PROJECT REPORT

West Fraser > Augusta Mill

Continuous Kilns Construction Permit Application

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1. EXECUTIVE SUMMARY

West Fraser, Inc. (West Fraser) owns and operates a lumber sawmill in Augusta, Richmond County, Georgia (Augusta Mill). The Augusta Mill is a major stationary source under Title V and New Source Review (NSR) as defined by the Georgia Environmental Protection (EPD) Air Protection Division. The mill currently operates under Part 70 Operating Permit No. 2421-245-0047-V-04-0, issued by EPD, effective June 13, 2012. West Fraser is proposing modifications to the Augusta Mill that will increase its production capacity of kiln dried lumber and improve the quality of the kiln dried lumber produced. 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 Richmond 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 Augusta Mill is an existing major PSD source, since potential emissions of several criteria air pollutants 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. West Fraser has determined that net emissions increase from the project will exceed the SER for volatile organic compounds (VOC). Additional information on the net emission increases can be found in Section 3.2.

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 new lumber drying kilns, which produce certain toxic air pollutants (TAP) regulated by EPD, toxics modeling has been included as part of this application. Additionally, because the VOC increase as a result of the project is greater than 100 tons per year, an ozone impacts analysis was also conducted as part of this application.

1.1. PROPOSED PROJECT

West Fraser is submitting this application to install two continuous dual path direct fired dry kilns at the Augusta Mill which will increase the total facility-wide production limit to 220 MMBF/yr. The three existing direct batch lumber drying kilns (KD01, KD02, and KD03), including the burners associated with all three kilns, will be shut down as part of the project. The new continuous direct-fired kilns will each operate with one green sawdust gassifier burner at a heat input capacity of 35 MMBtu/hr for a total heat input capacity of 70 MMBtu/hr for the two kilns. The reduced heat input in the burners required for kiln drying, as compared to the existing system, is because the continuous dual path kiln design will provide more thermally efficient lumber drying and will reduce the mill's energy input requirements.

As stated above, the total mill potential production will increase from 157 MMBF/yr dried lumber to 220 MMBF/yr after the completion of the proposed project.[1] There will be no new associated emission units installed or modified as part of the proposed project, and none of the existing ancillary equipment will be modified or shut down; however, there will be an increased throughput for all of the ancillary equipment,

[1] Past potential throughput of 157 MMBF/yr based on current facility permit.

including the hogger, chipper, saws, debarkers, and truck traffic on the mill roads. Therefore, these operations will be treated as associated emission units in the PSD analysis.

The anticipated schedule of installation and removal of emission units is expected to begin in the third quarter of 2013. At that time the first continuous kiln will be installed. Once the first continuous kiln has been tested, and found to be working properly, existing batch kilns and burner systems will be removed. The time between the installation of the first continuous kiln and the shutdown of the existing batch kilns and burners will be as minimal as possible. Following the removal of existing equipment, the second continuous kiln will be installed.

1.2. PERMITTING AND REGULATORY REQUIREMENTS

West Fraser is submitting this combined construction permit application and Title V significant modification application to EPD to request authorization to install and operate the proposed continuous lumber drying kilns under the provisions of EPD Rules for Air Quality Control, Chapter 391-3-1. West Fraser anticipates initiating construction of the project during the third quarter of 2013.

The Augusta Mill is located in Richmond County, which is designated as "attainment" or "unclassifiable" for all pollutants. Therefore, net emission increases from the proposed project and associated emission unit increases must be evaluated and compared to the major modification thresholds for regulated pollutants for New Source Review (NSR) permitting applicability. The pollutants evaluated for NSR 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 ($PM_{2.5}$), and greenhouse gases (GHGs) in the form of carbon dioxide equivalents (CO_2e). as shown in Table 1-1. [2]

[2] Please note that Total VOC, as referred to in Table 1-1, is VOC as terpenes plus methanol and formaldehyde as explained in Section 3.2.1 of this application.

Table 1-1. Proposed Project Net Emission Increases

Pollutant	Net Emissions Increase (tpy)	PSD SER Thresholds (tpy)	PSD Permitting Triggered?
NSR Pollutants			
CO	28.50	100	No
Fluorides	N/A	3	N/A
H_2S	N/A	10	N/A
Lead	5.83E-04	1	No
NO_X	10.93	40	No
Reduced Sulfur Compounds (including H_2S)	N/A	10	N/A
SO_2	0.82	40	No
H_2SO_4	N/A	7	N/A
Total PM	24.53	25	No
Total PM_{10}	2.52	15	No
Total $PM_{2.5}$	-3.63	10	No
Total Reduced Sulfur (including H2S)	N/A	10	N/A
Total VOC	146.57	40	Yes
Greenhouse Gases			
$CO_2e_{biomass\ deferral}$	143.45	75,000	No
HAPs			
Formaldehyde	1.56	N/A	N/A
Methanol	6.25	N/A	N/A

As detailed in Section 3.2 and summarized in Table 1-1, net emission increases from the proposed project and net emissions increases or decreases from the contemporaneous emission period, will be below the PSD major modification thresholds for all pollutants except VOC.

On May 13, 2010, the U.S. EPA issued the Tailoring Rule which establishes an approach for addressing greenhouse gases (GHGs) from stationary sources under the Clean Air Act (CAA) permitting programs (PSD and Title V).[3] Per the Tailoring Rule, as the proposed project requires NSR permitting for a criteria pollutant and the required PSD permit was not issued prior to January 2, 2011, PSD permitting for GHG for the proposed project must also be considered. On July 20, 2011, U.S. EPA published a rule making to defer GHG permitting requirements for three years for carbon dioxide (CO_2) emissions from biomass-fired and other biogenic sources.[4] Therefore, CO_2e estimates for the net emissions increase analysis only accounted for the methane (CH_4) and nitrous oxide (N_2O) component emissions of biomass combustion.

[3] Rule was published in the Federal Register on June 3, 2010, and became effective August 2, 2010. Federal Register Vol. 75, No. 106, June 3, 2010, pages 31541 – 31608.
[4] Federal Register Vol. 76, No. 139, July 20, 2011.

As a Title V major source, West Fraser is required to submit a Title V significant modification application as part of the PSD permitting process in Georgia. West Fraser 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 New Source Performance Standards (NSPS), National Emissions Standards for Hazardous Air Pollutants (NESHAP), and several state regulations.

1.3. BACT DETERMINATION

West Fraser performed a BACT analysis for the only NSR-regulated pollutant that exceeded the major modification thresholds, 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, West Fraser has determined that the technology and limits presented in Table 1-2 are BACT for the proposed continuous kilns. A detailed VOC BACT analysis is presented in Section 5.4 of this application.

Table 1-2. Proposed Primary BACT Limit Summary

Pollutant	Selected BACT	Emission/ Operating Limit	Compliance Method
VOC	Proper Maintenance and Operating Practices	3.76 lb/MBF	Recordkeeping

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 NSR applicability;
- Section 4 details the federal and state regulatory applicability analysis for the proposed project;
- Section 5 contains the required BACT assessment;
- Section 6 contains the toxics modeling assessment;
- Appendix A contains an area map, facility layout, and process flow diagrams of the facility;
- Appendix B includes documentation of emissions calculations;
- Appendix C contains EPD (SIP) construction 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;

- Appendix G includes the updated Title V Database;
- Appendix H includes the reference materials used to develop the application; and
- Appendix I includes letters sent to the Federal Land Managers of surrounding Class I areas.

2. FACILITY AND PROJECT DESCRIPTION

The Augusta Mill produces dimensional lumber from logs and is classified under Standard Industrial Classification (SIC) code 2421. The raw material for dimensional lumber, the principle product, is southern pine logs. Current emission generating operations at the mill include log processing, lumber manufacturing, by-products processing, and lumber processing. A facility site plan is included in Appendix A detailing the proposed locations of the continuous kilns. A process flow diagram for the current facility operations and the facility following implementation of the proposed project are also provided in Appendix A.

2.1. CURRENT FACILITY DESCRIPTION

2.1.1. Log Processing Area/Sawmill

The basic function of the initial log processing area is to prepare logs for further processing within the lumber area. Tree length logs are delivered by truck to the mill on unpaved roads. Logs are cut to desired length by saws, and manually fed into the debarker.

After the debarking stage, logs are cut into rough boards using a series of sawing techniques. The majority of the sawdust that is generated in the sawmill is pneumatically conveyed into the furnace systems that fire the batch kilns. Following the sawmill, boards are transported to the existing batch kilns.

The log processing/sawmill operations will not be changed as a result of this project. Existing equipment may operate at higher production levels due to increased hours of operation, however, there will not be an addition of any equipment that would alter the potential-to-emit for this area.

2.1.2. Lumber Manufacturing

The dimensional lumber cut in the sawmill is dried in one of the three existing direct fired kilns to reduce the moisture content from approximately 50 percent down to approximately 15-20 percent moisture content.

Currently, there are two different burner systems that provide heat to the three direct fired batch fired kilns at the facility. Furnace system #3, as defined in the permit, provides heat to both kilns KD01 and KD03 while furnace system #2 provides heat exclusively to KD02. Both furnace systems fire green sawdust that is generated from the sawmill operations. The current heat input capacities of the specific kilns (not the specific furnace systems) KD01, KD02, and KD03 are 15.05, 30.1, and 49.45 MMBtu/hr, respectively. The current maximum lumber production capacity from the three kilns located at the mill is 157.0 MMBF/yr.

The batch kilns and the existing furnace systems will all be removed as part of this project.

Upon completion of the proposed project, the mill will have two continuous kilns with direct fired kiln burners, with the capacity to produce 220 MMBF/yr dried lumber and each of the proposed continuous kilns will have a green sawdust gasifier burner, rated at 35 MMBTU/hr.

2.1.3. By-Products Processing

Multiple secondary products are produced as a result of the operations at the Augusta Mill. These products can include wood chips, sawdust, bark, and shavings. Although a majority of the green sawdust is used as fuel for

the drying kilns, what remains of the sawdust and other by-products is shipped off-site. No physical changes are planned to this area as part of the proposed project.

2.1.4. Lumber Finishing Area

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. The ends of the board are then trimmed to achieve the final board length. After trimming, each board is stamped and stacked for shipping. Shavings are hogged and routed to the Planer Mill Cyclone, which West Fraser proposes to eliminate as an emissions unit from this project. West Fraser proposes that this source be removed from the facility permit because it is not an emissions generating source and is used as a material recovery unit. Finished product is then loaded onto trucks and shipped off-site.

2.2. PROJECT DESCRIPTION

West Fraser proposes to complete several modifications to the Augusta Mill. These modifications include installing two new continuous direct fired kilns (KD04 and KD05), removing the three existing direct fired batch kilns (KD01, KD02, and KD03), and removing the existing burners associated with the current kilns.

2.2.1. Continuous Kiln Installation

Continuous lumber drying kilns 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 of 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.

Two new continuous kilns will be installed in the general location of the existing batch kilns. A figure of the proposed locations of the kilns is included in Appendix A.

2.2.2. Associated Ancillary Emission Units

The proposed project will not include any additional modifications to the Augusta Mill, with the exception of the installation of the continuous direct fired dry kilns and the removal of the existing in-direct batch kilns and corresponding burners. However, there will 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 debarking, material handling/transfer sources, hogger and chipper emissions, and haul roads.

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.

2.2.3. Existing Unit Shutdowns

The existing batch kilns are being decommissioned once the new continuous kilns are installed. Additionally, the existing burner systems will no longer be necessary, and therefore also decommissioned.

Note that the shutdowns of these equipment units are a separate project that is occurring within the same contemporaneous period as the continuous kiln installation, and have been properly accounted for in the emission netting calculations.

3. EMISSION CALCULATION METHODOLOGY

This section addresses the methodology used to quantify the emissions from the proposed project and assesses federal new source review (NSR) permitting applicability. Emissions from the proposed project will include carbon monoxide (CO), oxides of nitrogen (NO_X), sulfur dioxide (SO_2), volatile organic compounds (VOC), particulate matter (PM), particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), greenhouse gases (GHGs) in the form of carbon dioxide equivalents (CO_2e), and hazardous air pollutants (HAP). These emissions occur as a result of combustion in the kilns, 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 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: nonattainment NSR (NNSR) and Prevention of Significant Deterioration (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 Augusta Mill is located in Richmond County, which is presently designated as "attainment" or "unclassifiable" for all criteria pollutants.

The following sections discuss the methodology used in the project emissions increase evaluation conducted to assess PSD applicability under the NSR program.

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:

> *(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 kilns will be classified as new units as West Fraser intends to completely replace the existing batch kiln infrastructure (i.e., drying chambers, tracks) and increase overall kiln production capacity.

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 installing new emission units, PSD applicability using the actual-to-potential applicability test is defined at 40 CFR 52.21(a)(2)(iv)(d):

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

Major modification is defined by 40 CFR 52.21(b)(2)(i):

> *"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):

> *"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 (A) is commonly referred to as the "project emission increases" as it accounts only for emissions related to the proposed project itself. This first step in the analysis does not include the proposed shutdown of equipment associated with the project. If the emission increases estimated per step (A) exceed the major modification thresholds, then the applicant may move to step (B), 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.

While the prior quotations only reference three components of the NEI calculation, there are actually four calculated components, with the additional component being a subset of the definition for projected actual. The four components are listed below and are discussed individually, as appropriate.

1. Baseline actual emissions (A)
2. Projected actual emissions (B)
3. "Could have accommodated" emissions exclusion (C) (commonly called the demand growth exclusion)
4. Potential emissions (D)

For this project, West Fraser has not relied upon projected actual emissions or the "could have accommodated" emissions exclusion as the proposed project does not include a modification to an existing emission unit.

3.1.3. Baseline Actual Emissions (A)

Baseline actual emissions are the most straightforward of the components, and are defined in 40 CFR 52.21(b)(48)(ii).

> *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 by the Administrator for a permit required … whichever is earlier, except that the 10-year period shall not include any period earlier than November 15, 1990.*

Per 40 CFR 52.21(b)(48)(ii)(d) when a project involves multiple emission units, only one consecutive 24-month period may be used to determine the baseline actual emissions for all of the emission units to be modified. However, a different consecutive 24-month period can be used for each pollutant.

3.1.4. Potential Emissions (D)

Potential emissions are defined by 40 CFR 52.21(b)(4):

> *…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...*

Any modification (i.e., a physical change or change in method of operation) to the facility that has the potential to increase emissions of any air pollutant(s) regulated under the PSD or NNSR program must be evaluated to determine if the changes are subject to PSD or NNSR. The proposed process changes to the Augusta Mill qualify as a potential modification and require evaluation under the NSR permitting program.

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 NSR permitting major modification thresholds.[5]

3.2.1. Direct-Fired Continuous Kilns (New)

Potential emissions from the new direct-fired continuous kilns were evaluated using the maximum production capacities of the kilns (MBF/yr) and the burner heat input capacities (MMBtu/yr) in conjunction with either National Council for Air and Stream Improvements (NCASI) emission factors or AP-42 factors.[6] Continuous lumber kilns represent relatively new process technology, particularly to West Fraser. Theoretical design capacities of the kilns as presented by vendors have a general range between 1 – 1.5 MMBf annually per foot of primary drying chamber length. Presently, West Fraser believes that a design capacity of 1.1 MMBf/yr/ft of primary drying chamber length is a realistic estimate of what can be achieved. Hence, annual capacities of the

[5] Additional reference documentation for the sources of the emission factors are included in Appendix H.

[6] All NCASI values used in the application were either provided to Trinity by West Fraser or 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.

kilns are based on the 1.1 MMBf/yr/ft of primary drying chamber length and the design length for the primary drying chamber of each new continuous kiln.

Potential emissions of acetaldehyde, formaldehyde, methanol, methyl isobutyl ketone (MIBK), phenol, toluene, and all criteria pollutants (except SO_2) from the direct-fired continuous kilns were calculated by multiplying the maximum production capacity of dried lumber from the kilns (MBF/year) by the appropriate emission factor (lb/MBF). Potential emissions of SO_2 and all other HAP, except polycyclic aromatic compounds (PAC), were calculated based on the amount of wood combusted (MMBtu/year) multiplied by the pollutant emission factor (lb/MMBtu). Potential PAC emissions were calculated by multiplying the amount of wood combusted annually (MMBtu/year) by the pollutant emission factor (lb/ton) and dividing by the average heating value of the wood (MMBtu/ton).

All of the criteria pollutant emission factors, with the exception of SO_2, are based on NCASI values for direct-fired kilns that were either provided to Trinity Consultants by West Fraser or were obtained from publicly available sources. The emission factor for SO_2 is from AP-42, Section 1.6, *Wood Residue Combustion* for a boiler with no controls.[7] Appendix B provides a detailed list of emission factors and their sources.

The NCASI emission factors that are used in the emission calculations were initially developed for batch lumber kilns. Since continuous kilns are a new technology, there is limited testing data. No NCASI reviewed testing data currently exists for continuous kilns.[8] The emission factors for a continuous kiln are expected to be equal to or less than that of a batch kiln. The exception to this would be data reviewed regarding particulate matter emissions as part of the preliminary determination for Simpson Lumber Company, LLC (Application Number 20735). Based on a review of the preliminary determination document, the best available emission factors for particulate related emissions are based on tests conducted at Bibler Brothers Lumber Company, Russelville, AR. The Bibler Brothers data is for filterable PM only. The filterable PM emission factor is 0.068 lb/MBF. Condensable PM is based on unpublished data provided by NCASI. NCASI recommends a ratio of Condensable to Filterable PM of 1.016. The Condensable PM emission factor used is therefore 0.069 lb/MBF. Filterable PM_{10} is assumed to be 50% of filterable PM (based on Permit NO. 2421-107-0011-V-02-3 issued to Rayonier Wood Products LLC-Swainsboro Sawmill). Filterable $PM_{2.5}$ is assumed to be 87% of PM10 based on AP-42 for wood combustion. All condensable PM is assumed to be PM_{10} and $PM_{2.5}$. The resulting PM, PM_{10}, and $PM_{2.5}$ emission factors are 0.138 lb/MBF, 0.104 lb/MBF, and 0.099 lb/MBF, respectively.

The majority of VOC emitted by the lumber kilns are a result of compounds being released from the wood during the drying process. Relatively few VOCs are a result of combustion. VOC emissions from drying releases likely depend on a number of factors, including the type of wood being dried, the size of the wood, the season of the year, kiln operating conditions, and the original and final moisture contents of the wood. The main type of VOC emitted from the wood is in the form of terpenes, primarily alpha-pinene, from southern yellow pine. There are also water soluble VOC released from the kilns such as methanol and formaldehyde, which could potentially be entrained in the significant quantities of water discharged from continuous kilns.[9]

For NSR purposes, U.S. EPA requires the total mass of VOC be relied upon for permitting assessments. Given the unique nature of exhaust streams from wood product facilities, U.S. EPA has established a protocol for adjusting traditional VOC as carbon emission factors to a total mass VOC basis. The protocol is intended to address

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[7] U.S. EPA AP-42, Section 13.2.2, *Wood Residue Combustion*, September 2003.
[8] Emissions testing has been completed on a continuous gasifier-combustor kiln operated by Bibler Bros. in Arkansas. Additional testing was conducted by Georgia-Pacific on their continuous kiln located at the McCormick, South Carolina Mill. However, these testing events represent limited data sets from which overall trends cannot be reasonably established.
[9] Installed kilns have been generating between 2-6 gallons of water per minute at the end of the kiln. Per conversation with Mr. Gary Vande Linde (West Fraser) and Ms. Deanna L. Duram (Trinity), March 28, 2012.

limitations and challenges in VOC testing methods. Per the methodology established, the VOC emission factor for continuous kilns is calculated using the following equation:[10,11]

$$Total\ VOC = VOC\ as\ C \times 1.133 + (1 - 0.65) \times Methanol + Formaldehyde$$

The VOC as carbon emission factor (VOC as C, generally from a Method 25/25A test method) is multiplied by 1.133, the ratio of the molecular weight of pinene ($C_{10}H_{16}$, 136 amu) to the molecular weight of the carbon in pinene (120 amu). As the Method 25/25A test method does not register oxygenated compounds well, emissions of formaldehyde and methanol must be added to appropriately account for their presence in exhaust streams from wood product facilities. Accordingly, U.S. EPA has agreed to "response factors" for these chemicals that account for what the Method 25/25A tests would observe. For example, formaldehyde is not typically "recognized" in the VOC test method. Therefore, it has a 0% response factor; whereas 65% of methanol present in an exhaust stream is captured within the VOC as C emission factor. Hence, to avoid double-counting of emissions, the speciated methanol emission factor is reduced by 65%.

The emission factors for CO_2e emissions from wood combustion were based on factors established in the Greenhouse Gas Mandatory Reporting (MRR) rule in 40 CFR 98, Table C-1 and C-2. Per the biomass deferral, the CO_2e emission factor for the combustion of biomass excludes emissions of CO_2.[12]

3.2.2. Ancillary Equipment Emission Increases

In addition to emissions from the kilns, the proposed project will result in emissions increases from ancillary equipment at the mill associated with the kilns. 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 and Debarking

Increases in fugitive PM emissions from sawing and debarking were based on the increased lumber throughput through those portions of the facility. A control efficiency of 90 percent was applied to account for the activities being performed indoors.[13] 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 factors used are from U.S. EPA's EIIP Uncontrolled Emission Factors document for the processes of sawing and debarking, respectively.[14,15]

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, West Fraser has chosen to use the 0.35 lb/ton value for conservatism, as a starting

[10] U.S. EPA, document entitled, "Interim VOC Measurement Protocol for the Wood Products Industry – July 2007," page 2.
[11] Throughout the application, the terms "VOC" and "Total VOC" are used interchangeably. In all instances, the basis, for the purpose of this PSD application (including attachments) is as terpenes.
[12] Federal Register Vol. 76, No. 139 (pages 43490 – 43508).
[13] Based on guidance by the Texas Commission on Environmental Quality (TCEQ) entitled "Rock Crushing Plants" (Feb. 2002), a control efficiency of 90% should be applied for work performed fully enclosed.
[14] U.S. EPA's EIIP Uncontrolled Emission Factors (July 2001), per the Factor Information Retrieval (FIRE) database management system, version 6.23 for SCC Code 3-07-008-02, Log Sawing.
[15] U.S. EPA's EIIP Uncontrolled Emission Factors (July 2001), per the Factor Information Retrieval (FIRE) database management system, version 6.23 for SCC Code 3-07-008-01, Log Debarking.

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 $PM_{2.5}$.[16]

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.*[17] This estimate is expected to be a highly conservative assessment of the potential PM emissions.

3.2.2.3. Hogger and Chipper

The increase in fugitive PM emissions from the hogger and chipper was based on the increased lumber throughput for those units. A control efficiency of 90 percent was applied to account for the activities being performed indoors. The emission factors used for both processes are from U.S. EPA's EIIP Uncontrolled Emission Factors document for debarking.[18]

3.2.2.4. 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 kilns. 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*.[19,20]

3.2.3. Project Emissions Increases

Table 3-1 shows the total emissions increase for the proposed project compared to the NSR major modification thresholds.

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[16] 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.
[17] U.S. EPA AP-42, Section 13.2.4, *Aggregate Handling and Storage Files,* November 2006.
[18] *Ibid.*
[19] U.S. EPA AP-42, Section 13.2.1, P*aved Roads*, January 2011.
[20] U.S. EPA AP-42, Section 13.2.2, *Unpaved Roads*, November 2006.

Table 3-1. Project Emissions Increase

Pollutant	New Units (tpy)	Emissions Increase Associated Units (tpy)	Total (tpy)	PSD SER Thresholds (tpy)	PSD Permitting Triggered?
NSR Pollutants					
CO	80.30	N/A	80.30	100	No
Fluorides	N/A	N/A	N/A	3	No
H_2S	N/A	N/A	N/A	10	No
Lead	0.01	N/A	0.01	1	No
NO_X	30.80	N/A	30.80	40	No
Reduced Sulfur Compounds (including H_2S)	N/A	N/A	N/A	10	No
SO_2	7.67	N/A	7.67	40	No
H_2SO_4	N/A	N/A	N/A	7	No
Total PM	15.18	38.23	53.41	25	Yes
Total PM_{10}	11.44	8.61	20.05	15	Yes
Total $PM_{2.5}$	10.89	1.52	12.41	10	Yes
Total Reduced Sulfur (including H2S)	N/A	N/A	N/A	10	No
Total VOC	413.06	N/A	413.06	40	Yes
Greenhouse Gases					
$CO_2e_{biomass\ deferral}$	1,334.30	N/A	1,334.30	75,000	No
HAPs					
Formaldehyde	4.40	N/A	4.40	N/A	N/A
Methanol	17.60	N/A	17.60	N/A	N/A

As illustrated in Table 3-1, the project emission increases are below the major modification thresholds for CO, H_2SO_4, Lead, NO_X, SO_2, and $CO_2e_{biomass\ deferral}$, and PSD permitting is not required for those pollutants. However, project emission increases exceed the major modification thresholds for Total PM, Total PM_{10}, Total $PM_{2.5}$, and Total VOC. Therefore, the analysis proceeds to Step (B), the contemporaneous netting analysis.

3.3. CONTEMPORANEOUS NETTING ANALYSIS

West Fraser reviewed all projects completed at the Augusta Mill within the past five years to determine the net emissions increases for Total PM, Total PM_{10}, Total $PM_{2.5}$, and Total VOC for comparison to the applicable NSR thresholds for Step (B). The five calendar year period to review includes 2008 through 2012. Any units that are shut down during the five-year calendar period preceeding the project are allowed to be used as a reduction in project net emission increase calculations provided the 10-year baseline established for that source is used. Should the total emissions increases of any pollutant within the contemporaneous period exceed the respective major modification threshold, then the proposed project is subject to NSR permitting for that pollutant.

The emission decrease from the shutdown of the current indirect fired batch kilns and burners as part of the proposed project is accounted for in the contemporaneous netting analysis. The baseline emissions for these units are provided in Appendix B. The following sections describe the emission factors for Total PM, Total PM_{10}, Total $PM_{2.5}$, and Total VOC for the units that will be shutdown. Appendix B provides detailed calculations and information for the sources of the emission factors used, including pollutants not described in Section 3.3.

There were no other projects in the contemporaneous period leading to an increase or decrease in emissions that must be included in the netting analysis.

3.3.1. Direct Fired Batch Kiln Emission Factors

The emissions from the existing facility direct-fired batch kilns were primarily particulate matter and VOC.

The methodology for calculating a VOC emission factor for the existing kilns was based on the same VOC emission factor that was presented in Section 3.2.1 of this report. Additional details can be found in Appendix B of this application.

The methodology for calculating PM, PM_{10}, and $PM_{2.5}$ is completely described in Appendix B. The PM related values are primarily based on unpublished NCASI values for direct-fired kilns, provided in the NCDAQ Air Permit Review/Preliminary Determination (Page 9) for the Weyerhauser NR Lumber Mill (Plymouth, N.C.), May 2010 permit application.

3.3.2. Contemporaneous Netting

Table 3-2 summarizes the total net emissions changes over the contemporaneous period for Total PM, Total PM_{10}, Total $PM_{2.5}$, and Total VOC, which includes the shutdown of emission units as a result of the proposed project.

Table 3-2. Contemporaneous Netting Analysis

Source	Total PM (tpy)	Total PM_{10} (tpy)	Total $PM_{2.5}$ (tpy)	Total VOC (tpy)
Potential Emissions Increases				
Potential Emissions from New Units				
Continuous Direct-fired Kilns	15.18	11.44	10.89	413.06
Projected Actual Associated Emissions Increases				
Sawing and Debarking	4.90	0.23	0.23	-
Material Transfer/Chipper/Hogger	0.16	0.08	0.06	-
Roads	33.17	8.29	1.23	-
Contemporaneous Decreases				
Baseline Emissions from Decommissioned Units				
Batch Direct-fired Kilns	28.88	17.53	16.04	266.49
Total Potential Emissions Increases	53.41	20.05	12.41	413.06
Total Contemporaneous Emission Decreases	28.88	17.53	16.04	266.49
Net Emissions Increase	24.53	2.52	-3.63	146.57
PSD SER Thresholds	25	15	10	40
PSD Permitting Triggered?	No	No	No	Yes

As Table 3-2 shows, the Total PM, Total PM_{10}, Total $PM_{2.5}$ emissions are less than the applicable major modification thresholds, and thus, NSR permitting is not required for these pollutants. However, the Total VOC emissions increases exceed the applicable PSD major modification threshold, and thus NSR permitting is required for Total VOC.

Detailed calculations for the above discussed netting analysis can be found in Appendix B.

4. REGULATORY APPLICABILITY

The Augusta 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 New Source Review (NSR), Title V, New Source Performance Standards (NSPS), National Emissions Standards for Hazardous Air Pollutants (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: Nonattainment NSR (NNSR) and Prevention of Significant Deterioration (PSD). The NNSR program potentially applies to new construction or modifications that result in emission increases of a particular pollutant for which the area where the facility is located 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 facility is located in Richmond County, which has been designated by the U.S. EPA as "attainment" or "unclassifiable" for all criteria pollutants including ozone.[21] 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 and 100,000 tpy of GHGs in the form of CO_2e.[22]

As the Augusta Mill is a major PSD source, the net emissions increase from the proposed project must be compared to the major modification thresholds to determine if PSD permitting is required. The net emission increase analysis was presented in Section 3.3 of this report. Table 4-1 presents a summary of the analysis.

[21] 40 CFR 81.311.

