new equipment is 0 tpy). For the existing debarker, chippers, chip bin cyclone, planer mill, planer mill trim blocks cyclone, shavings truck bin cyclone, and shavings boiler fuel collection cyclone, the project emissions increase (or decrease) is calculated as the baseline emissions (i.e., the post-project projected actual and potential emissions for the existing planer mill are 0 tpy). Georgia has adopted its own version of baseline actual emissions in GRAQC 391-3-1-.02(7)(a)2.(i):

> *For an existing emissions unit (other than an electric utility steam generating unit), baseline actual emissions means the average rate, in tons per year, at which the emissions unit actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the 10-year period immediately preceding either the date the owner or operator begins actual construction of the project, or the date a complete permit application is received…*

For this project, Interfor has not relied upon the "could have accommodated" emissions exclusion.

3.2. PROPOSED PROJECT EMISSIONS INCREASES

The following sections summarize the methods to estimate the emissions increases from the proposed project for comparison to the PSD SER.

3.2.1. Potential Emissions from New Equipment

This section describes the methodology used to estimate potential emissions from new equipment. Table 3-1 summarizes the emissions from new equipment.

Table 3-1. Potential Emissions from New Equipment

Pollutant	Total (tpy)
Filterable PM	22.26
Total PM_{10}	17.64
Total $PM_{2.5}$	9.34
SO_2	4.38
NO_X	17.56
Total VOC	240.8
CO	44.57
Lead	2.70E-03
CO_2e	36,855
Total HAP	14.68

3.2.1.1. Debarker

Potential emissions for the debarker were calculated using uncontrolled emission factors from publicly available sources (e.g., air permit applications submitted by lumber facilities to state environmental agencies).[5] Interfor elected not to use a WebFIRE emission factor for log debarking as the factor is believed to result in overestimation of PM emissions from log debarking. An emission factor in terms of pounds per ton (lb/ton) of logs processed was multiplied by the potential log consumption following the project to estimate emissions.

3.2.1.2. Chippers

Potential emissions for the chippers were calculated using emission factors from U.S. EPA's Factor Information Retrieval (WebFIRE) database for debarking.[6] As previously discussed, Interfor believes that the factors for debarkers may result in an inaccurate overestimate of actual emissions. However, Interfor is using these factors to estimate emissions from the chippers as no other factors are readily available and because these factors should result in a conservative estimation of emissions.

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[5] Georgia-Pacific Wood Products LLC - Warrenton Lumber Facility PSD Air Permit Application No. 237752 submitted to Georgia EPD in April 2018.

[6] Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fourth Edition with Supplements A, B, and C, AP-42. , per the EPA Factor Information Retrieval (WebFIRE) database, updated 9/7/2016 for SCC Code 3-07-008-01, Log Debarking.

A control efficiency of 95 percent was applied to account for the activities being performed indoors. An emission factor in terms of lb/ton of chips processed was multiplied by the potential chip production following the project to estimate emissions.

3.2.1.3. Chip Bin Cyclone, Sawdust Cyclone, and Kiln Fuel Silo with Cyclone

Potential emissions of PM and PM_{10} for the new chip bin cyclone, sawdust cyclone, and kiln fuel silo cyclone were calculated using a PM_{10} emission factor for sawmill operation cyclones from U.S. EPA's Factor Information Retrieval (WebFIRE) database.[7] Although final specifications for the cyclones are not known, this emission factor is believed to result in a conservative estimate of emissions. Emissions of $PM_{2.5}$ are not expected from the conveyance of wet biomass materials; however, Interfor is assuming that 25% of PM_{10} emissions are $PM_{2.5}$ for conservatism. Emissions are calculated be multiplying the emission rate in terms of lb/hr by potential operating hours (8,760 hr/yr). These cyclones store green chips and green sawdust; as such, PM emissions are expected to be minimal.

3.2.1.4. Bark Hog

Potential emissions from the new bark hog was based on the potential amount of bark produced by the Thomaston Mill following the project. A control efficiency of 95% was applied to account for the activities being performed indoors. The emission factors used for the bark hog is from U.S. EPA's WebFIRE database for debarking.[8] As discussed in subsequent sections, Interfor believes that the factors for debarkers may result in an inaccurate overestimate of actual emissions. However, Interfor is using these factors to estimate emissions from the bark hog as no other factors are readily available and because these factors should result in a conservative estimation of emissions.

3.2.1.5. Direct-Fired Continuous Kiln

Potential emissions from the new direct-fired continuous kiln were evaluated using the maximum production capacities of the kiln (MMBF/yr) and the burner heat input capacities (MMBtu/yr) in conjunction with emission factors from different literature sources. For all pollutants except lead, Interfor relied upon emission factors from the *EPD Recommended Emission Factors for Lumber Kiln Permitting in Georgia* data sheet provided by Georgia EPD.[9] An emission factor from National Council for Air and Stream Improvement (NCASI) data was used to estimate emissions of lead.[10] Appendix B provides a detailed list of emission factors and their sources.

Potential emissions except SO_2, lead and greenhouse gases from the direct-fired continuous kiln were calculated by multiplying the maximum production capacity of dried lumber from the kiln (MBF/yr) by the appropriate emission factor (lb/MBF). Potential emissions of SO_2, lead, and greenhouse gases were calculated based on the fuel firing capacity (MMBtu/hr) multiplied by the pollutant emission factor (lb/MMBtu) and potential hours of operation (hr/yr).

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[7] EPA WebFIRE Emission factor ID No. 20855 for SCC No. 30700808, Industrial Processes, Pulp and Paper and Wood Products, Sawmill Operations, Other Cyclone: Exhaust, PM_{10}-filterable.

[8] Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fourth Edition with Supplements A, B, and C, AP-42. , per the EPA Factor Information Retrieval (WebFIRE) database, updated 9/7/2016 for SCC Code 3-07-008-01, Log Debarking.

[9] Provided by Mr. Manny Patel (EPD) to Trinity Consultants on August 23, 2018 agency meeting for Interfor Perry Mill application.

[10] All NCASI values used in the application were obtained from publicly available sources (e.g. air permit applications submitted by wood lumber facilities to state environmental agencies). Detailed references are provided in Appendix B.

3.2.1.6. Planer Mill Cyclone and Shavings Bin Cyclone (New)

Potential emissions from the new planer mill cyclone and shavings bin cyclone were derived based on uncontrolled emission factors from publicly available sources (e.g., air permit applications submitted by lumber facilities to state environmental agencies).[11] For conservatism, Interfor relied upon a control efficiency of 98% of PM and 95% control efficiency for PM_{10} and $PM_{2.5}$, which is less than the 99.5% control efficiency for $PM/PM_{10}/PM_{2.5}$ assumed in the referenced publically available application. Potential emissions were calculated by multiplying the potential throughput of shavings (ton/yr) through the planer mill by the appropriate emission factor (lb/ton) multiplied by the control efficiency for a single cyclone.

3.2.1.7. Emergency Fire-Pump Engine (New)

Potential emissions from the new emergency engine with associated generator were derived based on AP-42 Section 3.3, *Gasoline and Diesel Industrial Engines* (October 1996) as well as 40 CFR Part 60 Subpart IIII limits for PM, SO_2, Nonmethane Hydrocarbons, and oxides of nitrogen (NO_x). Emission factors for methane and nitrous oxide are from 40 CFR Part 98. Potential hourly emissions were calculated by multiplying the horsepower of the engine by the appropriate emission factor (lb/hp-hr) or by multiplying the heat input capacity (MMBtu/hr) by the appropriate emission factor (lb/MMBtu).

3.2.2. Ancillary Equipment Emission Increases

In addition to emissions from the proposed new kiln, fuel silo, planer mill, and emergency engine the proposed project will result in emissions increases from ancillary equipment at the mill associated with the kiln. Note that only Filterable PM, Filterable PM_{10}, and Filterable $PM_{2.5}$ are emitted from the ancillary equipment associated with the proposed project. Detailed emission calculations for each process are included in Appendix B.

3.2.2.1. Sawing

Increases in fugitive PM emissions from sawing are based on the increased lumber throughput through the sawmill. A control efficiency of 95% was applied to account for the activities being performed indoors.[12] Note that this control efficiency does not take into account that the wood being cut has a high moisture content and would therefore generate less emissions than dry materials.

The PM emission factor for sawing is from the EPA Factor Information Retrieval (WebFIRE) database.[13] The emission factor for sawing (0.35 pound of Total PM per ton of wood processed) was originally published in AP-42 with a “D” rating. It is likely that this number is much higher than appropriate and results in inaccurate PM emission calculations. The most recent version of AP-42, Section 10.5, *Plywood Manufacturing* (published in January 2002) does not list an emission factor for sawing. Given the lack of a more accurate value available for PM emissions from sawing, Interfor has chosen to use the 0.35 lb/ton value for conservatism, as a starting point. Based on observations and testing summarized by the North Carolina Division of Air Quality (NCDAQ), it was assumed that 1.89% of PM is PM_{10} and that all PM_{10} is conservatively $PM_{2.5}$.[14]

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[11] West Fraser – Augusta PSD Air Permit Application No. 43928 submitted to EPD in January 2017

[12] Per *EPA Region 10 Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country* (May 2014), emissions can be reduced by 100% for sawmill activities being performed indoors as emissions will struggle to escape through doorways and other openings. For conservatism, Interfor is assuming that 5% of emissions escape from doors or other openings.

[13] Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fourth Edition with Supplements A, B, and C, AP-42, per the EPA Factor Information Retrieval (WebFIRE) database, updated 9/7/2016 for SCC Code 3-07-008-02, Log Sawing.

[14] Per a document entitled "Estimating Emissions from Generation and Combustion of 'Waste' Wood - Draft" (July 1998) by the NCDAQ, the percentage of PM emitted from sawing operations that is PM_{10} is 1.89%. This factor was developed for dry wood; the amount of PM that is PM_{10} when sawing wet wood is most likely even lower.

3.2.2.2. Material Transfer Sources

Increases in fugitive PM emissions from the truck loading and transfer of chips, bark, sawdust, and wood shavings were calculated using emission factors based on Equation 1 of U.S. EPA's AP-42, Section 13.2.4, *Aggregate Handling and Storage Piles.*[15] This estimate is expected to be a highly conservative assessment of the potential PM emissions.

3.2.2.3. Roads

Fugitive PM emissions from the increased truck traffic on the facility roadways were estimated based on the vehicle miles travelled (VMT) by trucks that will transport additional materials to and from the facility. Vehicle miles traveled on site were estimated based on the distance of the anticipated truck route for each material and the number of trips necessary to support continuous operation of the new kiln. Emission calculations for fugitive paved road dust emissions were developed based on AP-42, Section 13.2.1, *Paved Roads* and for fugitive unpaved road dust from Section 13.2.2, *Unpaved Roads*.[16,17]

3.2.3. Baseline Emissions for Permanently Shutdown Equipment

Interfor estimated the baseline actual emissions for all equipment being permanently shutdown. As previously stated, the baseline actual emissions can be based off any 24-month consecutive period in the last ten (10) years. For simplicity, Interfor only calculated actual emissions for 2017 and 2018 to estimate baseline production and emissions for all units.

3.2.3.1. Debarking

Baseline actual emissions for the existing debarker were calculated using the same emission factors used to estimate emissions from the new debarker. As previously stated, these uncontrolled emission factors are from publicly available sources (e.g., air permit applications submitted by lumber facilities to state environmental agencies).[18] An emission factor in terms of pounds per ton (lb/ton) of logs processed was multiplied by the baseline actual log consumption to estimate emissions.

3.2.3.2. Chippers

Baseline actual emissions for the existing chippers were calculated using the same emission factors used to estimate emissions from the new chippers being installed. These emission factors are from U.S. EPA's Factor Information Retrieval (WebFIRE) database for debarking.[19] A control efficiency of 95 percent was applied to account for the activities being performed indoors. An emission factor in terms of lb/ton of chips processed was multiplied by the baseline actual chip production to estimate emissions.

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[15] U.S. EPA AP-42, Section 13.2.4, *Aggregate Handling and Storage Files,* November 2006.

[16] U.S. EPA AP-42, Section 13.2.1, P*aved Roads*, January 2011.

[17] U.S. EPA AP-42, Section 13.2.2, *Unpaved Roads*, November 2006.

[18] Georgia-Pacific Wood Products LLC - Warrenton Lumber Facility PSD Air Permit Application No. 237752 submitted to Georgia EPD in April 2018.

[19] Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fourth Edition with Supplements A, B, and C, AP-42. , per the EPA Factor Information Retrieval (WebFIRE) database, updated 9/7/2016 for SCC Code 3-07-008-01, Log Debarking.

3.2.3.3. Chip Bin Cyclone (OC07) and Planer Mill Trim Blocks Cyclone (OC04)

Potential emissions for the existing chip bin cyclone and planer mill trim blocks cyclone were calculated using the same emission factor used to estimate emissions from the new chip bin cyclone, sawdust cyclone, and kiln fuel silo cyclone. These emission factors are from U.S. EPA's WebFIRE database.[20] In reality, the existing cyclones may not perform as well as the new cyclones; however, Interfor is using the same emission factors to prevent overestimation of baseline actual emissions. Emissions are calculated be multiplying the emission rate in terms of lb/hr by the baseline actual hours of operation.

3.2.3.4. Planer Mill Cyclone (OC03), Shavings Truck Bin Cyclone (OC05), and Shavings Boiler Fuel Collection Cyclone (OC06)

Baseline actual emissions from the existing planer mill and shavings cyclones were derived based on the same uncontrolled emission factors used to estimate emissions from the new planer mill and associated shavings cyclones. These emissions factors are from publicly available sources (e.g., air permit applications submitted by lumber facilities to state environmental agencies).[21] For control efficiency, Interfor selected the same control efficiency as the new shavings cyclones. In reality, the existing cyclones may not perform as well as the new cyclones; however, Interfor is using the same control efficiency to prevent overestimation of baseline actual emissions. Baseline emissions from the existing planer mill and cyclones were calculated by multiplying the baseline actual throughput of shavings through the planer mill or cyclones by the appropriate emission factor (lb/ton) multiplied by the control efficiency for a single cyclone.

3.2.4. Project Emissions Increase

Table 3-2 shows the total emissions increase for the proposed project compared to the PSD SER. The project emissions increase is calculated as the potential emissions from new equipment plus the associated emissions increase from ancillary equipment minus the baseline emissions of equipment which will be shutdown as a result of the project.

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[20] EPA WebFIRE Emission factor ID No. 20855 for SCC No. 30700808, Industrial Processes, Pulp and Paper and Wood Products, Sawmill Operations, Other Cyclone: Exhaust, PM_{10}-filterable.
[21] West Fraser – Augusta PSD Air Permit Application No. 43928 submitted to EPD in January 2017

Table 3-2. Project Emissions Increase

Pollutant	A Potential Emissions of New Units (tpy)[1]	B Associated Units Emissions Increase (tpy)[2]	C Existing Shutdown Units Emissions (tpy)[3]	D = A + B - C Project Net Emissions Increases (tpy)[4]	E PSD SER Thresholds (tpy)[5]	Is D > E? PSD Permitting Triggered?
Filterable PM	22.26	4.40	4.03	22.63	25	No
Total PM_{10}	17.64	0.19	3.04	14.79	15	No
Total $PM_{2.5}$	9.34	0.09	0.89	8.54	10	No
SO_2	4.38	--	--	4.38	40	No
NO_X	17.56	--	--	17.56	40	No
VOC	240.8	--	--	240.8	40	Yes
CO	44.57	--	--	44.57	100	No
Lead	2.70E-03	--	--	2.70E-03	0.6	No
CO_2e	36,855	--	--	36,855	75000	No
Hydrogen Sulfide	--	--	--	--	10	No
Sulfuric Acid Mist	--	--	--	--	7	No
Total HAP	14.68	--	--	14.68	N/A	N/A

1. The proposed project will not modify any existing unit. Therefore, baseline actual emissions and potential emissions of modified units are not applicable. Potential emissions from new equipment are summarized in Table B-13.

2. Associated units emissions increases are summarized in Table B-18.

3. Baseline actual emissions for existing equipment being permanently shutdown are summarized in Table B-26.

4. Project Net Emissions Increases = Net Emissions Increase (Potential Emissions from New Units) + Associated Units Emissions Increase - Shutdown Units Baseline Emissions

5. For PSD permitting for CO_2 to be triggered, first PSD must be triggered for another regulated pollutant, then project emissions from both CO_2 (mass basis) and CO_2e must be greater than the SER.

As illustrated in Table 3-2, project emission increases from the proposed project, will be below the PSD SER for all pollutants except VOC.

4. REGULATORY REVIEW

The Thomaston Mill is subject to certain federal and state air regulations. This section of the application summarizes the air permitting requirements and key air quality regulations that will apply to the facility under both federal and state permitting programs. Applicability to NSR, Title V, New Source Performance Standards (NSPS), NESHAP, and EPD state rules are addressed.

4.1. NEW SOURCE REVIEW APPLICABILITY

The NSR permitting program generally requires a source to obtain a permit and undertake other obligations prior to construction of any project at an industrial facility if the proposed project results in the potential to emit air pollution in excess of certain threshold levels. The NSR program is comprised of two elements: NNSR and PSD. The NNSR program potentially applies to new construction or modifications that result in emission increases of a particular pollutant for which areas classified as “nonattainment.” The PSD program applies to project increases of those pollutants for which the area the facility is located in is classified as “attainment” or “unclassifiable.”

As previously discussed, the Thomaston Mill is located in Upson County, which has been designated by the U.S. EPA as “attainment” or “unclassifiable” for all criteria pollutants.[22] Therefore, the facility is not subject to NNSR permitting requirements. However, new construction or modifications that result in emissions increases are potentially subject to PSD permitting requirements.

The PSD program only regulates emissions from “major” stationary sources of regulated air pollutants. A stationary source is considered PSD major if potential emissions of any regulated pollutant exceed the major source thresholds. The PSD major source threshold is 250 tpy of a non-GHG criteria pollutant.[23] There is no major source threshold for GHGs in the form of CO_2e.

As the Thomaston Mill is a major PSD source, emission increases from proposed projects must be compared to the PSD SER to determine if PSD permitting is required. The emission increase analysis was presented in Section 3.2 of this report. Table 4-1 presents a summary of the analysis.

[22] 40 CFR 81.311.

[23] Wood product manufacturing facilities are not on the “List of 28” sources which are subject to a lower major source threshold for criteria pollutants of 100 tpy.

Table 4-1. Net Emission Increases Compared to PSD SER

Pollutant	A Potential Emissions of New Units (tpy)[1]	B Associated Units Emissions Increase (tpy)[2]	C Existing Shutdown Units Emissions (tpy)[3]	D = A + B - C Project Net Emissions Increases (tpy)[4]	E PSD SER Thresholds (tpy)[5]	Is D > E? PSD Permitting Triggered?
Filterable PM	22.26	4.40	4.03	22.63	25	No
Total PM_{10}	17.64	0.19	3.04	14.79	15	No
Total $PM_{2.5}$	9.34	0.09	0.89	8.54	10	No
SO_2	4.38	--	--	4.38	40	No
NO_X	17.56	--	--	17.56	40	No
VOC	240.8	--	--	240.8	40	Yes
CO	44.57	--	--	44.57	100	No
Lead	2.70E-03	--	--	2.70E-03	0.6	No
CO_2e	36,855	--	--	36,855	75000	No
Hydrogen Sulfide	--	--	--	--	10	No
Sulfuric Acid Mist	--	--	--	--	7	No
Total HAP	14.68	--	--	14.68	N/A	N/A

1. The proposed project will not modify any existing unit. Therefore, baseline actual emissions and potential emissions of modified units are not applicable. Potential emissions from new equipment are summarized in Table B-13.

2. Associated units emissions increases are summarized in Table B-18.

3. Baseline actual emissions for existing equipment being permanently shutdown are summarized in Table B-26.

4. Project Net Emissions Increases = Net Emissions Increase (Potential Emissions from New Units) + Associated Units Emissions Increase - Shutdown Units Baseline Emissions

5. For PSD permitting for CO_2 to be triggered, first PSD must be triggered for another regulated pollutant, then project emissions from both CO_2 (mass basis) and CO_2e must be greater than the SER.

As illustrated in Table 4-1, the proposed project net emission increase exceeds the PSD SER for VOC. Accordingly, PSD permitting is required for that pollutant.

4.2. FEDERAL REGULATORY APPLICABILITY

40 CFR Part 70 (Title V), 40 CFR Part 60 (NSPS) and 40 CFR Parts 61 and 63 (NESHAP) were reviewed to determine applicability to proposed emission units at the facility.

4.2.1. Title V Operating Permit Program

The Title V program was established as part of the 1990 Clean Air Act Amendments and is in the federal regulations at 40 CFR Part 70-71. Georgia has developed their own program under 40 CFR Part 70, which is provided in Chapter 391-3-1-.03(10) of the Georgia Rules for Air Quality Control. Title V requires that all new and existing major sources of air emissions obtain federally approved state administered operating permits. A major source as defined under the Title V program is a facility that has the potential to emit either more than 100 tpy for any criteria pollutant, more than 10 tpy for any single HAP, and more than 25 tpy for all HAP. Potential emissions of multiple pollutants exceed the Title V major source threshold and as such the Thomaston Mill will continue to be regulated as a Title V Major Source. As the project requires PSD permitting, the project will be authorized as a significant modification to the Thomaston Mill's Title V permit.

4.2.2. New Source Performance Standards

NSPS, located in 40 CFR 60, require new, modified, or reconstructed sources to control emissions to the level achievable by the best-demonstrated technology as specified in the applicable provisions. Moreover, any source subject to an NSPS is also subject to the general provisions of NSPS Subpart A, except as noted. Interfor assessed applicability of NSPS to the new continuous, direct-fired kiln, associated fuel silo, planer mill, and emergency fire pump engine only.

4.2.2.1. 40 CFR 60 Subpart Dc - Small Industrial-Commercial-Institutional Steam Generating Units

NSPS Subpart Dc, *Small Industrial-Commercial-Institutional Steam Generating Units*, applies to steam generating units rated between 10 and 100 MMBtu/hr constructed, modified, or reconstructed after June 9, 1989. The term "steam generating unit" is defined under this regulation as shown below:

> *"Steam generating unit means a device that combusts any fuel and produces steam or heats water or any other heat transfer medium. This term includes any duct burner that combusts fuel and is part of a combined cycle system. This term does not include process heaters as defined in this subpart."*[24]

The new continuous direct-fired kiln will operate with a green sawdust gasifier burner at a heat input capacity of 40 MMBtu/hr, and will be constructed in 2020. However, the gasifier burners will not generate steam because the combustion gases from the fuel (green sawdust) will directly contact the lumber during the drying process. Therefore, Subpart Dc is not applicable for the proposed project.

4.2.2.2. 40 CFR 60 Subpart IIII - Stationary Compression Ignition Internal Combustion Engines

NSPS Subpart IIII, *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*, is potentially applicable to stationary internal combustion engines (ICE) based on the date each engine was constructed, reconstructed, or modified. The rule provides performance standards for both engine manufacturers and operators. Engine operators must meet the specified emission standards and fuel type specifications.

The Thomaston Mill plans to operate one diesel-fired emergency fire pump (FWP1). As FWP1 will be manufactured after April 1, 2006, the unit is subject to the requirements under this part.

FWP1 will be rated between 300 and 600 HP. Pursuant to CFR 60.4202(d), FWP1 must be certified to meet the applicable emission standards of Table 4 of NSPS Subpart IIII, and Interfor will have to comply with these emission limits pursuant to 40 CFR 60.4205(c). Pursuant to 40 CFR 60.4211(a) and (c), compliance with these emissions standards will be met by:

- Operating and maintaining the engine according to manufacturer's emission-related written instructions;
- Changing only those emission-related settings that are permitted by the manufacturer;
- Meeting the requirements of 40 CFR Pat 89, 94, and/or 1068 as applicable;
- Purchasing an engine certified to the emission standards; and
- Installing and configuring the engine according to manufacturer's emission-related specifications.

Pursuant to 40 CFR 60.4211(f), operation of the fire pump engine will be limited to emergency situations (fire), testing/maintenance for 100 hours per year, and other non-emergency situations for 50 hours per year. Any non-emergency operation also counts toward the 100 hour per year limit for maintenance and testing. The engine will be equipped with a non-resettable hour meter pursuant to the requirements of 40 CFR 60.4209(a), and Interfor will record the hours and purpose of operation of the engine pursuant to 40 CFR 60.4214(b).

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[24] 40 CFR 60.41c.

Pursuant to 40 CFR 60.4207(b), purchased diesel fuel will meet the requirements of 40 CFR 80.510(b) for nonroad diesel fuel.

4.2.2.3. Non-Applicability of All Other NSPS

NSPS standards are developed for particular industrial source categories and the applicability of a particular NSPS to a facility can be readily ascertained based on the industrial source category covered. All other NSPS are categorically not applicable to the proposed project.

4.2.3. National Emission Standards for Hazardous Air Pollutants

NESHAP, located in 40 CFR 63, have been promulgated for source categories that emit HAP to the atmosphere. A facility that is a major source of HAP is defined as having potential emissions greater than 25 tpy of total HAP and/or 10 tpy of a single HAP. Facilities with a potential to emit HAP at an amount less than the major source thresholds are otherwise considered an area source. The NESHAP allowable emission limits are most often established on the basis of a maximum achievable control technology (MACT) determination for the particular source. The NESHAP apply to sources in specifically regulated industrial source categories (Clean Air Act Section 112(d)) or on a case-by-case basis (Section 112(g)) for facilities not regulated as a specific industrial source type.

The Thomaston Mill is classified as a major source of HAP as the mill has potential HAP emissions greater than the major source thresholds. The determination of applicability to NESHAP requirements for major sources of HAP are detailed in the following sections. Interfor assessed applicability of NESHAP to the new continuous, direct-fired kiln, associated fuel silo planer mill, and emergency fire pump engine only.

4.2.3.1. 40 CFR 63 Subpart A - General Provisions

NESHAP Subpart A, *General Provisions*, contains national emission standards for HAP defined in Section 112(b) of the Clean Air Act. All affected sources, which are subject to another NESHAP, are subject to the general provisions of NESHAP Subpart A, unless specifically excluded by the source-specific NESHAP.

4.2.3.2. 40 CFR 63 Subpart DDDD - Plywood and Composite Wood Products

NESHAP Subpart DDDD regulates HAP emissions from plywood and composite wood products (PCWP) manufacturing facilities that are major HAP sources. The PCWP MACT was initially finalized by U.S. EPA on July 30, 2004, and was reissued and amended after reconsideration on February 16, 2006. The rule was partially vacated and remanded by the D.C. Circuit Court of Appeals in June 2007, which led to the rule being finalized in October 2007. EPA is in the process of requesting and collecting information from plywood and composite wood product facilities, to evaluate further rule amendments. However, at this time, since no rule changes have been proposed, Interfor evaluated the rule applicability based on the final rule from 2007. Upon issuance of a proposed of final amendment to this rule in the future, Interfor will evaluate potential mill applicability.

Lumber kilns are process units within the existing “affected source” under the PCWP MACT, defined in 40 CFR 63.2232(b) as:

> *The collection of dryers, refiners, blenders, formers, presses, board coolers, and other process units associated with the manufacturing of plywood and composite wood products. The affected source includes, but is not limited to, green end operations, refining, drying operations (including any combustion unit exhaust stream routinely used to direct fire process unit(s)), resin preparation, blending and forming operations, pressing and board cooling operations, and miscellaneous finishing operations (such as sanding, sawing, patching, edge sealing, and other finishing operations not subject to other national emission standards for hazardous air pollutants (NESHAP)). The affected source also includes onsite storage and preparation of raw materials used in the manufacture of plywood and/or composite wood*

products, such as resins; onsite wastewater treatment operations specifically associated with plywood and composite wood products manufacturing; and miscellaneous coating operations (§63.2292). The affected source includes lumber kilns at PCWP manufacturing facilities and at any other kind of facility.

However, based on §63.2252, for process units not subject to the compliance options or work practice requirements specified in §63.2240 (including, but not limited to, lumber kilns), the Thomaston Mill is not required to comply with the compliance options; work practice requirements; performance testing; monitoring; startup, shutdown, and malfunction (SSM) plans; and recordkeeping or reporting requirements of NESHAP Subpart DDDD, or any other requirements in NESHAP Subpart A, *General Provisions*, except for the initial notification requirements in §63.9(b). Although lumber kilns are an affected source, there are no applicable requirements for the new direct-fired continuous kiln at the mill, except for the initial notification.

Pursuant to 40 CFR 63.9(b)(iii), affected sources may use the application for approval of construction to fulfill the initial notification requirements.

4.2.3.3. 40 CFR 63 Subpart ZZZZ - Internal Combustion Engines

40 CFR 63 Subpart ZZZZ, *National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines* (the RICE MACT) is applicable to any existing, new, or reconstructed stationary RICE at major or area sources of HAP. The requirements for engines at industrial facilities under the RICE MACT can differ based on several criteria including:

- The HAP source status of the entire facility (e.g., major or area);
- The date that construction or reconstruction of the engine commenced;
- Whether the RICE is in emergency or non-emergency service;
  - If in emergency service, whether the RICE participates in a demand response program;
- Whether the RICE is spark ignition (SI) or compression ignition (CI);
  - If SI, whether the engine is 2-stroke (2S) or 4-stroke (4S), and whether the engine is rich burn (RB) or lean burn (LB);
- The site rating of the engine in brake horsepower (bhp);
- Whether the engine is considered remote or non-remote; and
- Whether the engine is operated more than 24 hours per year.

The new fire pump engine will be considered a new stationary RICE.[25] New CI stationary RICE rated at less than 500 HP at major sources of HAP subject to a standard under 40 CFR 60 demonstrate compliance with the RICE MACT by complying with NSPS IIII.[26] In the previous section, it was determined that the fire pump engine is subject to NSPS IIII. No further requirements under the RICE MACT apply to the new engine.

4.2.3.4. 40 CFR 63 Subpart DDDDD - Industrial, Commercial, and Institutional Boilers and Process Heaters

NESHAP Subpart DDDDD, *National Emissions Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters* (Major Source Boiler MACT) regulates boilers and process heaters at major sources of HAP. The new kiln clearly does not meet the definition of a boiler. A process heater is defined in 40 CFR 63.7575, as

… an enclosed device using controlled flame, and the unit's primary purpose is to transfer heat indirectly to a process material (liquid, gas, or solid) or to a heat transfer material (e.g., glycol or a mixture of glycol and water) for use in a process unit, instead of generating steam. Process heaters are devices in which the

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[25] 40 CFR 63.6590(a)(2)

[26] 40 CFR 63.6590(c)(7)

combustion gases do not come into direct contact with process materials. A device combusting solid waste, as defined in §241.3 of this chapter, is not a process heater unless the device is exempt from the definition of a solid waste incineration unit as provided in section 129(g)(1) of the Clean Air Act. Process heaters do not include units used for comfort heat or space heat, food preparation for on-site consumption, or autoclaves. Waste heat process heaters are excluded from this definition.

The continuous lumber kiln will be direct-fired, as the combustion gases from the fuel will directly contact the lumber during the drying process. Therefore, the new lumber kiln is not considered a process heater, and Boiler MACT is not applicable.

4.2.3.5. Non-Applicability of All Other NESHAP

NESHAP standards are developed for particular industrial source categories for either major or area sources of HAP and the applicability of a particular NESHAP to a facility can be readily ascertained based on the industrial source category covered. All other NESHAP are categorically not applicable to the mill.

4.2.4. Compliance Assurance Monitoring Regulations

Under 40 CFR 64, the Compliance Assurance Monitoring (CAM) Regulations, facilities are required to prepare and submit monitoring plans for certain emission units with a Title V application. The CAM Plans provide an ongoing and reasonable assurance of compliance with emission limits. Under the general applicability criteria, this regulation only applies to emission 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.

The new kiln, debarker, bark hog, chippers, and fire pump engine will not use a control device; therefore, these units will not be subject to CAM. Interfor believes that all cyclones being installed qualify as inherent process equipment as they are necessary for the transport and collection of materials, and therefore, would not qualify as a control device, pursuant to 40 CFR 64.1.