[22] 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. Proposed Project Net Emission Increases

Pollutant	Net Emissions Increase (tpy)	PSD SER Thresholds (tpy)	PSD Permitting Triggered?
NSR Pollutants			
CO	28.50	100	No
Fluorides	N/A	3	N/A
H_2S	N/A	10	N/A
Lead	5.83E-04	1	No
NO_X	10.93	40	No
Reduced Sulfur Compounds (including H_2S)	N/A	10	N/A
SO_2	0.82	40	No
H_2SO_4	N/A	7	N/A
Total PM	24.53	25	No
Total PM_{10}	2.52	15	No
Total $PM_{2.5}$	-3.63	10	No
Total Reduced Sulfur (including H2S)	N/A	10	N/A
Total VOC	146.57	40	Yes
Greenhouse Gases			
$CO_2e_{biomass\ deferral}$	143.45	75,000	No
HAPs			
Formaldehyde	1.56	N/A	N/A
Methanol	6.25	N/A	N/A

As illustrated in Table 4-1, the proposed project net emission increase exceeds the major modification threshold for Total 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 tons per year (tpy) for any criteria pollutant, more than 10 tpy for any single hazardous air pollutant (HAP), and more than 25 tpy for all HAP. Additionally, 40 CFR Part 70.2 defines facilities with potential emissions

greater than 100,000 tpy of CO_2e are subject to regulation under the Title V permitting program. Potential emissions of multiple pollutants exceed the Title V major source threshold and as such the Augusta Mill will continue to be regulated as a Title V Major Source.

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.

4.2.2.1. 40 CFR 60 Subpart Dc, Standards of Performance for 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
NSPS Subpart Dc (Standards of Performance for Small Industrial Commercial-Institutional Steam Generating Units) applies to steam generating units with a heat input capacity greater than or equal to 10 MMBtu/hr and less than or equal to 100 MMBtu/hr that have been 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."*[23]

The new continuous direct-fired kilns will each operate with a green sawdust gasifier burner at a heat input capacity of 35 MMBtu/hr, and will be constructed in 2013. 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 CCCC, Standards of Performance for Commercial and Industrial Solid Waste Incineration Units for Which Construction is Commenced after November 30, 1999 or for which Modification or Reconstruction is Commenced on or After June 1, 2001

NSPS Subpart CCCC establishes emission limits and standards for operation and maintenance of commercial and industrial solid waste incineration (CISWI) units. As the proposed gasifier burners will combust wood waste for fuel, the potential applicability of this regulation was reviewed.

40 CFR 241.2 (part of the solid waste regulations) defines a clean cellulosic biomass as

> *….those residuals that are akin to traditional cellulosic biomass such as forest-derived biomass (e.g., green wood, forest thinnings, clean and unadulterated bark, sawdust, trim, and tree harvesting residuals from logging and sawmill materials), corn stover and other biomass crops used specifically for energy production (e.g., energy cane, other fast growing grasses), bagasse and other crop residues (e.g., peanut shells), wood collected from forest fire clearance activities, trees and clean wood found in disaster debris, clean biomass from land clearing operations, and clean construction and demolition wood. These fuels are not secondary materials or solid wastes unless discarded. Clean biomass is biomass that does not contain contaminants at concentrations not normally associated with virgin biomass materials."*

[23] 40 CFR 60.41(c).

The fuel for the gasifier burners will be green sawdust produced at the Augusta Mill. By the definition provided above, the green sawdust is not classified as secondary materials or solid waste in its proposed use at the mill. As such, the combustion units are not CISWI units, and Subpart CCCC is not applicable for the proposed project.

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 hazardous air pollutants (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 Augusta 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 are detailed in the following sections.

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

40 CFR 63 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.

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 facility 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 Subpart DDDD, or any other requirements in NESHAP Subpart A, *General Provisions*, except for the initial notification requirements in §63.9(b). Although the lumber kilns are an affected source, there are no applicable requirements for the proposed direct-fired kilns at the mill.

4.2.3.3. 40 CFR 63 Subpart DDDDD, Industrial, Commercial, and Institutional Boilers and Process Heaters

40 CFR 63 Subpart DDDDD, also known as Boiler MACT, was originally promulgated on September 13, 2004, and regulated HAP emissions from solid, liquid, and gaseous fuel-fired boilers and process heaters at facilities that are a major source of HAP. However, in June 2007, the U.S. Court of Appeals for the District of Columbia Circuit ruled to vacate Subpart DDDDD in its entirety, and the mandate was issued July 30, 2007.[24]

Boiler MACT was most recently finalized on March 21, 2011, with an effective date of May 20, 2011. However, on May 18, 2011, the effective date of the Boiler MACT was stayed pending reconsideration of elements of the regulation.[25] On December 23, 2011, U.S. EPA issued a notice of proposed revisions to the NHSM rule.[26] West Fraser will review applicability and requirements upon promulgation of the final standard following reconsideration and will comply with any requirements that are applicable.

However, under the most recent version of the Boiler MACT, a process heater is defined in 40 CFR 63.7570, as

> *…an enclosed device using controlled flame, that is not a boiler, 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 for use in a process unit, instead of generating steam. Process heaters are devices in which the combustion gases do not directly come into contact with process materials. Process heaters do not include units used for comfort heat or space heat, food preparation for on-site consumption, or autoclaves.*

The continuous lumber kilns will be direct-fired, as the combustion gases from the fuel will directly contact the lumber during the drying process. Therefore, the new lumber kilns are not considered process heaters, and Boiler MACT is not applicable as it is currently proposed and effective.

4.2.3.4. Non-Applicability of All Other NESHAP

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

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[24] *Natural Resources Defense Council, Sierra Club, Environmental Integrity Project v. U. S. EPA*, U.S. Court of Appeals for the District of Columbia Circuit, No. 04-1385, decided June 8, 2007: http://pacer.cadc.uscourts.gov/docs/common/opinions/200706/04-1385a.pdf

[25] Federal Register Volume 76, No. 96, pages 28662 – 28664, published on May 18, 2011.

[26] Refer to http://www.epa.gov/ttn/atw/boiler/fr23de11major.pdf for the proposed rule pre-publication version.

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 on-going 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 proposed project does not include the installation of any new add-on control devices or the modification of existing ones at the facility; therefore, it will not result in any CAM requirements.

4.3. STATE REGULATORY APPLICABILITY

In addition to federal air regulations, Georgia Rules for Air Quality Control (GRAQC) Chapter 391-3-1, updated August 9, 2012, establishes regulations applicable at the emission unit level (source specific) and at the facility level. 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).[27] All equipment associated with the proposed project are subject to this rule.

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.*[28]

Although the proposed lumber kilns will burn wood waste, the main purpose of the kilns is not the destruction of solid waste. Therefore, Rule (c) will not apply to the proposed kilns.

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.*[29]

Although the lumber drying kilns will be fuel-burning units, the primary purpose of the units is not to produce thermal energy. Therefore, the kilns are not subject to Rule (d).

[27] GRAQC 391-3-1-.02(2)(b)1
[28] GRAQC 391-3-1-.01(hh)
[29] GRAQC 391-3-1-.01(cc)

4.3.4. GRAQC 391-3-1-.02(2)(e) – Particulate Emissions 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):

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

$E = 55 \times P^{0.11} - 40$ for $P > 30$ 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. The input rate of wood into the facility is 924,000 ton/yr, making the allowable PM emissions from the facility 209.22 tpy. The calculated potential PM emissions are 119.53 tpy; therefore, 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 kilns will exclusively combust wood waste, which is not a fossil fuel. They are, therefore, not subject to the emission limitation in the rule. However, the rule also specifies 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 West Fraser kilns are subject to this limitation and shall continue to comply with it after the conversion of the kilns.

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 part of the proposed project will be covered by this generally applicable rule. West Fraser will take the appropriate precautions to prevent fugitive dust from becoming airborne and to ensure that the percent opacity is less than 20 percent.

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

Rule (tt) limits VOC emissions from facilities that are located in or near the original Atlanta 1-hour ozone nonattainment area. The Augusta 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 Georgia 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)(lll) – NO_X from Fuel-Burning Equipment

Rule (lll) limits NO_X emissions from fuel-burning equipment with capacities between 10 and 250 MMBtu/hr that are located in or near the original Atlanta 1-hour ozone nonattainment area. The Augusta 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-.03(1) – Construction (SIP) Permitting

The proposed project will require physical construction activities to allow construction of the new continuous lumber drying kilns and removal of the existing batch kilns. Emission increases associated with the proposed project are above the *de minimis* construction permitting thresholds specified in GRAQC 391-3-1-.03(6)(i).[30] Further, as discussed in Section 4.1, PSD permitting is required for VOC. Therefore, a construction permit application is necessary and the appropriate forms are included in Appendix C.

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

The Augusta Mill is a major stationary source, since the potential emissions of regulated pollutants exceed the thresholds established by Georgia's Title V Operating Permit Program. The mill operates under its renewal Title V permit, Permit No. 2421-245-0047-V-04-0, effective June 13, 2012. Modifications to the existing permit conditions will be required as part of the proposed project as well as the addition of new conditions to allow the project to avoid NSR permitting for certain pollutants and to establish appropriate BACT limits for pollutants undergoing NSR permitting.

Additionally, as part of this modification, West Fraser would also like to request that the planer mill cyclone be removed from the current permit. The planer mill cyclone is a non-emissions generating unit because all emissions are recycled back within the process and no emissions from the unit are released from the atmosphere.

Therefore, the proposed project constitutes a Title V major modification, and West Fraser has included the Title V operating permit application database in Appendix G.

4.3.12. Incorporation of Federal Regulations by Reference

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

- GRAQC 391-3-1-.02(7) – PSD
- GRAQC 391-3-1-.02(8) – NSPS
- GRAQC 391-3-1-.02(9) – NESHAP
- GRAQC 391-3-1-.02(11) – CAM

4.3.13. Non-Applicability of Other GRAQC

A thorough examination of the GRAQC applicability to the Augusta Mill reveals many GRAQC that do not apply and do not impose additional requirements on operations. Such GRAQC rules include those specific to a particular type of industrial operation which is not performed at the Augusta Mill.

[30] Based on Georgia EPD guidance, usage of the *de minimis* permitting exemption thresholds must consider actual-to-potential emissions increases, not actual-to-projected actual emissions increases.

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)]:

(j) Control Technology Review.

(2) A new major stationary source shall apply best available control technology for each regulated NSR pollutant that it would have the potential to emit in significant amounts.

BACT is defined in the PSD regulations [40 CFR 52.21(b)(12)] as:

> *...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 Administrator, 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 Administrator 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 pollutant (i.e., lb/hr).[31]

[31] 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).

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.* [32]

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.[33] 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.[34] 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 …[that DHEC] … determines is achievable … through application of production processes or available methods, systems and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques"

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.

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[32] U.S. EPA Responses to Public Comments on the Proposed PSD Permit for the Desert Rock Energy Facility, July 31, 2008, p.41-42.
[33] Memo dated December 1, 1987, from J. Craig Potter (EPA Headquarters) to EPA Regional Administrators, titled "Improving New Source Review Implementation."
[34] In November 2010, the U.S. EPA issued a guidance document for the permitting of GHG that recommends that permitting authorities use the same top-down BACT process to determine BACT for GHG. A revised guidance document was issued in March 2011. U.S. EPA Office of Air and Radiation, Office of Air Quality Planning and Standards, PSD and Title V Permitting Guidance for Greenhouse Gases, March 2011,page 17, http://www.epa.gov/air/nsr/ghgdocs/ghgpermittingguidance.pdf.

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."*[35]

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.* [36]

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.[37]

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.

5.1.4. Floor

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

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.

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

[36] 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.

[37] 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.

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.[38] The proposed continuous kilns are subject to BACT for each pollutant requiring PSD permitting. There will be no other new or modified emission sources at the facility.

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 kilns undergoing BACT are 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.[39]

5.3.1. Identification of Potential Control Technologies

Potentially applicable emission control technologies were identified for the continuous lumber kilns 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.

West Fraser performed searches of the RBLC database in November 2012 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 category was searched:

- Wood Lumber Kilns (RBLC Code 30.800)

Furthermore, the RBLC search results were supplemented with BACT determinations from several recently issued air permits, and are included in Appendix E. As noted previously, no other units are subject to BACT review. Therefore, no additional RBLC searches or other technical reviews were performed.

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.

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[38] 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).
[39] 40 CFR 63.223.

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.[40]

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 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.[41]

Note that all economic calculations are based onOctober 2012 dollars. Detailed cost calculations for economic analyses provided within this BACT analysis are presented in Appendix D.

5.4. LUMBER DRYING KILNS – 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

[40] 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
[41] 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

- 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.

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.[42]

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 percent.[43]

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

[42] 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.
[43] Ibid.

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.[44]

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 concentration of VOC in the exhaust stream, condensers exhibit a wide range of VOC control efficiency from as low as 50 percent to as high as 99 percent.[45,46]

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.[47]

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[44] 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.
[45] Ibid.
[46] U.S. EPA, Clean Air Technology Center, Technical Bulletin Refrigerated Condensers for Control of Organic Air Emissions, EPA 456/R-01-004, December 2001.
[47] U.S. EPA, Air Pollution Control Technology Fact Sheet – Recuperative Incinerator. EPA-452/F-03-020.

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 percent 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 percent depending on the system requirements of the air contaminant stream.[48]

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 percent 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.[49] U.S. EPA expects that an RTO can achieve a destruction/removal efficiency of greater than 95 percent depending on the system's requirements and the characteristics of the contaminated stream.[50]

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.[51] Below this range, the reaction rate drops sharply and effective oxidation of VOC is no longer feasible.

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 kilns, 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 kilns. The manufacturer's recommendations should be used when determining the appropriate operating specifications and developing a schedule for routine maintenance of the kilns.

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

[48] U.S. EPA, Air Pollution Control Technology Fact Sheet – Recuperative Incinerator. EPA-452/F-03-020.
[49] U.S. EPA, Air Pollution Control Technology Fact Sheet – Regenerative Incinerator. EPA-452/F-03-021.
[50] Ibid.
[51] U.S. EPA, Air Pollution Control Technology Fact Sheet – Catalytic Incinerator. EPA-452/F-03-018.

continuous kilns. Note that, based on a review of both batch and continuous lumber drying kilns in the U.S. EPA's RBLC database and several air permit applications for mills with lumber drying kilns, 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 kilns will be approximately a minimum of 120 °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. However, West Fraser is, for conservatism, further considering biofiltration in the future steps for the BACT determination to determine what the economic and environmental impact from the use of a biofilter would be in the situation that it is technically feasible with this type of unit (a point which West Fraser does not concede).

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 kilns 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 kilns 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, West Fraser may eliminate thermal oxidation from consideration based on technical infeasibility. However, West Fraser 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 West Fraser 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 kilns is a technically feasible option for minimizing the VOC emissions from the kilns and will be considered further in the future steps for BACT determination.

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, West Fraser does not concede that the use of an RTO or biofiltration on a lumber drying kiln is technically feasible; however, these control options are 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	Biofiltration [1]	65%
3	Proper Maintenance and Operating Practices	Base Case

1. Biofiltration control efficiency based on North Carolina Department of Environment and Natural Resources Air Permit Review for Weyerhauser's Plymouth facility continuous kiln construction application, which referenced an estimated 60-70% VOC control efficiency from biofilitration, based on a conversation with David Word of NCASI.

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 $23,179 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.

West Fraser has determined that an RTO is not BACT for the kilns based on the technical feasibility, environmental, energy, and economic analyses. Detailed cost calculations can be found in Appendix D.

5.4.4.2. Biofiltration

Even if the use of biofiltration was technically feasible on a lumber drying kiln, the cost of biofiltration exceeds the benefit of the VOC reduction it offers. The cost of controlling VOC with biofiltration is estimated at approximately $22,889 per ton of VOC removed. Despite the conservative assumption that biofiltration is technically feasible, it is not cost effective, and therefore is not BACT for the kilns.

5.4.4.3. Proper Maintenance and Operating Practices

The only remaining technology is proper maintenance and operating practices of the kilns, a logical option since a properly maintained and operated kiln can effectively minimize VOC formation. This control option is considered BACT for VOC for the continuous kilns.

5.4.5. Selection of BACT (Step 5)

Based on steps 1 through 4 of the BACT analysis, West Fraser has determined that proper maintenance and good operating practices are the only controls technically and economically feasible for the proposed continuous lumber drying kilns. All other potential control technologies were eliminated in earlier steps of the process. Therefore, West Fraser proposes the emission rate of 3.76 lb Total VOC (as terpene + methanol + formaldehyde)/MBF as BACT, calculated from the equation described in Section 3.2.1 and reproduced below.

$$Total\ VOC = VOC\ as\ C \times 1.133 + (1 - 0.65) \times Methanol + Formaldehyde$$

The basis for the VOC factor is adjusted per EPA protocol from the traditional VOC as carbon to a total mass VOC basis. In order to comply with BACT, West Fraser will develop an operating and maintenance plan for the new continuous kilns.

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.

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 National Ambient Air Quality Standards (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 West Fraser Augusta 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. Therefore, West Fraser 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 Augusta Mill are shown in Table 6-1 below.

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

Class I Area	Minimum Distance from Site (km)*
Joyce Kilmer - Slick Rock Wilderness	289
Cape Romain Fish & Wildlife	221
Wolf Island Fish & Wildlife	225
Shining Rock Wilderness	237
Okefenokee Fish & Wildlife	253
Great Smoky Mountains National Park	269
Linville Gorge Wilderness	276
Cohutta Wilderness	295

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).[52] 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 14.27 tons per year as a result of the proposed project.

[52] As part of the PSD analysis, the Augusta 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. Sum of Combined Annual Emission Increases

Pollutant	Facility-Wide Maximum 24-hr Emissions Increase (lb/hr)	FLAG 2010 Approach Annual Emissions[2] (tpy)
NO_X	2.50	10.93
Direct Particulate[1]	0.58	2.52
SO_2	0.19	0.82
Sum of Emissions (tpy)		14.27

1. Direct particulate includes all filterable and condensible PM_{10}.
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.

Table 6-3. Summary of Q/D Analysis for Class I Sites

Class I Area	Minimum Distance from Site (km)*	Annualized VAP Emissions (tpy)	Q/D
Joyce Kilmer - Slick Rock Wilderness	289	14.27	0.05
Cape Romain Fish & Wildlife	221	14.27	0.06
Wolf Island Fish & Wildlife	225	14.27	0.06
Shining Rock Wilderness	237	14.27	0.06
Okefenokee Fish & Wildlife	253	14.27	0.06
Great Smoky Mountains National Park	269	14.27	0.05
Linville Gorge Wilderness	276	14.27	0.05
Cohutta Wilderness	295	14.27	0.05

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, West Fraser is providing letters to the Federal Land Manager (FLM) responsible for each Class I area listed above concurrent with this application.

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, West Fraser projects that truck traffic on unpaved roads will increase by approximately 51,600 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. Further, the increase in truck traffic is expected to have a minimal impact when compared to the net decrease in emissions of Total PM_{10}, and Total $PM_{2.5}$ from the shutdown of the batch kilns.

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. West Fraser anticipates that very few additional personnel will be employed to aid the operation of the continuous kilns. 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 Augusta Mill is located in Richmond County, which is designated as attainment, or unclassifiable for NO_2 and ozone. Also, the Augusta 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, ozone production is expected to decrease as well. Thus West Fraser 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 limitation of 20% 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 is one existing ozone monitor in Richmond County, where the Augusta Mill is located. 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 up to date data available (up to 2011) was included.

Table 7-1. Ozone Concentration at Richmond County Monitor

Site Name	City	County	Distance to Facility (km)	3-Year Rolling Average (ppm)[1]		
				2007-2009	2008-2010	2009-2011
Bunalow Road	Augusta	Richmond	13	0.074	0.071	0.070

1. Ozone concentration for each year 2007 through 2011 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.

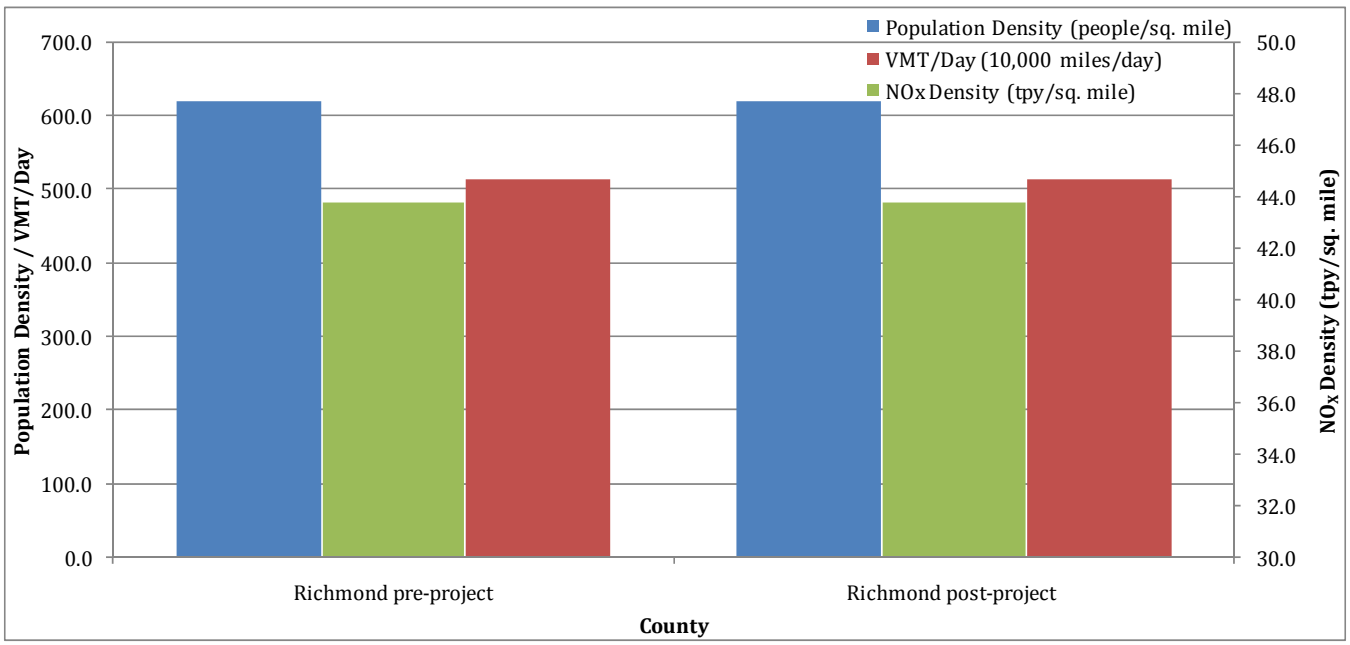
An assessment of the Richmond County monitor with and without the project was conducted. As the project is not expected to alter population density or vehicle miles travelled by a significant amount, the only change as a result of the project would be industrial NO_X emissions in the county. Expected changes in population density, VMT, and NO_X density for Richmond 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 Counties of Interest

Monitor County	Population Density[1] (people/sq. mile)	VMT/Day [2] (10,000 miles/day)	NO_X Density [3,4] (tpy/sq. mile)
Richmond pre-project	620.4	512.3	43.7
Richmond post-project	620.4	512.3	43.8

1. Population density for Richmond obtained from: http://quickfacts.census.gov/qfd/states/13/13245.html
2. VMT/day values for Richmond obtained from "Nonattainment Area Designations for Georgia Under the 2008 Revised 8-hour Ozone National Ambient Air Quality Standard Technical Analysis".
3. NO_X density calculated using NO_X emissions in "Nonattainment Area Designations for Georgia Under the 2008 Revised 8-hour Ozone National Ambient Air Quality Standard Technical Analysis" for Richmond county area per the county's website.
4. NO_X density for Richmond post-project calculated by summing potential emissions of NO_X from the project to the 2008 Non-Attainment Data.

Figure 7-1. Urbanization Evaluation of the Richmond County Monitor with and without the Project



The VOC project emission increases are greater than 100 tpy, which is the Significant Impact Level (SIL) trigger for ozone with respect to modeling. As NO_X and VOC are precursors to ozone formation, the project's potential impact on ozone formation is considered. The southeastern U.S. is considered a NO_X-limited atmosphere with respect to ozone formation, and while it is possible that increasing NO_X emissions in a NO_X-limited atmosphere could cause an increase in ozone production, this effect is miniscule on an individual source-level and for practical purposes cannot be quantified, but rather is qualitatively addressed as insignificant for all but the very largest sources. West Fraser asserts that ozone monitoring is not necessary in light of the magnitude of the NO_X and VOC emissions increases as well as the presence of the existing monitors that are nearby. Based on a

comparison of the factors in Figure 7-1, to the ozone concentrations in the counties of interest based on published monitoring data, the proposed project should not have a negative impact on ozone concentrations within Richmond County.

8. TOXIC AIR POLLUTANTS ASSESSMENT

This section details the assumptions used for completing the toxic air pollutant (TAP) modeling analysis (i.e., model setup) and the results of modeling analysis.

Georgia EPD regulates the emissions of toxic air pollutant (TAP) emissions through a program approved under the provisions of *Georgia Rules for Air Quality Control*, 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 Georgia EPD's review of toxic air pollutant emissions as part of air permit reviews are contained in the agency's *Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions (Guideline)*.[53]

8.1. DERIVATION OF ACCEPTABLE AMBIENT CONCENTRATION

According to the *Guideline*, dispersion modeling should be completed for each potentially toxic pollutant having quantifiable emission increases. The *Guideline* infers that a pollutant is identified as a toxic pollutant if any of the following toxicity-determined values have been established for that pollutant:

- EPA Integrated Risk Information System (IRIS) reference concentration (RfC) or unit risk;
- Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PEL);
- American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV);
- National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limits (REL); and,
- Lethal Dose – 50% (LD50) Standards.

The *Guideline* specifies that the resources should be referenced in the priority schedule listed above to determine long-term and short-term acceptable ambient concentrations (AACs) based on the exposure limits that are provided.

The AAC for each toxic pollutant is calculated from the toxicity data presented in the resources listed above. For any pollutant, both a long-term and short-term AAC might be calculated. If a pollutant has an RfC and/or unit risk, an annual average (long-term) AAC can be calculated as follows. The RfC is an estimate of daily inhalation exposure that is likely to be without an appreciable risk of deleterious effects during a lifetime. The unit risk is a quantitative assessment of cancer-causing potential per concentration of air inhaled. An annual average AAC is obtained by dividing the unit risk by a cancer risk factor based on the weight-of-evidence classification, i.e., 1:1,000,000 for known carcinogens (class A), 1:100,000 for probable carcinogens (class B), and 1:10,000 for suspected carcinogens (class C). The resultant is an annual average AAC in units of micrograms per cubic meter ($\mu g/m^3$). RfC values are given in units of milligrams per cubic meter (mg/m^3) and require no conversion.

If RfC and unit risk data are not available in the IRIS database, then an annual standard cannot be calculated and a 24-hour AAC must be derived. The bases for the 24-hour standards are the OSHA PEL given at 29 CFR Part 1910 Subpart Z, followed in priority by the ACGIH TLV, NIOSH REL, and LD50 databases. These resources provide exposure limits as time-weighted averages (TWA) in terms of occupational exposure duration (i.e., typically an 8-hour average). If a TWA value is provided for a given pollutant, the 24-hour average AAC is derived as follows. First, an adjustment factor (i.e., 40 divided by the total weekly emitting hours) is applied to the TWA to account for exposure in excess of occupational duration. This adjustment factor is assumed to be

[53] Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions. Georgia Department of Natural Resources, Environmental Protection Division, Air Protection Branch, Revised, June 21, 1998.

168 hours per week for continuous operation. Second, the adjusted TWA is divided by a safety factor to account for human carcinogenicity: 100 for pollutants that are not known human carcinogens, 300 for pollutants that are known human carcinogens. The resultant value is adopted as a 24-hour AAC. Per the *Guideline*, if a toxic air pollutant has an annual AAC, then the derivation of and comparison to a 24-hour standard is not required.

An additional standard must be met if a given pollutant has listed a Short Term Exposure Limit (STEL) or Ceiling (C) in any one of the above-named resources. A STEL is a 15-minute weighted average concentration that should not be exceeded at any time during the workday. A C value is a concentration that should not be exceeded at any time during occupational exposure. These values have been established for pollutants that are acute sensory irritants and apply as a 15-minute standard, also adjusted by a safety factor of 10 as recommended by the *Guideline*. No other adjustment factor is applied to STEL or C values. A 15-minute average standard, if applicable, must be met in addition to an annual average and/or 24-hour average standard. The *Guideline* clearly states that each of annual, 24-hour, and 15-minute AAC should be derived if the appropriate toxicity information is provided in any of the listed resources.

West Fraser has evaluated the available reference material to determine the applicable AAC standards for TAP identified as being emitted at the facility. TAPs modeled as part of this assessment were based on the worst-case TAPs as determined for previous continuous kiln installation projects accepted by EPD. The TAPs modeled as part of this assessment include:

- Acetaldehyde
- Formaldehyde
- Propionaldehyde
- Methanol

The tables in Appendix F summarize the derivation methodology for the annual, 24-hour and 15-minute AACs for the pollutants potentially emitted by the proposed facility.

8.2. DETERMINATION OF TOXIC AIR POLLUTION IMPACT

West Fraser completed refined modeling for the four toxic air pollutants listed above using the ISC dispersion model. Table 8-1 presents the modeled emission source parameters and Table 8-2 Table 8-2presents the modeled emission rates.

Table 8-1. Modeled Source Parameters

ID	Description	UTM E (m)	UTM N (m)	Elevation (m)	Height (m)	Temp. (F)	Velocity (m/s)	Diameter (m)
CK01A	Continuous Kiln #1 - Stack A	410,518.7	3,688,446.2	42.19	10.67	100	35.93	0.69
CK01B	Continuous Kiln #1 - Stack B	410,487.9	3,688,510.1	43.08	10.67	100	35.93	0.69
CK02A	Continuous Kiln #2 - Stack A	410,551.5	3,688,460.2	42.07	10.67	100	35.93	0.69
CK02B	Continuous Kiln #2 - Stack B	410,519.0	3,688,523.3	42.96	10.67	100	35.93	0.69

For the purposes of this application, it is assumed that 100 percent of all TAP emissions from the lumber drying process will be emitted from the two stacks that handle exhaust on each end of each continuous kiln. Induced flow is created at the outlet of each kiln in order to exhaust all emissions through the stacks. It is also assumed that the abort stacks that are present on each of the continuous kilns will not be involved with the release of the TAP that are being considered for this project. These TAP emissions are exclusively considered during wood drying periods and are focused on only the stacks present at the end of each kiln.

Table 8-2. Modeled TAP Emission Rates

ID	Description	Modeled Emission Rate (lb/hr)			
		Methanol	Formaldehyde	Propionaldehyde	Acetaldehyde
CK01A	Continuous Kiln #1 - Stack A	1.005	0.251	0.010	0.364
CK01B	Continuous Kiln #1 - Stack B	1.005	0.251	0.010	0.364
CK02A	Continuous Kiln #2 - Stack A	1.005	0.251	0.010	0.364
CK02B	Continuous Kiln #2 - Stack B	1.005	0.251	0.010	0.364

The pollutants modeled for this analysis are consistent with those modeled for other similar applications that have been provided to EPD. Total kiln TAP pollutant emissions are shown in Table B-19.

8.2.1. ISC Modeling Results

Table 8-3 presents the results for each pollutant and averaging period. Note that the maximum 15-minute impact is based on the maximum 1-hour predicted impact multiplied by 1.32.

Table 8-3. Summary of Modeling Analysis

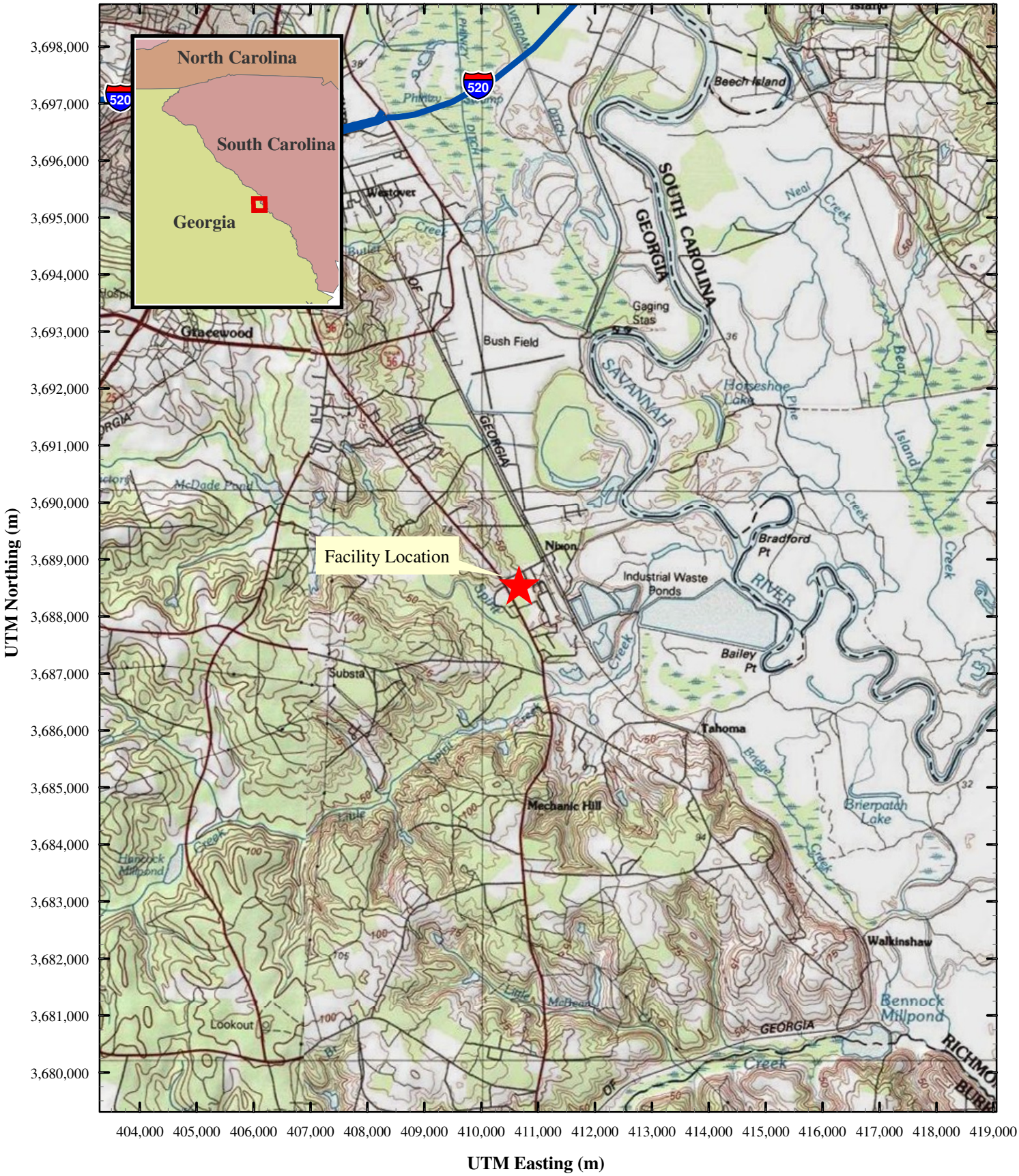
Pollutant	CAS	Maximum 1-Hour Impact[1] (µg/m^3)	Maximum 15-Min Impact[2] (µg/m^3)	15-min AAC (µg/m3)	Maximum 24-hr Impact[1] (µg/m3)	24-hr AAC (µg/m3)	Maximum Annual Impact[1] (µg/m3)	Annual AAC (µg/m3)	Exceed Standard?
Methanol	67-56-1	57.49	75.89	32,750	26	619	None		No
Formaldehyde	50-00-0	16.87	22.27	246	Not Required		0.50	1.11	No
Propionaldehyde	123-38-6	0.69	None		Not Required		0.02	8.00	No
Acetaldehyde	75-07-0	24.46	32.29	4,500	Not Required		0.73	9.00	No

1. First-high modeled impact over the five years of meteorological data.
2. Modeled 1-hour concentration multiplied by 1.32 to convert to 15-minute impact per GA Air Toxics Guidance (June 21, 1998).

As shown in the table above, impacts of all TAP from the proposed facility are below the respective AACs

APPENDIX A: FACILITY PLOT PLAN AND PROCESS FLOW DIAGRAMS

Figure A-1. Area Map
West Fraser Inc.
Augusta, Richmond County, Georgia



Coordinates reflect UTM projection Zone 17, NAD83.

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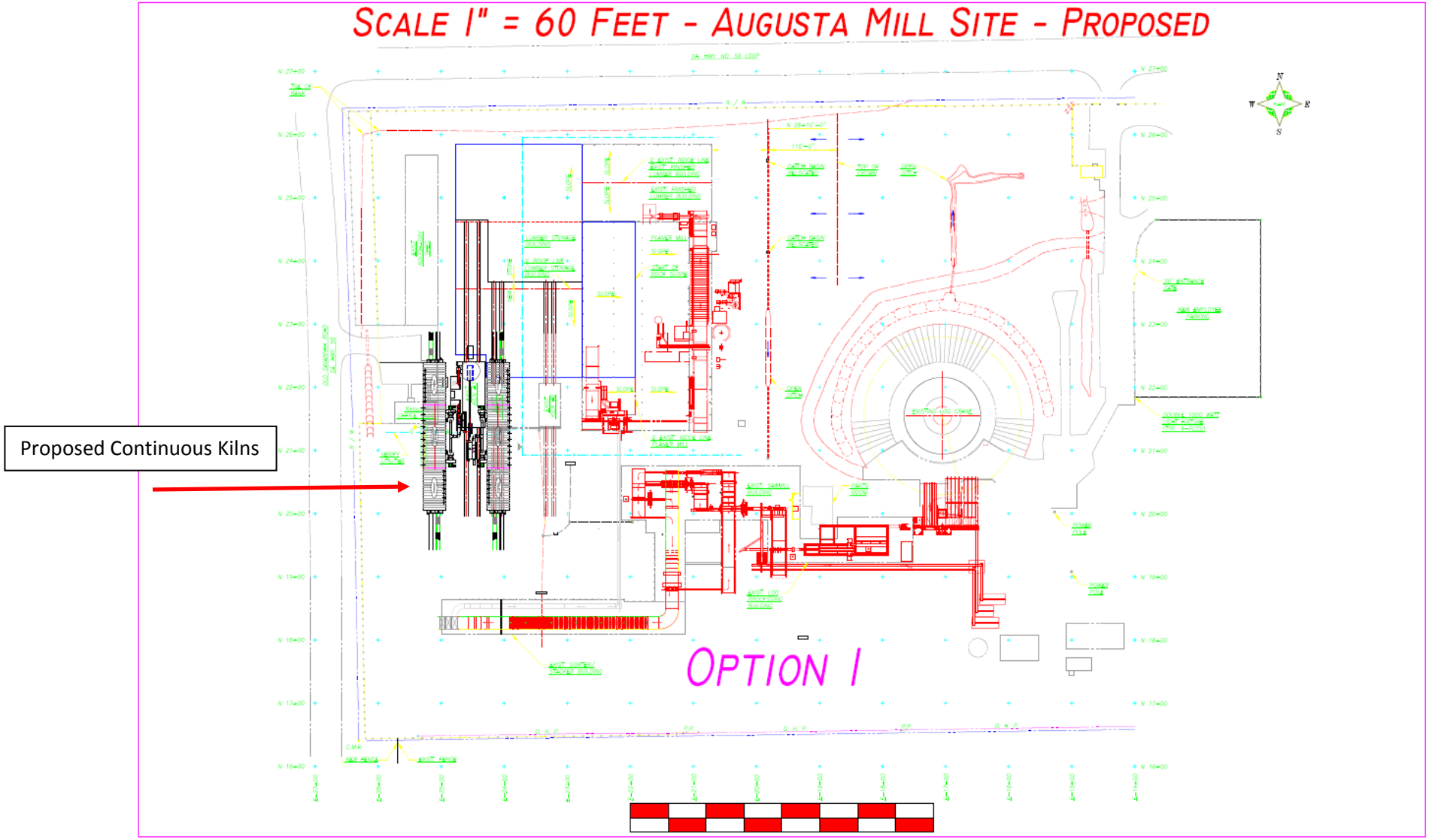
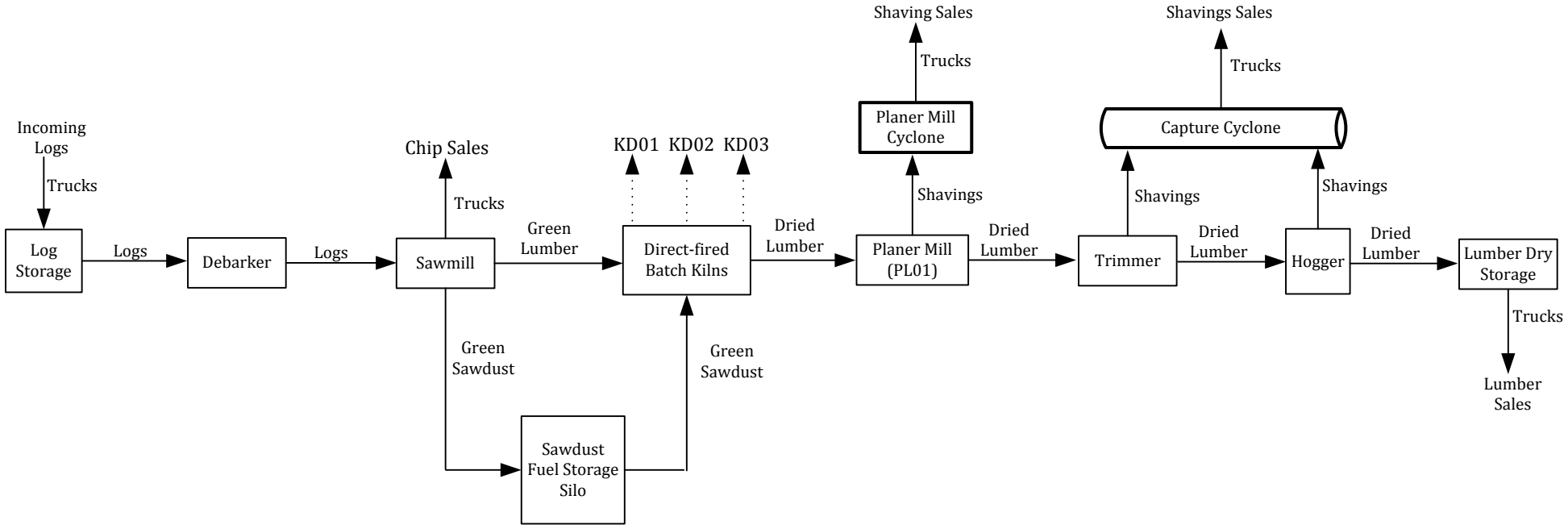
SCALE 1" = 60 FEET - AUGUSTA MILL SITE - PROPOSED





Legend

Emissions

Process Material

Control Device

Process Equipment

West Fraser, Inc.
Augusta Lumber Mill, Georgia

Figure A-3
Process Flow Diagram – Current Facility

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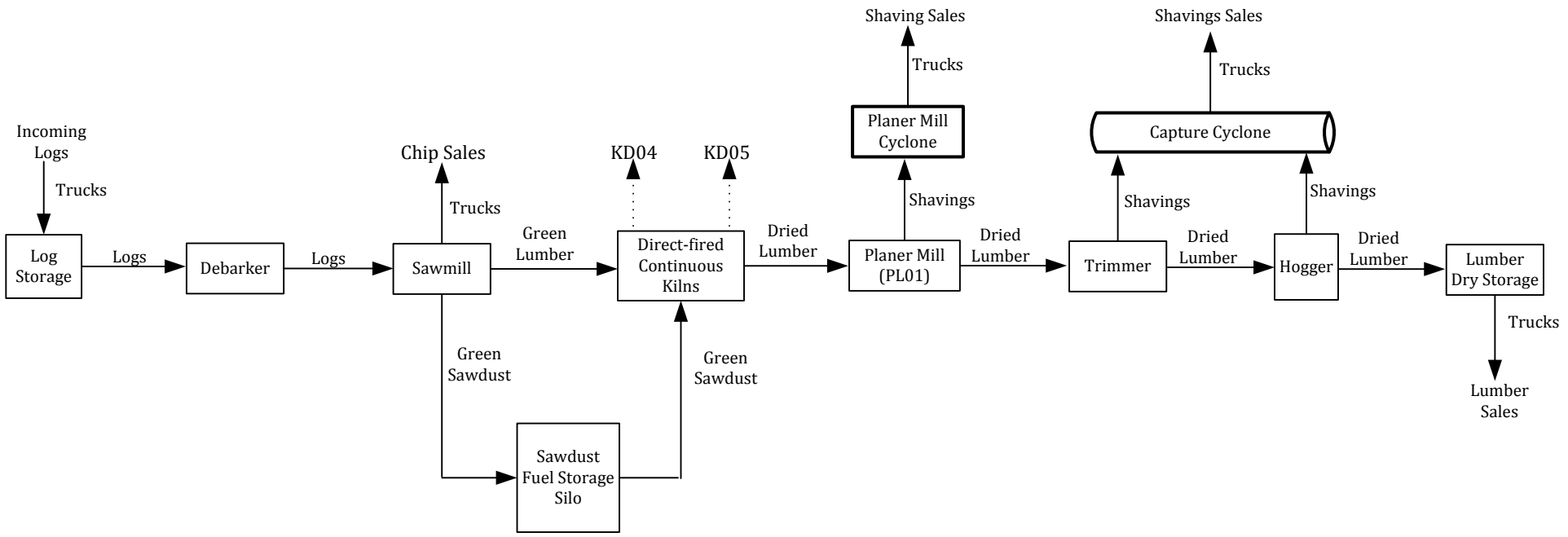
December 2012



Legend

Emissions

Process Material

Control Device

Process Equipment

West Fraser, Inc.
Augusta Lumber Mill, Georgia

Figure A-4
Process Flow Diagram – Proposed Project

Trinity Consultants

121101.0016
December 2012

APPENDIX B: DETAILED EMISSION CALCULATIONS

Table B-1. Current Operating Capacities for Direct-Fired Batch Kilns

Kiln	Operating Capacity[1] MMBtu/hr	BF/hr
Kiln No. 1	15.05	3,889
Kiln No. 2	30.10	7,778
Kiln No. 3	49.45	12,778

1. Operating Capacity (MMBtu/hr) from the facility's Title V renewal application review narrative (application received by EPD on October 25, 2004). Operating Capacity (BF/hr) copied during the Augusta Lumber Mill site visit on March 06, 2012 by Deanna Duram and Jake Stewart (Trinity), titled "West Fraser Augusta Permit Renewal Forms" (dated March 8, 2011).

Table B-2. Heating Value for Wood Combustion

Heating Value[1]	4,500	Btu/lb

1. From US EPA AP-42 Paragraph 1.6.1 (Sept. 2003).

Table B-3. Production Information for Direct-Fired Batch Kilns[1,2]

Month	Kiln 1 Production BF	Wood Waste Combusted tons	Kiln 2 Production BF	Wood Waste Combusted tons	Kiln 3 Production BF	Wood Waste Combusted tons	Total Kiln Production BF	Total Wood Waste Combusted tons
Jan-02	1,706,304	698.5	3,500,306	1,432.9	5,835,928	2,389.1	11,042,538	4,520.5
Feb-02	1,625,948	665.6	3,019,816	1,236.2	5,417,098	2,217.6	10,062,862	4,119.5
Mar-02	1,775,590	726.9	3,073,496	1,258.2	6,083,500	2,490.4	10,932,586	4,475.5
Apr-02	1,537,570	629.4	3,534,065	1,446.8	5,680,540	2,325.5	10,752,175	4,401.7
May-02	1,450,910	594.0	3,749,151	1,534.8	6,354,532	2,601.4	11,554,593	4,730.1
Jun-02	1,862,890	762.6	3,485,824	1,427.0	5,888,368	2,410.5	11,237,082	4,600.2
Jul-02	2,183,410	893.8	2,323,696	951.3	5,625,018	2,302.7	10,132,124	4,147.8
Aug-02	1,807,482	739.9	4,243,642	1,737.2	5,894,604	2,413.1	11,945,728	4,890.3
Sep-02	1,866,752	764.2	3,527,562	1,444.1	4,827,056	1,976.1	10,221,370	4,184.4
Oct-02	2,095,534	857.9	3,353,356	1,372.8	5,428,046	2,222.1	10,876,936	4,452.7
Nov-02	2,244,542	918.9	3,254,944	1,332.5	5,449,068	2,230.7	10,948,554	4,482.0
Dec-02	1,662,376	680.5	2,254,438	922.9	4,593,146	1,880.3	8,509,960	3,483.8
Jan-03	2,146,652	909.8	2,705,212	1,146.5	6,813,514	2,887.7	11,665,378	4,944.0
Feb-03	2,371,888	1,005.2	3,017,326	1,278.8	5,638,221	2,389.6	11,027,435	4,673.6
Mar-03	2,207,468	935.6	3,040,506	1,288.6	4,816,522	2,041.3	10,064,496	4,265.5
Apr-03	2,031,600	861.0	2,681,492	1,136.5	5,001,580	2,119.7	9,714,672	4,117.2
May-03	2,441,344	1,034.7	3,746,540	1,587.8	5,633,999	2,387.8	11,821,883	5,010.3
Jun-03	1,722,426	730.0	3,452,784	1,463.3	5,229,500	2,216.3	10,404,710	4,409.7
Jul-03	1,747,278	740.5	3,541,492	1,500.9	4,349,668	1,843.5	9,638,438	4,084.9
Aug-03	1,995,400	845.7	3,015,438	1,278.0	5,877,926	2,491.2	10,888,764	4,614.8
Sep-03	1,843,282	781.2	2,915,530	1,235.6	5,675,664	2,405.4	10,434,476	4,422.3
Oct-03	2,267,162	960.9	1,937,386	821.1	5,911,816	2,505.5	10,116,364	4,287.5
Nov-03	1,680,946	712.4	3,592,858	1,522.7	4,853,120	2,056.8	10,126,924	4,291.9
Dec-03	1,820,894	771.7	1,981,298	839.7	5,167,128	2,189.9	8,969,320	3,801.3
Jan-04	1,853,986	757.3	2,930,912	1,197.1	6,123,336	2,501.1	10,908,234	4,455.5
Feb-04	1,597,760	652.6	2,712,414	1,107.9	5,210,972	2,128.4	9,521,146	3,888.9
Mar-04	1,401,452	572.4	4,065,630	1,660.6	5,083,346	2,076.3	10,550,428	4,309.3
Apr-04	1,709,896	698.4	3,063,816	1,251.4	5,970,034	2,438.5	10,743,746	4,388.3
May-04	1,530,864	625.3	4,281,953	1,749.0	5,102,926	2,084.3	10,915,743	4,458.5
Jun-04	1,829,738	747.4	3,181,436	1,299.5	6,104,291	2,493.3	11,115,465	4,540.1
Jul-04	756,880	309.1	1,617,994	660.9	2,325,608	949.9	4,700,482	1,919.9
Aug-04	2,657,206	1,085.3	3,880,670	1,585.1	660,192	269.7	7,198,068	2,940.0
Sep-04	2,201,086	899.0	2,327,848	950.8	5,232,316	2,137.1	9,761,250	3,987.0
Oct-04	2,363,645	965.4	3,451,140	1,409.6	5,657,126	2,310.6	11,471,911	4,685.7
Nov-04	2,195,334	896.7	2,902,298	1,185.4	4,783,126	1,953.7	9,880,758	4,035.8
Dec-04	2,427,570	991.5	3,421,188	1,397.4	5,156,958	2,106.4	11,005,716	4,495.3
Jan-05	2,409,290	988.7	3,089,728	1,268.0	5,453,806	2,238.1	10,952,824	4,494.8
Feb-05	2,336,156	958.7	2,316,298	950.6	5,232,222	2,147.2	9,884,676	4,056.5
Mar-05	2,559,012	1,050.2	3,936,476	1,615.4	5,811,080	2,384.7	12,306,568	5,050.4
Apr-05	2,437,168	1,000.2	3,900,888	1,600.8	6,498,880	2,667.0	12,836,936	5,268.0
May-05	2,499,247	1,025.6	3,540,382	1,452.9	7,133,632	2,927.5	13,173,261	5,406.0
Jun-05	2,017,093	827.8	3,679,018	1,509.8	5,463,328	2,242.0	11,159,439	4,579.6
Jul-05	2,402,774	986.0	3,925,004	1,610.7	6,820,098	2,798.8	13,147,876	5,395.6
Aug-05	2,518,210	1,033.4	3,495,898	1,434.6	6,576,574	2,698.9	12,590,682	5,167.0
Sep-05	2,511,306	1,030.6	3,372,864	1,384.2	6,563,740	2,693.6	12,447,910	5,108.4
Oct-05	2,491,870	1,022.6	3,190,974	1,309.5	6,256,514	2,567.5	11,939,358	4,899.7
Nov-05	2,288,540	939.2	2,593,756	1,064.4	5,222,020	2,143.0	10,104,316	4,146.6
Dec-05	2,858,442	1,173.0	3,528,420	1,448.0	7,214,870	2,960.8	13,601,732	5,581.9
Jan-06	2,555,874	937.1	2,891,330	1,060.1	6,048,860	2,217.8	11,496,064	4,214.9
Feb-06	1,945,764	713.4	2,821,958	1,034.7	5,226,860	1,916.4	9,994,582	3,664.4
Mar-06	3,193,118	1,170.7	4,010,188	1,470.3	7,397,490	2,712.2	14,600,796	5,353.3
Apr-06	2,407,108	882.5	4,006,922	1,469.1	5,865,858	2,150.7	12,279,888	4,502.3
May-06	2,816,904	1,032.8	3,568,262	1,308.3	7,400,710	2,713.4	13,785,876	5,054.5
Jun-06	2,641,028	968.3	3,534,416	1,295.9	6,291,696	2,306.8	12,467,140	4,571.0
Jul-06	2,694,274	987.8	2,862,368	1,049.5	6,744,888	2,473.0	12,301,530	4,510.3
Aug-06	2,445,014	896.4	2,339,514	857.8	5,862,330	2,149.4	10,646,858	3,903.6
Sep-06	2,516,562	922.7	966,782	354.5	5,922,546	2,171.5	9,405,890	3,448.6
Oct-06	2,233,781	819.0	1,647,306	604.0	4,593,054	1,684.0	8,474,141	3,107.0
Nov-06	1,921,870	704.6	2,465,380	903.9	5,015,288	1,838.8	9,402,538	3,447.4
Dec-06	1,707,114	625.9	1,204,904	441.8	4,978,026	1,825.2	7,890,044	2,892.8
Jan-07	2,027,982	508.0	2,779,818	1,734.6	5,237,284	1,311.9	10,045,084	3,554.6
Feb-07	1,637,807	410.3	2,575,524	1,607.1	5,212,020	1,305.6	9,425,351	3,323.0
Mar-07	1,667,218	417.6	2,368,914	1,478.2	5,468,112	1,369.8	9,504,244	3,265.6
Apr-07	1,515,324	379.6	3,526,046	2,200.3	5,451,454	1,365.6	10,492,824	3,945.5
May-07	2,297,662	575.6	861,126	537.3	7,385,806	1,850.2	10,544,594	2,963.1
Jun-07	1,867,886	467.9	3,294,152	2,055.6	6,542,706	1,639.0	11,704,744	4,162.4
Jul-07	1,976,868	495.2	3,434,446	2,143.1	6,571,054	1,646.1	11,982,368	4,284.4
Aug-07	3,005,236	752.8	2,183,506	1,362.5	7,621,556	1,909.2	12,810,298	4,024.5
Sep-07	1,663,814	416.8	3,601,340	2,247.2	5,223,760	1,308.6	10,488,914	3,972.6
Oct-07	1,693,582	424.2	3,313,472	2,067.6	6,092,654	1,526.2	11,099,708	4,018.1
Nov-07	1,039,554	260.4	1,798,646	1,122.4	6,498,108	1,627.8	9,336,308	3,010.6
Dec-07	1,310,152	328.2	2,776,514	1,732.6	4,147,038	1,038.8	8,233,704	3,099.6
Jan-08	639,662	174.4	3,159,501	3,352.4	6,126,142	1,670.6	9,925,305	5,197.4
Feb-08	1,314,024	358.3	1,837,270	1,949.4	5,020,256	1,369.0	8,171,550	3,676.8
Mar-08	578,720	157.8	2,457,044	2,607.1	4,989,436	1,360.6	8,025,200	4,125.5
Apr-08	2,108,386	575.0	0	0.0	5,853,086	1,596.1	7,961,472	2,171.1
May-08	2,224,620	606.7	0	0.0	6,478,364	1,766.7	8,702,984	2,373.3
Jun-08	1,872,784	510.7	0	0.0	6,101,118	1,663.8	7,973,902	2,174.5
Jul-08	2,162,420	589.7	0	0.0	7,174,114	1,956.4	9,336,534	2,546.1
Aug-08	2,693,958	734.6	0	0.0	8,059,982	2,198.0	10,753,940	2,932.6
Sep-08	943,454	257.3	2,475,900	2,627.1	6,348,000	1,731.1	9,767,354	4,615.4
Oct-08	866,952	236.4	2,905,210	3,082.6	5,000,798	1,363.7	8,772,960	4,682.7
Nov-08	1,990,380	542.8	931,510	988.4	5,452,104	1,486.8	8,373,994	3,018.0
Dec-08	1,485,202	405.0	834,581	885.5	3,722,596	1,015.2	6,042,379	2,305.7
Jan-09	1,285,454	372.5	555,450	617.7	3,869,904	1,121.6	5,710,808	2,111.8
Feb-09	1,552,726	450.0	0	0.0	4,341,464	1,258.2	5,894,190	1,708.2
Mar-09	1,930,246	559.4	2,219,730	2,468.5	6,108,386	1,770.3	10,258,362	4,798.3
Apr-09	2,296,366	665.5	1,665,982	1,852.7	6,990,298	2,025.9	10,952,646	4,544.1
May-09	1,724,148	499.7	1,940,418	2,157.9	5,886,528	1,706.0	9,551,094	4,363.6
Jun-09	1,816,076	526.3	2,357,946	2,622.3	5,887,494	1,706.3	10,061,516	4,854.9
Jul-09	2,089,273	605.5	1,111,038	1,235.6	6,146,106	1,781.2	9,346,417	3,622.3
Aug-09	2,143,720	621.3	2,082,558	2,316.0	5,479,244	1,588.0	9,705,522	4,525.3
Sep-09	1,713,254	496.5	1,247,658	1,387.5	4,826,182	1,398.7	7,787,094	3,282.7
Oct-09	2,138,356	619.7	1,828,316	2,033.3	6,365,940	1,844.9	10,332,612	4,497.9
Nov-09	1,731,756	501.9	1,116,190	1,241.3	5,465,399	1,584.0	8,313,345	3,327.2
Dec-09	1,556,778	451.2	972,302	1,081.3	5,027,248	1,457.0	7,556,328	2,989.4
Jan-10	1,850,166	598.5	622,978	793.0	5,657,172	1,830.1	8,130,316	3,221.7
Feb-10	1,107,634	358.3	1,116,926	1,421.8	3,271,198	1,058.3	5,495,758	2,838.4
Mar-10	2,044,838	661.5	3,197,276	4,070.0	4,789,566	1,549.5	10,031,680	6,281.0
Apr-10	2,223,732	719.4	1,673,434	2,130.2	7,451,862	2,410.7	11,349,028	5,260.4
May-10	2,138,494	691.8	2,099,302	2,672.3	6,767,750	2,189.4	11,005,546	5,553.6
Jun-10	2,264,715	732.7	0	0.0	6,746,038	2,182.4	9,010,753	2,915.0
Jul-10	2,431,560	786.6	1,093,972	1,392.6	6,572,572	2,126.3	10,098,104	4,305.5
Aug-10	0	0.0	3,346,362	4,259.8	6,115,102	1,978.3	9,461,464	6,238.1
Sep-10	1,254,604	405.9	2,361,088	3,005.6	6,095,276	1,971.9	9,710,968	5,383.3
Oct-10	2,379,136	769.7	2,902,186	3,694.4	5,720,928	1,850.8	11,002,250	6,314.8
Nov-10	1,765,756	571.2	1,813,182	2,308.1	4,562,648	1,476.1	8,141,586	4,355.4
Dec-10	1,679,417	543.3	2,625,496	3,342.2	6,158,300	1,992.3	10,463,213	5,877.7
Jan-11	1,998,332	830.9	1,651,446	1,800.9	5,680,724	2,362.1	9,330,502	4,993.9
Feb-11	1,843,680	766.6	2,974,682	3,243.9	5,497,046	2,285.7	10,315,408	6,296.3
Mar-11	2,387,748	992.8	3,286,792	3,584.3	5,739,248	2,386.4	11,413,788	6,963.6
Apr-11	2,655,948	1,104.4	2,766,302	3,016.7	6,151,488	2,557.8	11,573,738	6,678.9
May-11	2,791,096	1,160.6	2,349,128	2,561.8	6,400,992	2,661.6	11,541,216	6,383.9
Jun-11	2,309,108	960.1	2,854,806	3,113.2	5,698,848	2,369.6	10,862,762	6,443.0
Jul-11	1,859,964	773.4	1,644,684	1,793.6	5,060,736	2,104.3	8,565,384	4,671.2
Aug-11	2,371,806	986.2	1,062,922	1,159.1	5,698,618	2,369.5	9,133,346	4,514.9
Sep-11	1,559,492	648.4	693,266	756.0	4,381,500	1,821.9	6,634,258	3,226.3
Oct-11	2,078,556	864.3	2,175,018	2,371.9	5,715,776	2,376.7	9,969,350	5,612.8
Nov-11	1,025,524	426.4	828,276	903.2	2,632,718	1,094.7	4,486,518	2,424.4
Dec-11	2,077,340	863.8	1,507,742	1,644.2	5,661,864	2,354.2	9,246,946	4,862.2

1. Monthly kiln production data from select years are from the file "Monthly Kiln Volume-2004-2012.pdf" copied during the Augusta Lumber Mill site visit on March 06, 2012 by Deanna Duram and Jake Stewart (Trinity). The remaining month's prooduction data were taken from documents on file at Georgia EPD in Atlanta, Georgia.