4.3. STATE REGULATORY APPLICABILITY

In addition to federal air regulations, the Georgia Rules for Air Quality Control (GRAQC) 391-3-1, establishes regulations applicable at the emission unit level (source specific) and at the facility level.[27] The rules also contain requirements related to the need for construction and/or operating permits.

4.3.1. GRAQC 391-3-1-.02(2)(b) – Visible Emissions

This regulation limits the visible emissions from all sources to 40% opacity, provided that the source is not subject to some other emission limitation under GRAQC 391-3-1-.02(2).[28] All equipment associated with the proposed project are subject to this rule.

[27] GRAQC effective May 19, 2019

[28] GRAQC 391-3-1-.02(2)(b)1

4.3.2. GRAQC 391-3-1-.02(2)(c) – Incinerators

This regulation limits the PM and visible emissions from incinerators. Per the GRAQC, an incinerator is defined as follows:

> *…all devices intended or used for the reduction or destruction of solid, liquid, or gaseous waste by burning.*[29]

Although the proposed lumber kiln will burn green sawdust produced as a byproduct from the sawmill, the main purpose of the kiln is not the destruction of solid waste. Therefore, Rule (c) will not apply to the proposed kiln.

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

This regulation limits PM emissions from all fuel-burning equipment. It also limits opacity and NO_X emissions from equipment constructed or modified after January 1, 1972. Georgia defines fuel-burning equipment as:

> *…equipment the primary purpose of which is the production of thermal energy from the combustion of fuel. Such equipment is generally that used for, but not limited to, heating water, generating or superheating steam, heating air as in warm air furnaces, furnishing process heat indirectly, through transfer by fluids or transmissions through process vessel walls.*[30]

Although the lumber drying kiln and fire pump engine will combust a fuel, the primary purpose of the units is not to produce thermal energy used for indirect heating. Therefore, the kiln and fire pump engine are not subject to Rule (d).

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

This regulation, commonly known as the process weight rule (PWR) establishes PM limits for all sources if not specified elsewhere. The PM emissions are limited based on the following equations (for equipment constructed or modified after July 2, 1968):

$$E = 4.1 \times P^{0.67} \qquad \text{for } P \leq 30 \text{ ton/hr}$$

$$E = 55 \times P^{0.11} - 40 \qquad \text{for } P > 30 \text{ ton/hr}$$

where: E = allowable PM emission rate [lb/hr]
P = process input weight rate [tons/hr]

This rule applies to all equipment associated with the proposed project, except the fire pump engine. The facility will continue to be in compliance with this rule after the completion of the proposed project.

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

This regulation establishes SO_2 emission limits for fuel-burning sources. New fuel burning sources constructed after January 1, 1972, capable of firing fossil fuel at a rate exceeding 250 MMBtu/hr are subject to SO_2 emission limitations. The kiln will exclusively combust wood waste, which is not a fossil fuel, and will also have a firing rate less than 250 MMBtu/hr. The fire pump engine will have a rating less than 250 MMBtu/hr. The kiln and fire pump engine therefore, are not subject to the emission limitation in the rule. However, the rule also specifies

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[29] GRAQC 391-3-1-.01(hh)

[30] GRAQC 391-3-1-.01(cc)

that all fuel burning sources with heat input capacities less than 100 MMBtu/hr shall not burn fuel containing more than 2.5% sulfur by weight. The new kiln will combust exclusively wood, and therefore, be in inherent compliance with this rule. As discussed in Section 4.2.2.2, the fire pump engine is required to combust non-road fuel meeting the requirements of 40 CFR 80.510(b), which specifies a sulfur content limit of 15 ppm. Therefore, the fire pump engine will be in compliance with this rule.

4.3.6. GRAQC 391-3-1-.02(2)(n) – Fugitive Dust

This regulation requires facilities to take reasonable precautions to prevent fugitive dust from becoming airborne. All units that are part of the proposed project will be covered by this generally applicable rule. Interfor will take the appropriate precautions to prevent fugitive dust from becoming airborne and to ensure that the percent opacity is less than 20%.

4.3.7. GRAQC 391-3-1-.02(2)(tt) – VOC Emissions from Major Sources

This regulation limits VOC emissions from facilities that are located in or near the original Atlanta 1-hour ozone nonattainment area. The Thomaston Mill is not located within the geographic area covered by this rule and is, therefore, not subject to this regulation.

4.3.8. GRAQC 391-3-1-.02(2)(uu) – Visibility Protection

Rule (uu) requires EPD to provide an analysis of a proposed major source or a major modification to an existing source's anticipated impact on visibility in any federal Class I area to the appropriate Federal land Manager (FLM). This project does not qualify as a major modification for visibility-impacting pollutants (NO_X, Total PM_{10}, SO_2, and H_2SO_4), and therefore no visibility impact modeling will be performed.

4.3.9. GRAQC 391-3-1-.02(2)(yy) – Emissions of Nitrogen Oxides from Major Sources

This regulation limits NO_X emissions from facilities that are located in or near the original Atlanta 1-hour ozone nonattainment area. The Thomaston Mill is not located within the geographic area covered by this rule and is, therefore, not subject to this regulation.

4.3.10. GRAQC 391-3-1-.02(2)(lll) – NO_X Emissions from Fuel-burning Equipment

This regulation limits the NO_X emission from fuel-burning equipment with a maximum design heat input capacity equal to or greater than 10 MMBtu/hr and less than or equal to 250 MMBtu/hr that are located in 45 counties surrounding the Atlanta metropolitan area, which includes Upson County. As previously discussed, the new kiln and fire pump engine do not meet the definition of fuel burning equipment and are, therefore, not subject to this regulation.

4.3.11. GRAQC 391-3-1-.02(2)(rrr) – NO_X Emissions from Small Fuel-Burning Equipment

This regulation limits NO_X emissions from facilities that are located in or near the original Atlanta 1-hour ozone nonattainment area. The Thomaston Mill is not located within the geographic area covered by this rule and is, therefore, not subject to this regulation.

4.3.12. GRAQC 391-3-1-.03(1) – Construction (SIP) Permitting

The proposed project will require physical construction activities to allow construction of the project. Emission increases associated with the proposed project are above the *de minimis* construction permitting thresholds specified in GRAQC 391-3-1-.03(6)(i). Further, as discussed in Section 4.1, PSD permitting is required for VOC. Therefore, a construction permit application is necessary.

4.3.13. GRAQC 391-3-1-.03(10) – Title V Operating Permits

The Thomaston Mill is a major stationary source, since the potential emission of regulated pollutants exceed the thresholds established by Georgia's Title V Operating Permit Program. The current permit is set to expire on May 28, 2022. The addition of new conditions to allow the project to avoid PSD permitting for certain pollutants and to establish appropriate BACT limits for pollutants undergoing PSD permitting will be required. As the project requires PSD permitting, it constitutes a modification under Title I of the Clean Air Act, and cannot be processed as a Section 502(b)10 operational flexibility change.[31] The change also cannot be processed as a minor modification as it requires a case-by-case determination of an emission limit (BACT).[32]

For these reasons, the proposed project constitutes a Title V permit significant modification.

4.3.14. Incorporation of Federal Regulations by Reference

The following federal regulations are incorporated in the GRAQC by reference and were addressed previously in this application:

- GRAQC 391-3-1-.02(8) – NSPS
- GRAQC 391-3-1-.02(9) – NESHAP
- GRAQC 391-3-1-.02(11) – CAM

4.3.15. Non-Applicability of Other GRAQC

A thorough examination of the Georgia SIP rule applicability to the project reveals many SIP regulations will not apply and do not impose additional requirements on the project. Such SIP rules include those specific to a particular type of unrelated industrial operation.

[31] GRAQC 391-3-1-.03(10)(b)5

[32] GRAQC 391-3-1-.03(10)(e)5

5. BEST AVAILABLE CONTROL TECHNOLOGY ASSESSMENT

This section discusses the regulatory basis for BACT, approach used in completing the BACT analyses, and the BACT analyses for new and modified equipment emitting pollutants triggering PSD review. Supporting documentation is included in Appendices D and E.

5.1. BACT DEFINITION

The requirement to conduct a BACT analysis is set forth in the PSD regulations [40 CFR 52.21(j)(2)] and adopted into the GRAQC by reference:

(j) Control Technology Review.

(3) A major modification shall apply best available control technology for each regulated NSR pollutant for which it would result in a significant net emissions increase at the source. This requirement applies to each proposed emissions unit at which a net emissions increase in the pollutant would occur as a result of a physical change or change in the method of operation in the unit.

BACT is defined in the PSD regulations [40 CFR 52.21(b)(12)] and is incorporated into the GRAQC as:[33]

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

If the Director determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of best available control technology. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for compliance by means which achieve equivalent results.
[allowance for secondary BACT standard under certain conditions]

The primary BACT definition can be best understood by breaking it apart into its separate components.

5.1.1. Emission Limitation

an emissions limitation

First and foremost, BACT is an emission limit. While BACT is prefaced upon the application of technologies to achieve that limit, the final result of BACT is a limit. In general, this limit would be an emission rate limit of a

[33] The GRAQC substitute the word "Director" for the word "Administrator".

pollutant (i.e., lb/hr).[34] If an emissions measurement is infeasible, then design, equipment, work practice, operational standard, or combination thereof may be established.

5.1.2. Case-by-Case Basis

> *a case-by-case basis, taking into account energy, environmental and economic impacts and other cost*

Unlike many of the Clean Air Act programs, the PSD program's BACT evaluation is case-by-case. As noted by U.S. EPA,

> *The case-by-case analysis is far more complex than merely pointing to a lower emissions limit or higher control efficiency elsewhere in a permit or a permit application. The BACT determination must take into account all of the factors affecting the facility, such as the choice of [fuel]… The BACT analysis, therefore, involves judgment and balancing.*[35]

To assist applicants and regulators with the case-by-case process, in 1987 U.S. EPA issued a memorandum that implemented certain program initiatives to improve the effectiveness of the PSD program within the confines of existing regulations and state implementation plans.[36] Among the initiatives was a "top-down" approach for determining BACT. In brief, the top-down process suggests that all available control technologies be ranked in descending order of control effectiveness. The most stringent or "top" control option is the default BACT emission limit unless the applicant demonstrates, and the permitting authority in its informed opinion agrees, that energy, environmental, and/or economic impacts justify the conclusion that the most stringent control option is not achievable in that case. Upon elimination of the most stringent control option based upon energy, environmental, and/or economic considerations, the next most stringent alternative is evaluated in the same manner. This process continues until BACT is selected.

The five steps in a top-down BACT evaluation can be summarized as follows:

> Step 1. Identify all possible control technologies;
> Step 2. Eliminate technically infeasible options;
> Step 3. Rank the technically feasible control technologies based upon emission reduction potential;
> Step 4. Evaluate ranked controls based on energy, environmental, and/or economic considerations; and
> Step 5. Select BACT.

While the top-down BACT analysis is a procedural approach suggested by U.S. EPA policy, this approach is not specifically mandated as a statutory requirement of the BACT determination. As discussed in Section 5.1.1, the BACT limit is an emissions limitation and does not require the installation of any specific control device.

5.1.3. Achievable

> *"based on the maximum degree of reduction …which the Director … determines is achievable … through application of production processes or available methods, systems and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques"*

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[34] Emission limits can be broadly differentiated as "rate-based" or "mass-based." For a kiln, a rate-based limit would typically be in units of lb/ton (mass emissions per ton material input). In contrast, a typical mass-based limit would be in units of lb/hr (mass emissions per time).

[35] U.S. EPA Responses to Public Comments on the Proposed PSD Permit for the Desert Rock Energy Facility, July 31, 2008, p.41-42.

[36] Memo dated December 1, 1987, from J. Craig Potter (EPA Headquarters) to EPA Regional Administrators, titled "Improving New Source Review Implementation."

BACT is to be set at the lowest value that is achievable. However, there is an important distinction between emission rates achieved at a specific time on a specific unit, and an emission limitation that a unit must be able to meet continuously over its operating life.

As discussed by the D.C. Circuit Court of Appeals,

> *In National Lime Ass'n v. EPA, 627 F.2d 416, 431 n.46 (D.C. Cir. 1980), we said that where a statute requires that a standard be "achievable," it must be achievable "under most adverse circumstances which can reasonably be expected to recur."*[37]

U.S. EPA has reached similar conclusions in prior determinations for PSD permits.

> *Agency guidance and our prior decisions recognize a distinction between, on the one hand, measured 'emissions rates,' which are necessarily data obtained from a particular facility at a specific time, and on the other hand, the 'emissions limitation' determined to be BACT and set forth in the permit, which the facility is required to continuously meet throughout the facility's life. Stated simply, if there is uncontrollable fluctuation or variability in the measured emission rate, then the lowest measured emission rate will necessarily be more stringent than the "emissions limitation" that is "achievable" for that pollution control method over the life of the facility. Accordingly, because the "emissions limitation" is applicable for the facility's life, it is wholly appropriate for the permit issuer to consider, as part of the BACT analysis, the extent to which the available data demonstrate whether the emissions rate at issue has been achieved by other facilities over a long term.* [38]

Thus, BACT must be set at the lowest feasible emission rate recognizing that the emission unit must be in compliance with that limit for the lifetime of the unit on a continuous basis. Thus, while viewing individual unit performance can be instructive in evaluating what BACT might be, any actual performance data must be viewed carefully, as rarely will the data be adequate to truly assess the performance that a unit will achieve during its entire operating life. While statistical variability of actual performance can be used to infer what is "achievable," such testing requires a detailed test plan akin to what teams in U.S. EPA use to develop MACT standards over a several year period, and is far beyond what is reasonable to expect of an individual source. In contrast to limited snapshots of actual performance data, emission limits from similar sources can reasonably be used to infer what is "achievable" for a given unit.[39]

To assist in meeting the BACT limit, the source must consider production processes or available methods, systems or techniques, as long as those considerations do not redefine the source. As previously stated, if an emissions measurement is infeasible, then design, equipment, work practice, operational standard, or combination thereof may be established.

5.1.4. Floor

> *Emissions [shall not] exceed …40 CFR Parts 60 and 61*

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[37] As quoted in Sierra Club v. EPA (97-1686).

[38] U.S. EPA Environmental Appeals Board decision, In re: Newmont Nevada Energy Investment L.L.C. PSD Appeal No. 05-04, decided December 21, 2005. Environmental Administrative Decisions, Volume 12, Page 442.

[39] Emission limits must be used with care in assessing what is "achievable." Limits established for facilities which were never built must be viewed with care, as they have never been demonstrated and that company never took a significant liability in having to meet that limit. Likewise, permitted units which have not yet commenced construction must also be viewed with special care for similar reasons.

The least stringent emission rate allowable for BACT is any applicable limit under either New Source Performance Standards (NSPS – Part 60) or National Emission Standards for Hazardous Air Pollutants (NESHAP – Parts 61 and 63). State SIP limitations must also be considered when determining the emissions floor.

5.2. BACT REQUIREMENT

The BACT requirement applies to each new or modified emission unit from which there are emissions increases of pollutants subject to PSD review. The proposed project is subject to PSD permitting for VOC, and thus, subject to BACT for this pollutant.[40] The proposed continuous kiln and fire pump engine is subject to BACT for VOC. The other equipment being installed are not subject to BACT as they are not sources of VOC emissions. There are no existing emission sources at the facility being physically modified as part of the project.

5.3. BACT ASSESSMENT METHODOLOGY

The following sections provide details on the assessment methodology utilized in preparing the BACT analyses for the proposed facility. As previously noted, the minimum control efficiency to be considered in a BACT assessment must result in an emission rate less than or equal to any applicable NSPS or NESHAP emission rate for the source. The kiln undergoing BACT is not subject to any NSPS or NESHAP emission limits for VOC. While a NESHAP exists that regulates HAP emissions from PCWP sources, lumber kilns are not subject to any numerical HAP limitations or work practice standards that could be considered BACT for VOC.[41] The emergency fire-water pump will be subject to a non-methane hydrocarbon (NMHC) emission limit of 4 g/kW-hr, pursuant to NSPS Subpart IIII.[42] As previously stated, compliance with the RICE MACT is demonstrated through compliance with NSPS Subpart IIII. No emission limits under the RICE MACT apply to the fire pump engine.

5.3.1. Identification of Potential Control Technologies

Potentially applicable emission control technologies were identified for the continuous lumber kiln and fire pump engine by researching the U.S. EPA control technology database, technical literature, control equipment vendor information, state permitting authority files, and by using process knowledge and engineering experience. The Reasonably Available Control Technology (RACT)/BACT/Lowest Achievable Emission Rate (LAER) Clearinghouse (RBLC), a database made available to the public through the U.S. EPA's Office of Air Quality Planning and Standards (OAQPS) Technology Transfer Network (TTN), lists technologies and corresponding emission limits that have been approved by regulatory agencies in permit actions. These technologies are grouped into categories by industry and can be referenced in determining what emissions levels were proposed for similar types of emission units.

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[40] As previously mentioned, this application uses the two terms "VOC" and "Total VOC" interchangeably. In all instances, the basis, for the purpose of this PSD application and BACT Analysis, is as terpenes (accounting for methanol and formaldehyde as appropriate).

[41] 40 CFR 63.2230 and 63.2252

[42] Table 4 to Subpart IIII of Part 60

Interfor performed searches of the RBLC database in March 2019 to identify the emission control technologies and emission limits that were imposed by permitting authorities as BACT within the past ten years for emission sources comparable to the proposed facility. The following categories were searched:

- Wood Lumber Kilns (RBLC Code 30.800)
- Small Internal Combustion Engines (< 500 HP) Fuel Oil (RBLC Code 17.210)[43]
- Miscellaneous Internal Combustion Engines (RBLC Code 19.800)

For the internal combustion engine categories, Interfor only considered engines that are used in some type of emergency service such as fire pump engines, emergency generator engines, etc. As noted previously, no other units are subject to BACT review. Therefore, no additional RBLC searches or other technical reviews were performed. A copy of the RBLC results are included in Appendix E.

5.3.2. Economic Feasibility Calculation Process

Economic analyses are performed to compare total costs (capital and annual) per ton of pollutant removed for various potential control technologies that have been deemed technically feasible. Capital costs include the initial cost of the components intrinsic to the complete control system. Annual operating costs include the financial requirements to operate the control system on an annual basis including overhead, maintenance, outages, raw materials, and utilities.

The capital cost estimating technique used is based on a factored method of determining direct and indirect installation costs. That is, installation costs are expressed as a function of known equipment costs. This method is consistent with the latest U.S. EPA OAQPS guidance manual on estimating control technology costs.[44]

Total Purchased Equipment Cost represents the delivered cost of the control equipment, auxiliary equipment, and instrumentation. Auxiliary equipment consists of all the structural, mechanical, and electrical components required for the efficient operation of the device. Auxiliary equipment costs are estimated as a straight percentage of the equipment cost. Direct installation costs consist of the direct expenditures for materials and labor for site preparation, foundations, structural steel, erection, piping, electrical, painting and facilities. Indirect installation costs include engineering and supervision of contractors, construction and field expenses, construction fees, and contingencies. Other indirect costs include equipment startup, performance testing, working capital, and interest during construction.

Annual costs are comprised of direct and indirect operating costs. Direct annual costs include labor, maintenance, replacement parts, raw materials, utilities, and waste disposal. Indirect operating costs include plant overhead, taxes, insurance, general administration, and capital charges. Replacement part costs were included where applicable, while raw material costs were estimated based upon the unit cost and annual consumption. With the exception of overhead, indirect operating costs were calculated as a percentage of the total capital costs. The indirect capital costs were based on the capital recovery factor (CRF) defined as:

$$CRF = \frac{i(1+i)^n}{(1+i)^n - 1}$$

where i is the annual interest rate and n is the equipment life in years. The equipment life is based on the normal life of the control equipment and varies on an equipment type basis. The same interest applies to all control

[43] Fuel oil includes ASTM #1 and #2, kerosene, aviation, and diesel fuel.

[44] U.S. EPA, *OAQPS Control Cost Manual*, 6th edition, EPA 452/B-02-001, July 2002. http://www.epa.gov/ttn/catc/dir1/c_allchs.pdf

equipment cost calculations. For this analysis, an interest rate of 7% was used based on information provided in the most recent OAQPS Control Cost Manual.[45]

Note that all economic calculations are based on February 2019 dollars. Detailed cost calculations for economic analyses provided within this BACT analysis are presented in Appendix D.

5.4. LUMBER DRYING KILN – VOC BACT

5.4.1. Identification of Potential Control Techniques (Step 1)

Candidate control options identified from the RBLC search and the literature review include those classified as pollution reduction techniques. VOC reduction options include:

- Adsorption
- Biofiltration
- Condensation
- Thermal Oxidation
- Wet Scrubbing
- Proper Maintenance and Operating Practices

These control technologies are briefly described in the following sections.

5.4.1.1. Adsorption

Regenerative adsorption systems are typically a batch operation involving two or more fixed adsorption beds. One or more of the beds operates in adsorption mode while the others operate in regeneration mode. Several adsorbent materials with substantial surface area per unit volume can be used in adsorbers including activated carbon, organic resin polymers, and inorganic materials such as zeolite. An induced draft fan is typically used to force the VOC-laden gas through the adsorption bed where the VOC molecules are physically bound to the pore space in the adsorbent by Van der Waals nuclear attraction forces. There are many types of carbon, polymer, and zeolite adsorbents available with different affinities for adsorbing various VOC. A key selection criterion for determining the appropriate adsorbent is the range of pore sizes relative to the largest molecular size of the VOC to be adsorbed.

The batch nature of the adsorption process concludes when the adsorbent bed becomes saturated with VOC and must be regenerated. The gas-solid interface within the bed at which adsorption is occurring is referred to as the mass transfer zone (MTZ), and the location of this MTZ within the bed determines its level of bed saturation and the time at which it must be regenerated. When the MTZ nears the end of the bed, the VOC concentration of the exhaust gas will increase producing a phenomenon referred to as "breakthrough."

After breakthrough has occurred in an adsorbent bed, it must be regenerated using a thermal swing or vacuum process. Thermal swing regeneration uses steam to raise the temperature of the loaded adsorbent bed to the boiling point of the VOC at which point the VOC is desorbed and is discharged from the bed with the steam. The VOC-laden steam is then routed to a condenser to produce a liquid water-VOC mixture. The VOC is then separated from the water using a decantation or distillation process and can be recycled back to the process from which it was generated or routed to an appropriate disposal site.

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[45] U.S. EPA, *OAQPS Control Cost Manual*, 6th edition, Section 2, Chapter 1, page 1-52. http://www.epa.gov/ttn/catc/dir1/c_allchs.pdf

Vacuum regeneration lowers the pressure of the adsorbent bed below the vapor pressure of the adsorbed VOC at the ambient temperature of the bed. At this reduced pressure, the VOC boils off of the adsorbent and can be collected in a condenser or routed to an oxidizer. Essentially, adsorbers capture VOC from relatively dilute concentration streams and release these VOC into a higher concentration stream that can be readily controlled using another VOC destruction or recovery technology. Once the regeneration cycle is complete, the fresh adsorbent bed is ready to begin capturing additional VOC in another adsorption cycle.[46]

The typical VOC inlet concentration required for effective adsorption falls in the range of 400 to 2,000 ppmv, and adsorbers and their associated follow-up control devices (i.e., condenser or decanter) are typically capable of achieving VOC control efficiencies greater than 95%.[47]

5.4.1.2. Biofiltration

In biofiltration, off-gases containing biodegradable organic compounds are vented, under controlled temperature and humidity, through a biologically active material. The process uses a biofilm containing a population of microorganisms immobilized on a porous substrate such as peat, soil, sand, wood, compost, or numerous synthetic media. As an air stream passes through the biofilter, the contaminants in the air stream partition from the gaseous phase to the liquid phase of the biofilm. Once contaminants pass into the liquid phase, they become available for the complex oxidative process by the microorganisms inhabiting the biofilm.

5.4.1.3. Condensation

Condensers operate by lowering the temperature of the exhaust gas streams containing condensable VOC to a temperature at which the target VOC's vapor pressure is lower than its entering partial pressure. This condition is commonly referred to as the saturation point. Before the VOC can condense, any sensible heat present in the exhaust gas above the saturation point must be removed. Cooling the exhaust stream to a temperature below the saturation point removes the latent heat from the exhaust and allows the VOC to condense on the surface of the condenser tubes for collection and recycle to the process or disposal to an appropriate location. The tubes located within the condenser contain re-circulating cooling liquid that provides a heat sink for rejecting both sensible and latent heat from the hot exhaust gas stream. Available cooling fluids (depending on the necessary outlet temperature of the exhaust stream to achieve high levels of recovery for the condensable VOC) include chilled water, brine, or refrigerants. Once the cooling liquid is passed through the condenser, it is chilled to the required condenser inlet temperature and recycled back to the cooling liquid inlet of the condenser.[48]

The VOC efficiency achieved by a condenser, as a sole add-on control device, is a function of: 1) the heat capacity and temperature of the inlet exhaust stream, 2) the heat transfer characteristics of the condenser (including the heat transfer area and the heat transfer coefficient), and 3) the outlet temperature of the exhaust gas exiting the condenser. Condensers are most effective in single component systems involving emission streams with a high percentage of a condensable VOC, because less heat must be removed from the exhaust gas to reduce the sensible heat of non-condensable gases and the required condenser temperature to achieve high levels of recovery. Unlike other VOC control devices for which quantifying control efficiency can require emissions testing, only the outlet exhaust gas temperature is required to estimate the VOC control efficiency of a condenser if the temperature, VOC concentration, and flow rate of the non-condensables in the inlet exhaust stream are all known. Since the control efficiency of a condenser is dynamic based on the outlet temperature and inlet

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[46] U.S. EPA, Clean Air Technology Center, Technical Bulletin Choosing an Adsorption System for VOC: Carbon, Zeolite, or Polymer?, EPA 456/F-99-004, May 1999.

[47] *Ibid.*

[48] U.S. EPA, Office of Air Quality Planning and Standards, Control of Volatile Organic compound Emissions from Batch Processes – Alternative Control Technique Information Document, EPA-450/R-94-020, February 1994.

concentration of VOC in the exhaust stream, condensers exhibit a wide range of VOC control efficiency from as low as 50% to as high as 99%.[49,50]

5.4.1.4. Thermal Oxidation

A thermal oxidizer supplies sufficient combustion air and supplemental fuel at a suitable temperature to allow for oxidation of VOC and other combustible compounds present in the exhaust stream within the combustion chamber. Oxidizers are categorized by either a thermal or catalytic design and can be further subdivided into units with and without exhaust gas heat recovery. Straight thermal oxidizers without heat recovery are reserved for applications where the heating value of the exhaust streams routed to the oxidizer is high enough that large amounts of supplemental fuel combustion or high levels of heat recovery are not necessary to bring the exhaust gases to oxidation reaction temperatures. In order to provide VOC control in a practical and efficient manner, straight thermal oxidizers require a VOC inlet concentration of greater than 1,500 ppmv, because at this concentration, the heat of combustion produced from oxidizing VOC present in the exhaust gas is sufficient to sustain adequate operating temperatures without the addition of large quantities of expensive auxiliary fuel.[51]

Oxidizers with heat recovery are either considered recuperative or regenerative depending on the design of the incoming process gas to exhaust gas heat exchange system. Recuperative oxidizers (labeled herein as a TO) use plate-to-plate or shell-and-tube gas heat exchangers to recover up to 70% of the sensible heat present in the hot exhaust to transfer it to the incoming process gas. U.S. EPA expects that a TO can achieve a destruction/removal efficiency (DRE) of greater than 98% depending on the system requirements of the air contaminant stream.[52]

A regenerative thermal oxidizer (RTO) uses a high-density packed heat transfer media, typically ceramic random saddle packing or honeycomb monolith structures, to preheat incoming waste gas streams and to achieve 85 to 95% heat recovery. The RTO consists of at least two modules that are cycled between inlet and outlet service to maintain appropriate operating temperatures and to conserve as much thermal energy as possible. The high level of heat integration offered by RTOs is particularly suited for high flow rate and low VOC concentration waste gas streams that do not vary in composition or flow rate over time. When necessary, the feed gas stream in an RTO can also be further heated to the oxidizer's operating temperatures (1,400 to 2,000 °F) through supplemental fuel combustion. RTOs have been used effectively in applications where the inlet VOC concentration is as low as 100 ppmv, and, therefore, they are the preferred oxidizer design for low VOC concentration exhaust streams.[53] U.S. EPA expects that an RTO can achieve a destruction/removal efficiency of greater than 95% depending on the system's requirements and the characteristics of the contaminated stream.[54]

Thermal oxidation systems designed to pass the gas stream over a catalyst bed (usually a noble metal such as palladium or platinum), where combustible compounds can be oxidized at a faster rate and at a lower temperature than is possible with a TO or RTO, are called catalytic oxidation systems (CatOx). The process requires temperatures of 600 to 1,000°F to achieve high destruction efficiencies for VOC.[55] Below this range, the reaction rate drops sharply and effective oxidation of VOC is no longer feasible.

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[49] Ibid.

[50] U.S. EPA, Clean Air Technology Center, Technical Bulletin Refrigerated Condensers for Control of Organic Air Emissions, EPA 456/R-01-004, December 2001.

[51] U.S. EPA, Air Pollution Control Technology Fact Sheet – Recuperative Incinerator. EPA-452/F-03-020.

[52] *Ibid.*

[53] U.S. EPA, Air Pollution Control Technology Fact Sheet – Regenerative Incinerator. EPA-452/F-03-021.

[54] *Ibid.*

[55] U.S. EPA, Air Pollution Control Technology Fact Sheet – Catalytic Incinerator. EPA-452/F-03-018.

5.4.1.5. Wet Scrubbing

Wet scrubbing of gas or vapor pollutants in a gas stream, like the exhaust that will exit the continuous kiln, is a potential method for reducing VOC emissions. Wet scrubbing is typically conducted using a packed column where pollutants are absorbed by a counter-current flow of scrubbing liquid. Wet scrubbing also requires that the VOCs that are in the exhaust gas stream are highly soluble in water.

5.4.1.6. Proper Maintenance and Operating Practices

VOC emissions can be reduced through proper maintenance and operating practices of the proposed lumber drying kiln. The manufacturer's recommendations should be used when determining the appropriate operating specifications and developing a schedule for routine maintenance of the kiln.

5.4.2. Elimination of Technically Infeasible Control Options (Step 2)

After the identification of control options, the second step in the BACT assessment is to eliminate any technically infeasible options. A control option is eliminated from consideration if there are process-specific conditions that would prohibit the implementation of the control or if the highest control efficiency of the option would result in an emission level that is higher than any applicable regulatory limits. The following sections evaluate the feasibility of the above mentioned control technologies for reducing VOC emissions from the proposed continuous kiln. Note that, based on a review of both batch and continuous lumber drying kilns in the U.S. EPA's RBLC database, a control device has never been applied to a lumber drying kiln.

5.4.2.1. Adsorption

The kiln exhaust contains the water vapor that has evaporated from the lumber as it is dried and will have a relative humidity over 100%. At high moisture contents, the water molecules and hydrocarbons in the exhaust stream will compete with each other for active adsorption site, reducing the efficiency of the of the adsorption system. This control device is, therefore, deemed technically infeasible.

5.4.2.2. Biofiltration

The microorganisms used in biofiltration cannot survive at temperatures exceeding 105 °F; however, the temperature of the exhaust stream from the kiln will be approximately 129 °F. Furthermore, the primary constituent of the VOC in the exhaust stream is terpenes, which are highly viscous and would cause the biofilter to easily foul. Because of the nature of the long-chained hydrocarbons in the exhaust stream, a biofilter with a reasonable footprint/retention time, will have a reduced control efficiency relative to a unit treating streams with large concentrations of methanol or formaldehyde. The microorganisms require a much longer retention time/size of a unit in order to provide an increased efficiency. For example, engineering firms have previously noted that to increase the control efficiency an additional 5% at these removal levels would essentially require a biofilter twice as large. This control device is, therefore, deemed technically infeasible.