2. Annual data for wood waste combusted was provided via email from West Fraser to Trinity on April 9, 2012. The annual values were converted to monthly values by taking the ratio of the lumber produced in a given month to the amount of lumber produced in the entire year.

Table B-4. Emission Factors for Direct-Fired Batch Kilns

Pollutant	Emission Factor		Reference
NSR Pollutants			
CO	0.73	lb/MBF	1
Fluorides	N/A	N/A	2
H_2S	N/A	N/A	2
Lead	1.77E-05	lb/MMBtu	3
NO_X	0.28	lb/MBF	4
Reduced Sulfur Compounds (including H_2S)	N/A	N/A	2
SO_2	0.025	lb/MMBtu	5
H_2SO_4	N/A	N/A	2
Total PM	0.41	lb/MBF	6
Total PM_{10}	0.25	lb/MBF	6
Total $PM_{2.5}$	0.226	lb/MBF	6
Total Reduced Sulfur (including H_2S)	N/A	N/A	2
Total VOC	3.76	lb/MBF	7
Greenhouse Gases			
CO_2	206.79	lb/MMBtu	8
CH_4	7.1E-02	lb/MMBtu	8
N_2O	9.3E-03	lb/MMBtu	8
CO_2e	211.15	lb/MMBtu	9
$CO_2e_{biomass\ deferral}$	4.35	lb/MMBtu	10
HAPs			
Formaldehyde	0.04	lb/MBF	3
Methanol	0.16	lb/MBF	3

1. Based on the average of NCASI test results as provided via email from Dr. Word of NCASI to the North Carolina Department of Air Quality (NCDAQ), published in the Air Permit Review/Preliminary Determination, p. 8 for the Weyerhaeuser NR Lumber Mill (Plymouth, N.C.) application submitted in May 2010 entitled "Final Report - Revised Air Permit Applicatin for Energy Project."

2. Emissions of these pollutants are not expected at the West Fraser Augusta, GA site.

3. Per NCASI SARA 313 Guidance - Wood Products - April 2009, as published in the Weyerhaeuser NR Lumber Mill (Plymouth, N.C.) revised air permit application entitled "Final Report - Revised Air Permit Applicatin for Energy Project," dated May 2010.

4. Provided by Dr. David Word of NCASI to the Weyerhaeuser facility in February 2008, as published in the Air Permit Review/Preliminary Determination, p. 5 for the Weyerhaeuser NR Lumber Mill (Plymouth, N.C.) for the May 2010 permit application.

5. Per U.S. EPA's AP-42, Section 1.6, Table 1.6-2, *Wood Residue Combustion in Boilers* (September 2003).

6. Based on preliminary determination for Simpson Lumber Company, LLC, the best available emission factors for particulate related emissions from batch kilns are based on NCASI data from the NCASI Environmental Resource Handbook for Wood Products Plants. The filterable PM emission factor is 0.32 lb/MBF. Condensable PM is based on unpublished data provided by NCASI . The Condensable PM emission factor is 0.087 lb/MBF. Filterable PM_{10} is assumed to be 50% of filterable PM (based on Permit NO. 2421-107-0011-V-02-3 issued to Rayonier Wood Products LLC-Swainsboro Sawmill). Filterable $PM_{2.5}$ is assumed to be 87% of PM_{10} based on AP-42 for wood combustion. All condensable PM is assumed to be PM_{10} and $PM_{2.5}$.

7. Total VOC (lb/MBF) is computed based on the following equation:

VOC as terpene + methanol + formaldehyde = VOC as Carbon [lb/MBF] * 1.133 + (1 - 0.65) * Methanol [lb/MBF] + Formaldehyde [lb/MBF].

The VOC as Carbon emission factor is based on the average of unpublished and published NCASI test results as provided by Dr. David Word of NCASI to NCDAQ and published in the NCDAQ Air Permit Review/Preliminary Determination for the Weyerhaeuser NR Lumber Mill (Plymouth, N.C.) application, pp. 7-8 . It is multiplied by 1.133, which is the ratio of the molecular weight of pinene ($C_{10}H_{16}$, 136 amu) to the molecular weight of carbon in pinene (120 amu). The factors for methanol and formaldehyde are multiplied by the response factors, defined as the FIA response divided by the actual compound concentration. According to an NCASI study and as printed in the NCDAQ Air Permit Review/Preliminary Determination, the response factors for formaldehyde and methanol are 0% and 65%, respectively. This methodology is supported in an EPA document entitled Interim VOC Measurement Protocol for the Wood Products Industry (July 2007).

8. Per 40 CFR Part 98, Subpart C, Tables C-1 and C-2. The CO_2 emission factor is the default factor for wood and wood residuals, and the CH_4 and N_2O emission factors are the default factors for all solid biomass fuels.

9. The CO_2e factor is calculated based on the emission factors for CO_2, CH_4, and N_2O and the global warming potential (GWP) for each pollutant per 40 CFR 98, Subpart A, Table A-1:

CO_2	1
CH_4	21
N_2O	310

10. Pursuant to 40 CFR Part 98.2(b)(2), biogenic carbon dioxide emissions (e.g., from biomass) are excluded from the combustion of biomass.

Table B-5. Baseline Monthly Emissions for Kiln 1 (tons per month)

Month	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Jan-02	0.62	N/A	N/A	5.56E-05	0.24	N/A	0.08	N/A	0.35	0.21	0.19	N/A	3.20	13.68	0.03	**0.14**
Feb-02	0.59	N/A	N/A	5.30E-05	0.23	N/A	0.07	N/A	0.33	0.20	0.18	N/A	3.05	13.04	0.03	**0.13**
Mar-02	0.65	N/A	N/A	5.79E-05	0.25	N/A	0.08	N/A	0.36	0.22	0.20	N/A	3.33	14.23	0.04	**0.14**
Apr-02	0.56	N/A	N/A	5.01E-05	0.22	N/A	0.07	N/A	0.31	0.19	0.17	N/A	2.89	12.33	0.03	**0.12**
May-02	0.53	N/A	N/A	4.73E-05	0.20	N/A	0.07	N/A	0.30	0.18	0.16	N/A	2.72	11.63	0.03	**0.12**
Jun-02	0.68	N/A	N/A	6.07E-05	0.26	N/A	0.09	N/A	0.38	0.23	0.21	N/A	3.50	14.93	0.04	**0.15**
Jul-02	0.80	N/A	N/A	7.12E-05	0.31	N/A	0.10	N/A	0.44	0.27	0.25	N/A	4.10	17.50	0.04	**0.17**
Aug-02	0.66	N/A	N/A	5.89E-05	0.25	N/A	0.08	N/A	0.37	0.22	0.20	N/A	3.39	14.49	0.04	**0.14**
Sep-02	0.68	N/A	N/A	6.09E-05	0.26	N/A	0.09	N/A	0.38	0.23	0.21	N/A	3.51	14.97	0.04	**0.15**
Oct-02	0.76	N/A	N/A	6.83E-05	0.29	N/A	0.10	N/A	0.43	0.26	0.24	N/A	3.93	16.80	0.04	**0.17**
Nov-02	0.82	N/A	N/A	7.32E-05	0.31	N/A	0.10	N/A	0.46	0.28	0.25	N/A	4.21	17.99	0.04	**0.18**
Dec-02	0.61	N/A	N/A	5.42E-05	0.23	N/A	0.08	N/A	0.34	0.21	0.19	N/A	3.12	13.33	0.03	**0.13**
Jan-03	0.78	N/A	N/A	7.25E-05	0.30	N/A	0.10	N/A	0.44	0.27	0.24	N/A	4.03	17.82	0.04	**0.17**
Feb-03	0.87	N/A	N/A	8.01E-05	0.33	N/A	0.11	N/A	0.48	0.29	0.27	N/A	4.45	19.69	0.05	**0.19**
Mar-03	0.81	N/A	N/A	7.45E-05	0.31	N/A	0.11	N/A	0.45	0.27	0.25	N/A	4.15	18.32	0.04	**0.18**
Apr-03	0.74	N/A	N/A	6.86E-05	0.28	N/A	0.10	N/A	0.41	0.25	0.23	N/A	3.81	16.86	0.04	**0.16**
May-03	0.89	N/A	N/A	8.24E-05	0.34	N/A	0.12	N/A	0.50	0.30	0.28	N/A	4.58	20.26	0.05	**0.20**
Jun-03	0.63	N/A	N/A	5.81E-05	0.24	N/A	0.08	N/A	0.35	0.21	0.19	N/A	3.23	14.30	0.03	**0.14**
Jul-03	0.64	N/A	N/A	5.90E-05	0.24	N/A	0.08	N/A	0.36	0.22	0.20	N/A	3.28	14.50	0.03	**0.14**
Aug-03	0.73	N/A	N/A	6.74E-05	0.28	N/A	0.10	N/A	0.41	0.25	0.23	N/A	3.75	16.56	0.04	**0.16**
Sep-03	0.67	N/A	N/A	6.22E-05	0.26	N/A	0.09	N/A	0.38	0.23	0.21	N/A	3.46	15.30	0.04	**0.15**
Oct-03	0.83	N/A	N/A	7.65E-05	0.32	N/A	0.11	N/A	0.46	0.28	0.26	N/A	4.26	18.82	0.05	**0.18**
Nov-03	0.61	N/A	N/A	5.67E-05	0.24	N/A	0.08	N/A	0.34	0.21	0.19	N/A	3.16	13.95	0.03	**0.13**
Dec-03	0.66	N/A	N/A	6.15E-05	0.25	N/A	0.09	N/A	0.37	0.22	0.21	N/A	3.42	15.11	0.04	**0.15**
Jan-04	0.68	N/A	N/A	6.03E-05	0.26	N/A	0.09	N/A	0.38	0.23	0.21	N/A	3.48	14.83	0.04	**0.15**
Feb-04	0.58	N/A	N/A	5.20E-05	0.22	N/A	0.07	N/A	0.33	0.20	0.18	N/A	3.00	12.78	0.03	**0.13**
Mar-04	0.51	N/A	N/A	4.56E-05	0.20	N/A	0.06	N/A	0.29	0.17	0.16	N/A	2.63	11.21	0.03	**0.11**
Apr-04	0.62	N/A	N/A	5.56E-05	0.24	N/A	0.08	N/A	0.35	0.21	0.19	N/A	3.21	13.68	0.03	**0.14**
May-04	0.56	N/A	N/A	4.98E-05	0.21	N/A	0.07	N/A	0.31	0.19	0.17	N/A	2.87	12.25	0.03	**0.12**
Jun-04	0.67	N/A	N/A	5.95E-05	0.26	N/A	0.08	N/A	0.37	0.23	0.21	N/A	3.44	14.64	0.04	**0.15**
Jul-04	0.28	N/A	N/A	2.46E-05	0.11	N/A	0.03	N/A	0.15	0.09	0.09	N/A	1.42	6.05	0.02	**0.06**
Aug-04	0.97	N/A	N/A	8.64E-05	0.37	N/A	0.12	N/A	0.54	0.33	0.30	N/A	4.99	21.25	0.05	**0.21**
Sep-04	0.80	N/A	N/A	7.16E-05	0.31	N/A	0.10	N/A	0.45	0.27	0.25	N/A	4.13	17.61	0.04	**0.18**
Oct-04	0.86	N/A	N/A	7.69E-05	0.33	N/A	0.11	N/A	0.48	0.29	0.27	N/A	4.44	18.91	0.05	**0.19**
Nov-04	0.80	N/A	N/A	7.14E-05	0.31	N/A	0.10	N/A	0.45	0.27	0.25	N/A	4.12	17.56	0.04	**0.18**
Dec-04	0.89	N/A	N/A	7.90E-05	0.34	N/A	0.11	N/A	0.49	0.30	0.27	N/A	4.56	19.42	0.05	**0.19**
Jan-05	0.88	N/A	N/A	7.88E-05	0.34	N/A	0.11	N/A	0.49	0.30	0.27	N/A	4.52	19.36	0.05	**0.19**
Feb-05	0.85	N/A	N/A	7.64E-05	0.33	N/A	0.11	N/A	0.48	0.29	0.26	N/A	4.39	18.78	0.05	**0.19**
Mar-05	0.93	N/A	N/A	8.36E-05	0.36	N/A	0.12	N/A	0.52	0.32	0.29	N/A	4.81	20.57	0.05	**0.20**
Apr-05	0.89	N/A	N/A	7.97E-05	0.34	N/A	0.11	N/A	0.50	0.30	0.28	N/A	4.58	19.59	0.05	**0.19**
May-05	0.91	N/A	N/A	8.17E-05	0.35	N/A	0.12	N/A	0.51	0.31	0.28	N/A	4.69	20.09	0.05	**0.20**
Jun-05	0.74	N/A	N/A	6.59E-05	0.28	N/A	0.09	N/A	0.41	0.25	0.23	N/A	3.79	16.21	0.04	**0.16**
Jul-05	0.88	N/A	N/A	7.85E-05	0.34	N/A	0.11	N/A	0.49	0.30	0.27	N/A	4.51	19.31	0.05	**0.19**
Aug-05	0.92	N/A	N/A	8.23E-05	0.35	N/A	0.12	N/A	0.51	0.31	0.28	N/A	4.73	20.24	0.05	**0.20**
Sep-05	0.92	N/A	N/A	8.21E-05	0.35	N/A	0.12	N/A	0.51	0.31	0.28	N/A	4.72	20.18	0.05	**0.20**
Oct-05	0.91	N/A	N/A	8.15E-05	0.35	N/A	0.12	N/A	0.51	0.31	0.28	N/A	4.68	20.03	0.05	**0.20**
Nov-05	0.84	N/A	N/A	7.48E-05	0.32	N/A	0.11	N/A	0.47	0.28	0.26	N/A	4.30	18.39	0.05	**0.18**
Dec-05	1.04	N/A	N/A	9.34E-05	0.40	N/A	0.13	N/A	0.58	0.35	0.32	N/A	5.37	22.97	0.06	**0.23**

Table B-5. Baseline Monthly Emissions for Kiln 1 (tons per month)

Month	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Jan-06	0.93	N/A	N/A	7.46E-05	0.36	N/A	0.11	N/A	0.52	0.32	0.29	N/A	4.80	18.35	0.05	**0.20**
Feb-06	0.71	N/A	N/A	5.68E-05	0.27	N/A	0.08	N/A	0.40	0.24	0.22	N/A	3.65	13.97	0.04	**0.16**
Mar-06	1.17	N/A	N/A	9.32E-05	0.45	N/A	0.13	N/A	0.65	0.39	0.36	N/A	6.00	22.93	0.06	**0.26**
Apr-06	0.88	N/A	N/A	7.03E-05	0.34	N/A	0.10	N/A	0.49	0.30	0.27	N/A	4.52	17.28	0.05	**0.19**
May-06	1.03	N/A	N/A	8.23E-05	0.39	N/A	0.12	N/A	0.57	0.35	0.32	N/A	5.29	20.23	0.06	**0.23**
Jun-06	0.96	N/A	N/A	7.71E-05	0.37	N/A	0.11	N/A	0.54	0.33	0.30	N/A	4.96	18.96	0.05	**0.21**
Jul-06	0.98	N/A	N/A	7.87E-05	0.38	N/A	0.11	N/A	0.55	0.33	0.30	N/A	5.06	19.35	0.05	**0.22**
Aug-06	0.89	N/A	N/A	7.14E-05	0.34	N/A	0.10	N/A	0.50	0.30	0.28	N/A	4.59	17.56	0.05	**0.20**
Sep-06	0.92	N/A	N/A	7.35E-05	0.35	N/A	0.10	N/A	0.51	0.31	0.28	N/A	4.73	18.07	0.05	**0.20**
Oct-06	0.82	N/A	N/A	6.52E-05	0.31	N/A	0.09	N/A	0.45	0.28	0.25	N/A	4.19	16.04	0.04	**0.18**
Nov-06	0.70	N/A	N/A	5.61E-05	0.27	N/A	0.08	N/A	0.39	0.24	0.22	N/A	3.61	13.80	0.04	**0.15**
Dec-06	0.62	N/A	N/A	4.99E-05	0.24	N/A	0.07	N/A	0.35	0.21	0.19	N/A	3.21	12.26	0.03	**0.14**
Jan-07	0.74	N/A	N/A	4.05E-05	0.28	N/A	0.06	N/A	0.41	0.25	0.23	N/A	3.81	9.95	0.04	**0.16**
Feb-07	0.60	N/A	N/A	3.27E-05	0.23	N/A	0.05	N/A	0.33	0.20	0.19	N/A	3.08	8.03	0.03	**0.13**
Mar-07	0.61	N/A	N/A	3.33E-05	0.23	N/A	0.05	N/A	0.34	0.21	0.19	N/A	3.13	8.18	0.03	**0.13**
Apr-07	0.55	N/A	N/A	3.02E-05	0.21	N/A	0.04	N/A	0.31	0.19	0.17	N/A	2.85	7.43	0.03	**0.12**
May-07	0.84	N/A	N/A	4.58E-05	0.32	N/A	0.06	N/A	0.47	0.28	0.26	N/A	4.31	11.27	0.05	**0.18**
Jun-07	0.68	N/A	N/A	3.73E-05	0.26	N/A	0.05	N/A	0.38	0.23	0.21	N/A	3.51	9.16	0.04	**0.15**
Jul-07	0.72	N/A	N/A	3.94E-05	0.28	N/A	0.06	N/A	0.40	0.24	0.22	N/A	3.71	9.70	0.04	**0.16**
Aug-07	1.10	N/A	N/A	6.00E-05	0.42	N/A	0.08	N/A	0.61	0.37	0.34	N/A	5.64	14.74	0.06	**0.24**
Sep-07	0.61	N/A	N/A	3.32E-05	0.23	N/A	0.05	N/A	0.34	0.21	0.19	N/A	3.12	8.16	0.03	**0.13**
Oct-07	0.62	N/A	N/A	3.38E-05	0.24	N/A	0.05	N/A	0.34	0.21	0.19	N/A	3.18	8.31	0.03	**0.14**
Nov-07	0.38	N/A	N/A	2.07E-05	0.15	N/A	0.03	N/A	0.21	0.13	0.12	N/A	1.95	5.10	0.02	**0.08**
Dec-07	0.48	N/A	N/A	2.61E-05	0.18	N/A	0.04	N/A	0.27	0.16	0.15	N/A	2.46	6.43	0.03	**0.10**
Jan-08	0.23	N/A	N/A	1.39E-05	0.09	N/A	0.02	N/A	0.13	0.08	0.07	N/A	1.20	3.42	0.01	**0.05**
Feb-08	0.48	N/A	N/A	2.85E-05	0.18	N/A	0.04	N/A	0.27	0.16	0.15	N/A	2.47	7.02	0.03	**0.11**
Mar-08	0.21	N/A	N/A	1.26E-05	0.08	N/A	0.02	N/A	0.12	0.07	0.07	N/A	1.09	3.09	0.01	**0.05**
Apr-08	0.77	N/A	N/A	4.58E-05	0.30	N/A	0.06	N/A	0.43	0.26	0.24	N/A	3.96	11.26	0.04	**0.17**
May-08	0.81	N/A	N/A	4.83E-05	0.31	N/A	0.07	N/A	0.45	0.27	0.25	N/A	4.18	11.88	0.04	**0.18**
Jun-08	0.68	N/A	N/A	4.07E-05	0.26	N/A	0.06	N/A	0.38	0.23	0.21	N/A	3.52	10.00	0.04	**0.15**
Jul-08	0.79	N/A	N/A	4.70E-05	0.30	N/A	0.07	N/A	0.44	0.27	0.24	N/A	4.06	11.55	0.04	**0.17**
Aug-08	0.98	N/A	N/A	5.85E-05	0.38	N/A	0.08	N/A	0.55	0.33	0.30	N/A	5.06	14.39	0.05	**0.22**
Sep-08	0.34	N/A	N/A	2.05E-05	0.13	N/A	0.03	N/A	0.19	0.12	0.11	N/A	1.77	5.04	0.02	**0.08**
Oct-08	0.32	N/A	N/A	1.88E-05	0.12	N/A	0.03	N/A	0.18	0.11	0.10	N/A	1.63	4.63	0.02	**0.07**
Nov-08	0.73	N/A	N/A	4.32E-05	0.28	N/A	0.06	N/A	0.41	0.25	0.22	N/A	3.74	10.63	0.04	**0.16**
Dec-08	0.54	N/A	N/A	3.23E-05	0.21	N/A	0.05	N/A	0.30	0.18	0.17	N/A	2.79	7.93	0.03	**0.12**
Jan-09	0.47	N/A	N/A	2.97E-05	0.18	N/A	0.04	N/A	0.26	0.16	0.15	N/A	2.41	7.30	0.03	**0.10**
Feb-09	0.57	N/A	N/A	3.58E-05	0.22	N/A	0.05	N/A	0.32	0.19	0.18	N/A	2.92	8.81	0.03	**0.12**
Mar-09	0.70	N/A	N/A	4.46E-05	0.27	N/A	0.06	N/A	0.39	0.24	0.22	N/A	3.62	10.96	0.04	**0.15**
Apr-09	0.84	N/A	N/A	5.30E-05	0.32	N/A	0.07	N/A	0.47	0.28	0.26	N/A	4.31	13.03	0.05	**0.18**
May-09	0.63	N/A	N/A	3.98E-05	0.24	N/A	0.06	N/A	0.35	0.21	0.19	N/A	3.24	9.79	0.03	**0.14**
Jun-09	0.66	N/A	N/A	4.19E-05	0.25	N/A	0.06	N/A	0.37	0.22	0.21	N/A	3.41	10.31	0.04	**0.15**
Jul-09	0.76	N/A	N/A	4.82E-05	0.29	N/A	0.07	N/A	0.43	0.26	0.24	N/A	3.92	11.86	0.04	**0.17**
Aug-09	0.78	N/A	N/A	4.95E-05	0.30	N/A	0.07	N/A	0.44	0.26	0.24	N/A	4.03	12.17	0.04	**0.17**
Sep-09	0.63	N/A	N/A	3.95E-05	0.24	N/A	0.06	N/A	0.35	0.21	0.19	N/A	3.22	9.72	0.03	**0.14**
Oct-09	0.78	N/A	N/A	4.94E-05	0.30	N/A	0.07	N/A	0.44	0.26	0.24	N/A	4.02	12.14	0.04	**0.17**
Nov-09	0.63	N/A	N/A	4.00E-05	0.24	N/A	0.06	N/A	0.35	0.21	0.20	N/A	3.25	9.83	0.03	**0.14**

Table B-5. Baseline Monthly Emissions for Kiln 1 (tons per month)

Month	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Dec-09	0.57	N/A	N/A	3.59E-05	0.22	N/A	0.05	N/A	0.32	0.19	0.18	N/A	2.92	8.84	0.03	**0.12**
Jan-10	0.68	N/A	N/A	4.77E-05	0.26	N/A	0.07	N/A	0.38	0.23	0.21	N/A	3.47	11.72	0.04	**0.15**
Feb-10	0.40	N/A	N/A	2.85E-05	0.16	N/A	0.04	N/A	0.23	0.14	0.13	N/A	2.08	7.02	0.02	**0.09**
Mar-10	0.75	N/A	N/A	5.27E-05	0.29	N/A	0.07	N/A	0.42	0.25	0.23	N/A	3.84	12.95	0.04	**0.16**
Apr-10	0.81	N/A	N/A	5.73E-05	0.31	N/A	0.08	N/A	0.45	0.27	0.25	N/A	4.18	14.09	0.04	**0.18**
May-10	0.78	N/A	N/A	5.51E-05	0.30	N/A	0.08	N/A	0.44	0.26	0.24	N/A	4.02	13.55	0.04	**0.17**
Jun-10	0.83	N/A	N/A	5.84E-05	0.32	N/A	0.08	N/A	0.46	0.28	0.26	N/A	4.25	14.35	0.05	**0.18**
Jul-10	0.89	N/A	N/A	6.27E-05	0.34	N/A	0.09	N/A	0.49	0.30	0.27	N/A	4.57	15.41	0.05	**0.19**
Aug-10	0.00	N/A	N/A	0.00E+00	0.00	N/A	0.00	N/A	0.00	0.00	0.00	N/A	0.00	0.00	0.00	**0.00**
Sep-10	0.46	N/A	N/A	3.23E-05	0.18	N/A	0.05	N/A	0.26	0.15	0.14	N/A	2.36	7.95	0.03	**0.10**
Oct-10	0.87	N/A	N/A	6.13E-05	0.33	N/A	0.09	N/A	0.48	0.29	0.27	N/A	4.47	15.07	0.05	**0.19**
Nov-10	0.64	N/A	N/A	4.55E-05	0.25	N/A	0.06	N/A	0.36	0.22	0.20	N/A	3.32	11.19	0.04	**0.14**
Dec-10	0.61	N/A	N/A	4.33E-05	0.24	N/A	0.06	N/A	0.34	0.21	0.19	N/A	3.15	10.64	0.03	**0.13**
Jan-11	0.73	N/A	N/A	6.62E-05	0.28	N/A	0.09	N/A	0.41	0.25	0.23	N/A	3.75	16.27	0.04	**0.16**
Feb-11	0.67	N/A	N/A	6.11E-05	0.26	N/A	0.09	N/A	0.38	0.23	0.21	N/A	3.46	15.01	0.04	**0.15**
Mar-11	0.87	N/A	N/A	7.91E-05	0.33	N/A	0.11	N/A	0.49	0.29	0.27	N/A	4.48	19.44	0.05	**0.19**
Apr-11	0.97	N/A	N/A	8.80E-05	0.37	N/A	0.12	N/A	0.54	0.33	0.30	N/A	4.99	21.63	0.05	**0.21**
May-11	1.02	N/A	N/A	9.24E-05	0.39	N/A	0.13	N/A	0.57	0.34	0.32	N/A	5.24	22.73	0.06	**0.22**
Jun-11	0.84	N/A	N/A	7.65E-05	0.32	N/A	0.11	N/A	0.47	0.29	0.26	N/A	4.34	18.80	0.05	**0.18**
Jul-11	0.68	N/A	N/A	6.16E-05	0.26	N/A	0.09	N/A	0.38	0.23	0.21	N/A	3.49	15.15	0.04	**0.15**
Aug-11	0.87	N/A	N/A	7.86E-05	0.33	N/A	0.11	N/A	0.48	0.29	0.27	N/A	4.45	19.31	0.05	**0.19**
Sep-11	0.57	N/A	N/A	5.16E-05	0.22	N/A	0.07	N/A	0.32	0.19	0.18	N/A	2.93	12.70	0.03	**0.12**
Oct-11	0.76	N/A	N/A	6.88E-05	0.29	N/A	0.10	N/A	0.42	0.26	0.23	N/A	3.90	16.93	0.04	**0.17**
Nov-11	0.37	N/A	N/A	3.40E-05	0.14	N/A	0.05	N/A	0.21	0.13	0.12	N/A	1.93	8.35	0.02	**0.08**
Dec-11	0.76	N/A	N/A	6.88E-05	0.29	N/A	0.10	N/A	0.42	0.26	0.23	N/A	3.90	16.92	0.04	**0.17**

1. Baseline monthly emissions are calculated two ways depending on the units of the emission factor of interest.
   If the emission factor is in units of lb/MBF, the following derivation is used: Actual Emissions [ton/month] = Emission Factor [lb/MBF] * Monthly Kiln Production [BF/month] / 2,000 lb/ton / 1,000 BF/MBF
   If the emission factor is in units of lb/MMBtu, the following derivation is used: Actual Emissions [ton/month] = Emission Factor [lb/MMBtu] * Monthly Wood Combusted [tons/month] * Heating Value [4,500 Btu/lb wood combusted] / 1,000,000 Btu/MMBtu

Table B-6. Total 24-Month Rolling Average Actual Annual Emissions for Kilns 1 (tpy)

24 Month Period	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Jan-02 - Dec-03	8.41	N/A	N/A	7.65E-04	3.23	N/A	1.08	N/A	4.69	2.85	2.60	N/A	43.28	188.21	0.46	1.84
Feb-02 - Jan-04	8.44	N/A	N/A	7.68E-04	3.24	N/A	1.08	N/A	4.71	2.86	2.61	N/A	43.42	188.78	0.46	1.85
Mar-02 - Feb-04	8.43	N/A	N/A	7.67E-04	3.24	N/A	1.08	N/A	4.70	2.85	2.61	N/A	43.39	188.66	0.46	1.85
Apr-02 - Mar-04	8.37	N/A	N/A	7.61E-04	3.21	N/A	1.08	N/A	4.66	2.83	2.59	N/A	43.04	187.14	0.46	1.83
May-02 - Apr-04	8.40	N/A	N/A	7.64E-04	3.22	N/A	1.08	N/A	4.68	2.84	2.60	N/A	43.20	187.82	0.46	1.84
Jun-02 - May-04	8.41	N/A	N/A	7.65E-04	3.23	N/A	1.08	N/A	4.69	2.85	2.60	N/A	43.28	188.13	0.46	1.84
Jul-02 - Jun-04	8.41	N/A	N/A	7.65E-04	3.22	N/A	1.08	N/A	4.69	2.84	2.60	N/A	43.25	187.98	0.46	1.84
Aug-02 - Jul-04	8.15	N/A	N/A	7.41E-04	3.12	N/A	1.05	N/A	4.54	2.76	2.52	N/A	41.91	182.25	0.45	1.79
Sep-02 - Aug-04	8.30	N/A	N/A	7.55E-04	3.18	N/A	1.07	N/A	4.63	2.81	2.57	N/A	42.70	185.63	0.45	1.82
Oct-02 - Sep-04	8.36	N/A	N/A	7.60E-04	3.21	N/A	1.07	N/A	4.66	2.83	2.59	N/A	43.02	186.95	0.46	1.83
Nov-02 - Oct-04	8.41	N/A	N/A	7.65E-04	3.23	N/A	1.08	N/A	4.69	2.85	2.60	N/A	43.27	188.01	0.46	1.84
Dec-02 - Nov-04	8.40	N/A	N/A	7.64E-04	3.22	N/A	1.08	N/A	4.68	2.84	2.60	N/A	43.22	187.79	0.46	1.84
Jan-03 - Dec-04	8.54	N/A	N/A	7.76E-04	3.28	N/A	1.10	N/A	4.76	2.89	2.64	N/A	43.94	190.83	0.47	1.87
Feb-03 - Jan-05	8.59	N/A	N/A	7.79E-04	3.29	N/A	1.10	N/A	4.79	2.91	2.66	N/A	44.19	191.61	0.47	1.88
Mar-03 - Feb-05	8.58	N/A	N/A	7.77E-04	3.29	N/A	1.10	N/A	4.79	2.90	2.66	N/A	44.16	191.15	0.47	1.88
Apr-03 - Mar-05	8.65	N/A	N/A	7.82E-04	3.32	N/A	1.10	N/A	4.82	2.93	2.68	N/A	44.49	192.27	0.47	1.90
May-03 - Apr-05	8.72	N/A	N/A	7.88E-04	3.35	N/A	1.11	N/A	4.86	2.95	2.70	N/A	44.87	193.64	0.48	1.91
Jun-03 - May-05	8.73	N/A	N/A	7.87E-04	3.35	N/A	1.11	N/A	4.87	2.95	2.70	N/A	44.92	193.55	0.48	1.91
Jul-03 - Jun-05	8.79	N/A	N/A	7.91E-04	3.37	N/A	1.12	N/A	4.90	2.97	2.72	N/A	45.20	194.51	0.48	1.93
Aug-03 - Jul-05	8.90	N/A	N/A	8.01E-04	3.42	N/A	1.13	N/A	4.96	3.01	2.76	N/A	45.81	196.91	0.49	1.95
Sep-03 - Aug-05	9.00	N/A	N/A	8.08E-04	3.45	N/A	1.14	N/A	5.02	3.05	2.79	N/A	46.30	198.75	0.49	1.97
Oct-03 - Sep-05	9.12	N/A	N/A	8.18E-04	3.50	N/A	1.16	N/A	5.09	3.09	2.82	N/A	46.93	201.19	0.50	2.00
Nov-03 - Oct-05	9.16	N/A	N/A	8.21E-04	3.51	N/A	1.16	N/A	5.11	3.10	2.84	N/A	47.14	201.79	0.50	2.01
Dec-03 - Nov-05	9.27	N/A	N/A	8.30E-04	3.56	N/A	1.17	N/A	5.17	3.14	2.87	N/A	47.71	204.01	0.51	2.03
Jan-04 - Dec-05	9.46	N/A	N/A	8.46E-04	3.63	N/A	1.19	N/A	5.28	3.20	2.93	N/A	48.69	207.94	0.52	2.07
Feb-04 - Jan-06	9.59	N/A	N/A	8.53E-04	3.68	N/A	1.20	N/A	5.35	3.25	2.97	N/A	49.35	209.71	0.53	2.10
Mar-04 - Feb-06	9.66	N/A	N/A	8.55E-04	3.70	N/A	1.21	N/A	5.38	3.27	2.99	N/A	49.67	210.30	0.53	2.12
Apr-04 - Mar-06	9.98	N/A	N/A	8.79E-04	3.83	N/A	1.24	N/A	5.57	3.38	3.09	N/A	51.35	216.16	0.55	2.19
May-04 - Apr-06	10.11	N/A	N/A	8.86E-04	3.88	N/A	1.25	N/A	5.64	3.42	3.13	N/A	52.01	217.96	0.55	2.22
Jun-04 - May-06	10.34	N/A	N/A	9.03E-04	3.97	N/A	1.28	N/A	5.77	3.50	3.20	N/A	53.22	221.95	0.57	2.27
Jul-04 - Jun-06	10.49	N/A	N/A	9.12E-04	4.02	N/A	1.29	N/A	5.85	3.55	3.25	N/A	53.98	224.12	0.57	2.30
Aug-04 - Jul-06	10.85	N/A	N/A	9.39E-04	4.16	N/A	1.33	N/A	6.05	3.67	3.36	N/A	55.80	230.76	0.59	2.38
Sep-04 - Aug-06	10.81	N/A	N/A	9.31E-04	4.15	N/A	1.32	N/A	6.03	3.66	3.35	N/A	55.60	228.91	0.59	2.37
Oct-04 - Sep-06	10.86	N/A	N/A	9.32E-04	4.17	N/A	1.32	N/A	6.06	3.68	3.36	N/A	55.89	229.14	0.60	2.38
Nov-04 - Oct-06	10.84	N/A	N/A	9.26E-04	4.16	N/A	1.31	N/A	6.04	3.67	3.36	N/A	55.77	227.71	0.59	2.38
Dec-04 - Nov-06	10.79	N/A	N/A	9.18E-04	4.14	N/A	1.30	N/A	6.02	3.65	3.34	N/A	55.52	225.83	0.59	2.37
Jan-05 - Dec-06	10.66	N/A	N/A	9.04E-04	4.09	N/A	1.28	N/A	5.94	3.61	3.30	N/A	54.84	222.25	0.58	2.34
Feb-05 - Jan-07	10.59	N/A	N/A	8.85E-04	4.06	N/A	1.25	N/A	5.90	3.58	3.28	N/A	54.48	217.54	0.58	2.32
Mar-05 - Feb-07	10.46	N/A	N/A	8.63E-04	4.01	N/A	1.22	N/A	5.83	3.54	3.24	N/A	53.82	212.17	0.57	2.29
Apr-05 - Mar-07	10.30	N/A	N/A	8.38E-04	3.95	N/A	1.18	N/A	5.74	3.48	3.19	N/A	52.99	205.98	0.56	2.26
May-05 - Apr-07	10.13	N/A	N/A	8.13E-04	3.89	N/A	1.15	N/A	5.65	3.43	3.14	N/A	52.12	199.90	0.56	2.22
Jun-05 - May-07	10.09	N/A	N/A	7.95E-04	3.87	N/A	1.12	N/A	5.63	3.42	3.13	N/A	51.93	195.50	0.55	2.21
Jul-05 - Jun-07	10.07	N/A	N/A	7.81E-04	3.86	N/A	1.10	N/A	5.61	3.41	3.12	N/A	51.79	191.97	0.55	2.21
Aug-05 - Jul-07	9.99	N/A	N/A	7.61E-04	3.83	N/A	1.08	N/A	5.57	3.38	3.09	N/A	51.39	187.17	0.55	2.19
Sep-05 - Aug-07	10.08	N/A	N/A	7.50E-04	3.87	N/A	1.06	N/A	5.62	3.41	3.12	N/A	51.85	184.42	0.55	2.21
Oct-05 - Sep-07	9.92	N/A	N/A	7.26E-04	3.81	N/A	1.02	N/A	5.53	3.36	3.07	N/A	51.05	178.41	0.54	2.18
Nov-05 - Oct-07	9.78	N/A	N/A	7.02E-04	3.75	N/A	0.99	N/A	5.45	3.31	3.03	N/A	50.30	172.55	0.54	2.14
Dec-05 - Nov-07	9.55	N/A	N/A	6.75E-04	3.66	N/A	0.95	N/A	5.32	3.23	2.96	N/A	49.13	165.90	0.52	2.09

Table B-6. Total 24-Month Rolling Average Actual Annual Emissions for Kilns 1 (tpy)

24 Month Period	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Jan-06 - Dec-07	9.27	N/A	N/A	6.41E-04	3.55	N/A	0.91	N/A	5.17	3.14	2.87	N/A	47.68	157.63	0.51	2.03
Feb-06 - Jan-08	8.92	N/A	N/A	6.11E-04	3.42	N/A	0.86	N/A	4.97	3.02	2.76	N/A	45.88	150.16	0.49	1.95
Mar-06 - Feb-08	8.80	N/A	N/A	5.97E-04	3.38	N/A	0.84	N/A	4.91	2.98	2.73	N/A	45.29	146.68	0.48	1.93
Apr-06 - Mar-08	8.33	N/A	N/A	5.56E-04	3.19	N/A	0.79	N/A	4.64	2.82	2.58	N/A	42.83	136.77	0.46	1.82
May-06 - Apr-08	8.27	N/A	N/A	5.44E-04	3.17	N/A	0.77	N/A	4.61	2.80	2.56	N/A	42.55	133.75	0.45	1.81
Jun-06 - May-08	8.16	N/A	N/A	5.27E-04	3.13	N/A	0.74	N/A	4.55	2.76	2.53	N/A	42.00	129.58	0.45	1.79
Jul-06 - Jun-08	8.02	N/A	N/A	5.09E-04	3.08	N/A	0.72	N/A	4.47	2.71	2.48	N/A	41.27	125.10	0.44	1.76
Aug-06 - Jul-08	7.93	N/A	N/A	4.93E-04	3.04	N/A	0.70	N/A	4.42	2.68	2.45	N/A	40.77	121.20	0.43	1.74
Sep-06 - Aug-08	7.97	N/A	N/A	4.87E-04	3.06	N/A	0.69	N/A	4.44	2.70	2.47	N/A	41.01	119.62	0.44	1.75
Oct-06 - Sep-08	7.68	N/A	N/A	4.60E-04	2.95	N/A	0.65	N/A	4.28	2.60	2.38	N/A	39.53	113.10	0.42	1.68
Nov-06 - Oct-08	7.43	N/A	N/A	4.37E-04	2.85	N/A	0.62	N/A	4.14	2.52	2.30	N/A	38.25	107.40	0.41	1.63
Dec-06 - Nov-08	7.45	N/A	N/A	4.30E-04	2.86	N/A	0.61	N/A	4.15	2.52	2.31	N/A	38.31	105.81	0.41	1.63
Jan-07 - Dec-08	7.41	N/A	N/A	4.22E-04	2.84	N/A	0.60	N/A	4.13	2.51	2.29	N/A	38.10	103.65	0.41	1.62
Feb-07 - Jan-09	7.27	N/A	N/A	4.16E-04	2.79	N/A	0.59	N/A	4.05	2.46	2.25	N/A	37.41	102.32	0.40	1.59
Mar-07 - Feb-09	7.26	N/A	N/A	4.18E-04	2.78	N/A	0.59	N/A	4.05	2.45	2.25	N/A	37.33	102.71	0.40	1.59
Apr-07 - Mar-09	7.30	N/A	N/A	4.23E-04	2.80	N/A	0.60	N/A	4.07	2.47	2.26	N/A	37.57	104.10	0.40	1.60
May-07 - Apr-09	7.45	N/A	N/A	4.35E-04	2.86	N/A	0.61	N/A	4.15	2.52	2.31	N/A	38.31	106.90	0.41	1.63
Jun-07 - May-09	7.34	N/A	N/A	4.32E-04	2.82	N/A	0.61	N/A	4.09	2.48	2.27	N/A	37.77	106.16	0.40	1.61
Jul-07 - Jun-09	7.33	N/A	N/A	4.34E-04	2.81	N/A	0.61	N/A	4.09	2.48	2.27	N/A	37.72	106.73	0.40	1.61
Aug-07 - Jul-09	7.35	N/A	N/A	4.38E-04	2.82	N/A	0.62	N/A	4.10	2.49	2.28	N/A	37.83	107.81	0.40	1.61
Sep-07 - Aug-09	7.20	N/A	N/A	4.33E-04	2.76	N/A	0.61	N/A	4.01	2.43	2.23	N/A	37.02	106.52	0.39	1.58
Oct-07 - Sep-09	7.20	N/A	N/A	4.36E-04	2.76	N/A	0.62	N/A	4.02	2.44	2.23	N/A	37.06	107.30	0.39	1.58
Nov-07 - Oct-09	7.29	N/A	N/A	4.44E-04	2.79	N/A	0.63	N/A	4.06	2.47	2.26	N/A	37.48	109.22	0.40	1.60
Dec-07 - Nov-09	7.41	N/A	N/A	4.54E-04	2.84	N/A	0.64	N/A	4.13	2.51	2.29	N/A	38.13	111.58	0.41	1.62
Jan-08 - Dec-09	7.46	N/A	N/A	4.59E-04	2.86	N/A	0.65	N/A	4.16	2.52	2.31	N/A	38.36	112.79	0.41	1.63
Feb-08 - Jan-10	7.68	N/A	N/A	4.76E-04	2.94	N/A	0.67	N/A	4.28	2.60	2.38	N/A	39.50	116.94	0.42	1.68
Mar-08 - Feb-10	7.64	N/A	N/A	4.76E-04	2.93	N/A	0.67	N/A	4.26	2.59	2.37	N/A	39.30	116.94	0.42	1.67
Apr-08 - Mar-10	7.91	N/A	N/A	4.96E-04	3.03	N/A	0.70	N/A	4.41	2.68	2.45	N/A	40.68	121.87	0.43	1.73
May-08 - Apr-10	7.93	N/A	N/A	5.01E-04	3.04	N/A	0.71	N/A	4.42	2.68	2.45	N/A	40.79	123.28	0.43	1.74
Jun-08 - May-10	7.91	N/A	N/A	5.05E-04	3.04	N/A	0.71	N/A	4.41	2.68	2.45	N/A	40.71	124.12	0.43	1.73
Jul-08 - Jun-10	7.98	N/A	N/A	5.14E-04	3.06	N/A	0.73	N/A	4.45	2.70	2.47	N/A	41.08	126.29	0.44	1.75
Aug-08 - Jul-10	8.03	N/A	N/A	5.21E-04	3.08	N/A	0.74	N/A	4.48	2.72	2.49	N/A	41.33	128.22	0.44	1.76
Sep-08 - Aug-10	7.54	N/A	N/A	4.92E-04	2.89	N/A	0.70	N/A	4.20	2.55	2.33	N/A	38.80	121.03	0.41	1.65
Oct-08 - Sep-10	7.60	N/A	N/A	4.98E-04	2.91	N/A	0.70	N/A	4.24	2.57	2.35	N/A	39.09	122.48	0.42	1.67
Nov-08 - Oct-10	7.87	N/A	N/A	5.19E-04	3.02	N/A	0.73	N/A	4.39	2.66	2.44	N/A	40.51	127.70	0.43	1.73
Dec-08 - Nov-10	7.83	N/A	N/A	5.21E-04	3.00	N/A	0.74	N/A	4.37	2.65	2.43	N/A	40.30	127.98	0.43	1.72
Jan-09 - Dec-10	7.87	N/A	N/A	5.26E-04	3.02	N/A	0.74	N/A	4.39	2.66	2.44	N/A	40.48	129.34	0.43	1.72
Feb-09 - Jan-11	8.00	N/A	N/A	5.44E-04	3.07	N/A	0.77	N/A	4.46	2.71	2.48	N/A	41.15	133.82	0.44	1.75
Mar-09 - Feb-11	8.05	N/A	N/A	5.57E-04	3.09	N/A	0.79	N/A	4.49	2.72	2.49	N/A	41.43	136.92	0.44	1.76
Apr-09 - Mar-11	8.14	N/A	N/A	5.74E-04	3.12	N/A	0.81	N/A	4.54	2.75	2.52	N/A	41.86	141.17	0.45	1.78
May-09 - Apr-11	8.20	N/A	N/A	5.92E-04	3.15	N/A	0.84	N/A	4.57	2.77	2.54	N/A	42.19	145.47	0.45	1.80
Jun-09 - May-11	8.40	N/A	N/A	6.18E-04	3.22	N/A	0.87	N/A	4.68	2.84	2.60	N/A	43.19	151.94	0.46	1.84
Jul-09 - Jun-11	8.49	N/A	N/A	6.35E-04	3.25	N/A	0.90	N/A	4.73	2.87	2.63	N/A	43.66	156.18	0.46	1.86
Aug-09 - Jul-11	8.44	N/A	N/A	6.42E-04	3.24	N/A	0.91	N/A	4.71	2.86	2.61	N/A	43.44	157.83	0.46	1.85
Sep-09 - Aug-11	8.49	N/A	N/A	6.56E-04	3.25	N/A	0.93	N/A	4.73	2.87	2.63	N/A	43.66	161.40	0.46	1.86
Oct-09 - Sep-11	8.46	N/A	N/A	6.62E-04	3.24	N/A	0.94	N/A	4.72	2.86	2.62	N/A	43.51	162.89	0.46	1.85
Nov-09 - Oct-11	8.45	N/A	N/A	6.72E-04	3.24	N/A	0.95	N/A	4.71	2.86	2.62	N/A	43.46	165.28	0.46	1.85
Dec-09 - Nov-11	8.32	N/A	N/A	6.69E-04	3.19	N/A	0.95	N/A	4.64	2.81	2.58	N/A	42.79	164.54	0.46	1.82
Jan-10 - Dec-11	8.41	N/A	N/A	6.86E-04	3.23	N/A	0.97	N/A	4.69	2.85	2.60	N/A	43.28	168.58	0.46	1.84

Table B-7. Baseline Monthly Emissions for Kiln 2 (tons per month)

Month	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Jan-02	1.28	N/A	N/A	1.14E-04	0.49	N/A	0.16	N/A	0.71	0.43	0.40	N/A	6.57	28.06	0.07	0.28
Feb-02	1.10	N/A	N/A	9.85E-05	0.42	N/A	0.14	N/A	0.61	0.37	0.34	N/A	5.67	24.21	0.06	0.24
Mar-02	1.12	N/A	N/A	1.00E-04	0.43	N/A	0.14	N/A	0.63	0.38	0.35	N/A	5.77	24.64	0.06	0.25
Apr-02	1.29	N/A	N/A	1.15E-04	0.49	N/A	0.16	N/A	0.72	0.44	0.40	N/A	6.64	28.33	0.07	0.28
May-02	1.37	N/A	N/A	1.22E-04	0.52	N/A	0.17	N/A	0.76	0.46	0.42	N/A	7.04	30.06	0.07	0.30
Jun-02	1.27	N/A	N/A	1.14E-04	0.49	N/A	0.16	N/A	0.71	0.43	0.39	N/A	6.55	27.95	0.07	0.28
Jul-02	0.85	N/A	N/A	7.58E-05	0.33	N/A	0.11	N/A	0.47	0.29	0.26	N/A	4.36	18.63	0.05	0.19
Aug-02	1.55	N/A	N/A	1.38E-04	0.59	N/A	0.20	N/A	0.86	0.52	0.48	N/A	7.97	34.02	0.08	0.34
Sep-02	1.29	N/A	N/A	1.15E-04	0.49	N/A	0.16	N/A	0.72	0.44	0.40	N/A	6.62	28.28	0.07	0.28
Oct-02	1.22	N/A	N/A	1.09E-04	0.47	N/A	0.15	N/A	0.68	0.41	0.38	N/A	6.30	26.88	0.07	0.27
Nov-02	1.19	N/A	N/A	1.06E-04	0.46	N/A	0.15	N/A	0.66	0.40	0.37	N/A	6.11	26.09	0.07	0.26
Dec-02	0.82	N/A	N/A	7.35E-05	0.32	N/A	0.10	N/A	0.46	0.28	0.25	N/A	4.23	18.07	0.05	0.18
Jan-03	0.99	N/A	N/A	9.13E-05	0.38	N/A	0.13	N/A	0.55	0.33	0.31	N/A	5.08	22.45	0.05	0.22
Feb-03	1.10	N/A	N/A	1.02E-04	0.42	N/A	0.14	N/A	0.61	0.37	0.34	N/A	5.67	25.04	0.06	0.24
Mar-03	1.11	N/A	N/A	1.03E-04	0.43	N/A	0.14	N/A	0.62	0.38	0.34	N/A	5.71	25.24	0.06	0.24
Apr-03	0.98	N/A	N/A	9.05E-05	0.38	N/A	0.13	N/A	0.55	0.33	0.30	N/A	5.04	22.26	0.05	0.21
May-03	1.37	N/A	N/A	1.26E-04	0.52	N/A	0.18	N/A	0.76	0.46	0.42	N/A	7.04	31.10	0.07	0.30
Jun-03	1.26	N/A	N/A	1.17E-04	0.48	N/A	0.16	N/A	0.70	0.43	0.39	N/A	6.48	28.66	0.07	0.28
Jul-03	1.29	N/A	N/A	1.20E-04	0.50	N/A	0.17	N/A	0.72	0.44	0.40	N/A	6.65	29.39	0.07	0.28
Aug-03	1.10	N/A	N/A	1.02E-04	0.42	N/A	0.14	N/A	0.61	0.37	0.34	N/A	5.66	25.03	0.06	0.24
Sep-03	1.06	N/A	N/A	9.84E-05	0.41	N/A	0.14	N/A	0.59	0.36	0.33	N/A	5.47	24.20	0.06	0.23
Oct-03	0.71	N/A	N/A	6.54E-05	0.27	N/A	0.09	N/A	0.39	0.24	0.22	N/A	3.64	16.08	0.04	0.15
Nov-03	1.31	N/A	N/A	1.21E-04	0.50	N/A	0.17	N/A	0.73	0.44	0.41	N/A	6.75	29.82	0.07	0.29
Dec-03	0.72	N/A	N/A	6.69E-05	0.28	N/A	0.09	N/A	0.40	0.24	0.22	N/A	3.72	16.44	0.04	0.16
Jan-04	1.07	N/A	N/A	9.54E-05	0.41	N/A	0.13	N/A	0.60	0.36	0.33	N/A	5.50	23.44	0.06	0.23
Feb-04	0.99	N/A	N/A	8.82E-05	0.38	N/A	0.12	N/A	0.55	0.33	0.31	N/A	5.09	21.70	0.05	0.22
Mar-04	1.48	N/A	N/A	1.32E-04	0.57	N/A	0.19	N/A	0.83	0.50	0.46	N/A	7.63	32.52	0.08	0.33
Apr-04	1.12	N/A	N/A	9.97E-05	0.43	N/A	0.14	N/A	0.62	0.38	0.35	N/A	5.75	24.51	0.06	0.25
May-04	1.56	N/A	N/A	1.39E-04	0.60	N/A	0.20	N/A	0.87	0.53	0.48	N/A	8.04	34.25	0.09	0.34
Jun-04	1.16	N/A	N/A	1.04E-04	0.45	N/A	0.15	N/A	0.65	0.39	0.36	N/A	5.97	25.45	0.06	0.25
Jul-04	0.59	N/A	N/A	5.26E-05	0.23	N/A	0.07	N/A	0.33	0.20	0.18	N/A	3.04	12.94	0.03	0.13
Aug-04	1.42	N/A	N/A	1.26E-04	0.54	N/A	0.18	N/A	0.79	0.48	0.44	N/A	7.29	31.04	0.08	0.31
Sep-04	0.85	N/A	N/A	7.57E-05	0.33	N/A	0.11	N/A	0.47	0.29	0.26	N/A	4.37	18.62	0.05	0.19
Oct-04	1.26	N/A	N/A	1.12E-04	0.48	N/A	0.16	N/A	0.70	0.43	0.39	N/A	6.48	27.61	0.07	0.28
Nov-04	1.06	N/A	N/A	9.44E-05	0.41	N/A	0.13	N/A	0.59	0.36	0.33	N/A	5.45	23.22	0.06	0.23
Dec-04	1.25	N/A	N/A	1.11E-04	0.48	N/A	0.16	N/A	0.70	0.42	0.39	N/A	6.42	27.37	0.07	0.27
Jan-05	1.13	N/A	N/A	1.01E-04	0.43	N/A	0.14	N/A	0.63	0.38	0.35	N/A	5.80	24.83	0.06	0.25
Feb-05	0.85	N/A	N/A	7.57E-05	0.32	N/A	0.11	N/A	0.47	0.29	0.26	N/A	4.35	18.62	0.05	0.19
Mar-05	1.44	N/A	N/A	1.29E-04	0.55	N/A	0.18	N/A	0.80	0.49	0.44	N/A	7.39	31.64	0.08	0.31
Apr-05	1.42	N/A	N/A	1.28E-04	0.55	N/A	0.18	N/A	0.79	0.48	0.44	N/A	7.33	31.35	0.08	0.31
May-05	1.29	N/A	N/A	1.16E-04	0.50	N/A	0.16	N/A	0.72	0.44	0.40	N/A	6.65	28.45	0.07	0.28
Jun-05	1.34	N/A	N/A	1.20E-04	0.52	N/A	0.17	N/A	0.75	0.45	0.42	N/A	6.91	29.57	0.07	0.29
Jul-05	1.43	N/A	N/A	1.28E-04	0.55	N/A	0.18	N/A	0.80	0.48	0.44	N/A	7.37	31.54	0.08	0.31
Aug-05	1.28	N/A	N/A	1.14E-04	0.49	N/A	0.16	N/A	0.71	0.43	0.40	N/A	6.56	28.10	0.07	0.28

Table B-7. Baseline Monthly Emissions for Kiln 2 (tons per month)