5.4.2.3. Condensation

Condensation requires that the exhaust stream be cooled to a low enough temperature for the vapor pressure to be lower than the VOC concentration. The primary constituent of the VOC in the exhaust stream from the lumber kiln is terpenes, which would require the temperature of the exhaust stream to be lowered to well below 0 °F in order to have a low enough vapor pressure to use condensation. Temperatures this low would cause the water vapor in the stream to freeze, and the ice would clog the unit. As such, condensation is not a technically feasible control technology.

5.4.2.4. Thermal Oxidation

The high moisture content and low exit temperature of the exhaust stream would likely make an RTO technically infeasible. While regenerative catalytic oxidizers can operate at lower temperatures than the RTO, the exit temperature of the exhaust stream from the kiln is still too low for this option to be feasible. Furthermore, the particulate matter and other contaminants in the exhaust stream would cause a loss of catalytic activity. Also, the low temperature of the exhaust stream precludes the system from using a CatOx system for VOC control.

Based on the reasons stated above and the fact that were no lumber drying kiln, batch or continuous, in the RBLC database or the air permit file review that utilized thermal oxidation, Interfor may eliminate thermal oxidation from consideration based on technical infeasibility. However, Interfor is, for conservatism, further considering an RTO in the future steps for the BACT determination to determine what the economic and environmental impact from the use of an RTO would be in the situation that it is technically feasible with this type of unit (a point which Interfor does not concede).

5.4.2.5. Wet Scrubbing

While some VOCs that will be present in the exhaust stream are highly soluble in water, other VOCs, most notably α-pinene, are only very slightly soluble in water due to the lower Henry's Law constant as described in Perry's Chemical Engineer's Handbook. Lower Henry's Law constant VOCs would require much longer residence time within a scrubber packed column and would eliminate this as a technically viable solution for the constant stream that would need to be handled by a continuous kiln.

5.4.2.6. Proper Maintenance and Operating Practices

Proper maintenance and operating practices of the kiln is a technically feasible option for potentially minimizing the VOC emissions from the kiln and will be considered further in the future steps for BACT determination. Please note that it is not possible to document a percent reduction due to implementation of proper maintenance and operating practices, and that the VOC emissions from a lumber kiln employing proper maintenance and operating practices versus a kiln not employing proper maintenance and operating practices would not be quantifiable.

5.4.3. Rank of Remaining Control Technologies (Step 3)

The third of the five steps in the top-down BACT assessment procedure is to rank technically feasible control technologies by control effectiveness. The remaining control technologies are presented in Table 5-1. As discussed in Step 2, Interfor does not concede that the use of an RTO on a lumber drying kiln is technically feasible; however, this control option is being evaluated in this and the future steps of the BACT determination for conservatism.

Table 5-1. Remaining VOC Control Technologies

Rank	Control Technology	Potential Control Efficiency (%)
1	RTO	98%
2	Proper Maintenance and Operating Practices	Base Case

5.4.4. Evaluation of Most Stringent Controls (Step 4)

The fourth of the five steps in the top-down BACT assessment procedure is to evaluate the most effective control and document the results. This has been performed for the remaining control technologies on the basis of economic, energy, and environmental considerations, and is described herein.

5.4.4.1. Regenerative Thermal Oxidation

Even if the use of an RTO was technically feasible on a lumber drying kiln, the cost of using an RTO exceeds the benefit of the VOC reduction it offers. The current cost of controlling VOC with an RTO is estimated at approximately $12,856 per ton of VOC removed. This high cost for VOC control is largely due to the high moisture content of the kiln exhaust stream and low exhaust temperature, as heating water vapor in the exhaust stream to RTO operating temperatures significantly increases the natural gas heating requirement. There would also be associated energy and environmental impacts resultant from use of the natural gas, including additional pollutant emissions such as NO_X from natural gas from combustion.

5.4.4.2. Proper Maintenance and Operating Practices

The only remaining technology is proper maintenance and operating practices of the kiln. This control option is considered BACT for VOC for the continuous kiln.

5.4.5. Selection of BACT (Step 5)

Based on steps 1 through 4 of the BACT analysis, Interfor has determined that proper maintenance and good operating practices are the only controls technically and economically feasible for the proposed continuous lumber drying kiln. All other potential control technologies were eliminated in earlier steps of the process. In order to comply with BACT, Interfor will develop an operating and maintenance plan for the new continuous kiln.

Appendix E contains the RBLC search results with listed emission factors in lb VOC per MBF. Of the factors listed, there is limited data and references available on how the VOC factor was derived and the appropriate basis of the factor. Additionally, many of the emission factors listed are for batch kilns, as continuous kilns are still an emerging technology.

5.5. EMERGENCY FIRE-WATER PUMP - VOC BACT

VOC from the emergency fire-water pump is generated as a result of diesel combustion. Carbon in the fuel that is not oxidized completely and results in VOC formation.

5.5.1. Identification of Potential Control Techniques (Step 1)

VOC reduction options include:

- Regenerative Thermal Oxidizer (RTO)
- Oxidation Catalyst
- Good combustion techniques

These control technologies are briefly described in the following sections.

5.5.1.1. Regenerative Thermal Oxidizer (RTO)

An RTO is typically used for volatile organic compound (VOC) control by oxidizing the VOC to CO_2. Similarly, an RTO can also be used to oxidize CO to CO_2 with a destruction efficiency of around 98%.[56] The RTO system uses a bed of ceramic material to absorb and retain heat from the combustion exhaust gas and uses this heat to preheat the incoming flue gas stream.

5.5.1.2. Oxidation Catalyst

VOC emissions resulting from fuel combustion can be decreased via an oxidation catalyst control system. The reaction is promoted by several noble metal-enriched catalysts at high temperatures. Under optimum operating temperatures, this technology can generally achieve approximately 95% reduction efficiency for VOC emissions.[57]

Oxidation efficiency also depends on exhaust flow rate and composition. Residence time required for oxidation to take place at the active sites of the catalyst may not be achieved if exhaust flow rates exceed design specifications. Also, sulfur and other compounds may foul the catalyst, leading to decreased efficiency.

Catalyst fouling occurs slowly under normal operating conditions and is accelerated by even moderate sulfur concentrations in the exhaust gas. The catalyst may be chemically washed to restore its effectiveness, but eventually irreversible degradation occurs. The catalyst replacement timeframe varies depending on type and operating conditions.

5.5.1.3. Good combustion techniques through proper maintenance and operating practices

Ensuring that the temperature, oxygen availability, and residence time are adequate for complete combustion minimizes organic formation. This can be achieved by ensuring the engine is installed, operated, and maintained in accordance with manufacturer's instructions.

5.5.2. Elimination of Technically Infeasible Control Options (Step 2)

After the identification of control options, the second step in the BACT assessment is to eliminate technically infeasible options. A control option is eliminated from consideration if there are process-specific conditions that would prohibit the implementation of the control or if the highest control efficiency of the option would result in an emission level that is higher than any applicable regulatory limits.

Although thermal or catalytic oxidation are technically feasible, these technologies may not provide consistent VOC control efficiencies and may be difficult to operate when used to reduce VOC emissions from sources that operate for short periods of time and that experience frequent starts/stops. Since it can take time for the exhaust

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[56] Based upon the OAQPS Manual, Section 3.2, Chapter 2, page 2-7.

[57] Based upon EPA's Air Pollution Control Technology Fact Sheet: http://www.epa.gov/ttn/catc/dir1/fcataly.pdf

stream to reach the required operating temperature range for efficient oxidation, the VOC control efficiency of thermal or catalytic oxidation for an engine is lower than for a unit that runs at steady-state. Except for emergencies, the engine will normally only be operated for readiness testing.

5.5.3. Rank of Remaining Control Technologies (Step 3)

The third of the five steps in the top-down BACT assessment procedure is to rank technically feasible control technologies by control effectiveness. The remaining control technologies are presented in Table 5-2.

Table 5-2. Remaining VOC Control Technologies

Rank	Control Technology	Potential Control Efficiency (%)
1	Good Combustion Techniques (Proper Maintenance and Operating Practices)	Base Case

5.5.4. Evaluation of Most Stringent Controls (Step 4)

The fourth of the five steps in the top-down BACT assessment procedure is to evaluate the most effective control and document the results.

As previously stated, EPA determined in the development of NSPS Subpart IIII that add-on controls are economically infeasible for emergency ICE. Based on EPA's economic analysis, Interfor has determined that the top and only remaining available and technically feasible VOC control option is good combustion practices through proper maintenance and operating practices.

5.5.5. Selection of BACT (Step 5)

In order to comply with BACT, Interfor will:

- Operate and maintain the engine according to manufacturer's emission-related written instructions;
- Change only those emission-related settings that are permitted by the manufacturer;
- Purchasing an engine certified to emission standards under NSPS Subpart IIII; and
- Installing and configuring the engine according to manufacturer's emission-related specifications.

Operation of the engine for the purposes of maintenance checks and readiness testing will be limited to 100 hours per year. Interfor has not identified any fire pump engines that have required add-on controls. As previously stated, Interfor has determined that the only technically feasible VOC control option is good combustion practices through proper maintenance and operating practices.

6. CLASS I AREA ANALYSIS

Sections 160-169 of the CAA, as amended by the CAA Amendments of 1990, establish a detailed policy and regulatory program to protect the quality of the air in regions of the United States in which the air is cleaner than required by the NAAQS to protect public health and welfare. One of the purposes of the PSD program is "to preserve, protect, and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic, or historic value."

Under the PSD provisions, Congress established a land classification scheme for those areas of the country with the quality better than the NAAQS. Class I allows very little deterioration of air quality and includes:

1. international parks;
2. national wilderness areas which exceed 5,000 acres in size;
3. national memorial parks which exceed 5,000 acres in size; and
4. national parks which exceed six thousand acres in size.

All other areas are designated as *Class II* areas and do not require emissions increments. The Interfor Thomaston Mill lies within a 300 kilometer radius and outside of a 50 kilometer radius of multiple different Class I areas in the southeastern United States.[58] Therefore, Interfor has performed a Q/D analysis to demonstrate that no visibility impacts will occur at this Class I area. The list of Class I areas that are located within 300 km of the Thomaston Mill are shown in Table 6-1.

Table 6-1. Class I Areas within 300 km of Interfor Thomaston Mill

Class I Area	Responsible FLM
Cohutta Wilderness	Forest Service
Joyce Kilmer-Slickrock Wilderness	Forest Service
Okefenokee Wilderness	Fish and Wildlife Service
Great Smokey Mountains National Park	National Park Service
Shining Rock Wilderness	Forest Service

In a Q/D analysis, the combined annual emissions increase in tons per year (Q) of SO_2, NO_X, Total PM_{10}, and H_2SO_4 is divided by the distance, in kilometers, from the facility to the Class I area (D).[59] If Q/D is less than 10, then no Air Quality Related Values (AQRV) analysis is required. As shown in Table 6-2, the combined annual emissions increase of the aforementioned pollutants is 36.73 tons per year as a result of the proposed project.

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[58] Pursuant to Appendix H to EPD's *PSD Permit Application Guidance Document* (February 2017), facilities should include the net project emissions increase of each visibility impacting pollutant and the distance (km) for each Class I area within 300 km of the facility. More stringent requirements apply to facilities within 50 km of a Class I area.

[59] As part of the PSD analysis, the Thomaston Mill must evaluate possible visibility impacts of Class I areas; however, VOC (the pollutant with the net emissions increase exceeding the SER), is not a listed pollutant with known impacts to the AQRVs of Class I areas.

Table 6-2. Combined Annual Emissions Increase

Pollutant	Facility-Wide Maximum 24-hr Emissions Increase (lb/hr)	FLAG 2010 Approach Annual Emissions[2] (tpy)
NO_X	4.01	17.56
Direct Particulate[1]	3.38	14.79
SO_2	1.00	4.38
Sum of Emissions (tpy)		36.73

1. Direct particulate includes all filterable and condensable PM10.
2. FLAG 2010 Approach: Q = Maximum 24 hour basis * 8,760 /2000.

Table 6-3 below, provides the Q/D analysis for all sites located within 300 km. All Q/D values shown are less than 10.

Table 6-3. Q/D Analysis

Class I Area	Responsible FLM	Minimum Distance from Site (km)	Sum of Annualized VAP Emissions - Q (tpy)	Flag 2010 Approach Q/D
Cohutta Wilderness	FS	214	36.73	0.17
Joyce Kilmer-Slickrock Wilderness	FS	270		0.14
Okefenokee Wilderness	FWS	278		0.13
Great Smoky Mountains National Park	NPS	282		0.13
Shining Rock Wilderness	FS	296		0.12

The project is only triggering PSD for VOC which is not considered a visibility impairing pollutant. Therefore, that fact combined with the low Q/D impacts indicates that Class I areas will not be adversely impacted by this project. As required by the most recent EPD PSD guidance, Interfor is providing letters to the Federal Land Manager (FLM) responsible for each Class I area listed above concurrent with this application.

7. ADDITIONAL IMPACT ANALYSIS

7.1. AIR QUALITY ANALYSIS

An ambient air impacts analysis will not be performed for the project because VOC are not modeled for NAAQS or PSD Increment compliance purposes. Additionally, because the project is exclusively related to VOC, a Class II visibility analysis is also not required.

7.2. MOBILE SOURCES

As shown in detail in Appendix B, Interfor projects that truck traffic on unpaved roads will increase by approximately 8,654 vehicle miles traveled (VMT) per year. The increase in Total PM/PM_{10}/$PM_{2.5}$ emissions has been accounted for in the application and supporting calculations.

7.3. GROWTH IMPACTS

A growth analysis is intended to quantify the amount of new growth that is likely to occur in support of the facility and to estimate emissions resulting from that associated growth. Associated growth includes residential and commercial/industrial growth resulting from the new facility. Residential growth depends on the number of new employees and the availability of housing in the area, while associated commercial and industrial growth consists of new sources providing services to the new employees and the facility. Interfor anticipates that few additional personnel will be employed to aid the operation of the mill. Therefore, additional growth from this project is expected to be minimal.

7.4. SOILS AND VEGETATION

The following discussion will review the project's potential to impact its agricultural surroundings based on the facility's allowable emission rates and resulting ground level concentrations of VOC.

The effects of gaseous air pollutants on vegetation may be classified into three rather broad categories: acute, chronic, and long-term. Acute effects are those that result from relatively short (less than 1 month) exposures to high concentrations of pollutants. Chronic effects occur when organisms are exposed for months or even years to certain threshold levels of pollutants. Long-term effects include abnormal changes in ecosystems and subtle physiological alterations in organisms. Acute and chronic effects are caused by the gaseous pollutant acting directly on the organism, whereas long-term effects may be indirectly caused by secondary agents such as changes in soil pH.

VOC are regulated by the U.S. EPA as precursors to tropospheric ozone. Elevated ground-level ozone concentrations can damage plant life and reduce crop production. VOC interfere with the ability of plants to produce and store food, making them more susceptible to disease, insects, other pollutants, and harsh weather. Ozone is formed by the interaction of NO_X, VOC, and sunlight in the atmosphere. The Thomaston Mill is located in Upson County, which is designated as attainment or unclassifiable for NO_2 and ozone. Also, the Thomaston Mill emits higher quantities of VOC than NO_X, and therefore, ozone formation is primarily dependent upon NO_X emissions and proper atmospheric conditions. Since NO_X emissions are only increasing slightly as a result of this project, a minimal increase in ozone production is expected. Thus Interfor does not predict there will be any significant negative impact on soil or vegetation as a result of this project.

7.5. VISIBILITY IMPAIRMENT

The project is not expected to produce any perceptible visibility impacts in the immediate vicinity of the plant. Given the limitations of 20% and 40% opacity of emissions, no immediate visibility impairment is anticipated. As this project is not evaluating PSD for any criteria pollutants associated with visibility impacts, no Class II visibility evaluation is required.

7.6. OZONE IMPACT ANALYSIS

This section includes an analysis of ozone impacts from the proposed project.

There are no existing ozone monitors in Upson County, where the Thomaston Mill is located. The closest ozone monitor can be found in Pike County. The 3-year rolling average ozone concentration, which is used when comparing monitor results to determine attainment status, is shown in Table 7-1. Please note that the most recent data available (up to 2017) is included.

Table 7-1. Ozone Concentration at Pike County Monitor

Site Name	City	County	Distance to Facility (km)	3-Year Rolling Average (ppm)[1] 2013-2015	2014-2016	2015-2017
CASTNET	Williamson	Pike	30	0.066	0.068	0.067

1. Ozone concentration for each year 2013 through 2017 were obtained from Georgia EPD's Ambient Air Surveillance Report, Appendix A, Ozone 8-Hour Average 4th Max value for each respective year. The 3-year rolling average reports the average of the 3 years indicated.

Ozone is formed when NO_X and VOC react in the presence of sunlight. In Georgia, this reaction is NO_X limited due to the presence of high amounts of biogenic VOC. NO_X primarily is emitted from mobile sources and industrial sources. Therefore, ozone formation is directly impacted by NO_X emissions, which is a reflection of population density, vehicle miles travelled (VMT), and industrial NO_X emissions.

An assessment of the monitor data with and without the project was conducted. As the project is not expected to alter population density or vehicle miles travelled by a significant amount, the only change as a result of the project would be industrial NO_X emissions in the county. Expected changes in population density, VMT, and NO_X density for Upson County as a result of the project are presented in Table 7-2. In order to indicate this graphically, this data is also shown in Figure 7-1.

Table 7-2. Urbanization Data for Upson County

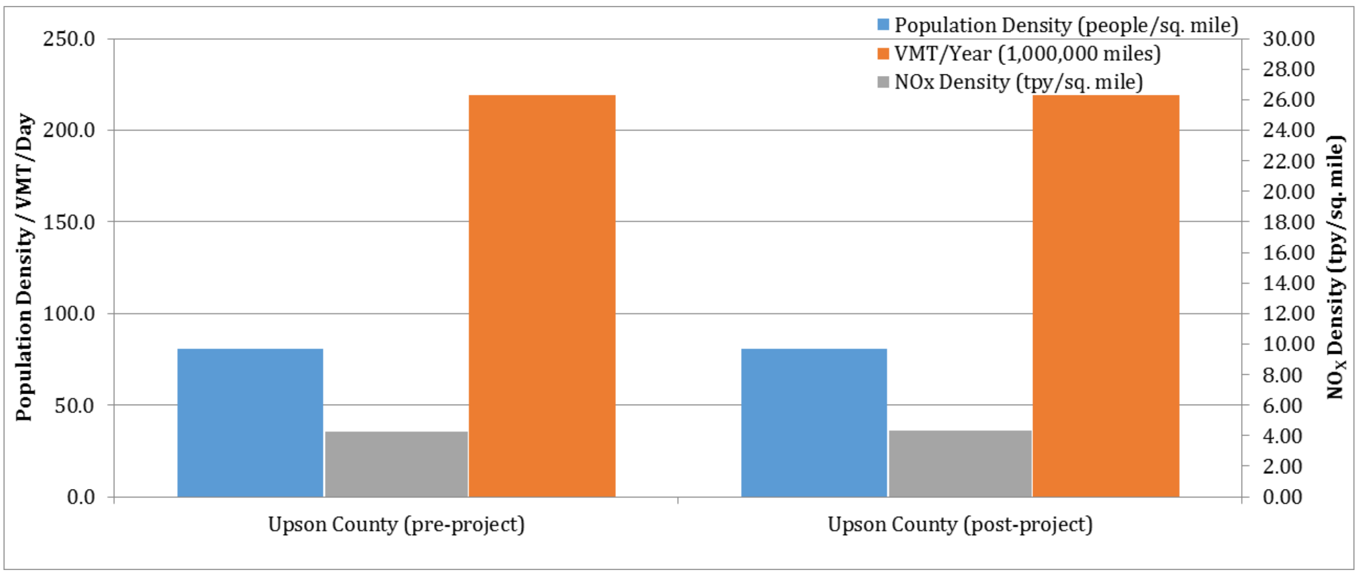
Scenario	Population Density[1] (people/sq. mile)	VMT/year[2] (10^6 miles)	NO_X Emissions[2] (tpy)	NO_X Density[2,3] (tpy/sq. mile)
Upson County (pre-project)	80.8	219	1,399	4.27
Upson County (post-project)	80.8	219	1,417	4.32

1. Population density for Upson County obtained from: https://www.census.gov/quickfacts/fact/table/upsoncountygeorgia,ga/PST045218

2. *Georgia's Nonattainment Area Designation Recommendations for the 2015 Ozone NAAQS - Technical Analysis Document*

3. Post-project NO_X emissions and NO_X density include net emissions increase from project.

Figure 7-1. Urbanization Data for Upson County



Per the revised and updated 40 CFR Part 51, Appendix W, precursor emission impacts to ozone and $PM_{2.5}$ (secondary $PM_{2.5}$) should be considered as part of a PSD permitting analysis. The ozone precursors are the pollutants VOC and NO_X. Interfor reviewed U.S. EPA's December 2, 2016 memorandum, February 23, 2017 errata memorandum, and April 30, 2019 errata memorandum titled "Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier l Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program". This guidance details a Tier I approach (under Appendix W) to estimate single source impacts on secondary formation of ozone and $PM_{2.5}$. The MERPs can be used to describe the emission rate of a precursor pollutant that is expected to result in a significant change in ambient concentration of the secondary pollutant. In other words, MERPS can be used to determine whether a project emissions increase will result in total impacts above the significant impact levels (SILs).

As part of consideration of modeling analyses, per the revised and updated 40 CFR Part 51, Appendix W, precursor emission impacts to ozone and $PM_{2.5}$ (secondary $PM_{2.5}$) should be considered. The ozone precursors are the pollutants VOC and NO_X, whereas the precursor emissions of interest for secondary $PM_{2.5}$ are NO_X and

SO_2. The default MERP values from Table 2 of the February 25, 2019 *Guidance on the Use of EPA's MERPs to Account for Secondary Formation of Ozone and $PM_{2.5}$ in Georgia* are shown in Table 7-3.

Table 7-3. Default MERPs Values for Georgia PSD Applications

Precursor	Emission Rate (tpy)
NO_X	156
VOC	3,980

7.6.1. Ozone MERPs Assessment

Utilizing the proposed project emission increases and the MERPs values, Table 7-4 demonstrates that there should be no concerns regarding adverse ozone ambient impacts from this proposed project. The calculations were performed consistent with the referenced guidance document.

Table 7-4. Comparison of Project Emissions Increases to MERPs

Precursor	Project Emissions Increase (tpy)	MERP (tpy)	Percent of MERPs[1] (%)	Overall Comparison to MERPs (%)
NO_X	17.56	156	11.3%	17.3%
VOC	240.8	3,980	6.0%	

1. Percent of MERPs (%) = Project Emissions Increase (tpy) / MERPs (tpy)
2. Overall comparison to MERPs is calculated by summing the percent of MERPs for the individual precursor pollutants.

Since there is no direct component of ozone which can be modeled, as its formation is dependent on the precursor emissions of VOC and NO_X, then the results of the Tier 1 analysis for ozone (17.3%) can be compared directly to the threshold level of concern of 100%. In other words, so long as the analysis above does not show results greater than 100%, there can be a presumption of no adverse impact associated with ozone. Therefore, there should be no adverse impact associated with precursor emissions for ozone as part of this project.

7.6.2. $PM_{2.5}$ MERPs Assessment

For $PM_{2.5}$, since the project does not exceed the PSD SERs for direct $PM_{2.5}$, or SO_2 or NO_X, an evaluation of $PM_{2.5}$ associated impacts is not required. Any numeric evaluation of project emissions increase for these pollutants would undoubtedly be less than the associated MERPs since they are less than the PSD SERs. Therefore, there is no presumed concern or adverse impact associated with secondary $PM_{2.5}$ on an annual basis.

8. TOXIC AIR POLLUTANT EMISSIONS IMPACT ASSESSMENT

EPD regulates the emissions of toxic air pollutants (TAPs) through a program approved under the provisions of GRAQC Rule 391-3-1-.02(2)(a)3(ii). A TAP is defined as any substance that may have an adverse effect on public health, excluding any specific substance that is covered by a State or Federal ambient air quality standard. Procedures governing the EPD's review of toxic air pollutant emissions as part of air permit reviews are contained in EPD's *Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions* (the *Guideline*).[60]

The *Guideline* has established the Allowable Ambient Concentration (AAC) and Minimum Emission Rate (MER) for each TAP, which are included in Appendix A of the *Guideline*. There are several TAPs emitted from the facility. Per discussion with EPD[61], only acetaldehyde, formaldehyde and methanol were modeled as part of this application as they are the pollutants of concern for these types of processes. As the emergency diesel-fired fire pump is an intermittent emission unit with limited operation (emergency situations, and maintenance/readiness testing), this unit was excluded from the toxics evaluation.

8.1. MODELING ASSESSMENT

Due to the number of stacks and variable stack parameters, refined modeling techniques were selected for this compliance assessment and SCREEN3 was not utilized for this modeling assessment. The following section describes the modeling protocol and source parameters used in the refined dispersion modeling assessment for the facility. This assessment was performed in accordance with the *Guideline*.

Section 6 of the *Guideline* requires the use of the Industrial Source Complex (ISCST3) dispersion model or the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) to determine the maximum ground level concentration (MGLC) for a TAP under the refined modeling procedures. ISCST3 was selected for this assessment. ISCST3 is a computer solution to the Gaussian plume dispersion model and is used to determine pollutant concentrations at the plume centerline and at the ground level downwind of the release points. Refined modeling was conducted in accordance with the ISCST3 User's Guides.

8.1.1. Source Parameters

TAP emissions were modeled as point sources for this refined assessment. For point sources, ISCST3 requires the stack height (m), inside stack exit diameter (m), temperature (K), and volumetric exhaust gas flow rate (acfm) or exit gas velocity (m/s) to be specified. Table 8-1 provides a summary of the location, base elevation, and stack parameters used in the dispersion model for the point sources. Table 8-2 provides a summary of the emission rates for the point sources evaluated in this assessment. A brief discussion of the design capacity and description of the release points for each source is discussed in the following sections.

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[60] *Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions*. Georgia Department of Natural Resources, Environmental Protection Division, Air Protection Branch, Revised, May 2017.

[61] Inputs from Mr. Manny Patel on August 23, 2018. Based on input from Manny Patel, only these pollutants were modeled, and no evaluation in comparison to the MERs was conducted.

Table 8-1. Point Source Parameters

Emission Unit ID	Emission Unit Description	Stack ID	Capped or Unobstructed?	Orientation[1]	Easting Zone 16S (m)	Northing Zone 16S (m)	Elevation (m)	Stack Height[2] (m)	Stack Height[2] (ft)	Stack Diameter[3] (m)	Stack Diameter[3] (ft)	Exit Gas Temperature[4] (F)	Exit Gas Temperature[4] (K)	Exhaust Flowrate[4] (acfm)	Exhaust Velocity[5] (m/s)	Exhaust Velocity (ft/sec)
OSK1	Kiln 1	OS10	Unobstructed	Vertical	753,969	3,646,710	230.99	7.620	25	0.717	2.35	123	324	17,570	20.5	67.3
		OS11	Unobstructed	Vertical	753,937	3,646,703	231.6	7.620	25	0.717	2.35	123	324	17,570	20.5	67.3
		DV1	Unobstructed	Horizontal	753,984	3,646,716	230.28	2.553	8.38	4.22	13.85	123	324	-	0.001	0.0033
		DV2	Unobstructed	Horizontal	753,921	3,646,698	231.31	2.553	8.38	4.22	13.85	123	324	-	0.001	0.0033
OSK3	Kiln 3	OS12	Unobstructed	Vertical	753,981	3,646,688	230.17	7.620	25	0.717	2.35	129	327	17,322	20.2	66.3
		OS13	Unobstructed	Vertical	753,950	3,646,681	231.54	7.620	25	0.717	2.35	129	327	17,322	20.2	66.3
		DV3	Unobstructed	Horizontal	753,999	3,646,694	229.31	2.553	8.38	4.22	13.85	129	327	-	0.001	0.0033
		DV4	Unobstructed	Horizontal	753,934	3,646,676	231.33	2.553	8.38	4.22	13.85	129	327	-	0.001	0.0033
OSK4	Kiln 4	OS14	Unobstructed	Vertical	753,861	3,646,607	227.53	9.754	32	1.067	3.50	129	327	20,000	10.6	34.6
		OS15	Unobstructed	Vertical	753,824	3,646,596	227.35	9.754	32	1.067	3.50	129	327	20,000	10.6	34.6
		DV5	Unobstructed	Horizontal	753,876	3,646,610	227.69	2.438	8	4.77	15.64	129	327	-	0.001	0.0033
		DV6	Unobstructed	Horizontal	753,811	3,646,592	227.24	2.438	8	4.77	15.64	129	327	-	0.001	0.0033
OB01	Boiler 1	OS08	Unobstructed	Vertical	753,894	3,646,703	230.18	16.764	55	0.701	2.3	515	542	16,565	20.3	66.4
OB02	Boiler 2	OS09	Unobstructed	Vertical	753,868	3,646,686	229.61	12.192	40	0.762	2.5	312	429	16,757	17.3	56.9

1. Pursuant to Section 4.1.D of the *Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions (the Guideline),* revised May 2017, the doors of the kiln may be modeled as a point source with a horizontal discharge.

2. Pursuant to Section 4.1.D of *the Guideline* , the doors of the kiln may be modeled as a point source with release height set to the midpoint of the door.

3. Pursuant to Section 4.1.D of *the Guideline* , the equivalent diameter for the kiln doors is calculated based on the following equation: Diameter (ft) = $[\text{Door Height (ft)} * \text{Door Width (ft)} * 4 / \pi]^{0.5}$

4. For boilers, maximum values from 2017-2019 performance testing.

5. Pursuant to Section 4.1.D of *the Guideline* , the stack velocity of the kiln doors should be modeled at 0.001 m/s.

Table 8-2. Modeled Emission Rates (g/s)

Emission Unit ID	Emission Unit Description	Stack ID	75-07-0 Acetaldehyde	50-00-0 Formaldehyde	67-56-1 Methanol
OSK1	Kiln 1	OS10	2.70E-03	7.46E-03	0.12
		OS11	2.70E-03	7.46E-03	0.12
		DV1	6.76E-04	1.86E-03	2.95E-02
		DV2	6.76E-04	1.86E-03	2.95E-02
OSK3	Kiln 3	OS12	2.70E-03	7.46E-03	0.12
		OS13	2.70E-03	7.46E-03	0.12
		DV3	6.76E-04	1.86E-03	2.95E-02
		DV4	6.76E-04	1.86E-03	2.95E-02
OSK4	Kiln 4	OS14	3.11E-02	2.66E-02	0.11
		OS15	3.11E-02	2.66E-02	0.11
		DV5	7.77E-03	6.66E-03	2.78E-02
		DV6	7.77E-03	6.66E-03	2.78E-02
OB01	Boiler 1	OS08	2.80E-03	1.49E-02	--
OB02	Boiler 2	OS09	3.00E-03	1.59E-02	--

1. Per GA Toxic Modeling Guidance (Revised May 2017), for continuous kilns with powered vents, the total air toxic emissions should be split assuming 80 percent exit through powered vents and 20 percent exit through doors.

8.1.1.1. New and Existing Continuous Kilns

Modeled source parameters are consistent with the *Guideline* for the continuous kiln sources. The new kiln (OSK4) will be rated at approximately 120 MMBF/yr and have a burner capacity of approximately 40 MMBtu/hr. The existing kilns (OSK1 and OSK3) have a combined capacity of 174 MMBF/yr and are indirect fired. All three (3) kilns each have/will have two powered vents, one on each end of the kiln. All three (3) kilns each have/will also have two exit openings, one on each end of the kiln. For all three (3) kilns, it is assumed that 80% of the emissions will be through the two powered vents on each kiln, and 20% of the emissions will be through the two exit openings (doors) at the ends of each kiln. The two powered vents on each kiln are modeled as stacks, and the emissions via the kiln openings are modeled as point sources consistent with discussions on Page 10 of the *Guideline* (May 2017). A velocity of 0.001 m/s is used for the kiln doors (openings) and the release height is set at the midpoint of the door, consistent with the *Guideline*. Table 8-3 summarizes the parameters for the kiln doors.

Table 8-3. Kiln Door Parameters

Emission Unit ID	Emission Unit Description	Door ID	Door Height (ft)	Door Width (ft)
OSK1	Kiln 1	DV1/DV2	16.75	9
OSK3	Kiln 3	DV3/DV4	16.75	9
OSK4	Kiln 4	DV5/DV6	16	12

8.1.1.2. Existing Wood-Fired Boilers

Interfor operates two (2) wood waste-fired boilers, OB01 and OB02, at the Thomaston Mill. OB01 is rated at 26.8 MMBtu/hr and combust dry biomass (planer mill shavings). OB02 is rates at 28.7 MMBtu/hr and combusts wet biomass. Each of the boilers is modeled as a point source as emissions are exhausted through a stack.

8.1.1.3. Emission Rates

Lumber kiln emissions were estimated based on *EPD Recommended Emission Factors for Lumber Kiln Permitting in Georgia.* The emission factors differ for direct-fired kilns (OSK4) and indirect-fired kilns (OSK1 and OSK3). Emission factors from U.S. EPA's AP-42 Section 1.6, *Wood Residue Combustion in Boilers,* Table 1.6-3 were used to estimate emissions of acetaldehyde and methanol from the wood-fired boilers. No emission factor is available for methanol; therefore, emissions of methanol are assumed to be zero from the boilers. TAP emissions from each boiler are summarized in Table 8-4.

Table 8-4. Toxic Air Pollutant Emission Rates

Emission Unit ID	Pollutant	Emission Factor[1]	Production Rate	Emission Rate
		(lb/MBF)	(MBF/hr)	(lb/hr)
OSK1	Acetaldehyde	5.40E-03	9.93	0.054
	Formaldehyde	1.49E-02		0.15
	Methanol	0.236		2.34
OSK3	Acetaldehyde	5.40E-03	9.93	0.054
	Formaldehyde	1.49E-02		0.15
	Methanol	0.236		2.34
OSK4	Acetaldehyde	0.045	13.7	0.62
	Formaldehyde	3.86E-02		0.53
	Methanol	0.161		2.21
		(lb/MMBtu)	(MMBtu/hr)	(lb/hr)
OB01	Acetaldehyde	8.30E-04	26.8	0.022
	Formaldehyde	4.40E-03		0.118
	Methanol	-		-
OB02	Acetaldehyde	8.30E-04	28.7	0.024
	Formaldehyde	4.40E-03		0.126
	Methanol	-		-

1. Kiln emission factors from document entitled: *EPD Recommended Emission Factors for Lumber Kiln Permitting in Georgia.* Boiler emission factors from AP-42 Section 1.6 Table 1.6-3

2. Kiln Emission Rate (lb/hr) = Emission Factor (lb/MBF) * Production Rate (MBF/hr). Boiler Emission Rate (lb/hr) = Emission Factor (lb/MMBtu) * Heat Input Capacity (MMBtu/hr)

8.1.2. Land Use Classification

Classification of land use in the immediate area surrounding a facility is important in determining the appropriate dispersion coefficients to select for a particular modeling application. The selection of either rural or urban dispersion coefficients for a specific application should follow one of two procedures. These include a land use classification procedure or a population-based procedure to determine whether the area is primarily urban or rural.

Of the two methods, the land use procedure is considered more definitive. As specified in Section 7.2.1.1.b.i of the *Guideline on Air Quality Models*, the land use within the total area circumscribed by a 3 kilometer (km) radius circle (28.3 km^2) about the facility was classified using the meteorological land use typing scheme proposed by Auer. If land use types I1 (Heavy Industrial), I2 (Light Industrial), C1 (Commercial), R2 (Residential; Small Lot Single Family & Duplex), and R3 (Residential; Multi-Family) account for 50% or more of the circumscribed area, urban dispersion coefficients should be used; otherwise, rural dispersion coefficients are appropriate.

Figure 8-1. Land Use Classification for Dispersion Coefficients (3 km radius)

Figure 8-1 presents an aerial image of the 28.3 km^2 area surrounding the facility in comparison to the 1992 United States Geological Survey (USGS) National Land Cover Dataset (NLCD92). The 1992 USGS NLCD92 set is convenient to use for characterizing land use surrounding a particular facility since it can be processed in AERSURFACE. The AERSURFACE tool was developed to aid users in obtaining surface characteristic values for input into AERMET for AERMOD meteorological data processing. AERSURFACE (v. 13016) was used to count the number of occurrences for each of the 21 USGS NLCD92 land use classes within the 3 km radius circle (28.3 km^2) about the facility.

Each USGS NLCD92 land use class was compared to the most appropriate Auer land use category to quantify the total urban and rural area. Table 8-5 summarizes the results of this land use analysis. As 98.91% of the area can be classified as rural, rural dispersion coefficients were used. The AERSURFACE files are enclosed in Appendix G.

Table 8-5. Summary of Land Use Analysis

USGS NLCD92		Auer Scheme		Rural/ Urban	Land Area
Land Class	Land Class Description	Land Use Type	Land Use Description		
11	Open Water	A5	Water Surfaces/Rivers/Lakes	Rural	1.56%
12	Perennial Ice/Snow	A5	Water Surfaces/Rivers/Lakes	Rural	0.00%
21	Low Intensity Residential	R1	Common Residential	Rural	2.62%
22	High Intensity Residential	R2 and R3	Compact Residential (Single Family, Multi-Family & Duplex)	Urban	0.39%
23	Commercial/Industrial/ Transportation	I1, I2, and C1	Heavy and Light-Moderate Industrial & Commercial	Urban	0.69%
31	Bare Rock/Sand/Clay	A3	Undeveloped	Rural	0.00%
32	Quarries/Strip Mines/Gravel	A4	Undeveloped Rural	Rural	0.00%
33	Transitional	A3	Undeveloped/Uncultivated	Rural	0.01%
41	Deciduous Forest	A4	Undeveloped Rural	Rural	16.82%
42	Evergreen Forest	A4	Undeveloped Rural	Rural	12.31%
43	Mixed Forest	A4	Undeveloped Rural	Rural	20.88%
51	Shrubland	A3	Undeveloped/Uncultivated	Rural	0.00%
61	Orchards/Vineyard/Other	A2	Agricultural Rural	Rural	0.00%
71	Grasslands/Herbaceous	A3	Undeveloped/Uncultivated	Rural	0.00%
81	Pasture/Hay	A2	Agricultural Rural	Rural	30.32%
82	Row Crops	A2	Agricultural Rural	Rural	11.37%
83	Small Grains	A2	Agricultural Rural	Rural	0.00%
84	Fallow	A2	Agricultural Rural	Rural	0.00%
85	Urban/Recreational Grasses	A1	Metropolitan Natural	Rural	1.38%
91	Woody Wetlands	A4	Undeveloped Rural	Rural	1.63%
92	Emergent Herbaceous Wetlands	A4	Undeveloped Rural	Rural	0.01%

8.1.3. Modeling Protocol

The following provides a brief summary of the protocol of methods used to determine the MGLCs:

- ISCST3 (v02035) was used;
- The regulatory default model option was used;
- Rural dispersion coefficients were used as discussed in Section 8.1.2;
- Downwash was not used as specified by Georgia Toxic Guidelines;
- The North American Datum of 1983 (NAD83) was used to specify receptor and source locations;

- Receptors spaced no more than 50 m apart were placed along the property line. A Cartesian grid extending 5,000 m away from the property line in all directions was used with receptor spacing of no more than 100 m. This refined grid is of sufficient size to ensure the receptor indicating the MGLC has at least one receptor on all sides showing a lower concentration;
  - The modeled property line encompasses land owned by Interfor as well as a railroad that runs through the property. As Interfor controls access to this portion of the railroad, there are no receptors modeled along this area.[62]
- Receptor and source elevations were determined by processing their respective NAD83 UTM coordinates in AERMAP using 1-arc second National Elevation Dataset (NED) data obtained from the USGS National Seamless Map Server; and
- Five years of ISC meteorological data for the Atlanta surface (No. 13874) and Athens upper air (No. 13873) stations for calendar years 1974 through 1978 were used (anemometer height of 20 ft). This meteorological data was downloaded from the GAEPD website. ISCST3 was executed for each individual year of meteorological data. The meteorological data set was selected based on proximity of the meteorological stations to the site.

8.1.4. Modeling Results

Using the source parameters specified in Table 8-1, the emission rates specified in Table 8-2, and the protocol described above in Section 8.1.3, ISCST3 was executed for each of the five years of meteorological data to determine the maximum 1-hr and annual concentrations of acetaldehyde, formaldehyde, and methanol at each receptor location. Table 8-6 summarizes the MGLC for each averaging period. Hourly concentrations were adjusted to a 15-min averaging period based on the *Guideline* (15-min MGLC = 1-hr MGLC * 1.32). As shown in Table 8-6, the MGLC for each averaging period is below its corresponding AAC established by EPD.

[62] EPA “Revised Policy on Exclusions from ‘Ambient Air’” (November 2018).

Table 8-6. ISCST3 Air Dispersion Modeling Results

Pollutant	CAS No.	Year	Maximum 1-Hour Impact[1] (µg/m^3)	Maximum 15-Min Impact[2] (µg/m^3)	15-min AAC[3] (µg/m^3)	Is MGLC >15-min AAC? (Y/N)	Maximum Annual Impact[1] (µg/m^3)	Annual AAC[3] (µg/m^3)	Is MGLC > Annual AAC? (Y/N)
Acetaldehyde	75-07-0	1974	81.52	--	--	--	0.87	--	--
		1975	97.68	--	--	--	0.77	--	--
		1976	95.39	--	--	--	0.93	--	--
		1977	109	--	--	--	0.82	--	--
		1978	97.79	--	--	--	0.92	--	--
		Max	**109**	**143**	**4,500**	**N**	**0.93**	**4.55**	**N**
Formaldehyde	50-00-0	1974	76.27	--	--	--	0.83	--	--
		1975	83.97	--	--	--	0.74	--	--
		1976	84.42	--	--	--	0.87	--	--
		1977	93.85	--	--	--	0.77	--	--
		1978	83.83	--	--	--	0.90	--	--
		Max	**93.85**	**124**	**245**	**N**	**0.90**	**1.10**	**N**
Methanol	67-56-1	1974	665	--	--	--	7.06	--	--
		1975	519	--	--	--	7.12	--	--
		1976	695	--	--	--	6.76	--	--
		1977	526	--	--	--	6.40	--	--
		1978	700	--	--	--	6.16	--	--
		Max	**700**	**924**	**32,800**	**N**	**7.12**	**20,000**	**N**

1. First-high modeled impact.
2. Modeled 1-hour concentration multiplied by 1.32 to convert to 15-minute impact per GA Air Toxics Guidance (May 2017).
3. Appendix A of the GA Air Toxics Guidance (Oct 2018)

All air dispersion modeling files are included in Appendix G.

APPENDIX A: FACILITY DIAGRAMS

Figure A-1. Area Map
Interfor U.S. Inc. - Thomaston, Upson County, Georgia

Coordinates reflect UTM projection Zone 16, NAD83.

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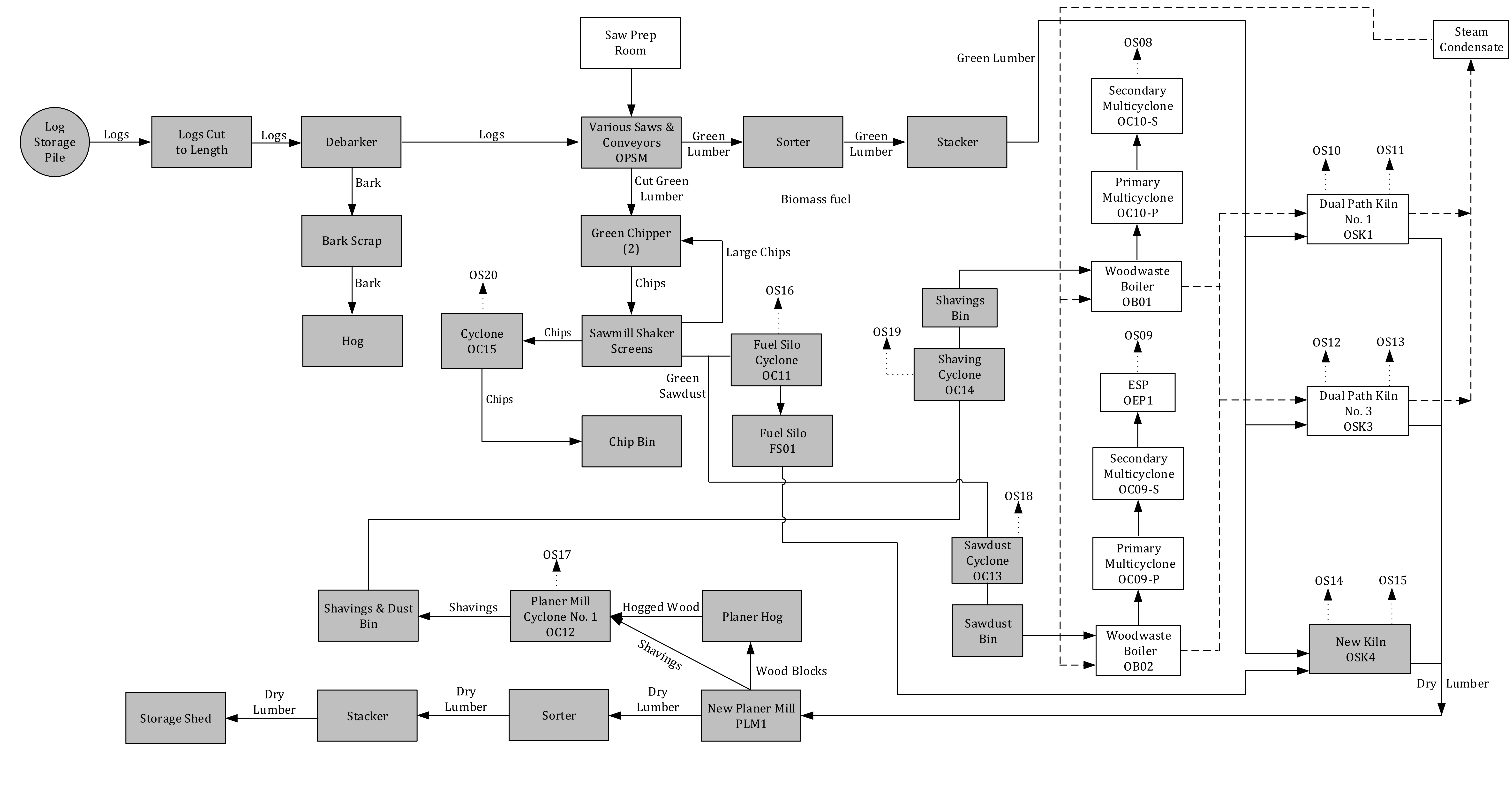

Legend

- Proposed Process/Process Equipment
- Process/Process Equipment
- Material Flow
- Steam Line
- Emissions

Interfor U.S. Inc. – Thomaston Mill
Thomaston, Georgia

Figure A-2
Process Flow Diagram

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181101.0190
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APPENDIX B: EMISSION CALCULATIONS

Table B-1. Potential Emissions for Debarking (DB01)

Emission Source	EUID	Annual Hours of Operation	Pollutant	Emission Factor (lb/ton)[1]	Potential Emissions (lb/hr)[2]	Potential Emissions (tpy)[3]
Debarking	DB01	8,760	Filterable PM	2.84E-04	0.03	0.15
			Filterable PM_{10}	2.84E-04	0.03	0.15
			Filterable $PM_{2.5}$	5.40E-05	0.01	0.03

1. Emission factors for debarking obtained from Georgia-Pacific Wood Products LLC - Warrenton Lumber Facility PSD Air Permit Application No. 237752 submitted to EPD in April 2018. References per EPD Application No. 237752 for Debarker (102S):
Uncontrolled $PM_{2.5}$ emission factor is calculated based on the test data of 4.5 x 10^{-5} lb/ton with safety factor of 20%. 19% of PM and PM_{10} is assumed to be $PM_{2.5}$.

2. Potential Hourly Emissions (lb/hr) = Potential Annual Emissions (tpy) × 2,000 (lb/ton) / Annual Hours of Operation (hr/yr)

3. Potential Annual Emissions (tpy) = Emission factor (lb/ton) × Potential Throughput (ton/yr) / 2,000 (lb/ton)

Potential Debarking Throughput (tpy): 1,023,146

Table B-2. Potential Emissions for Chippers (CH01)

Emission Source	EUID	Pollutant	Emission Factor[1] (lb/ton)	Control Efficiency[2] (%)	Potential Emissions (tpy)[3]
Chippers (2)	CH01	Filterable PM	2.00E-02	95%	0.14
		Filterable PM_{10}	1.10E-02	95%	0.08
		Filterable $PM_{2.5}$[4]	1.10E-02	95%	0.08

1. Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fourth Edition with Supplements A, B, and C, AP-42. , per the EPA Factor Information Retrieval (WebFIRE) database, updated 9/7/2016 for SCC Code 3-07-008-01, Log Debarking.

2. Per *EPA Region 10 Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country* (May 2014), emissions can be reduced by 100% for sawmill activities being performed indoors as emissions will struggle to escape through doorways and other openings. For conservatism, Interfor is assuming that 5% of emissions escape from doors or other openings.

3. Potential Emissions (tpy) = Emission Factor (lb/ton) × Potential Throughput (ton/year) / 2,000 lb/ton

Potential Throughput: 286,481 tpy

The throughput for the Chipper is based on the production of chips at the facility.

4. It is assumed that Filterable PM_{10} = Filterable $PM_{2.5}$. As this source does not involve combustion units, it is assumed that condensable emissions are negligible.

Table B-3. New Process Cyclones Potential Emissions

Pollutant	Emission Rate[1] (lb/hr)	Kiln Fuel Silo Cyclone (OC11) (tpy)[2]	Chip Bin Cyclone (OC13) (tpy)[2]	Sawdust Cyclone (OC14) (tpy)[2]	Total Cyclones Emissions (tpy)
Filterable PM	0.80	3.50	3.50	3.50	10.51
Filterable PM_{10}	0.80	3.50	3.50	3.50	10.51
Filterable $PM_{2.5}$	0.20	0.88	0.88	0.88	2.63

1. EPA WebFIRE factor for PM_{10} from sawmill operation cyclones. Original reference from AP-42 Section 10.4 (02/80). Fine particulate not expected from conveyance of wet biomass materials including chips and green sawdust. For conservatism, Interfor assumes 25% of PM is $PM_{2.5}$.

2. Potential Annual Emissions [tpy] = Emission factor [lb/hr] × Potential Hours of Operation [8,760 hr/yr] / 2,000 [lb/ton]

Table B-4. Bark Hog Potential Emissions (BH01)

Emission Source	EUID	Pollutant	Emission Factor[1] (lb/ton)	Control Efficiency[2] (%)	Potential Emissions (tpy)[3]
Bark Hog	BH01	Filterable PM	2.00E-02	95%	3.07E-02
		Filterable PM_{10}	1.10E-02	95%	1.69E-02
		Filterable $PM_{2.5}$[4]	1.10E-02	95%	1.69E-02

1. Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fourth Edition with Supplements A, B, and C, AP-42. , per the EPA Factor Information Retrieval (WebFIRE) database, updated 9/7/2016 for SCC Code 3-07-008-01, Log Debarking.

2. Per *EPA Region 10 Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country* (May 2014), emissions can be reduced by 100% for sawmill activities being performed indoors as emissions will struggle to escape through doorways and other openings. For conservatism, Interfor is assuming that 5% of emissions escape from doors or other openings.

3. Potential Emissions (tpy) = Emission Factor (lb/ton) × Potential Throughput (ton/year) / 2,000 lb/ton

Potential Bark Throughput: 61,389 tpy

The throughput for the Bark Hog is based on the production of both bark at the facility.

4. It is assumed that Filterable PM_{10} = Filterable $PM_{2.5}$. As this source does not involve combustion units, it is assumed that condensable emissions are negligible.

Table B-5. Direct-Fired Continuous Kiln Emission Factors (OSK4)

Pollutant	Emission Factor		Reference
Criteria			
PM	0.14	lb/MBF	1
Total PM_{10}	0.104	lb/MBF	1
Total $PM_{2.5}$	0.099	lb/MBF	1
SO_2	0.025	lb/MMBtu	1
NO_X	0.28	lb/MBF	1
Total VOC	4.00	lb/MBF	1
CO	0.73	lb/MBF	1
TRS, H_2S, H_2SO_4, Fluoride	Presumed negligible		
Lead	1.54E-05	lb/MMBtu	2
CO_2e	209.60	lb/MMBtu	1
HAPs			
Acetaldehyde	0.045	lb/MBF	1
Formaldehyde	0.0386	lb/MBF	1
Methanol	0.161	lb/MBF	1
Total HAP	0.245	lb/MBF	3

1. From document entitled: *EPD Recommended Emission Factors for Lumber Kiln Permitting in Georgia*
2. Emission factors for direct-fired, continuous lumber kilns obtained from Interfor Preston PSD Air Permit Application No. 40720 submitted to EPD January 25, 2016. References per EPD Application No. 40720: NCASI TB 1013, Table 4.3 Mechanical Collector Median
3. Sum of individual HAP emission factors.

Table B-6. New Direct-Fired Continuous Kiln Information (OSK4)

Kiln ID	Heat Input (MMBtu/hr)	Fuel HHV[1] (Btu/lb)	Annual Hours of Operation (hr/yr)	Production Capacity (MBF/hr)	(MMBF/yr)
Kiln 4	40.0	4,500	8,760	13.7	120

1. The average high heating value for wood/bark/fines is 4,500 Btu/lb, per U.S. EPA's AP-42, Section 1.6, *Wood Residue Combustion in Boilers* (Sept. 2003).

Table B-7. Potential Emissions from Direct-Fired Continuous Kiln (OSK4)[1]

Pollutant	Kiln 4 Emissions (lb/hr)	(tpy)
PM	1.92	8.40
Total PM_{10}	1.42	6.24
Total $PM_{2.5}$	1.36	5.94
SO_2	1.00	4.38
NO_X	3.84	16.8
Total VOC	54.8	240
CO	10.0	43.8
TRS, H_2S, H_2SO_4, Fluoride	Negligible	
Lead	6.16E-04	2.70E-03
CO_2e	8,384	36,722
HAPs		
Acetaldehyde	0.62	2.70
Formaldehyde	0.53	2.32
Methanol	2.21	9.66

1. Potential annual emissions were calculated using the following equations based on the units of the emission factor:
Potential emissions [tpy] = Emission factor [lb/MBF] * Annual production capacity [MMBF/yr] * 1,000 / 2,000 lb/ton
Potential emissions [tpy] = Emission factor [lb/MMBtu] * Heat input capacity [MMBtu/hr] * Annual hours of operation [hr/yr] / 2,000 lb/ton

Table B-8. New Planer Mill Cyclone Potential Emissions (PLM1/OC12)

Pollutant	Emission Factor[1,2] (lb/ton)	Control Efficiency[3] (%)	Potential Shavings Throughput[3] (ton/yr)	Potential Emissions (lb/hr)[4]	Potential Emissions (tpy)[5]
Filterable PM	3.2	98%	46,732	0.34	1.50
Filterable PM_{10}	0.17	95%		0.05	0.20
Filterable $PM_{2.5}$	0.17	95%		0.05	0.20

1. EPD Application No. 43928 for West Fraser Augusta for uncontrolled planer mill.
2. The emission factors are for filterable $PM/PM_{10}/PM_{2.5}$. Condensable PM is negligible for cyclone; therefore, Filterable $PM/PM_{10}/PM_{2.5}$ equal Total $PM/PM_{10}/PM_{2.5}$.
3. In EPD Application No. 43928 for West Fraser Augusta, a 99.5% control efficiency was assumed for a cyclone for PM, PM_{10}, and $PM_{2.5}$. For conservatism, Interfor is only assuming a control efficiency of 98% for PM and 95% for PM_{10} and $PM_{2.5}$.
4. Potential Annual Emissions [lb/hr] = Potential Annual Emissions [tpy] × 2,000 lb/ton / 8,760 hr/yr
5. Potential Annual Emissions [tpy] = Emission factor [lb/ton] × Potential Throughput [ton/yr] / 2,000 lb/ton

Table B-9. New Shavings Bin Cyclone Potential Emissions (PLM1/OC15)

Pollutant	Emission Factor[1,2] (lb/ton)	Control Efficiency[3] (%)	Potential Shavings Throughput[3] (ton/yr)	Potential Emissions (lb/hr)[4]	Potential Emissions (tpy)[5]
Filterable PM	3.2	98%	46,732	0.34	1.50
Filterable PM_{10}	0.17	95%		0.05	0.20
Filterable $PM_{2.5}$	0.17	95%		0.05	0.20

1. EPD Application No. 43928 for West Fraser Augusta for uncontrolled planer mill.
2. The emission factors are for filterable $PM/PM_{10}/PM_{2.5}$. Condensable PM is negligible for cyclone; therefore, Filterable $PM/PM_{10}/PM_{2.5}$ equal Total $PM/PM_{10}/PM_{2.5}$.
3. In EPD Application No. 43928 for West Fraser Augusta, a 99.5% control efficiency was assumed for a cyclone for PM, PM_{10}, and $PM_{2.5}$. For conservatism, Interfor is only assuming a control efficiency of 98% for PM and 95% for PM_{10} and $PM_{2.5}$.
4. Potential Annual Emissions [lb/hr] = Potential Annual Emissions [tpy] × 2,000 lb/ton / 8,760 hr/yr
5. Potential Annual Emissions [tpy] = Emission factor [lb/ton] × Potential Throughput [ton/yr] / 2,000 lb/ton

Table B-10. Fire Pump Operating Parameters (FWP1)

Parameter	FWP1[1]	Units
Fuel	Diesel	
Maximum Power Output[1]	460	hp, output
Potential Operation[2]	500	hr/yr
Heating Value of Diesel[3]	19,300	Btu/lb
Power Conversion[3]	7,000	Btu/hp-hr

1. Estimated.
2. FWP1 conservatively estimated to run a maximum of 500 hr/yr
3. Conversion factor for diesel fuel as noted in AP-42, Section 3.3, Table 3.3-1 footnote.

Table B-11. Fire Pump Potential Criteria Pollutant Emissions (FWP1)

Pollutant	Emission Factor[3] (lb/hp-hr)	Emission Factor[3] (lb/MMBtu)	FWP1 Potential Emissions[7,8] (lb/hr)	FWP1 Potential Emissions[7,8] (tpy)
NO_X[1]	6.58E-03	--	3.03	0.76
VOC	6.58E-03	--	3.03	0.76
CO[3]	6.68E-03	--	3.07	0.77
Filterable PM[1]	3.29E-04	--	1.51E-01	3.78E-02
Total PM[4]	2.20E-03	--	1.01	0.25
Total PM_{10}[4]	2.20E-03	--	1.01	0.25
Total $PM_{2.5}$[4]	2.20E-03	--	1.01	0.25
SO_2[2]	1.09E-05	--	5.01E-03	1.25E-03
CO_2	1.15	--	529.00	132.25
CH_4[5]	4.63E-05	6.61E-03	2.13E-02	5.32E-03
N_2O[5]	9.26E-06	1.32E-03	4.26E-03	1.06E-03
GHGs (CO_2e)[6]	1.15	--	530.80	132.70

1. FWP1 fire pump PM, NMHC, NO_X emissions factors are based on NSPS IIII emission limits.

	NSPS IIII Emission Limit	
NO_X =	4	g/kW-hr
NMHC =		g/kW-hr
Filterable PM =	0.2	g/kW-hr

Emission factors werer converted to lb/hp-hr by dividing 608 per AP-42, Section 3.3, Table 3.3-1 footnote.

2. Sulfur content (15 ppmv) in accordance with 40 CFR 60.4207(b) as required by NSPS Subpart IIII.

3. Otherwise emission factors from AP-42 Section 3.3 (Gasoline and Diesel Industrial Engines), Table 3.3-1 (10/96). Emission factors in lb/MMBtu were converted to lb/hp-hr by multiplying the power conversion factor of 7,000 Btu/hp-hr and 1MMBtu/1,000,000 Btu. VOC was estimated using the exhaust emission factor for diesel fuel. For VOC, maximum of AP-42 TOC factor and NSPS Subpart IIII NMHC factor was selected.

4. All PM is assumed to have a diameter of less than one micron. Additionally, there is no CPM factor available; thus, Total PM = Total PM_{10} = Total $PM_{2.5}$.

5. CH_4 and N_2O factors are from 40 CFR Part 98, Table C-2 for petroleum fuels. Factors were converted from kg/MMBtu to lb/MMBtu.

CH_4 =	0.003	kg/MMBtu
N_2O =	0.0006	kg/MMBtu

6. CO_2e is calculated using Global Warming Potentials (GWPs) from 40 CFR Part 98, Subpart A, Table A-1 effective January 1, 2014. GWPs used for CO_2, CH_4, and N_2O are listed below.

CO_2	1
CH_4	25
N_2O	298

7. Short-term emissions are calculated as follows:
Emissions (lb/hr) = Emission Factor (lb/hp-hr) * Engine Capacity (hp).

8. Annual emissions are calculated as follows:
Annual Emissions (tpy) = Hourly Emissions (lb/hr) * Annual Operation (hr/yr) / 2,000 (lb/ton).

Table B-12. Fire Pump Potential HAP Emissions

Pollutant	Emission Factor[1] (lb/hp-hr)	Emission Factor[1] (lb/MMBtu)	FWP1 Potential Emissions[2,3] (lb/hr)	FWP1 Potential Emissions[2,3] (tpy)
Acetaldehyde	5.37E-06	7.67E-04	2.47E-03	6.17E-04
Acrolein	6.48E-07	9.25E-05	2.98E-04	7.45E-05
Benzene	6.53E-06	9.33E-04	3.00E-03	7.51E-04
Formaldehyde	8.26E-06	1.18E-03	3.80E-03	9.50E-04
Toluene	2.86E-06	4.09E-04	1.32E-03	3.29E-04
Xylenes	2.00E-06	2.85E-04	9.18E-04	2.29E-04
1,3 Butadiene	2.74E-07	3.91E-05	1.26E-04	3.15E-05
Naphthalene	5.94E-07	8.48E-05	2.73E-04	6.83E-05
Acenaphthylene	3.54E-08	5.06E-06	1.63E-05	4.07E-06
Acenaphthene	9.94E-09	1.42E-06	4.57E-06	1.14E-06
Fluorene	2.04E-07	2.92E-05	9.40E-05	2.35E-05
Phenanthrene	2.06E-07	2.94E-05	9.47E-05	2.37E-05
Anthracene	1.31E-08	1.87E-06	6.02E-06	1.51E-06
Fluoranthene	5.33E-08	7.61E-06	2.45E-05	6.13E-06
Pyrene	3.35E-08	4.78E-06	1.54E-05	3.85E-06
Benzo(a)anthracene	1.18E-08	1.68E-06	5.41E-06	1.35E-06
Chrysene	2.47E-09	3.53E-07	1.14E-06	2.84E-07
Benzo(b)fluoranthene	6.94E-10	9.91E-08	3.19E-07	7.98E-08
Benzo(k)fluoranthene	1.09E-09	1.55E-07	4.99E-07	1.25E-07
Benzo(a)pyrene	1.32E-09	1.88E-07	6.05E-07	1.51E-07
Indeno(1,2,3-cd)pyrene	2.63E-09	3.75E-07	1.21E-06	3.02E-07
Dibenz(a,h)anthracene	4.08E-09	5.83E-07	1.88E-06	4.69E-07
Benzo(g,h,l)perylene	3.42E-09	4.89E-07	1.57E-06	3.94E-07
			Total HAP:	**3.12E-03**
			Max Single HAP:	**9.50E-04**

1. Otherwise emission factors from AP-42 Section 3.3 (Gasoline and Diesel Industrial Engines), Table 3.3-2 (10/96). Emission factors in lb/MMBtu were converted to lb/hp-hr by multiplying the power conversion factor of 7,000 Btu/hp-hr and 1MMBtu/1,000,000 Btu.