Month	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Sep-05	1.23	N/A	N/A	1.10E-04	0.47	N/A	0.16	N/A	0.69	0.42	0.38	N/A	6.33	27.11	0.07	0.27
Oct-05	1.16	N/A	N/A	1.04E-04	0.45	N/A	0.15	N/A	0.65	0.39	0.36	N/A	5.99	25.64	0.06	0.26
Nov-05	0.95	N/A	N/A	8.48E-05	0.36	N/A	0.12	N/A	0.53	0.32	0.29	N/A	4.87	20.85	0.05	0.21
Dec-05	1.29	N/A	N/A	1.15E-04	0.49	N/A	0.16	N/A	0.72	0.44	0.40	N/A	6.63	28.36	0.07	0.28
Jan-06	1.06	N/A	N/A	8.44E-05	0.40	N/A	0.12	N/A	0.59	0.36	0.33	N/A	5.43	20.76	0.06	0.23
Feb-06	1.03	N/A	N/A	8.24E-05	0.40	N/A	0.12	N/A	0.57	0.35	0.32	N/A	5.30	20.26	0.06	0.23
Mar-06	1.46	N/A	N/A	1.17E-04	0.56	N/A	0.17	N/A	0.82	0.50	0.45	N/A	7.53	28.79	0.08	0.32
Apr-06	1.46	N/A	N/A	1.17E-04	0.56	N/A	0.17	N/A	0.82	0.49	0.45	N/A	7.52	28.77	0.08	0.32
May-06	1.30	N/A	N/A	1.04E-04	0.50	N/A	0.15	N/A	0.73	0.44	0.40	N/A	6.70	25.62	0.07	0.29
Jun-06	1.29	N/A	N/A	1.03E-04	0.49	N/A	0.15	N/A	0.72	0.44	0.40	N/A	6.64	25.38	0.07	0.28
Jul-06	1.04	N/A	N/A	8.36E-05	0.40	N/A	0.12	N/A	0.58	0.35	0.32	N/A	5.37	20.55	0.06	0.23
Aug-06	0.85	N/A	N/A	6.83E-05	0.33	N/A	0.10	N/A	0.48	0.29	0.26	N/A	4.39	16.80	0.05	0.19
Sep-06	0.35	N/A	N/A	2.82E-05	0.14	N/A	0.04	N/A	0.20	0.12	0.11	N/A	1.82	6.94	0.02	0.08
Oct-06	0.60	N/A	N/A	4.81E-05	0.23	N/A	0.07	N/A	0.34	0.20	0.19	N/A	3.09	11.83	0.03	0.13
Nov-06	0.90	N/A	N/A	7.20E-05	0.35	N/A	0.10	N/A	0.50	0.30	0.28	N/A	4.63	17.70	0.05	0.20
Dec-06	0.44	N/A	N/A	3.52E-05	0.17	N/A	0.05	N/A	0.25	0.15	0.14	N/A	2.26	8.65	0.02	0.10
Jan-07	1.01	N/A	N/A	1.38E-04	0.39	N/A	0.20	N/A	0.57	0.34	0.31	N/A	5.22	33.97	0.06	0.22
Feb-07	0.94	N/A	N/A	1.28E-04	0.36	N/A	0.18	N/A	0.52	0.32	0.29	N/A	4.84	31.47	0.05	0.21
Mar-07	0.86	N/A	N/A	1.18E-04	0.33	N/A	0.17	N/A	0.48	0.29	0.27	N/A	4.45	28.95	0.05	0.19
Apr-07	1.29	N/A	N/A	1.75E-04	0.49	N/A	0.25	N/A	0.72	0.44	0.40	N/A	6.62	43.09	0.07	0.28
May-07	0.31	N/A	N/A	4.28E-05	0.12	N/A	0.06	N/A	0.18	0.11	0.10	N/A	1.62	10.52	0.02	0.07
Jun-07	1.20	N/A	N/A	1.64E-04	0.46	N/A	0.23	N/A	0.67	0.41	0.37	N/A	6.19	40.26	0.07	0.26
Jul-07	1.25	N/A	N/A	1.71E-04	0.48	N/A	0.24	N/A	0.70	0.42	0.39	N/A	6.45	41.97	0.07	0.27
Aug-07	0.80	N/A	N/A	1.09E-04	0.31	N/A	0.15	N/A	0.44	0.27	0.25	N/A	4.10	26.68	0.04	0.17
Sep-07	1.31	N/A	N/A	1.79E-04	0.50	N/A	0.25	N/A	0.73	0.44	0.41	N/A	6.76	44.01	0.07	0.29
Oct-07	1.21	N/A	N/A	1.65E-04	0.46	N/A	0.23	N/A	0.67	0.41	0.37	N/A	6.22	40.49	0.07	0.27
Nov-07	0.66	N/A	N/A	8.94E-05	0.25	N/A	0.13	N/A	0.37	0.22	0.20	N/A	3.38	21.98	0.04	0.14
Dec-07	1.01	N/A	N/A	1.38E-04	0.39	N/A	0.19	N/A	0.57	0.34	0.31	N/A	5.21	33.93	0.06	0.22
Jan-08	1.15	N/A	N/A	2.67E-04	0.44	N/A	0.38	N/A	0.64	0.39	0.36	N/A	5.93	65.65	0.06	0.25
Feb-08	0.67	N/A	N/A	1.55E-04	0.26	N/A	0.22	N/A	0.37	0.23	0.21	N/A	3.45	38.18	0.04	0.15
Mar-08	0.90	N/A	N/A	2.08E-04	0.34	N/A	0.29	N/A	0.50	0.30	0.28	N/A	4.61	51.06	0.05	0.20
Apr-08	0.00	N/A	N/A	0.00E+00	0.00	N/A	0.00	N/A	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00
May-08	0.00	N/A	N/A	0.00E+00	0.00	N/A	0.00	N/A	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00
Jun-08	0.00	N/A	N/A	0.00E+00	0.00	N/A	0.00	N/A	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00
Jul-08	0.00	N/A	N/A	0.00E+00	0.00	N/A	0.00	N/A	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00
Aug-08	0.00	N/A	N/A	0.00E+00	0.00	N/A	0.00	N/A	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00
Sep-08	0.90	N/A	N/A	2.09E-04	0.35	N/A	0.30	N/A	0.50	0.31	0.28	N/A	4.65	51.45	0.05	0.20
Oct-08	1.06	N/A	N/A	2.46E-04	0.41	N/A	0.35	N/A	0.59	0.36	0.33	N/A	5.46	60.37	0.06	0.23
Nov-08	0.34	N/A	N/A	7.87E-05	0.13	N/A	0.11	N/A	0.19	0.12	0.11	N/A	1.75	19.36	0.02	0.07
Dec-08	0.30	N/A	N/A	7.05E-05	0.12	N/A	0.10	N/A	0.17	0.10	0.09	N/A	1.57	17.34	0.02	0.07
Jan-09	0.20	N/A	N/A	4.92E-05	0.08	N/A	0.07	N/A	0.11	0.07	0.06	N/A	1.04	12.10	0.01	0.04
Feb-09	0.00	N/A	N/A	0.00E+00	0.00	N/A	0.00	N/A	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00
Mar-09	0.81	N/A	N/A	1.97E-04	0.31	N/A	0.28	N/A	0.45	0.27	0.25	N/A	4.17	48.34	0.04	0.18
Apr-09	0.61	N/A	N/A	1.48E-04	0.23	N/A	0.21	N/A	0.34	0.21	0.19	N/A	3.13	36.28	0.03	0.13
May-09	0.71	N/A	N/A	1.72E-04	0.27	N/A	0.24	N/A	0.39	0.24	0.22	N/A	3.64	42.26	0.04	0.16
Jun-09	0.86	N/A	N/A	2.09E-04	0.33	N/A	0.30	N/A	0.48	0.29	0.27	N/A	4.43	51.35	0.05	0.19
Jul-09	0.41	N/A	N/A	9.84E-05	0.16	N/A	0.14	N/A	0.23	0.14	0.13	N/A	2.09	24.20	0.02	0.09
Aug-09	0.76	N/A	N/A	1.84E-04	0.29	N/A	0.26	N/A	0.42	0.26	0.24	N/A	3.91	45.36	0.04	0.17

Table B-7. Baseline Monthly Emissions for Kiln 2 (tons per month)

Month	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Sep-09	0.46	N/A	N/A	1.11E-04	0.17	N/A	0.16	N/A	0.25	0.15	0.14	N/A	2.34	27.17	0.02	0.10
Oct-09	0.67	N/A	N/A	1.62E-04	0.26	N/A	0.23	N/A	0.37	0.23	0.21	N/A	3.43	39.82	0.04	0.15
Nov-09	0.41	N/A	N/A	9.89E-05	0.16	N/A	0.14	N/A	0.23	0.14	0.13	N/A	2.10	24.31	0.02	0.09
Dec-09	0.35	N/A	N/A	8.61E-05	0.14	N/A	0.12	N/A	0.20	0.12	0.11	N/A	1.83	21.18	0.02	0.08
Jan-10	0.23	N/A	N/A	6.32E-05	0.09	N/A	0.09	N/A	0.13	0.08	0.07	N/A	1.17	15.53	0.01	0.05
Feb-10	0.41	N/A	N/A	1.13E-04	0.16	N/A	0.16	N/A	0.23	0.14	0.13	N/A	2.10	27.84	0.02	0.09
Mar-10	1.17	N/A	N/A	3.24E-04	0.45	N/A	0.46	N/A	0.65	0.39	0.36	N/A	6.00	79.71	0.06	0.26
Apr-10	0.61	N/A	N/A	1.70E-04	0.23	N/A	0.24	N/A	0.34	0.21	0.19	N/A	3.14	41.72	0.03	0.13
May-10	0.77	N/A	N/A	2.13E-04	0.29	N/A	0.30	N/A	0.43	0.26	0.24	N/A	3.94	52.33	0.04	0.17
Jun-10	0.00	N/A	N/A	0.00E+00	0.00	N/A	0.00	N/A	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00
Jul-10	0.40	N/A	N/A	1.11E-04	0.15	N/A	0.16	N/A	0.22	0.14	0.12	N/A	2.05	27.27	0.02	0.09
Aug-10	1.22	N/A	N/A	3.39E-04	0.47	N/A	0.48	N/A	0.68	0.41	0.38	N/A	6.28	83.42	0.07	0.27
Sep-10	0.86	N/A	N/A	2.39E-04	0.33	N/A	0.34	N/A	0.48	0.29	0.27	N/A	4.43	58.86	0.05	0.19
Oct-10	1.06	N/A	N/A	2.94E-04	0.41	N/A	0.42	N/A	0.59	0.36	0.33	N/A	5.45	72.35	0.06	0.23
Nov-10	0.66	N/A	N/A	1.84E-04	0.25	N/A	0.26	N/A	0.37	0.22	0.20	N/A	3.40	45.20	0.04	0.15
Dec-10	0.96	N/A	N/A	2.66E-04	0.37	N/A	0.38	N/A	0.53	0.32	0.30	N/A	4.93	65.45	0.05	0.21
Jan-11	0.60	N/A	N/A	1.43E-04	0.23	N/A	0.20	N/A	0.34	0.20	0.19	N/A	3.10	35.27	0.03	0.13
Feb-11	1.09	N/A	N/A	2.58E-04	0.42	N/A	0.36	N/A	0.61	0.37	0.34	N/A	5.59	63.53	0.06	0.24
Mar-11	1.20	N/A	N/A	2.85E-04	0.46	N/A	0.40	N/A	0.67	0.41	0.37	N/A	6.17	70.19	0.07	0.26
Apr-11	1.01	N/A	N/A	2.40E-04	0.39	N/A	0.34	N/A	0.56	0.34	0.31	N/A	5.19	59.08	0.06	0.22
May-11	0.86	N/A	N/A	2.04E-04	0.33	N/A	0.29	N/A	0.48	0.29	0.27	N/A	4.41	50.17	0.05	0.19
Jun-11	1.04	N/A	N/A	2.48E-04	0.40	N/A	0.35	N/A	0.58	0.35	0.32	N/A	5.36	60.97	0.06	0.23
Jul-11	0.60	N/A	N/A	1.43E-04	0.23	N/A	0.20	N/A	0.33	0.20	0.19	N/A	3.09	35.12	0.03	0.13
Aug-11	0.39	N/A	N/A	9.23E-05	0.15	N/A	0.13	N/A	0.22	0.13	0.12	N/A	2.00	22.70	0.02	0.09
Sep-11	0.25	N/A	N/A	6.02E-05	0.10	N/A	0.09	N/A	0.14	0.09	0.08	N/A	1.30	14.81	0.01	0.06
Oct-11	0.79	N/A	N/A	1.89E-04	0.30	N/A	0.27	N/A	0.44	0.27	0.25	N/A	4.08	46.45	0.04	0.17
Nov-11	0.30	N/A	N/A	7.19E-05	0.12	N/A	0.10	N/A	0.17	0.10	0.09	N/A	1.56	17.69	0.02	0.07
Dec-11	0.55	N/A	N/A	1.31E-04	0.21	N/A	0.18	N/A	0.31	0.19	0.17	N/A	2.83	32.20	0.03	0.12

1. Baseline monthly emissions are calculated two ways depending on the units of the emission factor of interest.
   If the emission factor is in units of lb/MBF, the following derivation is used: Actual Emissions [ton/month] = Emission Factor [lb/MBF] * Monthly Kiln Production [BF/month] / 2,000 lb/ton / 1,000 BF/MBF
   If the emission factor is in units of lb/MMBtu, the following derivation is used: Actual Emissions [ton/month] = Emission Factor [lb/MMBtu] * Monthly Wood Combusted [tons/month] * Heating Value [4,500 Btu/lb wood combusted] / 1,000,000 Btu/MMBtu

Table B-8. Total 24-Month Rolling Average Actual Annual Emissions for Kiln 2 (tpy)

24 Month Period	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Jan-02 - Dec-03	13.68	N/A	N/A	1.24E-03	5.25	N/A	1.75	N/A	7.63	4.63	4.23	N/A	70.37	305.47	0.75	3.00
Feb-02 - Jan-04	13.57	N/A	N/A	1.23E-03	5.21	N/A	1.74	N/A	7.57	4.59	4.20	N/A	69.83	303.16	0.74	2.98
Mar-02 - Feb-04	13.52	N/A	N/A	1.23E-03	5.18	N/A	1.73	N/A	7.54	4.57	4.19	N/A	69.55	301.90	0.74	2.96
Apr-02 - Mar-04	13.70	N/A	N/A	1.24E-03	5.25	N/A	1.76	N/A	7.64	4.64	4.24	N/A	70.48	305.84	0.75	3.00
May-02 - Apr-04	13.61	N/A	N/A	1.24E-03	5.22	N/A	1.75	N/A	7.59	4.61	4.21	N/A	70.04	303.93	0.75	2.98
Jun-02 - May-04	13.71	N/A	N/A	1.24E-03	5.26	N/A	1.76	N/A	7.64	4.64	4.24	N/A	70.54	306.03	0.75	3.01
Jul-02 - Jun-04	13.65	N/A	N/A	1.24E-03	5.24	N/A	1.75	N/A	7.61	4.62	4.23	N/A	70.25	304.78	0.75	2.99
Aug-02 - Jul-04	13.53	N/A	N/A	1.23E-03	5.19	N/A	1.73	N/A	7.54	4.58	4.19	N/A	69.59	301.94	0.74	2.96
Sep-02 - Aug-04	13.46	N/A	N/A	1.22E-03	5.16	N/A	1.73	N/A	7.50	4.55	4.17	N/A	69.25	300.45	0.74	2.95
Oct-02 - Sep-04	13.24	N/A	N/A	1.20E-03	5.08	N/A	1.70	N/A	7.38	4.48	4.10	N/A	68.12	295.61	0.73	2.90
Nov-02 - Oct-04	13.26	N/A	N/A	1.20E-03	5.09	N/A	1.70	N/A	7.39	4.49	4.10	N/A	68.21	295.98	0.73	2.91
Dec-02 - Nov-04	13.19	N/A	N/A	1.20E-03	5.06	N/A	1.69	N/A	7.36	4.46	4.08	N/A	67.88	294.54	0.72	2.89
Jan-03 - Dec-04	13.41	N/A	N/A	1.22E-03	5.14	N/A	1.72	N/A	7.48	4.54	4.15	N/A	68.98	299.18	0.73	2.94
Feb-03 - Jan-05	13.48	N/A	N/A	1.22E-03	5.17	N/A	1.73	N/A	7.51	4.56	4.17	N/A	69.34	300.37	0.74	2.95
Mar-03 - Feb-05	13.35	N/A	N/A	1.21E-03	5.12	N/A	1.71	N/A	7.44	4.52	4.13	N/A	68.68	297.16	0.73	2.93
Apr-03 - Mar-05	13.51	N/A	N/A	1.22E-03	5.18	N/A	1.73	N/A	7.53	4.57	4.18	N/A	69.52	300.36	0.74	2.96
May-03 - Apr-05	13.74	N/A	N/A	1.24E-03	5.27	N/A	1.75	N/A	7.66	4.65	4.25	N/A	70.67	304.90	0.75	3.01
Jun-03 - May-05	13.70	N/A	N/A	1.23E-03	5.25	N/A	1.74	N/A	7.64	4.63	4.24	N/A	70.47	303.58	0.75	3.00
Jul-03 - Jun-05	13.74	N/A	N/A	1.24E-03	5.27	N/A	1.75	N/A	7.66	4.65	4.25	N/A	70.68	304.04	0.75	3.01
Aug-03 - Jul-05	13.81	N/A	N/A	1.24E-03	5.30	N/A	1.75	N/A	7.70	4.67	4.28	N/A	71.04	305.11	0.76	3.03
Sep-03 - Aug-05	13.90	N/A	N/A	1.25E-03	5.33	N/A	1.76	N/A	7.75	4.70	4.30	N/A	71.50	306.65	0.76	3.05
Oct-03 - Sep-05	13.98	N/A	N/A	1.25E-03	5.36	N/A	1.77	N/A	7.79	4.73	4.33	N/A	71.92	308.10	0.77	3.06
Nov-03 - Oct-05	14.21	N/A	N/A	1.27E-03	5.45	N/A	1.80	N/A	7.92	4.81	4.40	N/A	73.10	312.88	0.78	3.11
Dec-03 - Nov-05	14.03	N/A	N/A	1.25E-03	5.38	N/A	1.77	N/A	7.82	4.75	4.34	N/A	72.16	308.40	0.77	3.07
Jan-04 - Dec-05	14.31	N/A	N/A	1.28E-03	5.49	N/A	1.81	N/A	7.98	4.84	4.43	N/A	73.62	314.35	0.78	3.14
Feb-04 - Jan-06	14.30	N/A	N/A	1.27E-03	5.49	N/A	1.80	N/A	7.97	4.84	4.43	N/A	73.58	313.01	0.78	3.13
Mar-04 - Feb-06	14.32	N/A	N/A	1.27E-03	5.49	N/A	1.79	N/A	7.99	4.85	4.43	N/A	73.68	312.29	0.78	3.14
Apr-04 - Mar-06	14.31	N/A	N/A	1.26E-03	5.49	N/A	1.78	N/A	7.98	4.84	4.43	N/A	73.63	310.43	0.78	3.14
May-04 - Apr-06	14.48	N/A	N/A	1.27E-03	5.56	N/A	1.80	N/A	8.08	4.90	4.48	N/A	74.52	312.56	0.79	3.17
Jun-04 - May-06	14.35	N/A	N/A	1.25E-03	5.51	N/A	1.77	N/A	8.00	4.86	4.44	N/A	73.85	308.25	0.79	3.15
Jul-04 - Jun-06	14.42	N/A	N/A	1.25E-03	5.53	N/A	1.77	N/A	8.04	4.88	4.46	N/A	74.18	308.21	0.79	3.16
Aug-04 - Jul-06	14.65	N/A	N/A	1.27E-03	5.62	N/A	1.79	N/A	8.17	4.96	4.53	N/A	75.34	312.02	0.80	3.21
Sep-04 - Aug-06	14.36	N/A	N/A	1.24E-03	5.51	N/A	1.75	N/A	8.01	4.86	4.45	N/A	73.90	304.90	0.79	3.15
Oct-04 - Sep-06	14.12	N/A	N/A	1.22E-03	5.41	N/A	1.72	N/A	7.87	4.78	4.37	N/A	72.62	299.06	0.77	3.09
Nov-04 - Oct-06	13.79	N/A	N/A	1.18E-03	5.29	N/A	1.67	N/A	7.69	4.66	4.27	N/A	70.93	291.17	0.76	3.02
Dec-04 - Nov-06	13.71	N/A	N/A	1.17E-03	5.26	N/A	1.66	N/A	7.64	4.64	4.24	N/A	70.52	288.41	0.75	3.00
Jan-05 - Dec-06	13.30	N/A	N/A	1.13E-03	5.10	N/A	1.60	N/A	7.42	4.50	4.12	N/A	68.44	279.05	0.73	2.92
Feb-05 - Jan-07	13.25	N/A	N/A	1.15E-03	5.08	N/A	1.63	N/A	7.38	4.48	4.10	N/A	68.14	283.62	0.73	2.90
Mar-05 - Feb-07	13.29	N/A	N/A	1.18E-03	5.10	N/A	1.67	N/A	7.41	4.50	4.12	N/A	68.39	290.05	0.73	2.91
Apr-05 - Mar-07	13.01	N/A	N/A	1.17E-03	4.99	N/A	1.66	N/A	7.25	4.40	4.03	N/A	66.92	288.71	0.71	2.85
May-05 - Apr-07	12.94	N/A	N/A	1.20E-03	4.96	N/A	1.69	N/A	7.21	4.38	4.01	N/A	66.56	294.58	0.71	2.84
Jun-05 - May-07	12.45	N/A	N/A	1.16E-03	4.78	N/A	1.64	N/A	6.94	4.21	3.85	N/A	64.05	285.61	0.68	2.73
Jul-05 - Jun-07	12.38	N/A	N/A	1.18E-03	4.75	N/A	1.67	N/A	6.90	4.19	3.83	N/A	63.69	290.96	0.68	2.71
Aug-05 - Jul-07	12.29	N/A	N/A	1.20E-03	4.71	N/A	1.70	N/A	6.85	4.16	3.80	N/A	63.23	296.17	0.67	2.69
Sep-05 - Aug-07	12.05	N/A	N/A	1.20E-03	4.62	N/A	1.70	N/A	6.72	4.08	3.73	N/A	61.99	295.46	0.66	2.64
Oct-05 - Sep-07	12.09	N/A	N/A	1.24E-03	4.64	N/A	1.75	N/A	6.74	4.09	3.74	N/A	62.21	303.91	0.66	2.65
Nov-05 - Oct-07	12.11	N/A	N/A	1.27E-03	4.65	N/A	1.79	N/A	6.75	4.10	3.75	N/A	62.32	311.34	0.66	2.66
Dec-05 - Nov-07	11.97	N/A	N/A	1.27E-03	4.59	N/A	1.79	N/A	6.67	4.05	3.71	N/A	61.58	311.90	0.66	2.62

Table B-8. Total 24-Month Rolling Average Actual Annual Emissions for Kiln 2 (tpy)

24 Month Period	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Jan-06 - Dec-07	11.83	N/A	N/A	1.28E-03	4.54	N/A	1.81	N/A	6.60	4.00	3.66	N/A	60.87	314.69	0.65	2.59
Feb-06 - Jan-08	11.88	N/A	N/A	1.37E-03	4.56	N/A	1.94	N/A	6.62	4.02	3.68	N/A	61.12	337.14	0.65	2.60
Mar-06 - Feb-08	11.70	N/A	N/A	1.41E-03	4.49	N/A	1.99	N/A	6.52	3.96	3.62	N/A	60.20	346.09	0.64	2.56
Apr-06 - Mar-08	11.42	N/A	N/A	1.45E-03	4.38	N/A	2.05	N/A	6.37	3.86	3.53	N/A	58.74	357.23	0.63	2.50
May-06 - Apr-08	10.69	N/A	N/A	1.39E-03	4.10	N/A	1.97	N/A	5.96	3.62	3.31	N/A	54.98	342.84	0.59	2.34
Jun-06 - May-08	10.04	N/A	N/A	1.34E-03	3.85	N/A	1.90	N/A	5.60	3.40	3.11	N/A	51.63	330.03	0.55	2.20
Jul-06 - Jun-08	9.39	N/A	N/A	1.29E-03	3.60	N/A	1.82	N/A	5.24	3.18	2.91	N/A	48.31	317.34	0.51	2.06
Aug-06 - Jul-08	8.87	N/A	N/A	1.25E-03	3.40	N/A	1.76	N/A	4.94	3.00	2.75	N/A	45.62	307.06	0.49	1.94
Sep-06 - Aug-08	8.44	N/A	N/A	1.21E-03	3.24	N/A	1.72	N/A	4.71	2.86	2.61	N/A	43.43	298.67	0.46	1.85
Oct-06 - Sep-08	8.72	N/A	N/A	1.31E-03	3.34	N/A	1.84	N/A	4.86	2.95	2.70	N/A	44.84	320.92	0.48	1.91
Nov-06 - Oct-08	8.95	N/A	N/A	1.40E-03	3.43	N/A	1.98	N/A	4.99	3.03	2.77	N/A	46.02	345.19	0.49	1.96
Dec-06 - Nov-08	8.67	N/A	N/A	1.41E-03	3.32	N/A	1.99	N/A	4.83	2.93	2.68	N/A	44.58	346.02	0.47	1.90
Jan-07 - Dec-08	8.60	N/A	N/A	1.42E-03	3.30	N/A	2.01	N/A	4.79	2.91	2.66	N/A	44.24	350.36	0.47	1.88
Feb-07 - Jan-09	8.19	N/A	N/A	1.38E-03	3.14	N/A	1.95	N/A	4.57	2.77	2.54	N/A	42.15	339.42	0.45	1.80
Mar-07 - Feb-09	7.72	N/A	N/A	1.32E-03	2.96	N/A	1.86	N/A	4.31	2.61	2.39	N/A	39.73	323.69	0.42	1.69
Apr-07 - Mar-09	7.70	N/A	N/A	1.36E-03	2.95	N/A	1.92	N/A	4.29	2.60	2.38	N/A	39.59	333.39	0.42	1.69
May-07 - Apr-09	7.36	N/A	N/A	1.34E-03	2.82	N/A	1.90	N/A	4.10	2.49	2.28	N/A	37.84	329.98	0.40	1.61
Jun-07 - May-09	7.55	N/A	N/A	1.41E-03	2.90	N/A	1.99	N/A	4.21	2.56	2.34	N/A	38.86	345.85	0.41	1.66
Jul-07 - Jun-09	7.38	N/A	N/A	1.43E-03	2.83	N/A	2.02	N/A	4.12	2.50	2.29	N/A	37.98	351.40	0.40	1.62
Aug-07 - Jul-09	6.96	N/A	N/A	1.39E-03	2.67	N/A	1.97	N/A	3.88	2.35	2.15	N/A	35.80	342.51	0.38	1.53
Sep-07 - Aug-09	6.94	N/A	N/A	1.43E-03	2.66	N/A	2.02	N/A	3.87	2.35	2.15	N/A	35.70	351.85	0.38	1.52
Oct-07 - Sep-09	6.51	N/A	N/A	1.40E-03	2.50	N/A	1.97	N/A	3.63	2.20	2.02	N/A	33.49	343.43	0.36	1.43
Nov-07 - Oct-09	6.24	N/A	N/A	1.40E-03	2.39	N/A	1.97	N/A	3.48	2.11	1.93	N/A	32.10	343.09	0.34	1.37
Dec-07 - Nov-09	6.11	N/A	N/A	1.40E-03	2.35	N/A	1.98	N/A	3.41	2.07	1.89	N/A	31.46	344.26	0.34	1.34
Jan-08 - Dec-09	5.78	N/A	N/A	1.37E-03	2.22	N/A	1.94	N/A	3.23	1.96	1.79	N/A	29.76	337.88	0.32	1.27
Feb-08 - Jan-10	5.32	N/A	N/A	1.27E-03	2.04	N/A	1.80	N/A	2.97	1.80	1.65	N/A	27.38	312.82	0.29	1.17
Mar-08 - Feb-10	5.19	N/A	N/A	1.25E-03	1.99	N/A	1.77	N/A	2.89	1.76	1.61	N/A	26.70	307.65	0.28	1.14
Apr-08 - Mar-10	5.33	N/A	N/A	1.31E-03	2.04	N/A	1.85	N/A	2.97	1.80	1.65	N/A	27.40	321.98	0.29	1.17
May-08 - Apr-10	5.63	N/A	N/A	1.39E-03	2.16	N/A	1.97	N/A	3.14	1.91	1.74	N/A	28.97	342.84	0.31	1.23
Jun-08 - May-10	6.01	N/A	N/A	1.50E-03	2.31	N/A	2.12	N/A	3.35	2.03	1.86	N/A	30.94	369.01	0.33	1.32
Jul-08 - Jun-10	6.01	N/A	N/A	1.50E-03	2.31	N/A	2.12	N/A	3.35	2.03	1.86	N/A	30.94	369.01	0.33	1.32
Aug-08 - Jul-10	6.21	N/A	N/A	1.56E-03	2.38	N/A	2.20	N/A	3.46	2.10	1.92	N/A	31.97	382.64	0.34	1.36
Sep-08 - Aug-10	6.82	N/A	N/A	1.73E-03	2.62	N/A	2.44	N/A	3.80	2.31	2.11	N/A	35.11	424.35	0.37	1.50
Oct-08 - Sep-10	6.80	N/A	N/A	1.74E-03	2.61	N/A	2.46	N/A	3.79	2.30	2.11	N/A	35.00	428.06	0.37	1.49
Nov-08 - Oct-10	6.80	N/A	N/A	1.77E-03	2.61	N/A	2.49	N/A	3.79	2.30	2.11	N/A	35.00	434.05	0.37	1.49
Dec-08 - Nov-10	6.96	N/A	N/A	1.82E-03	2.67	N/A	2.57	N/A	3.88	2.36	2.16	N/A	35.83	446.97	0.38	1.53
Jan-09 - Dec-10	7.29	N/A	N/A	1.92E-03	2.80	N/A	2.71	N/A	4.06	2.47	2.26	N/A	37.51	471.03	0.40	1.60
Feb-09 - Jan-11	7.49	N/A	N/A	1.96E-03	2.87	N/A	2.77	N/A	4.18	2.53	2.32	N/A	38.54	482.61	0.41	1.64
Mar-09 - Feb-11	8.03	N/A	N/A	2.09E-03	3.08	N/A	2.95	N/A	4.48	2.72	2.49	N/A	41.33	514.38	0.44	1.76
Apr-09 - Mar-11	8.23	N/A	N/A	2.14E-03	3.16	N/A	3.02	N/A	4.59	2.78	2.55	N/A	42.33	525.30	0.45	1.80
May-09 - Apr-11	8.43	N/A	N/A	2.18E-03	3.23	N/A	3.08	N/A	4.70	2.85	2.61	N/A	43.37	536.70	0.46	1.85
Jun-09 - May-11	8.50	N/A	N/A	2.20E-03	3.26	N/A	3.11	N/A	4.74	2.88	2.63	N/A	43.75	540.65	0.47	1.86
Jul-09 - Jun-11	8.59	N/A	N/A	2.22E-03	3.30	N/A	3.13	N/A	4.79	2.91	2.66	N/A	44.22	545.46	0.47	1.88
Aug-09 - Jul-11	8.69	N/A	N/A	2.24E-03	3.33	N/A	3.16	N/A	4.85	2.94	2.69	N/A	44.72	550.93	0.48	1.91
Sep-09 - Aug-11	8.51	N/A	N/A	2.19E-03	3.26	N/A	3.10	N/A	4.74	2.88	2.63	N/A	43.76	539.60	0.47	1.86
Oct-09 - Sep-11	8.40	N/A	N/A	2.17E-03	3.22	N/A	3.06	N/A	4.69	2.84	2.60	N/A	43.24	533.41	0.46	1.84
Nov-09 - Oct-11	8.47	N/A	N/A	2.18E-03	3.25	N/A	3.08	N/A	4.72	2.87	2.62	N/A	43.56	536.73	0.46	1.86
Dec-09 - Nov-11	8.42	N/A	N/A	2.17E-03	3.23	N/A	3.06	N/A	4.69	2.85	2.61	N/A	43.29	533.42	0.46	1.84
Jan-10 - Dec-11	8.51	N/A	N/A	2.19E-03	3.27	N/A	3.10	N/A	4.75	2.88	2.64	N/A	43.80	538.93	0.47	1.87

Table B-9. Baseline Monthly Emissions for Kiln 3 (tons per month)