2. Short-term emissions are calculated as follows:
Emissions (lb/hr) = Emission Factor (lb/hp-hr) * Engine Capacity (hp).

3. Annual emissions are calculated as follows:
Annual Emissions (tpy) = Hourly Emissions (lb/hr) * Annual Operation (hr/yr) / 2,000 (lb/ton).

Table B-13. Potential Emissions from New Units

Pollutant	Debarking (tpy)	Chippers (tpy)	Chip Bin, Sawdust, and Kiln Fuel Cyclones (tpy)	Bark Hog (tpy)	New Kiln (tpy)	Planer Mill Cyclone (tpy)	Shavings Bin Cyclone (tpy)	Fire Pump Engine (tpy)	Total (tpy)
Filterable PM	0.15	0.14	10.5	0.03	8.40	1.50	1.50	0.04	22.26
Total PM_{10}	0.15	0.08	10.5	0.02	6.24	0.20	0.20	0.25	17.64
Total $PM_{2.5}$	0.03	0.08	2.63	0.02	5.94	0.20	0.20	0.25	9.34
SO_2	--	--	--	--	4.38	--	--	1.25E-03	4.38
NO_X	--	--	--	--	16.8	--	--	0.76	17.56
Total VOC	--	--	--	--	240	--	--	0.76	240.8
CO	--	--	--	--	43.8	--	--	0.77	44.57
Lead	--	--	--	--	2.70E-03	--	--	--	2.70E-03
CO_2e	--	--	--	--	36,722	--	--	132.7	36,855
Total HAP	--	--	--	--	14.68	--	--	--	14.68

Table B-14. Associated Emissions Increase From Sawing

Emission Source	EUID	Pollutant	Emission Factor (lb/ton)[1]	Control Efficiency[2] (%)	Associated Emissions Increase (tpy)[3]
Log Sawing	SAW1	Filterable PM	0.350	95%	3.58
		Filterable PM_{10}[4]	0.007	95%	0.07
		Filterable $PM_{2.5}$[5]	0.007	95%	0.07

1. Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fourth Edition with Supplements A, B, and C, AP-42. , per the EPA Factor Information Retrieval (WebFIRE) database, updated 9/7/2016 for SCC Code 3-07-008-02, Log Sawing.

2. Per *EPA Region 10 Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country* (May 2014), emissions can be reduced by 100% for sawmill activities being performed indoors as emissions will struggle to escape through doorways and other openings. For conservatism, Interfor is assuming that 5% of emissions escape from doors or other openings.

3. Associated Annual Emissions Increase (tpy) = Emission factor (lb/ton) × [1 - Control Efficiency (%)] × Associated Actual Throughput Increase (ton/yr) / 2,000 (lb/ton)

Associated actual throughput increase is estimated based on potential throughput and 2017 actual throughput

	Potential	Current Potential	Throughput Increase	
Log Sawing	920,831	511,573	409,258	(tpy)

Sawmill throughput estimated as 90% of logs that are debarked.

4. Per the document entitled "Estimating Emissions From Generation and Combustion of 'Waste' Wood - Draft" (July 1998) by the North Carolina Division of Air Quality (NCDAQ), the percentage of PM emitted from sawing operations that is PM_{10} is 1.89%.

5. It is assumed that Filterable PM_{10} = Filterable $PM_{2.5}$. As this source does not involve combustion units, it is assumed that condensable emissions are negligible.

Table B-15. Associated Emissions Increase for Material Transfer Sources

Emission Source	EUID	Emission Factors[1,3] (lb/ton) Filterable PM	Filterable PM_{10}	Filterable $PM_{2.5}$	Associated Emissions Increase[2] (tpy) Filterable PM	Filterable PM_{10}	Filterable $PM_{2.5}$
Chip Truck Loading	TLCH	2.16E-04	1.02E-04	1.54E-05	1.37E-02	6.49E-03	9.83E-04
Bark Truck Loading	TLBK	2.16E-04	1.02E-04	1.54E-05	2.94E-03	1.39E-03	2.11E-04
Sawdust Truck Loading	TLSD	2.16E-04	1.02E-04	1.54E-05	4.41E-03	2.09E-03	3.16E-04
Shavings Truck Loading	TLSH	2.16E-04	1.02E-04	1.54E-05	2.24E-03	1.06E-03	1.60E-04
Bark Transfer	MTCH	2.16E-04	1.02E-04	1.54E-05	2.94E-03	1.39E-03	2.11E-04
				Total	**2.63E-02**	**1.24E-02**	**1.88E-03**

1. Emission factor per AP-42 Section 13.2.4, *Aggregate Handling and Storage Piles* (Nov. 2006), Equation 1, as follows:

E = k(0.0032)((U/5)^1.3)/((M/2)^1.4)

where E = emission factor in pounds per ton
k = particle size multiplier as follows:

	0.74	for PM
	0.35	for PM_{10}
	0.053	for $PM_{2.5}$
U =	7.43	mph; average wind speed for Macon, GA from TANKS 4.0.9d
M =	16	%; material moisture content

Associated actual throughput increase is estimated based on potential throughput and 2017 actual throughput

	Future Potential	Current Potential	Throughput Increase	
Chips	286,481	159,156	127,325	tpy
Shavings	46,732	25,962	20,770	tpy
Bark	61,389	34,105	27,284	tpy
Sawdust	92,083	51,157	40,926	tpy

2. Associated Annual Emissions Increase (tpy) = Emission Factor (lb/ton) × Associated Throughput (ton/year) / 2,000 lb/ton

3. The emission factors are for filterable PM/PM_{10}/$PM_{2.5}$. Condensable PM is negligible for this process; therefore, Filterable PM/PM_{10}/$PM_{2.5}$ equal Total PM/PM_{10}/$PM_{2.5}$. Sawdust, chips, and shavi pnuematically transferred, and emissions are accounted for under transfer cyclone.

Table B-16. Inputs for Emissions from Road Travel

Source	Pre-Project Number of Trucks Per Year	Post-Project Number of Trucks Per Year	Pre-Project Distance Traveled per Round Trip[1]		Post-Project Distance Traveled per Round Trip[1]		Increased Vehicle Miles Traveled[2]		Associated Increase in Actual Number of Trucks Per Year	Average Weight[1] (W) (tons)	Events Per Year[1] (Days)	Increased Number of Trucks Per Day
			Paved Roads (ft)	Unpaved Roads (ft)	Paved Roads (ft)	Unpaved Roads (ft)	Paved Roads (VMT/yr)	Unpaved Roads (VMT/yr)				
Log Truck	14,000	19,000	--	5,280	--	5,280	--	5,000	5,000	30.0	250	20.00
Lumber Truck	5,460	9,730	1,056	4,224	2,640	--	3,773	--	4,270	30.0	250	17.08
Bark Truck	1,517	2,817	--	3,168	--	3,168	--	780	1,300	30.0	250	5.20
Chip Truck	5,067	9,410	700	3,168	--	3,168	--	2,606	4,343	27.0	250	17.37
Shavings Truck	650	1,207	1,056	4,224	2,640	--	474	--	557	20.5	250	2.23
Sawdust Truck	522	969	600	3,168	600	3,168	51	268	447	27.3	250	1.79

1. Road configuration of mill will be altered as a result of project and certain areas will be paved.

2. Increased Vehicle Miles Traveled (VMT/yr) = {[Post-Project Number of Trucks Per Year (Trucks/Year) * Post-Project Distance per Round Trip (ft/truck trip)] - [Pre-Project Number of Trucks Per Year (Trucks/Year) * Pre-Project Distance per Round Trip (ft/truck trip)]. If miles decrease for a given truck/road type, mileage increase assumed to be zero.

Table B-17. Associated Fugitive Emissions Increase from Road Travel

Source	EUID	Emission Factor[1,2] (lb/VMT)			Associated Fugitive Emissions Increase[3]		
		PM	PM_{10}	$PM_{2.5}$	Filterable PM (tpy)	Filterable PM_{10} (tpy)	Filterable $PM_{2.5}$ (tpy)
Unpaved Road Travel	INRD						
Log Truck		9.01E-02	7.34E-03	7.34E-04	0.23	1.83E-02	1.83E-03
Lumber Truck		9.01E-02	7.34E-03	7.34E-04	--	--	--
Bark Truck		9.01E-02	7.34E-03	7.34E-04	3.51E-02	2.86E-03	2.86E-04
Chip Truck		8.59E-02	7.00E-03	7.00E-04	0.11	9.11E-03	9.11E-04
Shavings Truck		7.59E-02	6.18E-03	6.18E-04	--	--	--
Sawdust Truck		8.63E-02	7.03E-03	7.03E-04	1.16E-02	9.43E-04	9.43E-05
Paved Road Travel							
Log Truck		0.20	3.96E-02	9.73E-03	--	--	--
Lumber Truck		0.20	3.96E-02	9.73E-03	0.37	7.48E-02	1.84E-02
Bark Truck		0.20	3.96E-02	9.73E-03	--	--	--
Chip Truck		0.18	3.56E-02	8.74E-03	--	--	--
Shavings Truck		0.13	2.69E-02	6.60E-03	3.18E-02	6.36E-03	1.56E-03
Sawdust Truck		0.18	3.60E-02	8.84E-03	4.57E-03	9.15E-04	2.24E-04
				Total Road Emissions	**0.79**	**0.11**	**0.02**

1. Unpaved Roads Emission Factor (lb/VMT) = [k (s/12)^a × (W/3)^b] × [(365 - P)/365] × (100% - % control efficiency), per AP-42 Section 13.2.2, *Unpaved Roads* (Nov. 2006), Equations 1a and 2, with variables defined as follows:

PM - k (lb/VMT) =	4.9	Particle size multiplier for PM per AP-42, Table 13.2.2-2
PM_{10} - k (lb/VMT) =	1.5	Particle size multiplier for PM_{10} per AP-42, Table 13.2.2-2
$PM_{2.5}$ - k (lb/VMT) =	0.15	Particle size multiplier for $PM_{2.5}$ per AP-42, Table 13.2.2-2
PM - a =	0.7	Empirical constant for PM per AP-42, Table 13.2.2-2
PM_{10} and $PM_{2.5}$ - a =	0.9	Empirical constant for PM_{10} and $PM_{2.5}$ per AP-42, Table 13.2.2-2
b =	0.45	Empirical constant for industrial roads per AP-42, Table 13.2.2-2
s (%) =	1.60%	Surface silt content based on maximum value from Georgia-Pacific Wood Products LLC - Warrenton Lumber Facility PSD Air Permit Application No. 237752 submitted to EPD in April 2018.
P =	120	No. days with rainfall greater than 0.01 inch, Per AP-42, Figure 13.2.2-1
% control efficiency =	0.0	% control efficiency

2. Paved Roads Emission Factor (lb/VMT) = [k (sL)^0.91 × (W)^1.02] × (100% - % control efficiency), per AP-42 Section 13.2.1, Paved Roads (Jan. 2011), Equation 1, with variables defined as follows:

PM - k (lb/VMT) =	0.011	Particle size multiplier for PM per AP-42, Table 13.2.1-1
PM_{10} - k (lb/VMT) =	0.0022	Particle size multiplier for PM_{10} per AP-42, Table 13.2.1-1
$PM_{2.5}$ - k (lb/VMT) =	0.00054	Particle size multiplier for $PM_{2.5}$ per AP-42, Table 13.2.1-1
sL (g/m^2) =	0.53	Road surface average silt loading from Georgia-Pacific Wood Products LLC - Warrenton Lumber Facility PSD Air Permit Application No. 237752 submitted to EPD in April 2018.
W =	Average weight (in tons) of the vehicle traveling the road	
% control efficiency =	0.0	% control efficiency

3. Associated emissions increase calculated as appropriate emission factor multiplied by vehicle miles traveled per time period.

Table B-18. Associated Emissions Increase Summary

Pollutant	Sawmill (tpy)	Material Transfer (tpy)	Road Travel (tpy)	Total (tpy)
Filterable PM	3.58	2.63E-02	0.79	4.40
Total PM_{10}	0.07	1.24E-02	0.11	0.19
Total $PM_{2.5}$	0.07	1.88E-03	0.02	0.09

Table B-19. 2017-2018 Mill Production Data

Type	Annual Average Throughput	Units
Lumber Produced	115,426	MBF/yr
Recovery	3.79	tons logs/MBF
Logs	437,399	tpy
Bark Production	6%	% of logs
	26,244	tpy
Chip Production	28%	% of logs
	122,472	tpy
Shavings Sold	8,040	tpy
Shavings Combusted in Boiler 1	9,203	tpy
Total Shavings Produced	17,243	tpy
Trim Loss	3%	
Planer Mill Input	118,996	MBF/yr
Lumber Hogged	3,570	MBF/yr
	13,528	tpy
Planer Mill Hours	3,475	hr/yr
Sawmill Hours	3,527	hr/yr

Table B-20. Debarking Baseline Emissions

Emission Source	Pollutant	Emission Factor (lb/ton)[1]	Baseline Emissions (tpy)[2]
Debarking	Filterable PM	2.84E-04	0.06
	Filterable PM_{10}	2.84E-04	0.06
	Filterable $PM_{2.5}$	5.40E-05	0.01

1. Emission factors for debarking obtained from Georgia-Pacific Wood Products LLC - Warrenton Lumber Facility PSD Air Permit Application No. 237752 submitted to EPD in April 2018. References per EPD Application No. 237752 for Debarker (102S):
Uncontrolled $PM_{2.5}$ emission factor is calculated based on the test data of 4.5 x 10^{-5} lb/ton with safety factor of 20%. 19% of PM and PM_{10} is assumed to be $PM_{2.5}$.

2. Baseline Annual Emissions (tpy) = Emission factor (lb/ton) × Baseline Throughput (ton/yr) / 2,000 (lb/ton)

Baseline Throughput:	Debarking	437,399	(tpy)

Table B-21. Chippers Baseline Emissions

Emission Source	Pollutant	Emission Factor[1] (lb/ton)	Control Efficiency[2] (%)	Baseline Emissions (tpy)[3]
Chippers (2)	Filterable PM	2.00E-02	95%	0.06
	Filterable PM_{10}	1.10E-02	95%	0.03
	Filterable $PM_{2.5}$[4]	1.10E-02	95%	0.03

1. Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fourth Edition with Supplements A, B, and C, AP-42. , per the EPA Factor Information Retrieval (WebFIRE) database, updated 9/7/2016 for SCC Code 3-07-008-01, Log Debarking.

2. Per *EPA Region 10 Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country* (May 2014), emissions can be reduced by 100% for sawmill activities being performed indoors as emissions will struggle to escape through doorways and other openings. For conservatism, Interfor is assuming that 5% of emissions escape from doors or other openings.

3. Baseline Emissions (tpy) = Emission Factor (lb/ton) × Baseline Throughput (ton/year) * [100% - Control Efficiency (%)] / 2,000 lb/ton

	Baseline Throughput	
Chipper	122,472	tpy

The throughput for the Chipper is based on the production of chips at the facility.

4. It is assumed that Filterable PM_{10} = Filterable $PM_{2.5}$. As this source does not involve combustion units, it is assumed that condensable emissions are negligible.

Table B-22. Trim Blocks Cyclone (OC04) and Chip Bin Cyclone (OC07) Baseline Emissions

Pollutant	Emission Rate[1] (lb/hr)	Planer Mill Trim Blocks Cyclone (OC04) (tpy)[2]	Chip Bin (OC07) (tpy)[2]	Total Cyclones Emissions (tpy)
Filterable PM	0.80	1.39	1.41	2.80
Filterable PM_{10}	0.80	1.39	1.41	2.80
Filterable $PM_{2.5}$	0.20	0.35	0.35	0.70

1. EPA WebFIRE factor for PM_{10} from sawmill operation cyclones. Original reference from AP-42 Section 10.4 (02/80). Fine particulate not expected from conveyance of trim blocks and green sawdust. For conservatism, Interfor assumes 25% of PM is $PM_{2.5}$.

2. Potential Annual Emissions [tpy] = Emission factor [lb/hr] × Baseline Hours of Operation [8,760 hr/yr] / 2,000 [lb/ton]. Hours of operation for trim blocks cyclone based on hours of operation for planer mill. Hours of operation for chip bin based on hours of operation for sawmill.

Table B-23. Existing Planer Mill Shavings Cyclone (OC03) Baseline Emissions

Pollutant	Emission Factor[1,2] (lb/ton)	Control Efficiency[3] (%)	2017-2018 Annual Average Throughput[3] (tpy)	Baseline Emissions[4] (tpy)
Filterable PM	3.2	98%		0.55
Filterable PM_{10}	0.17	95%	17,243	0.07
Filterable $PM_{2.5}$	0.17	95%		0.07

1. EPD Application No. 43928 for West Fraser Augusta for uncontrolled planer mill shavings cyclone.

2. The emission factors are for filterable $PM/PM_{10}/PM_{2.5}$. Condensable PM is negligible for cyclone; therefore, Filterable $PM/PM_{10}/PM_{2.5}$ equal Total $PM/PM_{10}/PM_{2.5}$.

3. To prevent overestimation of baseline emissions, Interfor is assuming the same control efficiency for both the new and existing shavings cyclones. In reality, better performance expected from new cyclones.

4. Baseline Emissions (tpy) = Emission Factor (lb/ton) × Baseline Throughput (ton/year) * [100% - Control Efficiency (%)] / 2,000 lb/ton

Table B-24. Existing Shavings Truck Bin Collection Cyclone (OC05) Baseline Emissions

Pollutant	Emission Factor[1,2] (lb/ton)	Control Efficiency[3] (%)	Baseline Shavings Throughput (tpy)	Baseline Emissions[4] (tpy)
Filterable PM	3.2	98%		0.26
Filterable PM_{10}	0.17	95%	8,040	0.03
Filterable $PM_{2.5}$	0.17	95%		0.03

1. EPD Application No. 43928 for West Fraser Augusta for uncontrolled planer mill shavings cyclone.

2. The emission factors are for filterable $PM/PM_{10}/PM_{2.5}$. Condensable PM is negligible for this process; therefore, Filterable $PM/PM_{10}/PM_{2.5}$ equal Total $PM/PM_{10}/PM_{2.5}$.

3. To prevent overestimation of baseline emissions, Interfor is assuming the same control efficiency for both the new and existing shavings cyclones. In reality, better performance expected from new cyclones.

4. Baseline Emissions (tpy) = Emission Factor (lb/ton) × Baseline Throughput (ton/year) * [100% - Control Efficiency (%)] / 2,000 lb/ton

Table B-25. Existing Shavings Boiler Fuel Collection Cyclone (OC06) Baseline Emissions

Pollutant	Emission Factor[1,2] (lb/ton)	Control Efficiency[3] (%)	Baseline Shavings Throughput[3] (tpy)	Baseline Emissions[4] (tpy)
Filterable PM	3.2	98%	9,203	0.29
Filterable PM_{10}	0.17	95%		0.04
Filterable $PM_{2.5}$	0.17	95%		0.04

1. EPD Application No. 43928 for West Fraser Augusta for uncontrolled planer mill shavings cyclone.

2. The emission factors are for filterable PM/PM_{10}/$PM_{2.5}$. Condensable PM is negligible for this process; therefore, Filterable PM/PM_{10}/$PM_{2.5}$ equal Total PM/PM_{10}/$PM_{2.5}$.

3. To prevent overestimation of baseline emissions, Interfor is assuming the same control efficiency for both the new and existing shavings cyclones. In reality, better performance expected from new cyclones.

4. Baseline Emissions (tpy) = Emission Factor (lb/ton) × Baseline Throughput (ton/year) * [100% - Control Efficiency (%)] / 2,000 lb/ton

Table B-26. Baseline Emissions - Shutdown Equipment

Pollutant	Baseline Emissions (tpy)[5]
Filterable PM	4.03
Filterable PM_{10}	3.04
Filterable $PM_{2.5}$	0.89

Table B-27. Project Net Emissions Increase Analysis

Pollutant	A Potential Emissions of New Units (tpy)[1]	B Associated Units Emissions Increase (tpy)[2]	C Existing Shutdown Units Emissions (tpy)[3]	D = A + B - C Project Net Emissions Increases (tpy)[4]	E PSD SER Thresholds (tpy)[5]	Is D > E? PSD Permitting Triggered?
Filterable PM	22.26	4.40	4.03	22.63	25	No
Total PM_{10}	17.64	0.19	3.04	14.79	15	No
Total $PM_{2.5}$	9.34	0.09	0.89	8.54	10	No
SO_2	4.38	--	--	4.38	40	No
NO_X	17.56	--	--	17.56	40	No
VOC	240.8	--	--	240.8	40	Yes
CO	44.57	--	--	44.57	100	No
Lead	2.70E-03	--	--	2.70E-03	0.6	No
CO_2e	36,855	--	--	36,855	75000	No
Hydrogen Sulfide	--	--	--	--	10	No
Sulfuric Acid Mist	--	--	--	--	7	No
Total HAP	14.68	--	--	14.68	N/A	N/A

1. The proposed project will not modify any existing unit. Therefore, baseline actual emissions and potential emissions of modified units are not applicable. Potential emissions from new equipment are summarized in Table B-13.

2. Associated units emissions increases are summarized in Table B-18.

3. Baseline actual emissions for existing equipment being permanently shutdown are summarized in Table B-26.

4. Project Net Emissions Increases = Net Emissions Increase (Potential Emissions from New Units) + Associated Units Emissions Increase - Shutdown Units Baseline Emissions

5. For PSD permitting for CO_2 to be triggered, first PSD must be triggered for another regulated pollutant, then project emissions from both CO_2 (mass basis) and CO_2e must be greater than the SER.

APPENDIX C: SIP PERMIT APPLICATION FORMS

State of Georgia
Department of Natural Resources
Environmental Protection Division
Air Protection Branch

Stationary Source Permitting Program
4244 International Parkway, Suite 120
Atlanta, Georgia 30354
404/363-7000
Fax: 404/363-7100

SIP AIR PERMIT APPLICATION

EPD Use Only

Date Received: ______________ Application No. ______________

FORM 1.00: GENERAL INFORMATION

1. Facility Information

Facility Name: Interfor U.S. Inc- Thomaston Mill

AIRS No. (if known): 04-13- 293 - 00007

Facility Location: Street: 75 Ben Hill Road

City: Thomaston Georgia Zip: 30286 County: Upson

Is this facility a "small business" as defined in the instructions? Yes: ☐ No: ☒

2. Facility Coordinates

Latitude: ° ' " **NORTH** Longitude: ° ' " **WEST**

UTM Coordinates: 754,101 **EAST** 3,646,661 **NORTH** **ZONE** 16S

3. Facility Owner

Name of Owner: Interfor U.S. Inc.

Owner Address Street: 700 West Park Drive

City: Peachtree City State: Georgia Zip: 30269

4. Permitting Contact and Mailing Address

Contact Person: Kari Franklin Title: Project Administrator, Operations

Telephone No.: 706-648-4917 Ext ______ Fax No.: ______

Email Address: Kari.Franklin@interfor.com

Mailing Address: Same as: Facility Location: ☒ Owner Address: ☐ Other: ☐

If Other: Street Address: ______

City: ______ State: ______ Zip: ______

5. Authorized Official

Name: Jody King Title: Mill Manager

Address of Official Street: 75 Ben Hill Road

City: Thomaston State: Georgia Zip: 30286

This application is submitted in accordance with the provisions of the Georgia Rules for Air Quality Control and, to the best of my knowledge, is complete and correct.

Signature: Jody King Date: 07/10/2019

6. Reason for Application: (Check all that apply)

- ☐ New Facility (to be constructed)
- ☐ Existing Facility (initial or modification application)
- ☒ Permit to Construct
- ☒ Permit to Operate
- ☐ Change of Location
- ☐ Permit to Modify Existing Equipment: Affected Permit No.: ______

☐ Revision of Data Submitted in an Earlier Application

Application No.: ______

Date of Original Submittal: ______

7. Permitting Exemption Activities (for permitted facilities only):

Have any exempt modifications based on emission level per Georgia Rule 391-3-1-.03(6)(i)(3) been performed at the facility that have not been previously incorporated in a permit?

☒ **No** ☐ **Yes, please fill out the SIP Exemption Attachment** (See Instructions for the attachment download)

8. Has assistance been provided to you for any part of this application?

☐ **No** ☐ **Yes, SBAP** ☒ **Yes, a consultant has been employed or will be employed.**

If yes, please provide the following information:

Name of Consulting Company: Trinity Consultants

Name of Contact: Chris Pool

Telephone No.: 404-751-0226 Fax No.: 678-441-9978

Email Address: cpool@trinityconsultants.com

Mailing Address: Street: 3495 Piedmont Road, Building 10, Suite 905

City: Atlanta State: Georgia Zip: 30305

Describe the Consultant's Involvement:

Prepared the permit application

9. Submitted Application Forms: Select only the necessary forms for the facility application that will be submitted.

No. of Forms	Form
1	2.00 Emission Unit List
1	2.01 Boilers and Fuel Burning Equipment
	2.02 Storage Tank Physical Data
	2.03 Printing Operations
	2.04 Surface Coating Operations
	2.05 Waste Incinerators (solid/liquid waste destruction)
1	2.06 Manufacturing and Operational Data
1	3.00 Air Pollution Control Devices (APCD)
	3.01 Scrubbers
	3.02 Baghouses & Other Filter Collectors
	3.03 Electrostatic Precipitators
1	4.00 Emissions Data
	5.00 Monitoring Information
	6.00 Fugitive Emission Sources
1	7.00 Air Modeling Information

10. Construction or Modification Date

Estimated Start Date: 1st Quarter 2020

11. **If confidential information is being submitted in this application, were the guidelines followed in the "Procedures for Requesting that Submitted Information be treated as Confidential"?**

☐ No ☐ Yes

12. New Facility Emissions Summary

Criteria Pollutant	New Facility	
	Potential (tpy)	Actual (tpy)
Carbon monoxide (CO)		
Nitrogen oxides (NOx)		
Particulate Matter (PM) (filterable only)		
PM <10 microns (PM10)		
PM <2.5 microns (PM2.5)		
Sulfur dioxide (SO_2)		
Volatile Organic Compounds (VOC)		
Greenhouse Gases (GHGs) (in CO2e)		
Total Hazardous Air Pollutants (HAPs)		
Individual HAPs Listed Below:		

13. Existing Facility Emissions Summary

Criteria Pollutant	Current Facility		After Modification	
	Potential (tpy)	Actual (tpy)	Potential (tpy)	Actual (tpy)
Carbon monoxide (CO)	190.3	< 190.3	234.9	< 234.9
Nitrogen oxides (NOx)	119.1	< 119.1	136.7	< 136.7
Particulate Matter (PM) (filterable only)	69.0	<69.0	82.4	< 82.4
PM <10 microns (PM10)	58.4	<58.4	68.7	< 68.7
PM <2.5 microns (PM2.5)	38.2	<38.2	45.5	< 45.5
Sulfur dioxide (SO_2)	6.08	< 6.08	10.5	< 10.5
Volatile Organic Compounds (VOC)	352.1	< 352.1	592.9	< 592.9
Greenhouse Gases (GHGs) (in CO2e)	50,941	< 50,941	87,795	< 87,795
Total Hazardous Air Pollutants (HAPs)	31.2	< 31.2	45.8	< 45.8
Individual HAPs Listed Below:				
Methanol	20.5	< 20.5	30.2	< 30.2

14. 4-Digit Facility Identification Code:

SIC Code: 2421 SIC Description: Sawmills and Planing Mills, General

NAICS Code: 321113 NAICS Description: Sawmills

15. Description of general production process and operation for which a permit is being requested. If necessary, attach additional sheets to give an adequate description. Include layout drawings, as necessary, to describe each process. References should be made to source codes used in the application.

Interfor is submitting this application for a mill modernization project at the Thomaston Mill. See application narrative for more information.

16. Additional information provided in attachments as listed below:

Attachment A - Area Map, Process Flow Diagram

Attachment B - Emission Calculations

Attachment C - SIP Application Forms

Attachment D - BACT Supporting Calculations

Attachment E - RACT/BACT/LAER Clearing House Database Reports

Attachment F - Toxics Modeling Documentation

Attachment G - Electronic Toxic Modeling Files

Attachment H - Letters for Federal Land Managers of Class 1 Areas

17. Additional Information: Unless previously submitted, include the following two items:

☒ Plot plan/map of facility location or date of previous submittal: Appendix A

☒ Flow Diagram or date of previous submittal: Appendix A

18. Other Environmental Permitting Needs:

Will this facility/modification trigger the need for environmental permits/approvals (other than air) such as Hazardous Waste Generation, Solid Waste Handling, Water withdrawal, water discharge, SWPPP, mining, landfill, etc.?

☐ **No** ☒ **Yes, please list below:**

Water discharge/pretreatment

19. List requested permit limits including synthetic minor (SM) limits.

See application narrative

20. Effective March 1, 2019, permit application fees will be assessed. The fee amount varies based on type of permit application. Application acknowledgement emails will be sent to the current registered fee contact in the GECO system. If fee contacts have changed, please list that below:

Fee Contact name:

Fee Contact email address:

Fee Contact phone number:

Fee invoices will be created through the GECO system shortly after the application is received. It is the applicant's responsibility to access the facility GECO account, generate the fee invoice, and submit payment within 10 days after notification.

Facility Name: Interfor - Thomaston Mill **Date of Application:** July 2019

FORM 2.00 – EMISSION UNIT LIST

Emission Unit ID	Name	Manufacturer and Model Number	Description
OSK4	Drying Kiln No. 4	Custom	Continuous Dual-Path Direct Fired Drying Kiln No. 4
FS01	Fuel Silo	Custom	Fuel Silo for OSK4
PLM1	Planer Mill	Custom	Planer mill for planing dried lumber
BHO1	Bark Hog	TBD	Hog for resizing bark
DB01	Debarker	TBD	Debarker for debarking logs
CH01	Green Wood Chippers (2)	TBD	Chippers for chipping wood blocks
FWP1	Fire Pump Engine	TBD	460 HP Diesel Fire Pump Engine

Facility Name: Interfor – Thomaston Mill **Date of Application:** July 2019

FORM 2.01 – BOILERS AND FUEL BURNING EQUIPMENT

Emission Unit ID	Type of Burner	Type of Draft[1]	Design Capacity of Unit (MMBtu/hr Input)	Percent Excess Air	Dates		Date & Description of Last Modification
					Construction	Installation	
OSK4	Green Sawdust Gassifier	Other	40.0	TBD	2020	2020	N/A

[1] This column does not have to be completed for natural gas only fired equipment.

Facility Name: Interfor – Thomaston Mill **Date of Application:** July 2019

FUEL DATA

Emission Unit ID	Fuel Type	Potential Annual Consumption				Hourly Consumption		Heat Content		Percent Sulfur		Percent Ash in Solid Fuel	
		Total Quantity		Percent Use by Season									
		Amount	Units	Ozone Season May 1 - Sept 30	Non-ozone Season Oct 1 - Apr 30	Max.	Avg.	Min.	Avg.	Max.	Avg.	Max.	Avg.
OSK4	**Green Sawdust**	**38,933**	**Tpy**	**41.7%**	**58.3%**	**8,889 lb/hr**	**8,889 lb/hr**	**4,500 Btu/lb**	**4,500 Btu/lb**	**N/A**	**N/A**	**N/A**	**N/A**

Fuel Supplier Information

Fuel Type	Name of Supplier	Phone Number	Supplier Location			
			Address	City	State	Zip
N/A						

Facility Name: Interfor – Thomaston Mill **Date of Application:** July 2019

FORM 2.06 – MANUFACTURING AND OPERATIONAL DATA

Normal Operating Schedule: 24 hours/day 7 days/week 52 weeks/yr

Additional Data Attached? ☒ - No ☐ - Yes, please include the attachment in list on Form 1.00, Item 16.