Month	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Jan-02	2.13	N/A	N/A	1.90E-04	0.82	N/A	0.27	N/A	1.19	0.72	0.66	N/A	10.96	46.79	0.12	0.47
Feb-02	1.98	N/A	N/A	1.77E-04	0.76	N/A	0.25	N/A	1.10	0.67	0.61	N/A	10.17	43.43	0.11	0.43
Mar-02	2.22	N/A	N/A	1.98E-04	0.85	N/A	0.28	N/A	1.24	0.75	0.69	N/A	11.42	48.77	0.12	0.49
Apr-02	2.07	N/A	N/A	1.85E-04	0.80	N/A	0.26	N/A	1.16	0.70	0.64	N/A	10.67	45.54	0.11	0.45
May-02	2.32	N/A	N/A	2.07E-04	0.89	N/A	0.29	N/A	1.29	0.78	0.72	N/A	11.93	50.94	0.13	0.51
Jun-02	2.15	N/A	N/A	1.92E-04	0.82	N/A	0.27	N/A	1.20	0.73	0.67	N/A	11.06	47.21	0.12	0.47
Jul-02	2.05	N/A	N/A	1.83E-04	0.79	N/A	0.26	N/A	1.14	0.69	0.64	N/A	10.56	45.10	0.11	0.45
Aug-02	2.15	N/A	N/A	1.92E-04	0.83	N/A	0.27	N/A	1.20	0.73	0.67	N/A	11.07	47.26	0.12	0.47
Sep-02	1.76	N/A	N/A	1.57E-04	0.68	N/A	0.22	N/A	0.98	0.60	0.55	N/A	9.06	38.70	0.10	0.39
Oct-02	1.98	N/A	N/A	1.77E-04	0.76	N/A	0.25	N/A	1.10	0.67	0.61	N/A	10.19	43.52	0.11	0.43
Nov-02	1.99	N/A	N/A	1.78E-04	0.76	N/A	0.25	N/A	1.11	0.67	0.62	N/A	10.23	43.69	0.11	0.44
Dec-02	1.68	N/A	N/A	1.50E-04	0.64	N/A	0.21	N/A	0.93	0.57	0.52	N/A	8.62	36.82	0.09	0.37
Jan-03	2.49	N/A	N/A	2.30E-04	0.95	N/A	0.32	N/A	1.39	0.84	0.77	N/A	12.79	56.55	0.14	0.55
Feb-03	2.06	N/A	N/A	1.90E-04	0.79	N/A	0.27	N/A	1.15	0.70	0.64	N/A	10.59	46.80	0.11	0.45
Mar-03	1.76	N/A	N/A	1.63E-04	0.67	N/A	0.23	N/A	0.98	0.59	0.54	N/A	9.04	39.98	0.10	0.39
Apr-03	1.83	N/A	N/A	1.69E-04	0.70	N/A	0.24	N/A	1.02	0.62	0.57	N/A	9.39	41.51	0.10	0.40
May-03	2.06	N/A	N/A	1.90E-04	0.79	N/A	0.27	N/A	1.15	0.70	0.64	N/A	10.58	46.76	0.11	0.45
Jun-03	1.91	N/A	N/A	1.77E-04	0.73	N/A	0.25	N/A	1.06	0.65	0.59	N/A	9.82	43.40	0.10	0.42
Jul-03	1.59	N/A	N/A	1.47E-04	0.61	N/A	0.21	N/A	0.89	0.54	0.49	N/A	8.17	36.10	0.09	0.35
Aug-03	2.15	N/A	N/A	1.98E-04	0.82	N/A	0.28	N/A	1.20	0.73	0.66	N/A	11.04	48.79	0.12	0.47
Sep-03	2.07	N/A	N/A	1.92E-04	0.79	N/A	0.27	N/A	1.15	0.70	0.64	N/A	10.66	47.11	0.11	0.45
Oct-03	2.16	N/A	N/A	2.00E-04	0.83	N/A	0.28	N/A	1.20	0.73	0.67	N/A	11.10	49.07	0.12	0.47
Nov-03	1.77	N/A	N/A	1.64E-04	0.68	N/A	0.23	N/A	0.99	0.60	0.55	N/A	9.11	40.28	0.10	0.39
Dec-03	1.89	N/A	N/A	1.74E-04	0.72	N/A	0.25	N/A	1.05	0.64	0.58	N/A	9.70	42.89	0.10	0.41
Jan-04	2.24	N/A	N/A	1.99E-04	0.86	N/A	0.28	N/A	1.25	0.76	0.69	N/A	11.50	48.98	0.12	0.49
Feb-04	1.90	N/A	N/A	1.70E-04	0.73	N/A	0.24	N/A	1.06	0.64	0.59	N/A	9.79	41.68	0.10	0.42
Mar-04	1.86	N/A	N/A	1.65E-04	0.71	N/A	0.23	N/A	1.03	0.63	0.57	N/A	9.55	40.66	0.10	0.41
Apr-04	2.18	N/A	N/A	1.94E-04	0.84	N/A	0.27	N/A	1.21	0.74	0.67	N/A	11.21	47.75	0.12	0.48
May-04	1.86	N/A	N/A	1.66E-04	0.71	N/A	0.23	N/A	1.04	0.63	0.58	N/A	9.58	40.82	0.10	0.41
Jun-04	2.23	N/A	N/A	1.99E-04	0.85	N/A	0.28	N/A	1.24	0.75	0.69	N/A	11.46	48.83	0.12	0.49
Jul-04	0.85	N/A	N/A	7.57E-05	0.33	N/A	0.11	N/A	0.47	0.29	0.26	N/A	4.37	18.60	0.05	0.19
Aug-04	0.24	N/A	N/A	2.15E-05	0.09	N/A	0.03	N/A	0.13	0.08	0.07	N/A	1.24	5.28	0.01	0.05
Sep-04	1.91	N/A	N/A	1.70E-04	0.73	N/A	0.24	N/A	1.06	0.65	0.59	N/A	9.83	41.85	0.10	0.42
Oct-04	2.06	N/A	N/A	1.84E-04	0.79	N/A	0.26	N/A	1.15	0.70	0.64	N/A	10.62	45.25	0.11	0.45
Nov-04	1.75	N/A	N/A	1.56E-04	0.67	N/A	0.22	N/A	0.97	0.59	0.54	N/A	8.98	38.26	0.10	0.38
Dec-04	1.88	N/A	N/A	1.68E-04	0.72	N/A	0.24	N/A	1.05	0.64	0.58	N/A	9.68	41.25	0.10	0.41
Jan-05	1.99	N/A	N/A	1.78E-04	0.76	N/A	0.25	N/A	1.11	0.67	0.62	N/A	10.24	43.83	0.11	0.44
Feb-05	1.91	N/A	N/A	1.71E-04	0.73	N/A	0.24	N/A	1.06	0.65	0.59	N/A	9.83	42.05	0.10	0.42
Mar-05	2.12	N/A	N/A	1.90E-04	0.81	N/A	0.27	N/A	1.18	0.72	0.66	N/A	10.91	46.70	0.12	0.46
Apr-05	2.37	N/A	N/A	2.12E-04	0.91	N/A	0.30	N/A	1.32	0.80	0.73	N/A	12.20	52.23	0.13	0.52
May-05	2.60	N/A	N/A	2.33E-04	1.00	N/A	0.33	N/A	1.45	0.88	0.81	N/A	13.40	57.33	0.14	0.57
Jun-05	1.99	N/A	N/A	1.79E-04	0.76	N/A	0.25	N/A	1.11	0.67	0.62	N/A	10.26	43.91	0.11	0.44
Jul-05	2.49	N/A	N/A	2.23E-04	0.95	N/A	0.31	N/A	1.39	0.84	0.77	N/A	12.81	54.81	0.14	0.55
Aug-05	2.40	N/A	N/A	2.15E-04	0.92	N/A	0.30	N/A	1.34	0.81	0.74	N/A	12.35	52.85	0.13	0.53
Sep-05	2.40	N/A	N/A	2.15E-04	0.92	N/A	0.30	N/A	1.34	0.81	0.74	N/A	12.33	52.75	0.13	0.53

Table B-9. Baseline Monthly Emissions for Kiln 3 (tons per month)

Month	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Oct-05	2.28	N/A	N/A	2.05E-04	0.88	N/A	0.29	N/A	1.27	0.77	0.71	N/A	11.75	50.28	0.13	0.50
Nov-05	1.91	N/A	N/A	1.71E-04	0.73	N/A	0.24	N/A	1.06	0.64	0.59	N/A	9.81	41.97	0.10	0.42
Dec-05	2.63	N/A	N/A	2.36E-04	1.01	N/A	0.33	N/A	1.47	0.89	0.82	N/A	13.55	57.98	0.14	0.58
Jan-06	2.21	N/A	N/A	1.77E-04	0.85	N/A	0.25	N/A	1.23	0.75	0.68	N/A	11.36	43.43	0.12	0.48
Feb-06	1.91	N/A	N/A	1.53E-04	0.73	N/A	0.22	N/A	1.06	0.65	0.59	N/A	9.81	37.53	0.10	0.42
Mar-06	2.70	N/A	N/A	2.16E-04	1.04	N/A	0.31	N/A	1.51	0.91	0.84	N/A	13.89	53.12	0.15	0.59
Apr-06	2.14	N/A	N/A	1.71E-04	0.82	N/A	0.24	N/A	1.19	0.72	0.66	N/A	11.01	42.12	0.12	0.47
May-06	2.70	N/A	N/A	2.16E-04	1.04	N/A	0.31	N/A	1.51	0.91	0.84	N/A	13.90	53.14	0.15	0.59
Jun-06	2.30	N/A	N/A	1.84E-04	0.88	N/A	0.26	N/A	1.28	0.78	0.71	N/A	11.81	45.18	0.13	0.50
Jul-06	2.46	N/A	N/A	1.97E-04	0.94	N/A	0.28	N/A	1.37	0.83	0.76	N/A	12.67	48.43	0.13	0.54
Aug-06	2.14	N/A	N/A	1.71E-04	0.82	N/A	0.24	N/A	1.19	0.72	0.66	N/A	11.01	42.09	0.12	0.47
Sep-06	2.16	N/A	N/A	1.73E-04	0.83	N/A	0.24	N/A	1.21	0.73	0.67	N/A	11.12	42.53	0.12	0.47
Oct-06	1.68	N/A	N/A	1.34E-04	0.64	N/A	0.19	N/A	0.93	0.57	0.52	N/A	8.62	32.98	0.09	0.37
Nov-06	1.83	N/A	N/A	1.46E-04	0.70	N/A	0.21	N/A	1.02	0.62	0.57	N/A	9.42	36.01	0.10	0.40
Dec-06	1.82	N/A	N/A	1.45E-04	0.70	N/A	0.21	N/A	1.01	0.61	0.56	N/A	9.35	35.74	0.10	0.40
Jan-07	1.91	N/A	N/A	1.04E-04	0.73	N/A	0.15	N/A	1.07	0.65	0.59	N/A	9.83	25.69	0.10	0.42
Feb-07	1.90	N/A	N/A	1.04E-04	0.73	N/A	0.15	N/A	1.06	0.64	0.59	N/A	9.79	25.57	0.10	0.42
Mar-07	2.00	N/A	N/A	1.09E-04	0.77	N/A	0.15	N/A	1.11	0.68	0.62	N/A	10.27	26.83	0.11	0.44
Apr-07	1.99	N/A	N/A	1.09E-04	0.76	N/A	0.15	N/A	1.11	0.67	0.62	N/A	10.24	26.74	0.11	0.44
May-07	2.70	N/A	N/A	1.47E-04	1.03	N/A	0.21	N/A	1.50	0.91	0.83	N/A	13.87	36.23	0.15	0.59
Jun-07	2.39	N/A	N/A	1.31E-04	0.92	N/A	0.18	N/A	1.33	0.81	0.74	N/A	12.29	32.10	0.13	0.52
Jul-07	2.40	N/A	N/A	1.31E-04	0.92	N/A	0.19	N/A	1.34	0.81	0.74	N/A	12.34	32.24	0.13	0.53
Aug-07	2.78	N/A	N/A	1.52E-04	1.07	N/A	0.21	N/A	1.55	0.94	0.86	N/A	14.31	37.39	0.15	0.61
Sep-07	1.91	N/A	N/A	1.04E-04	0.73	N/A	0.15	N/A	1.06	0.65	0.59	N/A	9.81	25.63	0.10	0.42
Oct-07	2.22	N/A	N/A	1.22E-04	0.85	N/A	0.17	N/A	1.24	0.75	0.69	N/A	11.44	29.89	0.12	0.49
Nov-07	2.37	N/A	N/A	1.30E-04	0.91	N/A	0.18	N/A	1.32	0.80	0.73	N/A	12.20	31.88	0.13	0.52
Dec-07	1.51	N/A	N/A	8.27E-05	0.58	N/A	0.12	N/A	0.84	0.51	0.47	N/A	7.79	20.34	0.08	0.33
Jan-08	2.24	N/A	N/A	1.33E-04	0.86	N/A	0.19	N/A	1.25	0.76	0.69	N/A	11.50	32.72	0.12	0.49
Feb-08	1.83	N/A	N/A	1.09E-04	0.70	N/A	0.15	N/A	1.02	0.62	0.57	N/A	9.43	26.81	0.10	0.40
Mar-08	1.82	N/A	N/A	1.08E-04	0.70	N/A	0.15	N/A	1.02	0.62	0.56	N/A	9.37	26.65	0.10	0.40
Apr-08	2.14	N/A	N/A	1.27E-04	0.82	N/A	0.18	N/A	1.19	0.72	0.66	N/A	10.99	31.26	0.12	0.47
May-08	2.36	N/A	N/A	1.41E-04	0.91	N/A	0.20	N/A	1.32	0.80	0.73	N/A	12.17	34.60	0.13	0.52
Jun-08	2.23	N/A	N/A	1.33E-04	0.85	N/A	0.19	N/A	1.24	0.75	0.69	N/A	11.46	32.58	0.12	0.49
Jul-08	2.62	N/A	N/A	1.56E-04	1.00	N/A	0.22	N/A	1.46	0.89	0.81	N/A	13.47	38.31	0.14	0.57
Aug-08	2.94	N/A	N/A	1.75E-04	1.13	N/A	0.25	N/A	1.64	1.00	0.91	N/A	15.13	43.04	0.16	0.64
Sep-08	2.32	N/A	N/A	1.38E-04	0.89	N/A	0.19	N/A	1.29	0.78	0.72	N/A	11.92	33.90	0.13	0.51
Oct-08	1.83	N/A	N/A	1.09E-04	0.70	N/A	0.15	N/A	1.02	0.62	0.57	N/A	9.39	26.71	0.10	0.40
Nov-08	1.99	N/A	N/A	1.18E-04	0.76	N/A	0.17	N/A	1.11	0.67	0.62	N/A	10.24	29.12	0.11	0.44
Dec-08	1.36	N/A	N/A	8.09E-05	0.52	N/A	0.11	N/A	0.76	0.46	0.42	N/A	6.99	19.88	0.07	0.30
Jan-09	1.41	N/A	N/A	8.93E-05	0.54	N/A	0.13	N/A	0.79	0.48	0.44	N/A	7.27	21.96	0.08	0.31
Feb-09	1.58	N/A	N/A	1.00E-04	0.61	N/A	0.14	N/A	0.88	0.54	0.49	N/A	8.15	24.64	0.09	0.35
Mar-09	2.23	N/A	N/A	1.41E-04	0.86	N/A	0.20	N/A	1.24	0.75	0.69	N/A	11.47	34.67	0.12	0.49
Apr-09	2.55	N/A	N/A	1.61E-04	0.98	N/A	0.23	N/A	1.42	0.86	0.79	N/A	13.13	39.67	0.14	0.56
May-09	2.15	N/A	N/A	1.36E-04	0.82	N/A	0.19	N/A	1.20	0.73	0.67	N/A	11.05	33.41	0.12	0.47
Jun-09	2.15	N/A	N/A	1.36E-04	0.82	N/A	0.19	N/A	1.20	0.73	0.67	N/A	11.06	33.42	0.12	0.47
Jul-09	2.24	N/A	N/A	1.42E-04	0.86	N/A	0.20	N/A	1.25	0.76	0.69	N/A	11.54	34.88	0.12	0.49
Aug-09	2.00	N/A	N/A	1.26E-04	0.77	N/A	0.18	N/A	1.12	0.68	0.62	N/A	10.29	31.10	0.11	0.44
Sep-09	1.76	N/A	N/A	1.11E-04	0.68	N/A	0.16	N/A	0.98	0.60	0.55	N/A	9.06	27.39	0.10	0.39
Oct-09	2.32	N/A	N/A	1.47E-04	0.89	N/A	0.21	N/A	1.30	0.79	0.72	N/A	11.95	36.13	0.13	0.51
Nov-09	1.99	N/A	N/A	1.26E-04	0.77	N/A	0.18	N/A	1.11	0.67	0.62	N/A	10.26	31.02	0.11	0.44

Table B-9. Baseline Monthly Emissions for Kiln 3 (tons per month)

Month	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Dec-09	1.83	N/A	N/A	1.16E-04	0.70	N/A	0.16	N/A	1.02	0.62	0.57	N/A	9.44	28.53	0.10	0.40
Jan-10	2.06	N/A	N/A	1.46E-04	0.79	N/A	0.21	N/A	1.15	0.70	0.64	N/A	10.62	35.84	0.11	0.45
Feb-10	1.19	N/A	N/A	8.43E-05	0.46	N/A	0.12	N/A	0.67	0.40	0.37	N/A	6.14	20.72	0.07	0.26
Mar-10	1.75	N/A	N/A	1.23E-04	0.67	N/A	0.17	N/A	0.97	0.59	0.54	N/A	8.99	30.34	0.10	0.38
Apr-10	2.72	N/A	N/A	1.92E-04	1.04	N/A	0.27	N/A	1.52	0.92	0.84	N/A	13.99	47.21	0.15	0.60
May-10	2.47	N/A	N/A	1.74E-04	0.95	N/A	0.25	N/A	1.38	0.84	0.76	N/A	12.71	42.88	0.14	0.54
Jun-10	2.46	N/A	N/A	1.74E-04	0.94	N/A	0.25	N/A	1.37	0.83	0.76	N/A	12.67	42.74	0.13	0.54
Jul-10	2.40	N/A	N/A	1.69E-04	0.92	N/A	0.24	N/A	1.34	0.81	0.74	N/A	12.34	41.64	0.13	0.53
Aug-10	2.23	N/A	N/A	1.58E-04	0.86	N/A	0.22	N/A	1.24	0.76	0.69	N/A	11.48	38.74	0.12	0.49
Sep-10	2.22	N/A	N/A	1.57E-04	0.85	N/A	0.22	N/A	1.24	0.75	0.69	N/A	11.45	38.62	0.12	0.49
Oct-10	2.09	N/A	N/A	1.47E-04	0.80	N/A	0.21	N/A	1.16	0.71	0.65	N/A	10.74	36.24	0.11	0.46
Nov-10	1.67	N/A	N/A	1.18E-04	0.64	N/A	0.17	N/A	0.93	0.56	0.52	N/A	8.57	28.91	0.09	0.37
Dec-10	2.25	N/A	N/A	1.59E-04	0.86	N/A	0.22	N/A	1.25	0.76	0.70	N/A	11.56	39.02	0.12	0.49
Jan-11	2.07	N/A	N/A	1.88E-04	0.80	N/A	0.27	N/A	1.16	0.70	0.64	N/A	10.67	46.26	0.11	0.45
Feb-11	2.01	N/A	N/A	1.82E-04	0.77	N/A	0.26	N/A	1.12	0.68	0.62	N/A	10.32	44.76	0.11	0.44
Mar-11	2.09	N/A	N/A	1.90E-04	0.80	N/A	0.27	N/A	1.17	0.71	0.65	N/A	10.78	46.73	0.11	0.46
Apr-11	2.25	N/A	N/A	2.04E-04	0.86	N/A	0.29	N/A	1.25	0.76	0.70	N/A	11.55	50.09	0.12	0.49
May-11	2.34	N/A	N/A	2.12E-04	0.90	N/A	0.30	N/A	1.30	0.79	0.72	N/A	12.02	52.12	0.13	0.51
Jun-11	2.08	N/A	N/A	1.89E-04	0.80	N/A	0.27	N/A	1.16	0.70	0.64	N/A	10.70	46.41	0.11	0.46
Jul-11	1.85	N/A	N/A	1.68E-04	0.71	N/A	0.24	N/A	1.03	0.63	0.57	N/A	9.50	41.21	0.10	0.40
Aug-11	2.08	N/A	N/A	1.89E-04	0.80	N/A	0.27	N/A	1.16	0.70	0.64	N/A	10.70	46.40	0.11	0.46
Sep-11	1.60	N/A	N/A	1.45E-04	0.61	N/A	0.20	N/A	0.89	0.54	0.50	N/A	8.23	35.68	0.09	0.35
Oct-11	2.09	N/A	N/A	1.89E-04	0.80	N/A	0.27	N/A	1.16	0.71	0.65	N/A	10.73	46.54	0.11	0.46
Nov-11	0.96	N/A	N/A	8.72E-05	0.37	N/A	0.12	N/A	0.54	0.33	0.30	N/A	4.94	21.44	0.05	0.21
Dec-11	2.07	N/A	N/A	1.88E-04	0.79	N/A	0.26	N/A	1.15	0.70	0.64	N/A	10.63	46.10	0.11	0.45

1. Baseline monthly emissions are calculated two ways depending on the units of the emission factor of interest.
   If the emission factor is in units of lb/MBF, the following derivation is used: Actual Emissions [ton/month] = Emission Factor [lb/MBF] * Monthly Kiln Production [BF/month] / 2,000 lb/ton / 1,000 BF/MBF
   If the emission factor is in units of lb/MMBtu, the following derivation is used: Actual Emissions [ton/month] = Emission Factor [lb/MMBtu] * Monthly Wood Combusted [tons/month] * Heating Value [4,500 Btu/lb wood combusted] / 1,000,000 Btu/MMBtu

Table B-10. Total 24-Month Rolling Average Actual Annual Emissions for Kiln 3 (tpy)

24 Month Period	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Jan-02 - Dec-03	24.10	N/A	N/A	2.19E-03	9.24	N/A	3.09	N/A	13.44	8.15	7.46	N/A	123.98	538.49	1.32	5.28
Feb-02 - Jan-04	24.15	N/A	N/A	2.19E-03	9.26	N/A	3.10	N/A	13.46	8.17	7.48	N/A	124.25	539.59	1.32	5.29
Mar-02 - Feb-04	24.11	N/A	N/A	2.19E-03	9.25	N/A	3.09	N/A	13.44	8.16	7.47	N/A	124.05	538.72	1.32	5.29
Apr-02 - Mar-04	23.93	N/A	N/A	2.17E-03	9.18	N/A	3.07	N/A	13.34	8.10	7.41	N/A	123.11	534.66	1.31	5.25
May-02 - Apr-04	23.98	N/A	N/A	2.18E-03	9.20	N/A	3.08	N/A	13.37	8.11	7.43	N/A	123.39	535.77	1.31	5.26
Jun-02 - May-04	23.76	N/A	N/A	2.16E-03	9.11	N/A	3.05	N/A	13.24	8.04	7.35	N/A	122.21	530.70	1.30	5.21
Jul-02 - Jun-04	23.79	N/A	N/A	2.16E-03	9.13	N/A	3.05	N/A	13.27	8.05	7.37	N/A	122.41	531.52	1.30	5.22
Aug-02 - Jul-04	23.19	N/A	N/A	2.11E-03	8.90	N/A	2.98	N/A	12.93	7.85	7.18	N/A	119.32	518.27	1.27	5.08
Sep-02 - Aug-04	22.24	N/A	N/A	2.02E-03	8.53	N/A	2.86	N/A	12.40	7.52	6.88	N/A	114.40	497.28	1.22	4.87
Oct-02 - Sep-04	22.31	N/A	N/A	2.03E-03	8.56	N/A	2.87	N/A	12.44	7.55	6.91	N/A	114.78	498.86	1.22	4.89
Nov-02 - Oct-04	22.35	N/A	N/A	2.03E-03	8.57	N/A	2.87	N/A	12.46	7.56	6.92	N/A	115.00	499.72	1.22	4.90
Dec-02 - Nov-04	22.23	N/A	N/A	2.02E-03	8.53	N/A	2.86	N/A	12.39	7.52	6.88	N/A	114.37	497.01	1.22	4.87
Jan-03 - Dec-04	22.33	N/A	N/A	2.03E-03	8.57	N/A	2.87	N/A	12.45	7.56	6.91	N/A	114.90	499.23	1.22	4.90
Feb-03 - Jan-05	22.09	N/A	N/A	2.00E-03	8.47	N/A	2.83	N/A	12.31	7.47	6.84	N/A	113.62	492.86	1.21	4.84
Mar-03 - Feb-05	22.01	N/A	N/A	1.99E-03	8.44	N/A	2.82	N/A	12.27	7.45	6.81	N/A	113.24	490.49	1.21	4.82
Apr-03 - Mar-05	22.19	N/A	N/A	2.01E-03	8.51	N/A	2.84	N/A	12.37	7.51	6.87	N/A	114.18	493.85	1.22	4.86
May-03 - Apr-05	22.47	N/A	N/A	2.03E-03	8.62	N/A	2.87	N/A	12.53	7.60	6.96	N/A	115.58	499.21	1.23	4.92
Jun-03 - May-05	22.74	N/A	N/A	2.05E-03	8.72	N/A	2.90	N/A	12.68	7.69	7.04	N/A	116.99	504.50	1.25	4.98
Jul-03 - Jun-05	22.78	N/A	N/A	2.05E-03	8.74	N/A	2.90	N/A	12.70	7.71	7.05	N/A	117.21	504.75	1.25	4.99
Aug-03 - Jul-05	23.23	N/A	N/A	2.09E-03	8.91	N/A	2.95	N/A	12.95	7.86	7.19	N/A	119.53	514.10	1.27	5.09
Sep-03 - Aug-05	23.36	N/A	N/A	2.10E-03	8.96	N/A	2.97	N/A	13.02	7.90	7.23	N/A	120.19	516.14	1.28	5.12
Oct-03 - Sep-05	23.52	N/A	N/A	2.11E-03	9.02	N/A	2.98	N/A	13.12	7.96	7.28	N/A	121.02	518.96	1.29	5.16
Nov-03 - Oct-05	23.59	N/A	N/A	2.11E-03	9.05	N/A	2.98	N/A	13.15	7.98	7.30	N/A	121.34	519.57	1.29	5.17
Dec-03 - Nov-05	23.65	N/A	N/A	2.12E-03	9.07	N/A	2.99	N/A	13.19	8.00	7.32	N/A	121.69	520.41	1.30	5.18
Jan-04 - Dec-05	24.03	N/A	N/A	2.15E-03	9.22	N/A	3.03	N/A	13.40	8.13	7.44	N/A	123.61	527.96	1.32	5.27
Feb-04 - Jan-06	24.01	N/A	N/A	2.14E-03	9.21	N/A	3.02	N/A	13.39	8.13	7.43	N/A	123.54	525.19	1.32	5.26
Mar-04 - Feb-06	24.02	N/A	N/A	2.13E-03	9.21	N/A	3.01	N/A	13.39	8.13	7.44	N/A	123.56	523.11	1.32	5.26
Apr-04 - Mar-06	24.44	N/A	N/A	2.15E-03	9.37	N/A	3.04	N/A	13.63	8.27	7.57	N/A	125.73	529.34	1.34	5.36
May-04 - Apr-06	24.42	N/A	N/A	2.14E-03	9.37	N/A	3.02	N/A	13.62	8.26	7.56	N/A	125.63	526.52	1.34	5.35
Jun-04 - May-06	24.84	N/A	N/A	2.17E-03	9.53	N/A	3.06	N/A	13.85	8.40	7.69	N/A	127.79	532.68	1.36	5.44
Jul-04 - Jun-06	24.87	N/A	N/A	2.16E-03	9.54	N/A	3.05	N/A	13.87	8.42	7.70	N/A	127.97	530.85	1.36	5.45
Aug-04 - Jul-06	25.68	N/A	N/A	2.22E-03	9.85	N/A	3.14	N/A	14.32	8.69	7.95	N/A	132.11	545.77	1.41	5.63
Sep-04 - Aug-06	26.63	N/A	N/A	2.29E-03	10.21	N/A	3.24	N/A	14.85	9.01	8.24	N/A	137.00	564.17	1.46	5.84
Oct-04 - Sep-06	26.76	N/A	N/A	2.30E-03	10.26	N/A	3.24	N/A	14.92	9.05	8.28	N/A	137.65	564.51	1.47	5.86
Nov-04 - Oct-06	26.56	N/A	N/A	2.27E-03	10.19	N/A	3.21	N/A	14.81	8.99	8.22	N/A	136.65	558.37	1.46	5.82
Dec-04 - Nov-06	26.60	N/A	N/A	2.27E-03	10.20	N/A	3.20	N/A	14.83	9.00	8.24	N/A	136.87	557.25	1.46	5.83
Jan-05 - Dec-06	26.57	N/A	N/A	2.26E-03	10.19	N/A	3.19	N/A	14.81	8.99	8.23	N/A	136.70	554.50	1.46	5.82
Feb-05 - Jan-07	26.53	N/A	N/A	2.22E-03	10.18	N/A	3.13	N/A	14.79	8.98	8.21	N/A	136.49	545.43	1.45	5.82
Mar-05 - Feb-07	26.53	N/A	N/A	2.18E-03	10.18	N/A	3.09	N/A	14.79	8.98	8.21	N/A	136.48	537.19	1.45	5.81
Apr-05 - Mar-07	26.47	N/A	N/A	2.14E-03	10.15	N/A	3.03	N/A	14.76	8.95	8.19	N/A	136.15	527.25	1.45	5.80
May-05 - Apr-07	26.27	N/A	N/A	2.09E-03	10.08	N/A	2.96	N/A	14.65	8.89	8.13	N/A	135.17	514.50	1.44	5.76
Jun-05 - May-07	26.32	N/A	N/A	2.05E-03	10.10	N/A	2.90	N/A	14.67	8.91	8.15	N/A	135.41	503.96	1.44	5.77
Jul-05 - Jun-07	26.52	N/A	N/A	2.03E-03	10.17	N/A	2.86	N/A	14.78	8.97	8.21	N/A	136.42	498.05	1.45	5.81
Aug-05 - Jul-07	26.47	N/A	N/A	1.98E-03	10.15	N/A	2.80	N/A	14.76	8.96	8.20	N/A	136.19	486.76	1.45	5.80
Sep-05 - Aug-07	26.66	N/A	N/A	1.95E-03	10.23	N/A	2.75	N/A	14.87	9.02	8.25	N/A	137.17	479.03	1.46	5.84
Oct-05 - Sep-07	26.42	N/A	N/A	1.89E-03	10.13	N/A	2.67	N/A	14.73	8.94	8.18	N/A	135.91	465.47	1.45	5.79
Nov-05 - Oct-07	26.39	N/A	N/A	1.85E-03	10.12	N/A	2.62	N/A	14.71	8.93	8.17	N/A	135.76	455.27	1.45	5.78
Dec-05 - Nov-07	26.62	N/A	N/A	1.83E-03	10.21	N/A	2.59	N/A	14.84	9.01	8.24	N/A	136.95	450.23	1.46	5.83