Seasonal and/or Peak Operating Periods: N/A

Dates of Annually Occurring Shutdowns: N/A

PRODUCTION INPUT FACTORS

Emission Unit ID	Emission Unit Name	Const. Date	Input Raw Material(s)	Annual Input	Hourly Process Input Rate		
					Design	Normal	Maximum
OSK4	Drying Kiln No. 4	2020	Green Dimensional Lumber	120 MMBF/yr	13.7 MBF/hr	13.7 MBF/hr	13.7 MBF/hr
PLM1	Planer Mill	2020	Dried Unplaned Dimensional Lumber	294 MMBF/yr	33.6 MBF/hr	33.6 MBF/hr	33.6 MBF/hr
BHOG	Bark Hog	2020	Bark	61,389 ton/yr	7.0 ton/hr	7.0 ton/hr	7.0 ton/hr
DEBK	Debarker	2020	Logs	1,023,146 ton/yr	117 ton/hr	117 ton/hr	117 ton/hr
CH01	Green Wood Chippers (2)	2020	Wood	286,481 ton/yr	32.7 ton/hr	32.7 ton/hr	32.7 ton/hr

PRODUCTS OF MANUFACTURING

Emission Unit ID	Description of Product	Production Schedule		Hourly Production Rate (Give units: e.g. lb/hr, ton/hr)			
		Tons/yr	Hr/yr	Design	Normal	Maximum	Units
OSK4	**Dried Dimensional Lumber**	**120 MMBF/yr**	**8,760**	**120**	**120**	**120**	**MMBF /yr**
PLM1	**Dried Planer Dimensional Lumber**	**294 MMBF/yr**	**8,760**	**294**	**294**	**294**	**MMBF/ yr**
BHOG	**Resized Bark**	**61,389 ton/yr**	**8,760**	**7.0**	**7.0**	**7.0**	**ton/hr**
DEBK	**Debarked Logs and Bark**	**1,023,146 ton/yr**	**8,760**	**117**	**117**	**117**	**ton/hr**
CH01	**Green Wood Chippers (2)**	**286,481 ton/yr**	**8,760**	**32.7**	**32.7**	**32.7**	**ton/hr**

Facility Name: Interfor – Thomaston Mill **Date of Application:** July 2019

Form 3.00 – AIR POLLUTION CONTROL DEVICES - PART A: GENERAL EQUIPMENT INFORMATION

APCD Unit ID	Emission Unit ID	APCD Type (Baghouse, ESP, Scrubber etc)	Date Installed	Make & Model Number (Attach Mfg. Specifications & Literature)	Unit Modified from Mfg Specifications?	Gas Temp. °F		Inlet Gas Flow Rate (acfm)
						Inlet	Outlet	
OC11	FS01	Cyclone	2020	TBD	N/A	TBD	TBD	TBD
OC12	PLM1	Cyclone	2020	TBD	N/A	TBD	TBD	TBD
OC13	CH01	Cyclone	2020	TBD	N/A	TBD	TBD	TBD
OC14	OPTM	Cyclone	2020	TBD	N/A	TBD	TBD	TBD
OC15	PLM1	Cyclone	2020	TBD	N/A	TBD	TBD	TBD

Facility Name: Interfor – Thomaston Mill **Date of Application:** July 2019

Form 3.00 – AIR POLLUTION CONTROL DEVICES – PART B: EMISSION INFORMATION

APCD Unit ID	Pollutants Controlled	Percent Control Efficiency		Inlet Stream To APCD		Exit Stream From APCD		Pressure Drop Across Unit (Inches of water)
		Design	Actual	lb/hr	Method of Determination	lb/hr	Method of Determination	
OC11	Particulate Matter (PM)	*See emission calculations*						TBD
OC12	Particulate Matter (PM)	*See emission calculations*						TBD
OC13	Particulate Matter (PM)	*See emission calculations*						TBD
OC14	Particulate Matter (PM)	*See emission calculations*						TBD
OC15	Particulate Matter (PM)	*See emission calculations*						TBD

Facility Name: Interfor – Thomaston Mill **Date of Application:** July 2019

FORM 4.00 – EMISSION INFORMATION

Emission Unit ID	Air Pollution Control Device ID	Stack ID	Pollutant Emitted	Emission Rates				
				Hourly Actual Emissions (lb/hr)	Hourly Potential Emissions (lb/hr)	Actual Annual Emission (tpy)	Potential Annual Emission (tpy)	Method of Determination
OSK4	N/A	OS14/OS15	Total PM	< 1.92	1.92	< 8.40	8.40	Factor obtained from *EPD Recommended Emission Factors for Lumber Kiln Permitting in Georgia*
OSK4	N/A	OS14/OS15	Total PM_{10}	< 1.42	1.42	< 6.24	6.24	
OSK4	N/A	OS14/OS15	Total $PM_{2.5}$	< 1.36	1.36	< 5.94	5.94	
OSK4	N/A	OS14/OS15	SO_2	<1.00	1.00	<4.38	4.38	
OSK4	N/A	OS14/OS15	NO_X	< 3.84	3.84	< 16.8	16.8	
OSK4	N/A	OS14/OS15	VOC	< 54.8	54.8	< 240	240	
OSK4	N/A	OS14/OS15	CO	< 10.0	10.0	< 43.8	43.8	
OSK4	N/A	OS14/OS15	Lead	<6.16E-04	6.16E-04	<2.70E-03	2.70E-03	Factor obtained from Interfor Preston PSD Permit Application (No. 40720)
OSK4	N/A	OS14/OS15	CO2e	< 8,384	8,384	< 36,722	36,722	Factor obtained from *EPD Recommended Emission Factors for Lumber Kiln Permitting in Georgia*
OSK4	N/A	OS14/OS15	Acetaldehyde	< 0.62	0.62	< 2.70	2.70	
OSK4	N/A	OS14/OS15	Formaldehyde	< 0.53	0.53	< 2.32	2.32	
OSK4	N/A	OS14/OS15	Methanol	< 2.21	2.21	< 9.66	9.66	
FS01	OC11	OS16	Filterable PM	< 0.80	0.80	<3.50	3.50	U.S. EPA WebFIRE
FS01	OC11	OS16	Filterable PM_{10}	< 0.80	0.80	<3.50	3.50	U.S. EPA WebFIRE
FS01	OC11	OS16	Filterable $PM_{2.5}$	<0.20	0.20	< 0.88	0.88	U.S. EPA WebFIRE/Assumed 25% of PM
PLM1	OC12	OS17	Total PM	< 0.34	0.34	< 1.50	1.50	Emission Factors per West Fraser Augusta application (No. 43928)

PLM1	OC12	OS17	Total PM_{10}	< 0.02	0.02	< 0.08	0.08	Emission Factors per West Fraser Augusta application (No. 43928)
PLM1	OC12	OS17	Total $PM_{2.5}$	< 0.02	0.02	< 0.08	0.08	Emission Factors per West Fraser Augusta application (No. 43928)
BHO1	N/A	N/A	Filterable PM	< 7.01E-03	7.01E-03	< 3.07E-02	3.07E-02	EPA WebFIRE factor for log debarking, 95% control for being performed indoors.
BHO1	N/A	N/A	Filterable PM_{10}	< 3.85E-03	3.85E-03	< 1.69E-02	1.69E-02	EPA WebFIRE factor for log debarking, 95% control for being performed indoors.
BHO1	N/A	N/A	Filterable $PM_{2.5}$	< 3.85E-03	3.85E-03	< 1.69E-02	1.69E-02	EPA WebFIRE factor for log debarking, 95% control for being performed indoors.
DB01	N/A	N/A	Filterable PM	< 0.03	0.03	< 0.15	0.15	Emission factors per Georgia-Pacific Wood Products LLC - Warrenton Lumber Facility PSD Air Permit Application (No. 237752)
DB01	N/A	N/A	Filterable PM_{10}	< 0.03	0.03	< 0.15	0.15	Emission factors per Georgia-Pacific Wood Products LLC - Warrenton Lumber Facility PSD Air Permit Application (No. 237752)
DB01	N/A	N/A	Filterable $PM_{2.5}$	< 0.01	0.01	< 0.03	0.03	Emission factors per Georgia-Pacific Wood Products LLC - Warrenton Lumber Facility PSD Air Permit Application (No. 237752)
CH01	N/A	N/A	Filterable PM	< 0.03	0.03	< 0.14	0.14	EPA WebFIRE factor for log debarking, 95% control for being performed indoors.

CH01	N/A	N/A	Filterable PM_{10}	< 0.02	0.02	< 0.08	0.08	EPA WebFIRE factor for log debarking, 95% control for being performed indoors.
CH01	N/A	N/A	Filterable $PM_{2.5}$	< 0.02	0.02	< 0.08	0.08	EPA WebFIRE factor for log debarking, 95% control for being performed indoors.
CH01	OC13	OS18	Filterable PM	< 0.80	0.80	<3.50	3.50	U.S. EPA WebFIRE
CH01	OC13	OS18	Filterable PM_{10}	< 0.80	0.80	<3.50	3.50	U.S. EPA WebFIRE
CH01	OC13	OS18	Filterable $PM_{2.5}$	<0.20	0.20	< 0.88	0.88	U.S. EPA WebFIRE/Assumed 25% of PM
OPTM	OC14	OS19	Filterable PM	< 0.80	0.80	<3.50	3.50	U.S. EPA WebFIRE
OPTM	OC14	OS19	Filterable PM_{10}	< 0.80	0.80	<3.50	3.50	U.S. EPA WebFIRE
OPTM	OC14	OS19	Filterable $PM_{2.5}$	<0.20	0.20	< 0.88	0.88	U.S. EPA WebFIRE/Assumed 25% of PM
PLM1	OC15	OS20	Filterable PM	< 0.34	0.34	< 1.50	1.50	Emission Factors per West Fraser Augusta application (No. 43928)
PLM1	OC15	OS20	Filterable PM_{10}	< 0.02	0.02	< 0.08	0.08	Emission Factors per West Fraser Augusta application (No. 43928)
PLM1	OC15	OS20	Filterable $PM_{2.5}$	< 0.02	0.02	< 0.08	0.08	Emission Factors per West Fraser Augusta application (No. 43928)
FWP1	N/A	OS21	NO_X	< 3.03	3.03	< 0.76	0.76	NSPS Subpart IIII Emission Limit
FWP1	N/A	OS21	VOC	< 3.03	3.03	< 0.76	0.76	NSPS Subpart IIII Emission Limit
FWP1	N/A	OS21	CO	< 3.07	3.07	< 0.77	0.77	AP-42 Section 3.3
FWP1	N/A	OS21	Filterable PM	< 0.15	0.15	< 0.04	0.04	NSPS Subpart IIII Emission Limit
FWP1	N/A	OS21	Total PM_{10}	< 1.01	1.01	< 0.25	0.25	AP-42 Section 3.3
FWP1	N/A	OS21	Total $PM_{2.5}$	< 1.01	1.01	< 0.25	0.25	AP-42 Section 3.3
FWP1	N/A	OS21	SO_2	< 0.005	< 0.005	< 0.001	0.001	AP-42 Section 3.3

FWP1	N/A	OS21	CO_2e	< 530.8	530.8	< 132.7	132.7	40 CFR Part 98

Facility Name: Interfor – Thomaston Mill **Date of Application:** July 2019

FORM 7.00 – AIR MODELING INFORMATION: Stack Data

Stack ID	Emission Unit ID(s)	Stack Information			Dimensions of largest Structure Near Stack		Exit Gas Conditions at Maximum Emission Rate			
		Height Above Grade (ft)	Inside Diameter (ft)	Exhaust Direction	Height (ft)	Longest Side (ft)	Velocity (ft/sec)	Temperature (°F)	Flow Rate (acfm) Average	Flow Rate (acfm) Maximum
OS14	OSK4	32	3.5	Vertical	N/A	N/A	34.6	327	20,000	20,000
OS15	OSK4	32	3.5	Vertical	N/A	N/A	34.6	327	20,000	20,000
DV5	OSK4	8	15.64	Horizontal	N/A	N/A	0.0033	327		
DV6	OSK4	8	15.64	Horizontal	N/A	N/A	0.0033	327		

NOTE: If emissions are not vented through a stack, describe point of discharge below and, if necessary, include an attachment. List the attachment in Form 1.00 *General Information*, Item 16.

DV5 and DV6 are the openings (doors) on the ends of the kiln. Pursuant to Section 4.1.D of the *Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions* (the Guideline), revised May 2017, the doors of the kiln may be modeled as a point source with a horizontal discharge and release height set to the midpoint of the door. Diameter shown for doors is equivalent diameter for kiln doors.

Facility Name: Interfor – Thomaston Mill **Date of Application:** July 2019

FORM 7.00 AIR MODELING INFORMATION: Chemicals Data

Chemical	Potential Emission Rate (lb/hr)	Toxicity	Reference	MSDS Attached
See application with additional information about modeling				☐
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APPENDIX D. BACT SUPPORTING CALCULATIONS

Table D-1. Emission Units Subject to BACT

Unit	Max. Production Capacity
OSK4	120.0 MMBF/yr

Table D-2. Potential Control Scenario Summary

Emission Unit	Pollutant	Control Basis	Current Potential Emissions [1]	Capture Efficiency [2]	Total Controlled Emissions Through the Stacks
OSK4	VOC	RTO	4.00 lb/MBF	80.0%	0.064 lb/MBF

1. VOC is an EPA recommended emission factor
2. Per GA Toxic Modeling Guidance (Revised May 2017), for continuous kilns with powered vents, the total air toxic emissions should be split assuming 80 percent exit through powered vents and 20 percent exit through doors. It is assumed that the portion of emissions through powered vents could be captured.

Table D-3. Cost Summary

Emission Unit	Pollutant	Technology	Control Efficiency [1] (%)	Baseline Emissions (tpy)	Capture Efficiency [2] (%)	Pollutant Removed (tpy)	Operating Cost ($/ton removed)
OSK4	VOC	RTO	98%	240.00	80.0%	188.16	$ 12,856

1. RTO control efficiency per OAQPS Manual, Section 3.2, Chapter 2.
2. Based on engineering estimate.

Table D-4. Cost Analysis Supporting Information for RTO

Parameter	Kiln 4 (OSK4)	Units	Note(s)
Maximum Production Capacity	120	MMBF/yr	
OSK4	192.00	tpy	1
Removal Efficiency	98	%	2
VOC Removed	188.16	tpy	3
Control Equip. Outlet Temperature	1,450	° F	4
Airflow	40,000	acfm	5
Airflow Capture Efficiency	50	%	7
Exhaust Temperature	129	° F	5
Air Moisture Content	13.6	%	6
Exhaust Gas Flow Rate	35,667	scfm	8
Specific Heat of Dry Air	6.85	Btu/lb-mole·°F	9
Specific Heat of Water	17.99	Btu/lb-mole·°F	9
Pressure Drop	19	inches of H_2O	10
Fan Motor Efficiency	70	%	11
Fan Electricity Usage	63.5	kW-hr	12
Energy Required From Fuel	61.49	MMBtu/hr	13
Natural Gas Heat Capacity	1,020	MMBtu/MMscf	14
Operating Labor Cost	12.0	$/hr	15
Maintenance Labor Cost	13.2	$/hr	15
Electricity Cost	0.06	$/kW-hr	16
Natural Gas Cost	3.3	$/1,000 scf	17
RTO Equipment Life	10	years	18
Interest Rate	7.0	%	18
2002 $	179.9	n/a	19
2019 $ (February)	252.8	n/a	19

1. Potential inlet emissions based on maximum capacity and emissions. VOC as terpene + methanol + formaldehyde.
2. Per OAQPS Manual, Section 3.2, Chapter 2.
3. VOC Removed (tpy) = Removal Efficiency (%) × Uncontrolled Stack Inlet Emissions (tpy).
4. Based on average operating temperature (1,400 ° F - 1,500 ° F) in EPA Fact Sheet: http://www.epa.gov/ttn/catc/dir1/fregen.pdf
5. Preliminary estimate from Interfor
6. Values based stack test performed on Bibler Brothers Lumber Company continuous lumber kiln in Russellville, AR on March 12, 2009.
7. Engineering estimate based on North Carolina Department of Environment and Natural Resources Air Permit Review for Weyerhauser's Plymouth facility's continuous kiln construction application, which estimated a 50% capture efficiency for emissions from a continuous lumber kiln.
8. Calculated based on fuel F-factor of 11,936 Btu/CF, and accounting for 18.86 percent oxygen based on information from Bibler Brothers Lumber Company March 12, 2009 stack test result and multiplied by the capture efficiency of 50%.
9. Standard value.
10. Based on example problem in OAQPS Manual, Section 3.2, Chapter 2, page 2-43.
11. Per OAQPS Manual, Section 3.2, Chapter 2, page 2-41, efficiency ranges from 40 to 70%. 70% is conservatively chosen.
12. Total Fan Electricity Usage based on Equation 2.42 of OAQPS Manual, Section 3.2, Chapter 2, page 2-41.
13. Estimated as Exhaust Gas Flow Rate, scfm *60, min/hr * Density (Air), 0.0026 lb-mole/scf * Specific Heat (Btu/lb-mole·°F) * (Outlet Temp - Exhaust Temp, °F) / 10^6, based on the sensible heat integral, Q = m Cp (T_1 - T_2), where Q is the heat required, m is the mass flow rate of the air, Cp is the specific heat of air, T_1 is the outlet temperature of the RTO, and T_2 is the exhaust temperature from the equipment. Also incorporates energy required to heat water vapor.
14. Average natural gas heating value per AP-42 Section 1.4 *Natural Gas Combustion* (July 1998).
15. Labor costs per OAQPS Manual, Section 3.1, Chapter 1, pages 1-29 and 1-37.
16. Based on OAQPS, Section 2, Chapter 3, page 3-32.
17. Based on OAQPS, Section 3.2, Chapter, 2, page 2-46
18. Based on example problem in OAQPS Manual, Section 3.2, Chapter 2, page 2-45.
19. Values based on U.S. Historical Consumer Price Index: https://www.bls.gov/regions/midwest/data/consumerpriceindexhistorical_us_table.pdf

Table D-5. Capital Cost Analysis for RTO for VOC Control

	Capital Cost	Kiln 4 (OSK4)	OAQPS Notation[1]
Purchased Equipment Costs			
OSK4	Total Equipment Cost[2]	1,754,020	A
	Instrumentation	175,402	0.10 × A
	Sales Tax	52,621	0.03 × A
	Freight	87,701	0.05 × A
Total Purchased Equipment Costs		*2,069,743*	*B = 1.18 × A*
Direct Installation Costs			
	Foundations and Supports	165,579	0.08 × B
	Handling and Erection	289,764	0.14 × B
	Electrical	82,790	0.04 × B
	Piping	41,395	0.02 × B
	Insulation	20,697	0.01 × B
	Painting	20,697	0.01 × B
	Site Preparation & Buildings	-	-
	Additional duct work	-	-
Total Direct Installation Costs		*620,923*	*C = 0.30 × B*
Indirect Installation Costs			
	Engineering	206,974	0.10 × B
	Construction and Field Expense	103,487	0.05 × B
	Contractor Fees	206,974	0.10 × B
	Start-up	41,395	0.02 × B
	Performance Test	20,697	0.01 × B
	Process Contingencies	62,092	0.03 × B
Total Indirect Installation Costs		*641,620*	*D = 0.31 × B*
Total Capital Investment ($)		**3,332,286**	**TCI = B + C + D**

1. U.S. EPA OAQPS, *EPA Air Pollution Control Cost Manual (6th Edition)* , January 2002, Section 3.2 (VOC Destruction Controls), Chapter 2 (Incinerators).
2. Capital Costs are based the EPA CATC Regenerative Incinerator Fact Sheet (EPA-452/F-03-021) average $/scfm capital cost, scaled from 2002 $ to 201

Minimum regenerative thermal oxidizer cost	35	2002 dollars/scfm
Conversion from 2002 to February 2019 dollars	1.41	February 2019 dollars per 2002 dollar
Minimum regenerative incinerator cost	49.18	February 2019 dollars/scfm

Table D-6. Operating Cost Analysis for RTO for VOC control

Operating Cost	Kiln 4 (OSK4)	OAQPS Notation[1]
Direct Annual Costs		
Operating Labor (0.5 hr, per 8-hr shift)	6,570	E
Supervisory Labor	986	F = 0.15 × E
Maintenance Labor (0.5 hr, per 8-hr shift)	7,227	G
Maintenance Materials	7,227	H = G
Electricity	33,383	I
Natural Gas	1,742,567	J
Total Direct Annual Costs	*1,797,959*	*DAC = E + F + G + H + I + J*
Indirect Annual Costs		
Overhead	13,206	K = 0.60 × (E + F + G + H)
Administrative Charges	66,646	L = 0.02 × TCI
Property Tax	33,323	M = 0.01 × TCI
Insurance	33,323	N = 0.01 × TCI
Capital Recovery[2]	474,443	O
Total Indirect Annual Costs	*620,940*	*IDAC = K + L + M + N + O*
Total Annual Cost ($)	**2,418,899**	*TAC = DAC + IDAC*
Pollutant Removed (tpy)	188.16	
Cost per ton of Pollutant Removed ($)	**12,856**	*$/ton = TAC / Pollutant Removed*

1. U.S. EPA OAQPS, *EPA Air Pollution Control Cost Manual (6th Edition)* , January 2002, Section 3.2 (VOC Destruction Controls), Chapter 2 (Incinerators).
2. Capital Recovery factor calculated based on Equation 2.8a (Section 1, Chapter 2, page 2-21) and Table 1.13 (Section 2, Chapter 1, page 1-52) of U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), January 2002.

APPENDIX E. RACT/BACT/LAER CLEARINGHOUSE DATABASE REPORTS

Table E-1. RBLC Search Results for Lumber Kilns - VOC Control

Facility Name	Company Name	State	Permit Issuance Date	Process Name	Fuel	Throughput	Throughput Units	Control Method	Emission Limit 1	Emission Limit 1 Units	Emission Limit 1 Averaging Time	Emission Limit 2	Emission Limit 2 Units	Emission Limit 2 Averaging Time
WEST FRASER-OPELIKA LUMBER MILL	WEST FRASER, INC.	AL	11/01/2013	Two(2) 87.5 MMBF/YR Continuous kilns with a 35 MMBtu/hr direct-fired wood burner	Wood Shavings	175	MMBF/YR	-	3.76	LB/MBF	-	175	K/12 MONTHS	-
WEST FRASER, INC. - MAPLESVILE MILL	WEST FRASER, INC.	AL	04/15/2013	Two(2) 100 MMBF/Y Continuous direct fired kiln	Wood Residuals	200	MMBF/YR	-	3.76	LB/MBF	-	-	-	-
THE WESTERVELT COMPANY	THE WESTERVELT COMPANY	AL	08/21/2013	Three (3) 93 MMBF/Y Continous, Dual path, indirect fired kilns	Steam (Indirect heat)	-	-	-	4.57	LB/MMBF	-	-	-	-
MILLPORT WOOD PRODUCTS FACILITY	WEYER HAEUSER NR COMPANY	AL	12/30/2014	Continuous direct-lumber dry kiln	Green sawdust	140000	mbf/yr	Proper maintenance & operating practice requirements. Test method information: Method 18/25.	4.7	LB	MBF AS WPP 1*	-	-	-
RESOLUTE FOREST PRODUCTS - ALABAMA SAWMILL	RESOLUTE FP U.S., INC.	AL	06/24/2015	Continuous Direct-Fired Lumber Dry Kilns with 35 mmbtu/hr Wood Fired Burner	Wood	108.33	mmbf/yr - each	-	3.76	LB/MBF	ROLLING 12 MONTHS	-	-	-
TWO RIVERS LUMBER CO., LLC	TWO RIVERS LUMBER CO., LLC	AL	01/03/2017	15.4 MBF/HR CDK (DPK-1) W/ 38.8 MMBTU/HR NATURAL GAS BURNER	NATURAL GAS	15.4	MBF/H	-	3.8	LB/MBF	MEASURED AS CARBON	-	-	-
TWO RIVERS LUMBER CO., LLC	TWO RIVERS LUMBER CO., LLC	AL	01/03/2017	15.4 MBF/HR CDK (DPK-2) W/ 38.8 MMBTU/HR NATURAL GAS BURNER	NATURAL GAS	15.4	MBF/H	-	3.8	LB/MBF	MEASURED AS CARBON	-	-	-

Table E-1. RBLC Search Results for Lumber Kilns - VOC Control

Facility Name	Company Name	State	Permit Issuance Date	Process Name	Fuel	Throughput	Throughput Units	Control Method	Emission Limit 1	Emission Limit 1 Units	Emission Limit 1 Averaging Time	Emission Limit 2	Emission Limit 2 Units	Emission Limit 2 Averaging Time
FULTON SAWMILL	SCOTCH GULF LUMBER, LLC	AL	06/08/2017	11.4 MBF/HR CONTINUOUS DIRECT-FIRED LUMBER DRY KILN, 40 MMBTU/HR NATURAL GAS BURNER, & 4 MMBTU/HR NATURAL GAS CONDENSATE EVAPORATOR	NATURAL GAS	11.4	MBF/H	BACT DETERMINED AS PROPER KILN OPERATION AND MAINTENANCE PRACTICES	4	LB/MBF	MBF	-	-	-
MILLPORT WOOD PRODUCTS FACILITY	WEYERHAEUSER NR COMPANY	AL	08/30/2016	THREE CONTINUOUS DIRECT-FIRED LUMBER DRY KILNS, CDK-4/X023A, CDK-5/X023B, CDK-6/X023C	WOOD-SAWDUST	385	MMBF/YR	OPERATING AND MAINTENANCE PRACTICES	4.7	LB/MBF AS WPP1	-	-	-	-
BELK CHIP-N-SAW FACILITY	GEORGIA-PACIFIC WOOD PRODUCTS LLC	AL	05/26/2016	115,000 MBF/YR CDK D (ES-006) WITH 35 MMBTU/HR WOOD-FIRED AND 7 MMBTU/HR NG-FIRED BURNERS	WOOD-SAWDUST	115	MMBF/YR	OPERATING AND MAINTANCE PRACTICES MEASURE LUMBER MOISTURE CONTENT	5.49	LB/MBF AS WPPI VOC	-	-	-	-
BELK CHIP-N-SAW FACILITY	GEORGIA-PACIFIC WOOD PRODUCTS LLC	AL	05/26/2016	115,000 MBF/YR CDK E (ES-009) WITH 35 MMBTU/HR WOOD-FIRED AND 7 MMBTU/HR NG-FIRED BURNERS	WOOD-SAWDUST	115	MMBF/YR	OPERATING AND MAINTENANCE PRACTICES LUMBER MOISTURE CONTENT MEASUREMENT	5.49	LB/MBF AS WPP1 VOC	-	-	-	-
TALLADEGA SAWMILL	GEORGIA PACIFIC WOOD PRODUCTS, LLC	AL	12/18/2017	Dry Kiln 1	natural gas	343530	MCF/hr	-	5.49	LB/MBF AS WPP1 VOC	-	-	-	-
TALLADEGA SAWMILL	GEORGIA PACIFIC WOOD PRODUCTS, LLC	AL	12/18/2017	Dry Kiln 2	Natural Gas	343530	MCF/hr	-	5.49	LB/MBF AS WPP1 VOC	-	-	-	-
TALLADEGA SAWMILL	GEORGIA PACIFIC WOOD PRODUCTS, LLC	AL	12/18/2017	Dry Kiln 3	Natural Gas	257648	MCF/hr	-	5.49	LB/MBF AS WPP1 VOC	-	-	-	-

Table E-1. RBLC Search Results for Lumber Kilns - VOC Control

Facility Name	Company Name	State	Permit Issuance Date	Process Name	Fuel	Throughput	Throughput Units	Control Method	Emission Limit 1	Emission Limit 1 Units	Emission Limit 1 Averaging Time	Emission Limit 2	Emission Limit 2 Units	Emission Limit 2 Averaging Time
COTTONTON SAWMILL	WESTROCK COATED BOARD, LLC	AL	08/05/2015	Continuous Direct-fired Lumber Dry Kiln with 34 MMBtu/hr Wood-fired burner	Biomass	16.4	MBF/hr	Good combustion practices and proper maintenance	4.21	LB/MBF	VOC AS TERPENES, M25A	-	-	-
ANTHONY TIMBERLANDS, INC.	-	AR	09/16/2009	KILN #3 INDIRECT-FIRED	NONE	200	MMBF/YR	-	3.5	LB/MBF	-	350	T/YR	-
ANTHONY TIMBERLANDS, INC.	-	AR	09/16/2009	KILN #4 INDIRECT-FIRED	NONE	200	MMBF/YR	-	3.5	LB/MBF	-	350	T/YR	-
ANTHONY TIMBERLANDS, INC.	-	AR	09/16/2009	KILN #5 INDIRECT-FIRED	NONE	200	MMBF/YR	-	3.5	LB/MBF	-	350	T/YR	-
OLA	DELTIC TIMBER CORPORATION	AR	02/11/2015	Dry Kiln No. 3 (SN-06)	None	105	MMBF/yr	-	33.3	LB/H	AVERAGE OF THREE 1-HR TEST RUNS	-	-	-
OLA	DELTIC TIMBER CORPORATION	AR	02/11/2015	Drying Kiln No. 4 (SN-12)	None	105	MMBF/yr	-	33.2	LB/H	AVERAGE OF THREE 1-HR TEST RUNS	-	-	-
OLA	DELTIC TIMBER CORPORATION	AR	02/11/2015	Drying Kiln No. 5 (SN-21)	wood residue	60	MMBF/yr	-	23.5	LB/H	AVERAGE OF THREE 1-HR TEST RUNS	-	-	-
GEORGIA-PACIFIC WOOD PRODUCTS SOUTH LLC (GURDON PLYWOOD AND	GEORGIA-PACIFIC WOOD PRODUCTS SOUTH LLC (GURDON PL	AR	02/06/2015	SN-09 #4 LUMBER KILN	NATURAL GAS	130	MILLION BOARD FEET	-	3.8	LB/ 1000 BOARD FEET	-	373.7	T/YR	
DELTIC TIMBER CORPORATION WALDO	DELTIC TIMBER CORPORATION	AR	10/18/2013	KILN NO. 3	-	-	-	PROPER KILN OPERATION	27	LB/H	-	-	-	-
DELTIC TIMBER CORPORATION WALDO	DELTIC TIMBER CORPORATION	AR	10/18/2013	KILN NO. 4	-	-	-	-	46.2	LB/H	-	-	-	-
DELTIC TIMBER CORPORATION WALDO	DELTIC TIMBER CORPORATION	AR	10/18/2013	KILN NO. 5	-	-	-	-	27	LB/H	-	-	-	-
DELTIC TIMBER CORPORATION WALDO	DELTIC TIMBER CORPORATION	AR	10/18/2013	WOOD-FIRED BOILER #1	WOOD RESIDUE	60	MMBTU/H	-	4.2	LB/H	-	18.4	T/YR	
DELTIC TIMBER CORPORATION WALDO	DELTIC TIMBER CORPORATION	AR	10/18/2013	WOOD-FIRED BOILER #2	WOOD RESIDUE	60	MMBTU/H	-	4.2	LB/H	-	18.4	T/YR	
DELTIC TIMBER CORPORATION WALDO	DELTIC TIMBER CORPORATION	AR	10/18/2013	WOOD-FIRED BOILER #3	WOOD RESIDUE	60	MMBTU/H	-	4.2	LB/H	-	18.4	T/YR	

Table E-1. RBLC Search Results for Lumber Kilns - VOC Control

Facility Name	Company Name	State	Permit Issuance Date	Process Name	Fuel	Throughput	Throughput Units	Control Method	Emission Limit 1	Emission Limit 1 Units	Emission Limit 1 Averaging Time	Emission Limit 2	Emission Limit 2 Units	Emission Limit 2 Averaging Time
EL DORADO SAWMILL	UNION COUNTY LUMBER COMPANY	AR	08/03/2015	LUMBER DRYING KILN SN-01	NATURAL GAS	45	MMBTU/H	PROPER MAINTENANCE AND OPERATION	3.8	LB/MBF	-	-	-	-
EL DORADO SAWMILL	UNION COUNTY LUMBER COMPANY	AR	08/03/2015	LUMBER DRYING KILN SN-02	NATURAL GAS	45	MMBTU/H	-	3.8	LB/MBF	-	-	-	-
EL DORADO SAWMILL	UNION COUNTY LUMBER COMPANY	AR	08/03/2015	LUMBER DRYING KILN SN-03	NATURAL GAS	45	MMBTU/H	-	3.8	LB/MBF	-	-	-	-
DELTIC TIMBER CORPORATION - OLA	DELTIC TIMBER CORPORATION	AR	10/13/2015	STEAM HEATED CONTINUOUS KILN NO. 3	-	79000	MBF/YR	PROPER DRYING SCHEDULE AND A TEMPERATURE BASED ON MOISTURE CONTENT OF THE LUMBER TO BE DRIED AND THE MANUFACTURER'S SPECIFICATIONS	33.3	LB/H	AVERAGED OVER DRYING CYCLE TIME	-	-	-
DELTIC TIMBER CORPORATION - OLA	DELTIC TIMBER CORPORATION	AR	10/13/2015	STEAM HEATED CONTINUOUS KILN NO. 4	-	79000	MBF/YR	PROPER DRYING SCHEDULE AND A TEMPERATURE BASED ON MOISTURE CONTENT OF THE LUMBER TO BE DRIED AND THE MANUFACTURER'S SPECIFICATIONS	33.3	LB/H	AVERAGED OVER DRYING CYCLE TIME	-	-	-
DELTIC TIMBER CORPORATION - OLA	DELTIC TIMBER CORPORATION	AR	10/13/2015	DIRECT-FIRED CONTINUOUS KILN NO. 5	-	79000	MBF/YR	PROPER DRYING SCHEDULE AND A TEMPERATURE BASED ON MOISTURE CONTENT OF THE LUMBER TO BE DRIED AND THE MANUFACTURER'S SPECIFICATIONS	38.2	LB/H	AVERAGED OVER DRYING CYCLE TIME	-	-	-
WEST FRASER, INC. (LEOLA LUMBER MILL)	WEST FRASER, INC.	AR	08/05/2013	LUMBER KILN, CONTINUOUS, INDIRECT	-	275	MMBF/YR	-	3.5	LB/MBF	-	481.3	T/YR	-
CADDO RIVER LLC	CADDO RIVER LLC	AR	02/08/2017	CONTINUOUS LUMBER DRYING KILNS	WOOD	116000000	BOARD FEET	-	53.2	LB/H	-	220.4	T/YR	12 MONTH ROLLING TOTAL
WEST FRASER, INC.	WEST FRASER, INC.	AR	09/14/2017	SN-22gx START UP ABORT STACK	WOOD	30	MMBTU/HR	Good Combustion Practice	0.017	LB/MMBTU	-	0.2	LB/HR	-
WEST FRASER, INC.	WEST FRASER, INC.	AR	09/14/2017	22	wood	-	-	-	3.8	LB/MMBOARD FEET	-	63.6	LB/HR	-
ANTHONY FOREST PRODUCTS COMPANY, LLC	ANTHONY FOREST PRODUCTS COMPANY, LLC	AR	10/02/2017	Dual Path Kiln #3	sawdust	31.5	MMBtu/hr	-	3.8	LB/MBF	-	-	-	-

Table E-1. RBLC Search Results for Lumber Kilns - VOC Control

Facility Name	Company Name	State	Permit Issuance Date	Process Name	Fuel	Throughput	Throughput Units	Control Method	Emission Limit 1	Emission Limit 1 Units	Emission Limit 1 Averaging Time	Emission Limit 2	Emission Limit 2 Units	Emission Limit 2 Averaging Time
CADDO RIVER LLC	CADDO RIVER LLC	AR	01/29/2018	Dual Path Kiln # 3	Wood	185000	MBF	-	3.8	LB/MBF	-	53.2	LB/HR	-
CADDO RIVER LLC	CADDO RIVER LLC	AR	01/29/2018	DPK # 3 Abort Stack	Wood	2000	lb	-	0.017	LB/MMBTU	-	0.2	LB/HR	-
INTERFOR U.S. INC	INTERFOR U.S. INC	AR	06/29/2018	Convert Kiln #2 to continuous operation	sawdust	209014	MBF/yr	-	3.8	LB/MBF	-	-	-	-
ANTHONY TIMBERLANDS, INC	ANTHONY TIMBERLANDS, INC	AR	08/02/2018	Continuos Drying Kiln	-	200	MMBF	-	36.8	LB/HR VOC	-	350	TPY VOC	-
POTLATCHDELTIC MANUFACTURING L.L.C. -WALDO MILL	POTLATCHDELTIC MANUFACTURING L.L.C.	AR	11/29/2018	Continuous Drying Kilns	-	300	MMBF	-	3.5	LB/MBF	-	543.2	T/YR	-
POTLATCHDELTIC LAND AND LUMBER, LLC - WARREN LUMBER MILL	POTLATCHDELTIC LAND & LUMBER, LLC	AR	01/03/2019	Continuous Drying Kilns	-	360	MMBF	-	3.5	LB/MBF	-	630	T/YR	-
NORTH FLORIDA LUMBER/BRISTOL SAW MILL	NORTH FLORIDA LUMBER	FL	08/04/2009	Wood lumber kiln	steam heated	92000000	board-f lumber/yr	Best operating practices: 1) minimize over-drying lumber; 2) maintain consistent moisture content for processed lumber charge; and 3) dry at the minimum temperature.	116.93	T/YR	-	-	-	-

Table E-1. RBLC Search Results for Lumber Kilns - VOC Control

Facility Name	Company Name	State	Permit Issuance Date	Process Name	Fuel	Throughput	Throughput Units	Control Method	Emission Limit 1	Emission Limit 1 Units	Emission Limit 1 Averaging Time	Emission Limit 2	Emission Limit 2 Units	Emission Limit 2 Averaging Time
PERRY MILL	GILMAN BUILDING PRODUCTS	FL	04/01/2014	Direct-fired lumber drying kiln	Waste wood	90	million board ft/yr	At a minimum, the permittee shall operate the kiln in accordance with the following best operating practices (BMP). a. Minimize over-drying the lumber; b. Maintain consistent moisture content for the processing lumber charge; and c. Dry at the minimum temperature. The permittee shall develop and operate in accordance with a written plan to implement the above BMP and any others required by the kiln manufacturer. Ninety days before the initial startup of the kiln, the permitted shall submit to the Compliance Authority the BMP plan. The Title V air operation permit shall include the submitted BMP plan.	3.5	LB/THOUSAND BOARD FT	-	-	-	-

Table E-1. RBLC Search Results for Lumber Kilns - VOC Control

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WHITEHOUSE LUMBER MILL	WEST FRASER, INC	FL	09/09/2014	Direct-Fired Continuous Kilns	Wood waste	40	MMBTU/H	Proper Maintenance and Operating Procedures: Minimize over-drying the lumber. Maintain consistent moisture content for the processing lumber charge. Dry the lumber at the minimum temperature. Develop a written Operation and Maintenance (O&M) plan identifying the above practices and the operation and maintenance requirements from the kiln manufacturer. Record and monitor the total monthly amount and 12-month annual total of wood dried in each kiln (board-feet). Record the calculated monthly and 12-month annual total emissions of VOC to demonstrate compliance with the process and emissions limits.	3.76	LB/THOUSAND BOARD FT	-	-	-	-
GRACEVILLE LUMBER MILL	REX LUMBER, LLC	FL	07/14/2016	Direct-fired continuous lumber drying Kiln No. 5	Sawdust	110000	Thousand bf/yr	Lumber moisture used as proxy for VOC emissions -- product that is over dried likely means more VOC driven off and emitted	3.5	LB/THOUSAND BF	-	-	-	-
PERRY MILL	GILMAN BUILDING PRODUCTS, LLC	FL	04/11/2017	Direct-Fired Batch Lumber Drying Kiln No. 5	Waste wood	50000	MMBF per year	Minimization of over-drying	3.5	LB/MBF	-	-	-	-
SIMPSON LUMBER CO, LLC MELDRIM OPERATIONS	SIMPSON LUMBER CO.	GA	04/25/2012	KILN 3	WASTE WOOD	65000000	BF/YR	PROPER MAINTENANCE AND OPERATION	3.83	LB/MBF	DAILY	-	-	-

Table E-1. RBLC Search Results for Lumber Kilns - VOC Control

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SIMPSON LUMBER CO, LLC MELDRIM OPERATIONS	SIMPSON LUMBER CO.	GA	04/25/2012	KILN 4	WASTE WOOD	73000000	BF/YR	PROPER MAINTENANCE AND OPERATION	3.93	LB/MBF	DAILY	-	-	-
JOYCE MILL	WEST FRASER TIMBER COMPANY, LTD	LA	08/16/2011	Lumber kilns	-	300	million board feet/yr	properly design and operation	930	T/YR	-	-	-	-
SOUTHWEST LOUISIANA LUMBER OPERATIONS	TIN INC. DBA TEMPLE-INLAND	LA	01/31/2014	EP-3K -Wood-Fired Dry Kiln No. 1	Wood	60000	MBF/YR	Proper kiln design & operation; annual production limit	29.27	LB/H	HOURLY MAXIMUM	2.96	LB/M BF	WHEN DRYING LUMBER
SOUTHWEST LOUISIANA LUMBER OPERATIONS	TIN INC. DBA TEMPLE-INLAND	LA	01/31/2014	EP-4K â€" Wood-Fired Dry Kiln No. 2	Wood	60000	MBF/YR	Proper kiln design & operation; annual production limit	29.27	LB/H	HOURLY MAXIMUM	2.96	LB/M BF	WHEN DRYING LUMBER
SOUTHWEST LOUISIANA LUMBER OPERATIONS	TIN INC. DBA TEMPLE-INLAND	LA	01/31/2014	EP-5K â€" Wood-Fired Dry Kiln No. 3	Wood	60000	MBF/YR	Proper kiln design & operation; annual production limit	29.27	LB/H	HOURLY MAXIMUM	2.96	LB/M BF	WHEN DRYING LUMBER
SOUTHWEST LOUISIANA LUMBER OPERATIONS	TIN INC. DBA TEMPLE-INLAND	LA	01/31/2014	EP-6K â€" Wood-Fired Dry Kiln No. 4	Wood	60000	MBF/YR	Proper kiln design & operation; annual production limit	29.27	LB/H	HOURLY MAXIMUM	2.96	LB/M BF	WHEN DRYING LUMBER
CHOPIN MILL	MARTCO LIMITED PARTNERSHIP	LA	03/18/2014	Lumber Dry Kilns Nos. 1 & 2 (EQT 37 & 38)	-	25000	M BD-FT/YR	Good operating practices to limit VOC emissions to 4.29 lb/M bd-ft (12-month rolling average).	24.51	LB/H	HOURLY MAXIMUM	53.68	T/YR	ANNUAL MAXIMUM*
DODSON DIVISION	WEYERHAEUSER NR COMPANY	LA	12/30/2013	Dry Kiln 1 (033, EQT 15)	-	14	M BD-FT/H	Good operating practices, including proper design, operation, and maintenance	79.4	LB/H	HOURLY MAXIMUM	481.37	T/YR	ANNUAL MAXIMUM*
DODSON DIVISION	WEYERHAEUSER NR COMPANY	LA	12/30/2013	Dry Kiln 2 (034, EQT 16)	-	14	M BD-FT/H	Good operating practices, including proper design, operation, and maintenance	79.4	LB/H	HOURLY MAXIMUM	481.37	T/YR	ANNUAL MAXIMUM*

Table E-1. RBLC Search Results for Lumber Kilns - VOC Control

Facility Name	Company Name	State	Permit Issuance Date	Process Name	Fuel	Throughput	Throughput Units	Control Method	Emission Limit 1	Emission Limit 1 Units	Emission Limit 1 Averaging Time	Emission Limit 2	Emission Limit 2 Units	Emission Limit 2 Averaging Time
DODSON DIVISION	WEYERHAEUSER NR COMPANY	LA	12/30/2013	Dry Kiln 3 (035, EQT 17)	-	16	M BD-FT/H	Good operating practices, including proper design, operation, and maintenance	90.74	LB/H	HOURLY MAXIMUM	481.37	T/YR	ANNUAL MAXIMUM*
DODSON DIVISION	WEYERHAEUSER NR COMPANY	LA	12/30/2013	Dry Kiln 4 (051, EQT 32)	-	16	M BD-FT/H	Good operating practices, including proper design, operation, and maintenance	90.74	LB/H	HOURLY MAX (SEE NOTE KILN NOT BUILT)	481.37	T/YR	ANNUAL MAX*(SEE NOTE KILN NOT BUILT)
NEW SOUTH COMPANIES, INC. - CONWAY PLANT	NEW SOUTH COMPANIES, INC.	SC	09/24/2012	LUMBER KILNS	-	380.56	MMBD-FT/YR	PROPER MAINTENANCE AND OPERATION	799.18	T/YR	-	4.2	LB/MBF	AS TOTAL VOC
SIMPSON LUMBER COMPANY, LLC	SIMPSON LUMBER COMPANY, LLC	SC	08/29/2012	DIRECT-FIRED LUMBER DRYING KILN NO. 4	DRY WOOD WASTE	34	MMBTU/H	WORK PRACTICE STANDARDS	104	T/YR	-	3.8	LB/MBF	-
ELLIOTT SAWMILLING COMPANY	ELLIOTT SAWMILLING COMPANY	SC	04/14/2009	DIRECT FIRED LUMBER DRYING KILN NO.5	SAWDUST	35	MMBTU/H	WORK PRACTICE STANDARDS	119	T/YR	-	4.5	LB/MBF	-
KLAUSNER HOLDING USA, INC	KLAUSNER HOLDING USA, INC	SC	01/03/2013	LUMBER DRYING KILNS EU007	-	700	MILLION BOARD FOOT PER YEAR	-	3.5	LB/MBF	-	-	-	-
WEST FRASER - NEWBERRY LUMBER MILL	WEST FRASER TIMBER CO. LTD	SC	04/30/2013	TWO - 35 MMBTU/H DUAL PATH, DIRECT FIRED, CONTINUOUS LUMBER KILNS, 15 THOUSAND BF/H, EACH	SAWDUST	-	-	PROPER OPERATION AND GOOD OPERATING PRACTICES	3.76	LB/MBF	-	376	T/YR	-
NEW SOUTH LUMBER COMPANY, INC. DARLINGTON PLANT	NEW SOUTH LUMBER COMPANY, INC.	SC	06/18/2013	DKN1	STEAM HEATED	60	MMBF/YR	PROPER OPERATION AND MAINTENANCE	343.98	T/YR	-	0		-

Table E-1. RBLC Search Results for Lumber Kilns - VOC Control

Facility Name	Company Name	State	Permit Issuance Date	Process Name	Fuel	Throughput	Throughput Units	Control Method	Emission Limit 1	Emission Limit 1 Units	Emission Limit 1 Averaging Time	Emission Limit 2	Emission Limit 2 Units	Emission Limit 2 Averaging Time
NEW SOUTH LUMBER COMPANY, INC. DARLINGTON PLANT	NEW SOUTH LUMBER COMPANY, INC.	SC	06/18/2013	DKN4	STEAM HEATED	60	MMBF/YR	MAINTENACE AND OPERATING PRACTICES	343.98	T/YR	-	0		-
NEW SOUTH LUMBER COMPANY, INC. DARLINGTON PLANT	NEW SOUTH LUMBER COMPANY, INC.	SC	06/18/2013	DKN5	WOOD WASTE	75	MMBF/YR	PROPER MAINTENANCE AND OPERATION	141	T/YR	-	0		-
KAPSTONE CHARLESTON KRAFT LLC-SUMMERVILLE	KAPSTONE CHARLESTON KRAFT LLC	SC	01/20/2015	LUMBER KILNS	-	194.83	MMBF/YR	PROPER MAINTENANCE AND OPERATION	225.6	T/YR	-	3.76	LB/MBF	-
SIMPSON LUMBER COMPANY, LLC	SIMPSON LUMBER COMPANY, LLC	SC	06/20/2014	LUMBER KILNS	-	166	MMBF/YR	PROPER OPERATION AND MAINTENANCE	156	T/YR	-	3.76	LB/MBF	-
NEW SOUTH COMPANIES, INC. - CONWAY PLANT	NEW SOUTH COMPANIES, INC.	SC	10/15/2014	LUMBER KILNS	-	295.6	MMBF/YR	PROPER MAINTENANCE AND OPERATION	602	T/YR	(442 T/YR KILNS 1-5, 160 T/YR KILN 6)	4.2	LB/MBF	-
NEW SOUTH LUMBER COMPANY - DARLINGTON INC.	NEW SOUTH LUMBER COMPANY - DARLINGTON INC.	SC	01/26/2016	TWO KILNS - KLN5 AND KLN6	GREEN SAWDUST	85	MILLION BD-FT/YR	PROPER OPERATION AND MAINTENANCE	-	-	-	-	-	-
CAMDEN PLANT	NEW SOUTH LUMBER COMPANY, INC.	SC	06/18/2014	DKN6 - DIRECT FIRED CONTINUOUS LUMBER DRYING KILN	WOOD	80	MMBD-FT/YR	-	150.4	T/YR	-	-	-	-
GEORGIA PACIFIC - MCCORMICK SAWMILL	GEORGIA PACIFIC WOOD PRODUCTS LLC	SC	10/27/2016	Direct fired continuous lumber kiln	Wood Fired	26	MMBTU/HR	-	-	-	-	-	-	-
ELLIOTT SAWMILLING COMPANY, INC.	ELLIOTT SAWMILLING COMPANY, INC.	SC	06/10/2014	Batch Drying Lumber Kiln No. 5	wood	53	MM BF/YR	-	3.76	LB/M BF	TERPENE + METHANOL + FORMALDEHYDE	99.64	T/YR	-

Table E-1. RBLC Search Results for Lumber Kilns - VOC Control

Facility Name	Company Name	State	Permit Issuance Date	Process Name	Fuel	Throughput	Throughput Units	Control Method	Emission Limit 1	Emission Limit 1 Units	Emission Limit 1 Averaging Time	Emission Limit 2	Emission Limit 2 Units	Emission Limit 2 Averaging Time
RESOLUTE FP US INC. - CATAWBA LUMBER MILL	RESOLUTE FP US INC.	SC	11/03/2017	3 Continuous Direct-Fired Lumber Kilns, CDK1, CDK2, CDK3	green sawdust	104.17	MM BF/YR	-	5.82	LB/M BF	VOC AS TERPENE+METHANOL+FORMALDEHYDE	-	-	-
TEMPLE INLAND PINELAND MANUFACTURING COMPLEX	TIN INC	TX	08/12/2011	Dry studmill kilns 1 and 2	wood	156000	boardfeet per charge	good operating practice and maintenance	2.49	LB VOC/1000 BOARDFEE	-	-	-	-
LUMBER MILL	WEST FRASER, INC.	TX	12/15/2011	Continuous lumber kilns (2)	wood	275	MMBF/YR	proper temperature and process management; drying to appropriate moisture content	3.5	LB/MBF	-	-	-	-
LUMBER MILL	WEST FRASER WOOD PRODUCTS	TX	06/15/2018	Kilns (EPNs CK01 and CK02)	-	25	MBF/KILN	Proper design and operation	3.38	LB / DBF	-	-	-	-

Table E-2. RBLC Search Results for Small Emergency Engines - VOC Control

Facility Name	Company Name	State	Permit Issuance Date	Process Name	Fuel	Throughput	Throughput Units	Control Method	Emission Limit 1	Emission Limit 1 Units	Emission Limit 1 Averaging Time	Emission Limit 2	Emission Limit 2 Units	Emission Limit 2 Averaging Time
IOWA FERTILIZER COMPANY	IOWA FERTILIZER COMPANY	IA	10/26/2012	Fire Pump	diesel fuel	14	GAL/H	good combustion practices	0.25	G/KW-H	AVERAGE OF 3 STACK TEST RUNS	0.03	TONS/YR	ROLLING 12 MONTH TOTAL
LANGLEY GULCH POWER PLANT	IDAHO POWER COMPANY	ID	06/25/2010	FIRE PUMP ENGINE	DIESEL	235	KW	TIER 3 ENGINE-BASED, GOOD COMBUSTION PRACTICES (GCP)	4	G/KW-H	NOX+NMHC	-	-	-
CRONUS CHEMICALS, LLC	CRONUS CHEMICALS, LLC	IL	09/05/2014	Firewater Pump Engine	distillate fuel oil	373	hp	Tier IV standards for non-road engines at 40 CFR 1039.102, Table 7.	0.4	G/KW-H	-	-	-	-
ST. JOSEPH ENEGRY CENTER, LLC	ST. JOSEPH ENERGY CENTER, LLC	IN	12/03/2012	TWO (2) FIREWATER PUMP DIESEL ENGINES	DIESEL	371	BHP, EACH	COMBUSTION DESIGN CONTROLS AND USAGE LIMITS	0.16	LB/H	-	500	HOURS OF OPERATION	YEARLY
OHIO VALLEY RESOURCES, LLC	OHIO VALLEY RESOURCES, LLC	IN	09/25/2013	DIESEL-FIRED EMERGENCY WATER PUMP	NO. 2 FUEL OIL	481	BHP	GOOD COMBUSTION PRACTICES	0.141	G/B-HP-H	3-HR AVERAGE	-	-	-
GRAIN PROCESSING CORPORATION	GRAIN PROCESSING CORPORATION	IN	12/08/2015	EMERGENCY FIRE PUMP ENGINE	DISTILLATE OIL	-	-	GOOD COMBUSTION PRACTICES	0.05	G/HP-H	-	-	-	-
STEEL DYNAMICS, INC. - ENGINEERED BAR PRODUCTS DIVISION	STEEL DYNAMICS, INC. - ENGINEERED BAR PRODUCTS DIV	IN	02/23/2018	Emergency Diesel Generators	Deisel	150	hp	-	1.134	G/HP-HR	-	0.0025	LB/HP-HR	-
STEEL DYNAMICS, INC. - ENGINEERED BAR PRODUCTS DIVISION	STEEL DYNAMICS, INC. - ENGINEERED BAR PRODUCTS DIV	IN	02/23/2018	Emergency Diesel Generators	Diesel	250	hp	-	1.134	G/HP-HR	-	0.0025	LB/HP-HR	-
MID-KANSAS ELECTRIC COMPANY, LLC - RUBART STATION	MID-KANSAS ELECTRIC COMPANY, LLC - RUBART STATION	KS	03/31/2016	Compression ignition RICE emergency fire pump	Ultra-lowsulfur diesel (ULSD)	197	HP	-	1.14	G/HP-HR	EXCLUDES STARTUP, SHUTDOWN & MALFUNCTION	-	-	-
WESTAR ENERGY - EMPORIA ENERGY CENTER	WESTAR ENERGY	KS	03/18/2013	Cummins 6BTA 5.9F-1 Diesel Engine Fire Pump	No. 2 Fuel Oil	182	BHP	utilize efficient combustion/design technology	0.77	G/BHP-H	-	-	-	-
NINEMILE POINT ELECTRIC GENERATING PLANT	ENTERGY LOUISIANA LLC	LA	08/16/2011	EMERGENCY FIRE PUMP	DIESEL	350	HP	ULTRA LOW SULFUR DIESEL AND GOOD COMBUSTION PRACTICES	1	G/HP-H	ANNUAL AVERAGE	-	-	-

Table E-2. RBLC Search Results for Small Emergency Engines - VOC Control

Facility Name	Company Name	State	Permit Issuance Date	Process Name	Fuel	Throughput	Throughput Units	Control Method	Emission Limit 1	Emission Limit 1 Units	Emission Limit 1 Averaging Time	Emission Limit 2	Emission Limit 2 Units	Emission Limit 2 Averaging Time
LAKE CHARLES CHEMICAL COMPLEX ETHYLENE 2 UNIT	SASOL CHEMICALS (USA) LLC	LA	05/23/2014	Firewater Pump Nos. 1-3 (EQTs 997, 998, & 999)	Diesel	500	HP	Compliance with 40 CFR 60 Subpart IIII and operating the engine in accordance with the engine manufacturer's instructions and/or written procedures (consistent with safe operation) designed to maximize combustion efficiency and minimize fuel usage	0.1	LB/HR	HOURLY MAXIMUM	0.005	TPY	ANNUAL MAXIMUM
BENTELER STEEL TUBE FACILITY	BENTELER STEEL / TUBE MANUFACTURING CORPORATION	LA	06/04/2015	Firewater Pump Engines	Diesel	288	hp (each)	Complying with 40 CFR 60 Subpart IIII	-	-	-	-	-	-
ST. CHARLES POWER STATION	ENTERGY LOUISIANA, LLC	LA	08/31/2016	SCPS Emergency Diesel Firewater Pump 1	Diesel	282	HP	Good combustion practices	1.87	LB/H	HOURLY MAXIMUM	0.47	T/YR	ANNUAL MAXIMUM
INDORAMA LAKE CHARLES FACILITY	INDORAMA VENTURES OLEFINS, LLC	LA	08/03/2016	Diesel Firewater pump engines (6 units)	diesel	425	hp	complying with 40 CFR 63 subpart ZZZZ	-	-	-	-	-	-
INDORAMA LAKE CHARLES FACILITY	INDORAMA VENTURES OLEFINS, LLC	LA	08/03/2016	Diesel emergency generator engine - EGEN	diesel	350	hp	complying with 40 CFR 63 subpart ZZZZ	-	-	-	-	-	-
CAMERON LNG FACILITY	CAMERON LNG LLC	LA	02/17/2017	firewater pump engines (8 units)	diesel	460	hp	Complying with 40 CFR 60 Subpart IIII	-	-	-	-	-	-
PLAQUEMINES PLANT 1	SHINTECH LOUISIANA, LLC	LA	05/02/2018	Emergency Diesel Engine Pump P-39A	Diesel Fuel	375	HP	Good combustion practices and NSPS Subpart IIII	4	G/KW-H	-	-	-	-
PLAQUEMINES PLANT 1	SHINTECH LOUISIANA, LLC	LA	05/02/2018	Emergency Diesel Engine Pump P-39B	Diesel Fuel	300	HP	Good combustion practices and NSPS Subpart IIII	4	G/KW-H	-	-	-	-
CPV ST. CHARLES	CPV MARYLAND, LLC	MD	04/23/2014	EMERGENCY GENERATOR	ULTRA-LOW SULFUR DIESEL	1500	KW	EXCLUSIVE USE OF ULSD FUEL, GOOD COMBUSTION PRACTICES, AND LIMITING THE HOURS OF OPERATION	4.8	LB/MMBTU	N/A	-	-	-
COVE POINT LNG TERMINAL	DOMINION COVE POINT LNG, LP	MD	06/09/2014	5 EMERGENCY FIRE WATER PUMP ENGINES	ULTRA LOW SULFUR DIESEL	350	HP	USE ONLY ULSD, GOOD COMBUSTION PRACTICES, AND DESIGNED TO ACHIEVE EMISSION LIMIT	3	G/HP-H	NOX + NMHC	4	G/KW-H	NOX + NMHC

Table E-2. RBLC Search Results for Small Emergency Engines - VOC Control

Facility Name	Company Name	State	Permit Issuance Date	Process Name	Fuel	Throughput	Throughput Units	Control Method	Emission Limit 1	Emission Limit 1 Units	Emission Limit 1 Averaging Time	Emission Limit 2	Emission Limit 2 Units	Emission Limit 2 Averaging Time
THETFORD GENERATING STATION	CONSUMERS ENERGY COMPANY	MI	07/25/2013	EU-FPENGINE: Diesel fuel fired emergency backup fire pump	diesel fuel	315	hp nameplate	Proper combustion design and ultra low sulfur diesel fuel.	-	-	-	-	-	-
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	HOLLAND BOARD OF PUBLIC WORKS	MI	12/04/2013	Emergency Engine --Diesel Fire Pump (EUFPENGINE)	Diesel	165	HP	Good combustion practices	0.001	LB/H	TEST PROTOCOL	-	-	-
INDECK NILES, LLC	INDECK NILES, LLC	MI	01/04/2017	EUFPENGINE (Emergency engine--diesel fire pump)	Diesel	1.66	MMBTU/H	Good combustion practices	0.64	LB/H	TEST PROTOCOL WILL SPECIFY AVG TIME	-	-	-
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	HOLLAND BOARD OF PUBLIC WORKS	MI	12/05/2016	EUFPENGINE (Emergency engine--diesel fire pump)	diesel	500	H/YR	Good combustion practices	0.47	LB/H	TEST PROTOCOL WILL SPECIFY AVG TIME	-	-	-
MEC NORTH, LLC AND MEC SOUTH LLC	MARSHALL ENERGY CENTER LLC	MI	06/29/2018	EUFPENGINE (South Plant): Fire pump engine	Diesel	300	HP	Good combustion practices.	0.75	LB/H	HOURLY	-	-	-
MEC NORTH, LLC AND MEC SOUTH LLC	MARSHALL ENERGY CENTER LLC	MI	06/29/2018	EUFPENGINE (North Plant): Fire pump engine	Diesel	300	HP	Good combustion practices	0.75	LB/H	HOURLY	-	-	-
BELLE RIVER COMBINED CYCLE POWER PLANT	DTE ELECTRIC COMPANY	MI	07/16/2018	EUFPENGINE: Fire pump engine	Diesel	399	BHP	State of the art combustion design.	0.13	LB/H	HOURLY	-	-	-
EMBERCLEAR GTL MS	EMBERCLEAR GTL MS LLC	MS	05/08/2014	firewater pumps, diesel	diesel	325	HP, EACH	-	-	-	-	-	-	-
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	03/07/2014	Emergency diesel fire pump	Ultra Low Sulfur Distillate oil	-	-	-	0.119	LB/H	-	-	-	-
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	03/10/2016	Emergency Diesel Fire Pump	ULSD	100	H/YR	use of ULSD a clean burning fuel, and limited hours of operation	0.1	LB/H	-	-	-	-

Table E-2. RBLC Search Results for Small Emergency Engines - VOC Control

Facility Name	Company Name	State	Permit Issuance Date	Process Name	Fuel	Throughput	Throughput Units	Control Method	Emission Limit 1	Emission Limit 1 Units	Emission Limit 1 Averaging Time	Emission Limit 2	Emission Limit 2 Units	Emission Limit 2 Averaging Time
MIDDLESEX ENERGY CENTER, LLC	STONEGATE POWER, LLC	NJ	07/19/2016	EMERGENCY GENERATOR DIESEL	DIESEL OIL	-	100 H/YR	Use of Ultra Low Sulfur Diesel (ULSD) Oil a clean burning fuel and limited hours of operation	0.557	LB/H	-	-	-	-
MIDDLESEX ENERGY CENTER, LLC	STONEGATE POWER, LLC	NJ	07/19/2016	EMERGENCY DIESEL FIRE PUMP	ULSD	100	H/YR	Use of Ultra Low Sulfur Diesel (ULSD) Oil a clean burning fuel and limited hours of operation	0.117	LB/H	-	-	-	-
CRICKET VALLEY ENERGY CENTER	CRICKET VALLEY ENERGY CENTER LLC	NY	02/03/2016	Emergency fire pump	ultra low sulfur diesel	460	hp	Compliance demonstrated with vendor emission certification and adherence to vendor-specified maintenance recommendations.	0.1	G/BHP-H	1 H	-	-	-
CPV VALLEY ENERGY CENTER	CPV VALLEY LLC	NY	08/01/2013	Fire pump	ultra low sulfur diesel	-	-	Good combustion practice.	0.3612	LB/MMBTU	1 H	-	-	-
OREGON CLEAN ENERGY CENTER	ARCADIS, US, INC.	OH	06/18/2013	Emergency fire pump engine	diesel	300	HP	Purchased certified to the standards in NSPS Subpart IIII	0.25	LB/H	-	0.06	T/YR	PER ROLLING 12-MONTHS
CARROLL COUNTY ENERGY	CARROLL COUNTY ENERGY	OH	11/05/2013	Emergency fire pump engine (P004)	diesel	400	HP	Purchased certified to the standards in NSPS Subpart IIII	0.325	LB/H	-	0.08	T/YR	PER ROLLING 12 MONTH PERIOD
CHOUTEAU POWER PLANT	ASSOCIATED ELECTRIC COOPERATIVE INC	OK	01/23/2009	EMERGENCY FIRE PUMP (267-HP DIESEL)	LOW SULFUR DIESEL	267	HP	GOOD COMBUSTION	0.66	LB/H	-	-	-	-
MIDWEST CITY AIR DEPOT	TINKER AIR FORCE BASE LOGISTICS CENTER	OK	01/08/2015	Diesel-Fueled Fire Pump Engines	Ultra-Low Sulfur Distillate Fuel	300	HP	1. Good Combustion Practices.	0.15	GRAMS PER HP-HR	TOTAL FOR 3 ENGINES.	-	-	-
WILDHORSE TERMINAL	WILDHORSE TERMINAL LLC	OK	06/29/2017	Emergency Use Engine less than or equal to 500 HP	Diesel	-	-	Good combustion practices, certified to meet EPA Tier 3 engine standards. Gen-1, FP-1, and FP-2 shall be limited to operate no more than 500 hr/yr.	3	GM/HP-HR	-	-	-	-

Table E-2. RBLC Search Results for Small Emergency Engines - VOC Control

Facility Name	Company Name	State	Permit Issuance Date	Process Name	Fuel	Throughput	Throughput Units	Control Method	Emission Limit 1	Emission Limit 1 Units	Emission Limit 1 Averaging Time	Emission Limit 2	Emission Limit 2 Units	Emission Limit 2 Averaging Time
BPV GATHERING AND MARKETING CUSHING STATION	BPV GATHERING AND MARKETING LLC	OK	07/19/2017	Emergency Generator	Diesel	400	HP	Equipped with non-resettable hour meter. Fired with ultra-low sulfur diesel fuel (0.015 % or less by wt. sulfur.	217.24	TONS/YEAR/F ACILITY	12-MONTH	-	-	-
MOXIE LIBERTY LLC/ASYLUM POWER PL T	MOXIE ENERGY LLC	PA	10/10/2012	Fire Pump	Diesel	-	-	-	0.1	G/B-HP-H	-	0.1	LB/H	-
MOXIE ENERGY LLC/PATRIOT GENERATION PLT	MOXIE ENERGY LLC	PA	01/31/2013	Fire Pump Engine - 460 BHP	Diesel	-	-	-	0.1	G/HP-H	-	0.1	LB/H	-
HICKORY RUN ENERGY STATION	HICKORY RUN ENERGY LLC	PA	04/23/2013	EMERGENCY FIREWATER PUMP	ULTRA LOW SULFUR DISTILLATE	3.25	MMBTU/H	-	1.11	LB/H	-	0.06	T/YR	A 12-MONTH ROLLING TOTAL
BERKS HOLLOW ENERGY ASSOC LLC/ONTELAUNE E	BERKS HOLLOW ENERGY ASSOC LLC	PA	12/17/2013	Emergency Firewater Pump	Diesel	16	Gal/hr	-	0.013	T/YR	BASED ON 12-MONTH ROLLING TOTAL	-	-	-
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA ENERGY CENTER, LLC	PA	12/23/2015	Fire pump engine	Ultra-low sulfur diesel	15	gal/hr	-	0.12	GM/HP-HR	-	0.002	TONS	12-MONTH ROLLING BASIS
ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	ENERGY ANSWERS ARECIBO, LLC	PR	04/10/2014	Emergency Diesel Fire Pump	ULSD Fuel Oil #2	-	-	-	0.15	G/B-HP-H	-	0.11	LB/H	-
PYRAMAX CERAMICS, LLC	PYRAMAX CERAMICS, LLC	SC	02/08/2012	EMERGENCY ENGINE 1 THRU 8	DIESEL	29	HP	PURCHASE OF CERTIFIED ENGINES. HOURS OF OPERATION LIMITED TO 100 HOURS FOR MAINTENANCE AND TESTING.	7.5	GR/KW-H	-	-	-	-

Table E-2. RBLC Search Results for Small Emergency Engines - VOC Control

Facility Name	Company Name	State	Permit Issuance Date	Process Name	Fuel	Throughput	Throughput Units	Control Method	Emission Limit 1	Emission Limit 1 Units	Emission Limit 1 Averaging Time	Emission Limit 2	Emission Limit 2 Units	Emission Limit 2 Averaging Time
PYRAMAX CERAMICS, LLC	PYRAMAX CERAMICS, LLC	SC	02/08/2012	FIRE PUMP	DIESEL	500	HP	CERTIFIED ENGINES THAT COMPLY WITH NSPS, SUBPART IIII. HOURS OF OPERATION LIMITED TO 100 HOURS PER YEAR FOR MAINTENANCE AND TESTING.	4	GR/KW-H	-	-	-	-
US10 FACILITY	MICHELIN NORTH AMERICA, INC.	SC	07/09/2012	FIRE PUMPS, FIRE1, FIRE2, FIRE3	DIESEL	211	KW	BACT HAS BEEN DETERMINED TO BE COMPLIANCE WITH NSPS, SUBPART IIII, 40 CFR60.4202 AND 40 CFR60.4205.	4	GKW-H	-	-	-	-
NATURAL GAS FRACTIONATION	OCCIDENTAL CHEMICAL CORPORATION	TX	01/23/2014	Emergency Engines	Ultra-low sulfur diesel	-	-	-	0.03	TPY	-	-	-	-
BEAUMONT TERMINAL	PHILLIPS 66 PIPELINE LLC	TX	06/08/2016	EMERGENCY ENGINES	diesel	-	-	Equipment specifications and good combustion practices. Operation limited to 100 hours per year.	0.0025	LB/HP-HR	-	-	-	-
MOTOR VEHICLE ASSEMBLY PLANT	TOYOTA MOTORS	TX	09/23/2018	FIRE PUMP DIESEL ENGINE	NO 2 DIESEL	214	kW	Meets EPA Tier 4 requirements	0.19	G/KW	HR	-	-	-
GREENSVILLE POWER STATION	VIRGINIA ELECTRIC AND POWER COMPANY	VA	06/17/2016	DIESEL-FIRED WATER PUMP 376 bph (1)	DIESEL FUEL	-	-	Good Combustion Practices/Maintenance	3	G/HP-H	PER HR	-	-	-

Table E-2. RBLC Search Results for Small Emergency Engines - VOC Control

Facility Name	Company Name	State	Permit Issuance Date	Process Name	Fuel	Throughput	Throughput Units	Control Method	Emission Limit 1	Emission Limit 1 Units	Emission Limit 1 Averaging Time	Emission Limit 2	Emission Limit 2 Units	Emission Limit 2 Averaging Time
C4GT, LLC	NOVI ENERGY	VA	04/26/2018	Emergency Fire Water Pump	Ultra Low Sulfur Diesel	500	HR/YR	good combustion practices and the use of ultra low sulfur diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.	-	-	-	-	-	-
ENBRIDGE ENERGY - SUPERIOR TERMINAL	ENBRIDGE ENERGY LIMITED PARTNERSHIP	WI	06/12/2014	EG7 - Diesel Emergency Electric Generator w/ tank	Diesel fuel oil	197	BHP	NSPS engine [Tier 3 emergency engine]. EG7 Storage tank, conventional fuel oil storage tank, good operating practices; limiting leakage, spills. (FT01). Engine limited to 200 hours / year (total) and NSPS requirements.	3.75	GRAM / HP-HR	NOX + NMHC HOURLY AVG., FOR EG7	3	GRAM / HP-HR	NOX + NMHC FOR ENGINE CLASS (HOURLY AVG.
WISCONSIN POWER & LIGHT - NEENAH GENERATING STATION	ALLIANT ENERGY	WI	02/15/2016	Fire pump (process P05)	Diesel	1.27	mmBtu/hr	Good combustion practices, use diesel fuel, and operate <500 hr/yr	-	-	-	-	-	-
MOUNDSVILLE COMBINED CYCLE POWER PLANT	MOUNDSVILLE POWER, LLC	WV	11/21/2014	Fire Pump Engine	Diesel	251	HP	-	0.17	LB/H	-	-	-	-

Table E-3. RBLC Search Results for Miscellaneous Emergency Engines - VOC Control

Facility Name	Company Name	State	Permit Issuance Date	Process Name	Fuel	Throughput	Throughput Units	Control Method	Emission Limit 1	Emission Limit 1 Units	Emission Limit 1 Averaging Time	Emission Limit 2	Emission Limit 2 Units	Emission Limit 2 Averaging Time
BIG RIVER STEEL LLC	BIG RIVER STEEL LLC	AR	09/18/2013	EMERGENCY GENERATOR SN-62	DIESEL	625	HP	GOOD OPERATING PRACTICES, LIMITED HOURS OF OPERATION, COMPLIANCE WITH NSPS SUBPART IIII	19	G/KW-H	-	-	-	-
EL DORADO CHEMICAL COMPANY	EL DORADO CHEMICAL COMPANY	AR	06/21/2016	AMMONIA PLANT EMERGENCY GENERATOR	NATURAL GAS	4.71	MMBTU/H	GOOD COMBUSTION PRACTICE	1	G/HP-H	3 HR	-	-	-
EL DORADO CHEMICAL COMPANY	EL DORADO CHEMICAL COMPANY	AR	06/21/2016	EMERGENCY WATER PUMP SN-65	DIESEL	2.21	MMBTU/H	GOOD COMBUSTION PRACTICE	0.225	G/HP-H	3 HR	-	-	-
EL DORADO CHEMICAL COMPANY	EL DORADO CHEMICAL COMPANY	AR	06/21/2016	AMMONIA PLANT EMERGENCY GENERATOR	NATURAL GAS	4.71	MMBTU/H	GOOD COMBUSTION PRACTICE	1	G/HP-H	3 HR	-	-	-
EL DORADO CHEMICAL COMPANY	EL DORADO CHEMICAL COMPANY	AR	06/21/2016	EMERGENCY WATER PUMP SN-65	DIESEL	2.21	MMBTU/H	GOOD COMBUSTION PRACTICE	0.225	G/HP-H	3 HR	-	-	-
CMC STEEL OKLAHOMA	COMMERCIAL METALS COMPANY	OK	01/19/2016	Emergency Diesel Engines	Ultra-low sulfur diesel	15	ppm by weight sulfur	The applicant has proposed BACT for the control of VOC emissions resulting from the combustion of fuel oil for the emergency generators and fire pump as the use of low sulfur No. 2 fuel oil combined with good combustion practices and limited annual operation.	-	-	-	-	-'	-
PASADENA TERMINAL	MAGELLAN TERMINALS HOLDINGS, L.P.	TX	07/14/2017	Fire Water Pump Engines	-	-	-	Operate with low-sulfur diesel with maintenance and testing hours limited to 100 hours per year	0.78	T/YR	-	-	-	-

APPENDIX F. TOXICS MODELING DOCUMENTATION

Table F-1. Kiln Door Parameters

Emission Unit ID	Emission Unit Description	Door ID	Door Height (ft)	Door Width (ft)
OSK1	Kiln 1	DV1/DV2	16.75	9
OSK3	Kiln 3	DV3/DV4	16.75	9
OSK4	Kiln 4	DV5/DV6	16	12

Table F-2. Modeled Stack Information

Emission Unit ID	Emission Unit Description	Stack ID	Capped or Unobstructed?	Orientation[1]	Easting Zone 16S	Northing Zone 16S	Elevation	Stack Height[2]		Stack Diameter[3]		Exit Gas Temperature[4]		Exhaust Flowrate[4]	Exhaust Velocity[5]	Exhaust Velocity
					(m)	(m)	(m)	(m)	(ft)	(m)	(ft)	(F)	(K)	(acfm)	(m/s)	(ft/sec)
OSK1	Kiln 1	OS10	Unobstructed	Vertical	753,969	3,646,710	230.99	7.620	25	0.717	2.35	123	324	17,570	20.5	67.3
		OS11	Unobstructed	Vertical	753,937	3,646,703	231.6	7.620	25	0.717	2.35	123	324	17,570	20.5	67.3
		DV1	Unobstructed	Horizontal	753,984	3,646,716	230.28	2.553	8.38	4.22	13.85	123	324	-	0.001	0.0033
		DV2	Unobstructed	Horizontal	753,921	3,646,698	231.31	2.553	8.38	4.22	13.85	123	324	-	0.001	0.0033
OSK3	Kiln 3	OS12	Unobstructed	Vertical	753,981	3,646,688	230.17	7.620	25	0.717	2.35	129	327	17,322	20.2	66.3
		OS13	Unobstructed	Vertical	753,950	3,646,681	231.54	7.620	25	0.717	2.35	129	327	17,322	20.2	66.3
		DV3	Unobstructed	Horizontal	753,999	3,646,694	229.31	2.553	8.38	4.22	13.85	129	327	-	0.001	0.0033
		DV4	Unobstructed	Horizontal	753,934	3,646,676	231.33	2.553	8.38	4.22	13.85	129	327	-	0.001	0.0033
OSK4	Kiln 4	OS14	Unobstructed	Vertical	753,861	3,646,607	227.53	9.754	32	1.067	3.50	129	327	20,000	10.6	34.6
		OS15	Unobstructed	Vertical	753,824	3,646,596	227.35	9.754	32	1.067	3.50	129	327	20,000	10.6	34.6
		DV5	Unobstructed	Horizontal	753,876	3,646,610	227.69	2.438	8	4.77	15.64	129	327	-	0.001	0.0033
		DV6	Unobstructed	Horizontal	753,811	3,646,592	227.24	2.438	8	4.77	15.64	129	327	-	0.001	0.0033
OB01	Boiler 1	OS08	Unobstructed	Vertical	753,894	3,646,703	230.18	16.764	55	0.701	2.3	515	542	16,565	20.3	66.4
OB02	Boiler 2	OS09	Unobstructed	Vertical	753,868	3,646,686	229.61	12.192	40	0.762	2.5	312	429	16,757	17.3	56.9

1. Pursuant to Section 4.1.D of the *Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions (the Guideline),* revised May 2017, the doors of the kiln may be modeled as a point source with a horizontal discharge.
2. Pursuant to Section 4.1.D of *the Guideline* , the doors of the kiln may be modeled as a point source with release height set to the midpoint of the door.
3. Pursuant to Section 4.1.D of *the Guideline* , the equivalent diameter for the kiln doors is calculated based on the following equation: Diameter (ft) = $[\text{Door Height (ft)} * \text{Door Width (ft)} * 4 / \pi]^{0.5}$
4. For boilers, maximum values from 2017-2019 performance testing.
5. Pursuant to Section 4.1.D of *the Guideline* , the stack velocity of the kiln doors should be modeled at 0.001 m/s.

Table F-3. Toxic Air Pollutant Emission Rates

Emission Unit ID	Pollutant	Emission Factor[1]	Production Rate	Emission Rate
		(lb/MBF)	(MBF/hr)	(lb/hr)
OSK1	Acetaldehyde	5.40E-03	9.93	0.054
	Formaldehyde	1.49E-02		0.15
	Methanol	0.236		2.34
OSK3	Acetaldehyde	5.40E-03	9.93	0.054
	Formaldehyde	1.49E-02		0.15
	Methanol	0.236		2.34
OSK4	Acetaldehyde	0.045	13.7	0.62
	Formaldehyde	3.86E-02		0.53
	Methanol	0.161		2.21
		(lb/MMBtu)	(MMBtu/hr)	(lb/hr)
OB01	Acetaldehyde	8.30E-04	26.8	0.022
	Formaldehyde	4.40E-03		0.118
	Methanol	-		-
OB02	Acetaldehyde	8.30E-04	28.7	0.024
	Formaldehyde	4.40E-03		0.126
	Methanol	-		-

1. Kiln emission factors from document entitled: *EPD Recommended Emission Factors for Lumber Kiln Permitting in Georgia.* Boiler emission factors from AP-42 Section 1.6 Table 1.6-3

2. Kiln Emission Rate (lb/hr) = Emission Factor (lb/MBF) * Production Rate (MBF/hr). Boiler Emission Rate (lb/hr) = Emission Factor (lb/MMBtu) * Heat Input Capacity (MMBtu/hr)

Table F-4. Modeled Rate (lb/hr)

Emission Unit ID	Emission Unit Description	Stack ID	75-07-0 Acetaldehyde	50-00-0 Formaldehyde	67-56-1 Methanol
OSK-1	Kiln 1	OS10	2.15E-02	5.92E-02	0.94
		OS11	2.15E-02	5.92E-02	0.94
		DV1	5.36E-03	1.48E-02	0.23
		DV2	5.36E-03	1.48E-02	0.23
OSK-3	Kiln 3	OS12	2.15E-02	5.92E-02	0.94
		OS13	2.15E-02	5.92E-02	0.94
		DV3	5.36E-03	1.48E-02	0.23
		DV4	5.36E-03	1.48E-02	0.23
OSK-4	Kiln 4	OS14	0.25	0.21	0.88
		OS15	0.25	0.21	0.88
		DV5	6.16E-02	5.29E-02	0.22
		DV6	6.16E-02	5.29E-02	0.22
OB01	Boiler 1	OS08	2.22E-02	0.12	--
OB02	Boiler 2	OS09	2.38E-02	0.13	--

1. Per GA Toxic Modeling Guidance (Revised May 2017), for continuous kilns with powered vents, the total air toxic emissions should be split assuming 80 percent exit through powered vents and 20 percent exit through doors.

Table F-5. Modeled Rate (g/s)

Emission Unit ID	Emission Unit Description	Stack ID	75-07-0 Acetaldehyde	50-00-0 Formaldehyde	67-56-1 Methanol
OSK-1	Kiln 1	OS10	2.70E-03	7.46E-03	0.12
		OS11	2.70E-03	7.46E-03	0.12
		DV1	6.76E-04	1.86E-03	2.95E-02
		DV2	6.76E-04	1.86E-03	2.95E-02
OSK-3	Kiln 3	OS12	2.70E-03	7.46E-03	0.12
		OS13	2.70E-03	7.46E-03	0.12
		DV3	6.76E-04	1.86E-03	2.95E-02
		DV4	6.76E-04	1.86E-03	2.95E-02
OSK-4	Kiln 4	OS14	3.11E-02	2.66E-02	0.11
		OS15	3.11E-02	2.66E-02	0.11
		DV5	7.77E-03	6.66E-03	2.78E-02
		DV6	7.77E-03	6.66E-03	2.78E-02
OB01	Boiler 1	OS08	2.80E-03	1.49E-02	--
OB02	Boiler 2	OS09	3.00E-03	1.59E-02	--

1. Per GA Toxic Modeling Guidance (Revised May 2017), for continuous kilns with powered vents, the total air toxic emissions should be split assuming 80 percent exit through powered vents and 20 percent exit through doors.

Table F-6. Modeling Results

Pollutant	CAS No.	Year	Maximum 1-Hour Impact[1] (μg/m^3)	Maximum 15-Min Impact[2] (μg/m^3)	15-min AAC[3] (μg/m^3)	Is MGLC >15-min AAC? (Y/N)	Maximum Annual Impact[1] (μg/m^3)	Annual AAC[3] (μg/m^3)	Is MGLC > Annual AAC? (Y/N)
Acetaldehyde	75-07-0	1974	81.52	--	--	--	0.87	--	--
		1975	97.68	--	--	--	0.77	--	--
		1976	95.39	--	--	--	0.93	--	--
		1977	109	--	--	--	0.82	--	--
		1978	97.79	--	--	--	0.92	--	--
		Max	**109**	**143**	**4,500**	**N**	**0.93**	**4.55**	**N**
Formaldehyde	50-00-0	1974	76.27	--	--	--	0.83	--	--
		1975	83.97	--	--	--	0.74	--	--
		1976	84.42	--	--	--	0.87	--	--
		1977	93.85	--	--	--	0.77	--	--
		1978	83.83	--	--	--	0.90	--	--
		Max	**93.85**	**124**	**245**	**N**	**0.90**	**1.10**	**N**
Methanol	67-56-1	1974	665	--	--	--	7.06	--	--
		1975	519	--	--	--	7.12	--	--
		1976	695	--	--	--	6.76	--	--
		1977	526	--	--	--	6.40	--	--
		1978	700	--	--	--	6.16	--	--
		Max	**700**	**924**	**32,800**	**N**	**7.12**	**20,000**	**N**

1. First-high modeled impact.
2. Modeled 1-hour concentration multiplied by 1.32 to convert to 15-minute impact per GA Air Toxics Guidance (May 2017).
3. Appendix A of the GA Air Toxics Guidance (Oct 2018)

APPENDIX G. ELECTRONIC TOXICS MODELING FILES

APPENDIX H. FLM LETTERS

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July 12, 2019

Mr. Bill Jackson
USDA Forest Service (FS)
160A Zillicoa Drive
Asheville, NC 28801
bjackson02@fs.fed.us

RE: Interfor U.S., Inc. – Thomaston, GA
Notification of PSD Project in Reference to FS Class I Areas

Dear Mr. Jackson,

Trinity Consultants (Trinity) is submitting this letter to your attention on behalf of our client Interfor U.S., Inc. (Interfor) for a proposed modification at their facility located in Thomaston, Georgia (Upson County). Interfor intends to install a new continuous dual path direct fired lumber drying kiln and other equipment at the Thomaston Mill as part of a mill modernization project. The proposed project will require a Prevention of Significant Deterioration (PSD) permit as a major modification to an existing major source.[1]

Expected emissions from the proposed project include oxides of nitrogen (NO_X), volatile organic compounds (VOC), greenhouse gases (GHG) in the form of carbon dioxide equivalents (CO_2e)[2], particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}), particulate matter with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$), particulate matter (PM), sulfur dioxide (SO_2), carbon monoxide (CO), hazardous air pollutants (HAP), and all other combustion emissions associated with biomass. The proposed project will require a Prevention of Significant Deterioration (PSD) permit as potential emission increases from the proposed project are anticipated to exceed PSD significant emission rate (SER) thresholds for VOC.

As part of the PSD application process, Interfor has qualitatively evaluated its impacts on federally-protected Class I areas. The purpose of this letter is to provide the Federal Land Manager (FLM) with preliminary information on the proposed project and to request concurrence from the FLM on the findings presented.

Q/D SCREENING ANALYSIS

A Q/D screening analysis was performed in a manner consistent with the approach discussed in the most recent Federal Land Managers' Air Quality Related Values Work Group (FLAG) guidance document (FLAG 2010), which compares the ratio of visibility affecting pollutant emissions to the distance from the Class I area (i.e., referenced herein as the FLAG 2010 Approach).[3] "Q" is the sum of the annual NO_X, PM_{10}, SO_2, and sulfuric acid mist (H_2SO_4)

---

[1] The Thomaston Mill is an existing PSD major source as potential facility-wide emissions of volatile organic compounds (VOC) are greater than the major source threshold of 250 tons per year (tpy).

[2] CO2e is carbon dioxide equivalents calculated as the sum of the six well-mixed GHGs (CO2, CH4, N2O, HFCs, PFCs, and SF6) with applicable global warming potentials per 40 CFR 98 applied.

[3] Federal Land Managers' Air Quality Related Values Work Group (FLAG) Phase I Report – Revised 2010, *October 7, 2010*.

emissions, in tons per year (tpy) [4] and "D" is the distance, in kilometers (km), from the proposed facility to the corresponding Class I area. The total emissions for this "project" includes the emissions from the new sources, and any emissions increases from existing sources at the Mill impacted by the project.

A summary of the visibility-affecting pollutant (VAP) emissions resulting from the proposed project are shown in Table 1 using the FLAG 2010 Approach.

Table 1. Summary of Visibility-Affecting Pollutant Emission Increases

Pollutant	Facility-Wide Maximum 24-hr Emissions Increase (lb/hr)	FLAG 2010 Approach Annual Emissions[2] (tpy)
NO_X	4.01	17.56
Direct Particulate[1]	3.38	14.79
SO_2	1.00	4.38
Sum of Emissions (tpy)		36.73

1. Direct particulate includes all filterable and condensable PM10.
2. FLAG 2010 Approach: Q = Maximum 24 hour basis * 8,760 /2000.

As shown in Table 2, five (5) Class I areas are located within 300 km of the proposed project in Upson County, Georgia. [5] The only Class I areas within 300 km of the proposed facility managed by the Forest Service (FS) are Cohutta Wilderness, Joyce Kilmer-Slickrock Wilderness, and Shining Rock Wilderness, which are approximately 214, 270, and 296 kilometers away, respectively.

[4] It is specified within the Flag 2010 Report that "Q" be calculated as the sum of the worst-case 24-hour emissions converted to an annual basis.

[5] Pursuant to Appendix H to EPD's *PSD Permit Application Guidance Document* (February 2017), facilities should include the net project emissions increase of each visibility impacting pollutant and the distance (km) for each Class I area within 300 km of the facility. More stringent requirements apply to facilities within 50 km of a Class I area.

Table 2. Summary of Class I Areas within 300 km of the Proposed Project

Class I Area	Responsible FLM	Minimum Distance from Site (km)	Sum of Annualized VAP Emissions - Q (tpy)	Flag 2010 Approach Q/D
Cohutta Wilderness	FS	214	36.73	0.17
Joyce Kilmer-Slickrock Wilderness	FS	270		0.14
Okefenokee Wilderness	FWS	278		0.13
Great Smoky Mountains National Park	NPS	282		0.13
Shining Rock Wilderness	FS	296		0.12

Table 2 shows the results of the Q/D screening analysis for the FLAG 2010 Approach. As shown in Table 2, the project has a Q/D well below ten. This suggests that the proposed project will have no adverse impacts to any AQRVs at near-by Class I areas; therefore, Interfor plans no AQRV analyses for the proposed project. Based on Table 2, Interfor requests that the FS provide written concurrence of this finding of no impact.

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Interfor greatly appreciates your feedback on this conclusion regarding no presumptive impacts to AQRVs at Class I areas under management of the FS. Please feel free to contact me at 404-751-0226 with any questions that you have.

Sincerely,

TRINITY CONSULTANTS

Chris Pool, P.E.
Managing Consultant

cc: Ms. Meredith Bond (Fish and Wildlife Service)
Mr. Eric Cornwell (Georgia EPD)
Ms. Kari Franklin (Interfor)
Ms. Carol McCoy (National Park Service)
~~~~~~

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Trinity Consultants

July 12, 2019

Ms. Meredith Bond
United States Department of the Interior
U.S. Fish and Wildlife Service
National Wildlife Refuge System
Branch of Air Quality
7333 W. Jefferson Ave., Suite 375
Lakewood, CO 80235-2017

RE: Interfor U.S., Inc. – Thomaston, GA
Notification of PSD Project in Reference to FWS Class I Area

Dear Ms. Bond,

Trinity Consultants (Trinity) is submitting this letter to your attention on behalf of our client Interfor U.S., Inc. (Interfor) for a proposed modification at their facility located in Thomaston, Georgia (Upson County). Interfor intends to install a new continuous dual path direct fired lumber drying kiln and other equipment at the Thomaston Mill as part of a mill modernization project. The proposed project will require a Prevention of Significant Deterioration (PSD) permit as a major modification to an existing major source.[1]

Expected emissions from the proposed project include oxides of nitrogen (NO_X), volatile organic compounds (VOC), greenhouse gases (GHG) in the form of carbon dioxide equivalents (CO_2e)[2], particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}), particulate matter with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$), particulate matter (PM), sulfur dioxide (SO_2), carbon monoxide (CO), hazardous air pollutants (HAP), and all other combustion emissions associated with biomass. The proposed project will require a Prevention of Significant Deterioration (PSD) permit as potential emission increases from the proposed project are anticipated to exceed PSD significant emission rate (SER) thresholds for VOC.

As part of the PSD application process, Interfor has qualitatively evaluated its impacts on federally-protected Class I areas. The purpose of this letter is to provide the Federal Land Manager (FLM) with preliminary information on the proposed project and to request concurrence from the FLM on the findings presented.

Q/D SCREENING ANALYSIS

Q/D screening analysis was performed in a manner consistent with the approach discussed in the most recent Federal Land Managers' Air Quality Related Values Work Group (FLAG) guidance document (FLAG 2010), which compares the ratio of visibility affecting pollutant emissions to the distance from the Class I area (i.e., referenced herein as the FLAG 2010 Approach).[3] "Q" is the sum of the annual NO_X, PM_{10}, SO_2, and sulfuric acid mist (H_2SO_4)

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[1] The Thomaston Mill is an existing PSD major source as potential facility-wide emissions of volatile organic compounds (VOC) are greater than the major source threshold of 250 tons per year (tpy).

[2] CO2e is carbon dioxide equivalents calculated as the sum of the six well-mixed GHGs (CO2, CH4, N2O, HFCs, PFCs, and SF6) with applicable global warming potentials per 40 CFR 98 applied.

[3] Federal Land Managers' Air Quality Related Values Work Group (FLAG) Phase I Report – Revised 2010, *October 7, 2010*.

emissions, in tons per year (tpy) [4] and "D" is the distance, in kilometers (km), from the proposed facility to the corresponding Class I area. The total emissions for this "project" includes the emissions from the new sources, and any emissions increases from existing sources at the Mill impacted by the project.

A summary of the visibility-affecting pollutant (VAP) emissions resulting from the proposed project are shown in Table 1 using the FLAG 2010 Approach.

Table 1. Summary of Visibility-Affecting Pollutant Emission Increases

Pollutant	Facility-Wide Maximum 24-hr Emissions Increase (lb/hr)	FLAG 2010 Approach Annual Emissions[2] (tpy)
NO_X	4.01	17.56
Direct Particulate[1]	3.38	14.79
SO_2	1.00	4.38
Sum of Emissions (tpy)		36.73

1. Direct particulate includes all filterable and condensable PM10.
2. FLAG 2010 Approach: Q = Maximum 24 hour basis * 8,760 /2000.

As shown in Table 2, five (5) Class I areas are located within 300 km of the proposed project in Upson County, Georgia. [5] The only Class I areas within 300 km of the proposed facility managed by the Fish and Wildlife Service (FWS) is the Okefenokee Wilderness which is 278 kilometers away.

[4] It is specified within the Flag 2010 Report that "Q" be calculated as the sum of the worst-case 24-hour emissions converted to an annual basis.

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Table 2 shows the results of the Q/D screening analysis for the FLAG 2010 Approach. As shown in Table 2, the project has a Q/D well below ten. This suggests that the proposed project will have no adverse impacts to any AQRVs at near-by Class I areas; therefore, Interfor plans no AQRV analyses for the proposed project. Based on Table 2, Interfor requests that the FWS provide written concurrence of this finding of no impact.

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Interfor greatly appreciates your feedback on this conclusion regarding no presumptive impacts to AQRVs at Class I areas under management of the FWS. Please feel free to contact me at 404-751-0226 with any questions that you have.

Sincerely,

TRINITY CONSULTANTS

Chris Pool, P.E.
Managing Consultant

cc: Mr. Eric Cornwell (Georgia EPD)
Ms. Kari Franklin (Interfor)
Mr. Bill Jackson (Forest Service)
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July 12, 2019

Ms. Carol McCoy
United States Department of the Interior
National Park Service
Air Resources Division
PO Box 25287
Denver, CO 80225-0287

RE: *Interfor U.S., Inc. – Thomaston, GA*
Notification of PSD Project in Reference to NPS Class I Area

Dear Ms. McCoy,

Trinity Consultants (Trinity) is submitting this letter to your attention on behalf of our client Interfor U.S., Inc. (Interfor) for a proposed modification at their facility located in Thomaston, Georgia (Upson County). Interfor intends to install a new continuous dual path direct fired lumber drying kiln and other equipment at the Thomaston Mill as part of a mill modernization project. The proposed project will require a Prevention of Significant Deterioration (PSD) permit as a major modification to an existing major source.[1]

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Interfor greatly appreciates your feedback on this conclusion regarding no presumptive impacts to AQRVs at Class I areas under management of the NPS. Please feel free to contact me at 404-751-0226 with any questions that you have.

Sincerely,

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Chris Pool, P.E.
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