Table B-10. Total 24-Month Rolling Average Actual Annual Emissions for Kiln 3 (tpy)

24 Month Period	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Jan-06 - Dec-07	26.06	N/A	N/A	1.75E-03	10.00	N/A	2.48	N/A	14.53	8.82	8.07	N/A	134.07	431.41	1.43	5.71
Feb-06 - Jan-08	26.07	N/A	N/A	1.73E-03	10.00	N/A	2.45	N/A	14.54	8.82	8.07	N/A	134.15	426.05	1.43	5.72
Mar-06 - Feb-08	26.04	N/A	N/A	1.71E-03	9.99	N/A	2.42	N/A	14.52	8.81	8.06	N/A	133.95	420.69	1.43	5.71
Apr-06 - Mar-08	25.60	N/A	N/A	1.66E-03	9.82	N/A	2.34	N/A	14.27	8.66	7.92	N/A	131.69	407.45	1.40	5.61
May-06 - Apr-08	25.60	N/A	N/A	1.64E-03	9.82	N/A	2.31	N/A	14.27	8.66	7.92	N/A	131.68	402.02	1.40	5.61
Jun-06 - May-08	25.43	N/A	N/A	1.60E-03	9.75	N/A	2.26	N/A	14.18	8.60	7.87	N/A	130.81	392.75	1.39	5.57
Jul-06 - Jun-08	25.39	N/A	N/A	1.57E-03	9.74	N/A	2.22	N/A	14.16	8.59	7.86	N/A	130.63	386.46	1.39	5.57
Aug-06 - Jul-08	25.47	N/A	N/A	1.55E-03	9.77	N/A	2.19	N/A	14.20	8.62	7.89	N/A	131.04	381.40	1.40	5.58
Sep-06 - Aug-08	25.87	N/A	N/A	1.55E-03	9.92	N/A	2.19	N/A	14.42	8.75	8.01	N/A	133.10	381.87	1.42	5.67
Oct-06 - Sep-08	25.95	N/A	N/A	1.54E-03	9.95	N/A	2.17	N/A	14.47	8.78	8.03	N/A	133.50	377.56	1.42	5.69
Nov-06 - Oct-08	26.02	N/A	N/A	1.52E-03	9.98	N/A	2.15	N/A	14.51	8.81	8.06	N/A	133.88	374.43	1.43	5.70
Dec-06 - Nov-08	26.10	N/A	N/A	1.51E-03	10.01	N/A	2.13	N/A	14.55	8.83	8.08	N/A	134.29	370.98	1.43	5.72
Jan-07 - Dec-08	25.87	N/A	N/A	1.48E-03	9.92	N/A	2.09	N/A	14.43	8.75	8.01	N/A	133.11	363.05	1.42	5.67
Feb-07 - Jan-09	25.62	N/A	N/A	1.47E-03	9.83	N/A	2.07	N/A	14.29	8.67	7.93	N/A	131.83	361.18	1.40	5.62
Mar-07 - Feb-09	25.47	N/A	N/A	1.47E-03	9.77	N/A	2.07	N/A	14.20	8.62	7.88	N/A	131.01	360.72	1.40	5.58
Apr-07 - Mar-09	25.58	N/A	N/A	1.48E-03	9.81	N/A	2.09	N/A	14.26	8.66	7.92	N/A	131.61	364.64	1.40	5.61
May-07 - Apr-09	25.86	N/A	N/A	1.51E-03	9.92	N/A	2.13	N/A	14.42	8.75	8.01	N/A	133.06	371.11	1.42	5.67
Jun-07 - May-09	25.59	N/A	N/A	1.50E-03	9.82	N/A	2.12	N/A	14.27	8.66	7.92	N/A	131.65	369.70	1.40	5.61
Jul-07 - Jun-09	25.47	N/A	N/A	1.51E-03	9.77	N/A	2.13	N/A	14.20	8.62	7.89	N/A	131.04	370.36	1.40	5.58
Aug-07 - Jul-09	25.39	N/A	N/A	1.51E-03	9.74	N/A	2.14	N/A	14.16	8.59	7.86	N/A	130.64	371.68	1.39	5.57
Sep-07 - Aug-09	25.00	N/A	N/A	1.50E-03	9.59	N/A	2.12	N/A	13.94	8.46	7.74	N/A	128.63	368.53	1.37	5.48
Oct-07 - Sep-09	24.93	N/A	N/A	1.50E-03	9.56	N/A	2.12	N/A	13.90	8.44	7.72	N/A	128.25	369.42	1.37	5.46
Nov-07 - Oct-09	24.98	N/A	N/A	1.52E-03	9.58	N/A	2.14	N/A	13.93	8.45	7.73	N/A	128.51	372.54	1.37	5.47
Dec-07 - Nov-09	24.79	N/A	N/A	1.51E-03	9.51	N/A	2.14	N/A	13.82	8.39	7.67	N/A	127.54	372.11	1.36	5.43
Jan-08 - Dec-09	24.95	N/A	N/A	1.53E-03	9.57	N/A	2.16	N/A	13.91	8.44	7.72	N/A	128.37	376.20	1.37	5.47
Feb-08 - Jan-10	24.87	N/A	N/A	1.54E-03	9.54	N/A	2.17	N/A	13.86	8.41	7.70	N/A	127.93	377.76	1.36	5.45
Mar-08 - Feb-10	24.55	N/A	N/A	1.52E-03	9.42	N/A	2.15	N/A	13.69	8.31	7.60	N/A	126.28	374.72	1.35	5.38
Apr-08 - Mar-10	24.51	N/A	N/A	1.53E-03	9.40	N/A	2.16	N/A	13.67	8.29	7.59	N/A	126.10	376.57	1.34	5.37
May-08 - Apr-10	24.80	N/A	N/A	1.56E-03	9.51	N/A	2.21	N/A	13.83	8.39	7.68	N/A	127.60	384.55	1.36	5.44
Jun-08 - May-10	24.85	N/A	N/A	1.58E-03	9.53	N/A	2.23	N/A	13.86	8.41	7.69	N/A	127.87	388.69	1.36	5.45
Jul-08 - Jun-10	24.97	N/A	N/A	1.60E-03	9.58	N/A	2.26	N/A	13.92	8.45	7.73	N/A	128.47	393.76	1.37	5.47
Aug-08 - Jul-10	24.86	N/A	N/A	1.61E-03	9.54	N/A	2.27	N/A	13.86	8.41	7.70	N/A	127.91	395.43	1.36	5.45
Sep-08 - Aug-10	24.51	N/A	N/A	1.60E-03	9.40	N/A	2.26	N/A	13.66	8.29	7.59	N/A	126.08	393.28	1.34	5.37
Oct-08 - Sep-10	24.46	N/A	N/A	1.61E-03	9.38	N/A	2.27	N/A	13.64	8.28	7.57	N/A	125.85	395.63	1.34	5.36
Nov-08 - Oct-10	24.59	N/A	N/A	1.63E-03	9.43	N/A	2.30	N/A	13.71	8.32	7.61	N/A	126.52	400.40	1.35	5.39
Dec-08 - Nov-10	24.43	N/A	N/A	1.63E-03	9.37	N/A	2.30	N/A	13.62	8.27	7.56	N/A	125.69	400.30	1.34	5.35
Jan-09 - Dec-10	24.88	N/A	N/A	1.67E-03	9.54	N/A	2.35	N/A	13.87	8.42	7.70	N/A	127.97	409.87	1.36	5.45
Feb-09 - Jan-11	25.21	N/A	N/A	1.72E-03	9.67	N/A	2.42	N/A	14.05	8.53	7.80	N/A	129.67	422.01	1.38	5.52
Mar-09 - Feb-11	25.42	N/A	N/A	1.76E-03	9.75	N/A	2.48	N/A	14.17	8.60	7.87	N/A	130.76	432.07	1.39	5.57
Apr-09 - Mar-11	25.35	N/A	N/A	1.78E-03	9.72	N/A	2.52	N/A	14.13	8.58	7.85	N/A	130.41	438.11	1.39	5.56
May-09 - Apr-11	25.20	N/A	N/A	1.80E-03	9.66	N/A	2.55	N/A	14.05	8.53	7.80	N/A	129.63	443.32	1.38	5.52
Jun-09 - May-11	25.29	N/A	N/A	1.84E-03	9.70	N/A	2.60	N/A	14.10	8.56	7.83	N/A	130.11	452.67	1.39	5.54
Jul-09 - Jun-11	25.26	N/A	N/A	1.87E-03	9.69	N/A	2.64	N/A	14.08	8.55	7.82	N/A	129.93	459.17	1.38	5.54
Aug-09 - Jul-11	25.06	N/A	N/A	1.88E-03	9.61	N/A	2.66	N/A	13.97	8.48	7.76	N/A	128.91	462.33	1.37	5.49
Sep-09 - Aug-11	25.10	N/A	N/A	1.91E-03	9.63	N/A	2.70	N/A	13.99	8.49	7.77	N/A	129.12	469.98	1.38	5.50
Oct-09 - Sep-11	25.02	N/A	N/A	1.93E-03	9.60	N/A	2.72	N/A	13.95	8.46	7.74	N/A	128.70	474.13	1.37	5.48
Nov-09 - Oct-11	24.90	N/A	N/A	1.95E-03	9.55	N/A	2.75	N/A	13.88	8.42	7.71	N/A	128.09	479.33	1.36	5.46
Dec-09 - Nov-11	24.38	N/A	N/A	1.93E-03	9.35	N/A	2.73	N/A	13.59	8.25	7.55	N/A	125.43	474.54	1.34	5.34
Jan-10 - Dec-11	24.50	N/A	N/A	1.97E-03	9.40	N/A	2.78	N/A	13.66	8.29	7.58	N/A	126.03	483.33	1.34	5.37

Table B-11. Total 24-Month Rolling Average Actual Annual Emissions for All Kilns (tpy)

24 Month Period	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Form-aldehyde	Methanol
Jan-02 - Dec-03	46.19	N/A	N/A	4.20E-03	17.72	N/A	5.93	N/A	25.75	15.63	14.30	N/A	237.62	1,032.17	2.53	10.12
Feb-02 - Jan-04	46.16	N/A	N/A	4.20E-03	17.71	N/A	5.93	N/A	25.74	15.62	14.29	N/A	237.50	1,031.53	2.53	10.12
Mar-02 - Feb-04	46.07	N/A	N/A	4.19E-03	17.67	N/A	5.91	N/A	25.68	15.59	14.26	N/A	236.99	1,029.28	2.52	10.10
Apr-02 - Mar-04	46.00	N/A	N/A	4.18E-03	17.64	N/A	5.90	N/A	25.64	15.56	14.24	N/A	236.63	1,027.65	2.52	10.08
May-02 - Apr-04	45.99	N/A	N/A	4.18E-03	17.64	N/A	5.90	N/A	25.64	15.56	14.24	N/A	236.62	1,027.52	2.52	10.08
Jun-02 - May-04	45.88	N/A	N/A	4.17E-03	17.60	N/A	5.89	N/A	25.58	15.52	14.20	N/A	236.02	1,024.86	2.51	10.06
Jul-02 - Jun-04	45.86	N/A	N/A	4.17E-03	17.59	N/A	5.88	N/A	25.57	15.52	14.20	N/A	235.91	1,024.27	2.51	10.05
Aug-02 - Jul-04	44.86	N/A	N/A	4.08E-03	17.21	N/A	5.76	N/A	25.01	15.18	13.89	N/A	230.81	1,002.45	2.46	9.83
Sep-02 - Aug-04	44.00	N/A	N/A	4.00E-03	16.88	N/A	5.65	N/A	24.53	14.89	13.62	N/A	226.35	983.36	2.41	9.64
Oct-02 - Sep-04	43.91	N/A	N/A	3.99E-03	16.84	N/A	5.64	N/A	24.48	14.86	13.60	N/A	225.92	981.43	2.41	9.62
Nov-02 - Oct-04	44.02	N/A	N/A	4.00E-03	16.89	N/A	5.65	N/A	24.54	14.90	13.63	N/A	226.48	983.71	2.41	9.65
Dec-02 - Nov-04	43.83	N/A	N/A	3.98E-03	16.81	N/A	5.63	N/A	24.44	14.83	13.57	N/A	225.48	979.34	2.40	9.61
Jan-03 - Dec-04	44.28	N/A	N/A	4.02E-03	16.99	N/A	5.68	N/A	24.69	14.98	13.71	N/A	227.82	989.24	2.43	9.71
Feb-03 - Jan-05	44.15	N/A	N/A	4.01E-03	16.94	N/A	5.66	N/A	24.62	14.94	13.67	N/A	227.15	984.84	2.42	9.68
Mar-03 - Feb-05	43.94	N/A	N/A	3.98E-03	16.86	N/A	5.62	N/A	24.50	14.87	13.60	N/A	226.08	978.80	2.41	9.63
Apr-03 - Mar-05	44.35	N/A	N/A	4.01E-03	17.01	N/A	5.67	N/A	24.73	15.01	13.73	N/A	228.18	986.49	2.43	9.72
May-03 - Apr-05	44.92	N/A	N/A	4.06E-03	17.23	N/A	5.73	N/A	25.05	15.20	13.91	N/A	231.11	997.75	2.46	9.85
Jun-03 - May-05	45.17	N/A	N/A	4.07E-03	17.33	N/A	5.75	N/A	25.18	15.28	13.98	N/A	232.38	1,001.63	2.48	9.90
Jul-03 - Jun-05	45.31	N/A	N/A	4.08E-03	17.38	N/A	5.76	N/A	25.26	15.33	14.03	N/A	233.09	1,003.29	2.48	9.93
Aug-03 - Jul-05	45.95	N/A	N/A	4.13E-03	17.62	N/A	5.84	N/A	25.62	15.55	14.23	N/A	236.39	1,016.13	2.52	10.07
Sep-03 - Aug-05	46.26	N/A	N/A	4.15E-03	17.74	N/A	5.87	N/A	25.79	15.65	14.32	N/A	237.98	1,021.53	2.53	10.14
Oct-03 - Sep-05	46.63	N/A	N/A	4.18E-03	17.88	N/A	5.91	N/A	26.00	15.78	14.43	N/A	239.87	1,028.25	2.55	10.22
Nov-03 - Oct-05	46.96	N/A	N/A	4.21E-03	18.01	N/A	5.94	N/A	26.18	15.89	14.54	N/A	241.59	1,034.25	2.57	10.29
Dec-03 - Nov-05	46.95	N/A	N/A	4.20E-03	18.01	N/A	5.93	N/A	26.18	15.89	14.54	N/A	241.57	1,032.82	2.57	10.29
Jan-04 - Dec-05	47.80	N/A	N/A	4.27E-03	18.33	N/A	6.03	N/A	26.65	16.17	14.80	N/A	245.91	1,050.26	2.62	10.48
Feb-04 - Jan-06	47.91	N/A	N/A	4.26E-03	18.38	N/A	6.02	N/A	26.71	16.21	14.83	N/A	246.47	1,047.90	2.63	10.50
Mar-04 - Feb-06	47.99	N/A	N/A	4.25E-03	18.41	N/A	6.01	N/A	26.76	16.24	14.86	N/A	246.91	1,045.70	2.63	10.52
Apr-04 - Mar-06	48.73	N/A	N/A	4.29E-03	18.69	N/A	6.07	N/A	27.17	16.49	15.09	N/A	250.71	1,055.93	2.67	10.68
May-04 - Apr-06	49.01	N/A	N/A	4.30E-03	18.80	N/A	6.07	N/A	27.33	16.58	15.17	N/A	252.16	1,057.04	2.69	10.74
Jun-04 - May-06	49.54	N/A	N/A	4.32E-03	19.00	N/A	6.11	N/A	27.62	16.76	15.34	N/A	254.85	1,062.88	2.71	10.86
Jul-04 - Jun-06	49.78	N/A	N/A	4.32E-03	19.10	N/A	6.11	N/A	27.76	16.84	15.41	N/A	256.12	1,063.18	2.73	10.91
Aug-04 - Jul-06	51.17	N/A	N/A	4.43E-03	19.63	N/A	6.25	N/A	28.53	17.31	15.84	N/A	263.26	1,088.55	2.80	11.22
Sep-04 - Aug-06	**51.80**	N/A	N/A	4.47E-03	**19.87**	N/A	6.31	N/A	**28.88**	**17.53**	**16.04**	N/A	**266.49**	1,097.98	**2.84**	**11.35**
Oct-04 - Sep-06	51.74	N/A	N/A	4.44E-03	19.84	N/A	6.28	N/A	28.84	17.51	16.02	N/A	266.16	1,092.71	2.83	11.34
Nov-04 - Oct-06	51.19	N/A	N/A	4.38E-03	19.63	N/A	6.19	N/A	28.54	17.32	15.85	N/A	263.35	1,077.25	2.80	11.22
Dec-04 - Nov-06	51.10	N/A	N/A	4.36E-03	19.60	N/A	6.16	N/A	28.49	17.29	15.82	N/A	262.90	1,071.49	2.80	11.20
Jan-05 - Dec-06	50.53	N/A	N/A	4.29E-03	19.38	N/A	6.07	N/A	28.17	17.10	15.64	N/A	259.97	1,055.80	2.77	11.08
Feb-05 - Jan-07	50.37	N/A	N/A	4.26E-03	19.32	N/A	6.01	N/A	28.08	17.04	15.59	N/A	259.12	1,046.59	2.76	11.04
Mar-05 - Feb-07	50.28	N/A	N/A	4.23E-03	19.29	N/A	5.97	N/A	28.03	17.01	15.57	N/A	258.69	1,039.41	2.76	11.02
Apr-05 - Mar-07	49.77	N/A	N/A	4.16E-03	19.09	N/A	5.87	N/A	27.75	16.84	15.41	N/A	256.06	1,021.93	2.73	10.91
May-05 - Apr-07	49.34	N/A	N/A	4.10E-03	18.93	N/A	5.80	N/A	27.51	16.70	15.28	N/A	253.86	1,008.98	2.70	10.82
Jun-05 - May-07	48.86	N/A	N/A	4.01E-03	18.74	N/A	5.66	N/A	27.24	16.53	15.13	N/A	251.39	985.06	2.68	10.71
Jul-05 - Jun-07	48.96	N/A	N/A	3.99E-03	18.78	N/A	5.64	N/A	27.30	16.57	15.16	N/A	251.90	980.98	2.68	10.73
Aug-05 - Jul-07	48.75	N/A	N/A	3.95E-03	18.70	N/A	5.57	N/A	27.18	16.50	15.09	N/A	250.81	970.10	2.67	10.69
Sep-05 - Aug-07	48.79	N/A	N/A	3.90E-03	18.71	N/A	5.51	N/A	27.20	16.51	15.11	N/A	251.01	958.91	2.67	10.69
Oct-05 - Sep-07	48.43	N/A	N/A	3.85E-03	18.58	N/A	5.44	N/A	27.00	16.39	14.99	N/A	249.17	947.79	2.65	10.62
Nov-05 - Oct-07	48.28	N/A	N/A	3.82E-03	18.52	N/A	5.40	N/A	26.92	16.34	14.95	N/A	248.38	939.16	2.65	10.58
Dec-05 - Nov-07	48.14	N/A	N/A	3.77E-03	18.46	N/A	5.33	N/A	26.84	16.29	14.90	N/A	247.66	928.03	2.64	10.55

Table B-11. Total 24-Month Rolling Average Actual Annual Emissions for All Kilns (tpy)

24 Month Period	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Form-aldehyde	Methanol
Jan-06 - Dec-07	47.16	N/A	N/A	3.68E-03	18.09	N/A	5.19	N/A	26.29	15.96	14.60	N/A	242.62	903.73	2.58	10.34
Feb-06 - Jan-08	46.87	N/A	N/A	3.71E-03	17.98	N/A	5.25	N/A	26.13	15.86	14.51	N/A	241.15	913.35	2.57	10.27
Mar-06 - Feb-08	46.54	N/A	N/A	3.72E-03	17.85	N/A	5.25	N/A	25.95	15.75	14.41	N/A	239.44	913.47	2.55	10.20
Apr-06 - Mar-08	45.34	N/A	N/A	3.67E-03	17.39	N/A	5.18	N/A	25.28	15.34	14.04	N/A	233.26	901.45	2.48	9.94
May-06 - Apr-08	44.55	N/A	N/A	3.57E-03	17.09	N/A	5.05	N/A	24.84	15.07	13.79	N/A	229.21	878.62	2.44	9.77
Jun-06 - May-08	43.63	N/A	N/A	3.47E-03	16.73	N/A	4.90	N/A	24.32	14.76	13.51	N/A	224.44	852.37	2.39	9.56
Jul-06 - Jun-08	42.81	N/A	N/A	3.37E-03	16.42	N/A	4.76	N/A	23.87	14.48	13.25	N/A	220.22	828.90	2.35	9.38
Aug-06 - Jul-08	42.26	N/A	N/A	3.29E-03	16.21	N/A	4.65	N/A	23.56	14.30	13.08	N/A	217.43	809.67	2.32	9.26
Sep-06 - Aug-08	42.28	N/A	N/A	3.25E-03	16.22	N/A	4.60	N/A	23.57	14.31	13.09	N/A	217.53	800.16	2.32	9.27
Oct-06 - Sep-08	42.35	N/A	N/A	3.30E-03	16.24	N/A	4.66	N/A	23.61	14.33	13.11	N/A	217.87	811.58	2.32	9.28
Nov-06 - Oct-08	42.40	N/A	N/A	3.36E-03	16.26	N/A	4.75	N/A	23.64	14.35	13.13	N/A	218.15	827.01	2.32	9.29
Dec-06 - Nov-08	42.22	N/A	N/A	3.35E-03	16.19	N/A	4.73	N/A	23.54	14.28	13.07	N/A	217.19	822.81	2.31	9.25
Jan-07 - Dec-08	41.88	N/A	N/A	3.32E-03	16.06	N/A	4.69	N/A	23.35	14.17	12.97	N/A	215.45	817.06	2.29	9.18
Feb-07 - Jan-09	41.09	N/A	N/A	3.27E-03	15.76	N/A	4.61	N/A	22.91	13.90	12.72	N/A	211.38	802.93	2.25	9.01
Mar-07 - Feb-09	40.44	N/A	N/A	3.20E-03	15.51	N/A	4.52	N/A	22.55	13.68	12.52	N/A	208.07	787.12	2.22	8.86
Apr-07 - Mar-09	40.58	N/A	N/A	3.26E-03	15.57	N/A	4.61	N/A	22.63	13.73	12.56	N/A	208.78	802.13	2.22	8.89
May-07 - Apr-09	40.67	N/A	N/A	3.29E-03	15.60	N/A	4.64	N/A	22.67	13.76	12.59	N/A	209.21	807.99	2.23	8.91
Jun-07 - May-09	40.48	N/A	N/A	3.34E-03	15.53	N/A	4.72	N/A	22.57	13.70	12.53	N/A	208.28	821.70	2.22	8.87
Jul-07 - Jun-09	40.18	N/A	N/A	3.37E-03	15.41	N/A	4.76	N/A	22.40	13.60	12.44	N/A	206.73	828.48	2.20	8.81
Aug-07 - Jul-09	39.70	N/A	N/A	3.34E-03	15.23	N/A	4.72	N/A	22.14	13.43	12.29	N/A	204.26	822.00	2.18	8.70
Sep-07 - Aug-09	39.14	N/A	N/A	3.36E-03	15.01	N/A	4.75	N/A	21.82	13.24	12.12	N/A	201.34	826.90	2.14	8.58
Oct-07 - Sep-09	38.64	N/A	N/A	3.34E-03	14.82	N/A	4.71	N/A	21.55	13.08	11.96	N/A	198.81	820.15	2.12	8.47
Nov-07 - Oct-09	38.50	N/A	N/A	3.35E-03	14.77	N/A	4.74	N/A	21.47	13.03	11.92	N/A	198.09	824.85	2.11	8.44
Dec-07 - Nov-09	38.32	N/A	N/A	3.37E-03	14.70	N/A	4.76	N/A	21.36	12.96	11.86	N/A	197.13	827.95	2.10	8.40
Jan-08 - Dec-09	38.19	N/A	N/A	3.36E-03	14.65	N/A	4.75	N/A	21.29	12.92	11.82	N/A	196.49	826.87	2.09	8.37
Feb-08 - Jan-10	37.87	N/A	N/A	3.28E-03	14.52	N/A	4.64	N/A	21.11	12.81	11.72	N/A	194.80	807.52	2.07	8.30
Mar-08 - Feb-10	37.38	N/A	N/A	3.25E-03	14.34	N/A	4.59	N/A	20.84	12.65	11.57	N/A	192.29	799.31	2.05	8.19
Apr-08 - Mar-10	37.74	N/A	N/A	3.34E-03	14.48	N/A	4.71	N/A	21.04	12.77	11.68	N/A	194.18	820.42	2.07	8.27
May-08 - Apr-10	38.36	N/A	N/A	3.46E-03	14.71	N/A	4.89	N/A	21.39	12.98	11.88	N/A	197.36	850.67	2.10	8.41
Jun-08 - May-10	38.78	N/A	N/A	3.59E-03	14.88	N/A	5.07	N/A	21.62	13.12	12.01	N/A	199.52	881.81	2.13	8.50
Jul-08 - Jun-10	38.97	N/A	N/A	3.62E-03	14.95	N/A	5.11	N/A	21.73	13.19	12.07	N/A	200.49	889.06	2.14	8.54
Aug-08 - Jul-10	39.11	N/A	N/A	3.69E-03	15.00	N/A	5.21	N/A	21.81	13.23	12.11	N/A	201.21	906.29	2.14	8.57
Sep-08 - Aug-10	38.87	N/A	N/A	3.82E-03	14.91	N/A	5.39	N/A	21.67	13.15	12.04	N/A	199.99	938.66	2.13	8.52
Oct-08 - Sep-10	38.86	N/A	N/A	3.85E-03	14.91	N/A	5.44	N/A	21.67	13.15	12.03	N/A	199.94	946.18	2.13	8.52
Nov-08 - Oct-10	39.27	N/A	N/A	3.91E-03	15.06	N/A	5.53	N/A	21.89	13.29	12.16	N/A	202.03	962.16	2.15	8.61
Dec-08 - Nov-10	39.23	N/A	N/A	3.97E-03	15.05	N/A	5.60	N/A	21.87	13.27	12.14	N/A	201.82	975.25	2.15	8.60
Jan-09 - Dec-10	40.04	N/A	N/A	4.11E-03	15.36	N/A	5.80	N/A	22.32	13.55	12.39	N/A	205.97	1,010.23	2.19	8.77
Feb-09 - Jan-11	40.70	N/A	N/A	4.22E-03	15.61	N/A	5.97	N/A	22.69	13.77	12.60	N/A	209.37	1,038.45	2.23	8.92
Mar-09 - Feb-11	41.50	N/A	N/A	4.41E-03	15.92	N/A	6.22	N/A	23.14	14.04	12.85	N/A	213.52	1,083.38	2.27	9.10
Apr-09 - Mar-11	41.71	N/A	N/A	4.49E-03	16.00	N/A	6.35	N/A	23.26	14.11	12.91	N/A	214.60	1,104.58	2.29	9.14
May-09 - Apr-11	41.83	N/A	N/A	4.58E-03	16.04	N/A	6.47	N/A	23.32	14.15	12.95	N/A	215.18	1,125.48	2.29	9.17
Jun-09 - May-11	42.19	N/A	N/A	4.66E-03	16.18	N/A	6.58	N/A	23.52	14.28	13.06	N/A	217.05	1,145.26	2.31	9.25
Jul-09 - Jun-11	42.34	N/A	N/A	4.72E-03	16.24	N/A	6.67	N/A	23.60	14.32	13.11	N/A	217.80	1,160.81	2.32	9.28
Aug-09 - Jul-11	42.19	N/A	N/A	4.76E-03	16.18	N/A	6.73	N/A	23.52	14.28	13.06	N/A	217.07	1,171.08	2.31	9.25
Sep-09 - Aug-11	42.09	N/A	N/A	4.76E-03	16.14	N/A	6.73	N/A	23.47	14.24	13.03	N/A	216.53	1,170.98	2.31	9.23
Oct-09 - Sep-11	41.88	N/A	N/A	4.76E-03	16.06	N/A	6.72	N/A	23.35	14.17	12.97	N/A	215.45	1,170.43	2.29	9.18
Nov-09 - Oct-11	41.81	N/A	N/A	4.80E-03	16.04	N/A	6.79	N/A	23.31	14.15	12.94	N/A	215.11	1,181.35	2.29	9.16
Dec-09 - Nov-11	41.11	N/A	N/A	4.77E-03	15.77	N/A	6.74	N/A	22.92	13.91	12.73	N/A	211.52	1,172.51	2.25	9.01
Jan-10 - Dec-11	41.42	N/A	N/A	**4.84E-03**	15.89	N/A	**6.84**	N/A	23.09	14.02	12.82	N/A	213.11	**1,190.84**	2.27	9.08

Table B-12. Summary of Selected Baseline Periods and Emissions

Pollutant	Total Emissions for Kilns 1 - 3 Baseline Period Start Month	End Month	Baseline Emissions (tpy)
NSR Pollutants			
CO	Sep-05	Aug-06	51.80
Fluorides	N/A	N/A	N/A
H_2S	N/A	N/A	N/A
Lead	Jan-10	Dec-11	4.84E-03
NO_X	Sep-05	Aug-06	19.87
Reduced Sulfur Compounds (including H_2S)	N/A	N/A	N/A
SO_2	Jan-10	Dec-11	6.84
H_2SO_4	N/A	N/A	N/A
Total PM	Sep-05	Aug-06	28.88
Total PM_{10}	Sep-05	Aug-06	17.53
Total $PM_{2.5}$	Sep-05	Aug-06	16.04
Total Reduced Sulfur (including H_2S)	N/A	N/A	N/A
Total VOC	Sep-05	Aug-06	266.49
Greenhouse Gases			
$CO_2e_{biomass\ deferral}$	Jan-10	Dec-11	1190.84
HAPs			
Formaldehyde	Sep-05	Aug-06	2.84
Methanol	Sep-05	Aug-06	11.35

Table B-13. NCASI Emission Factors for Direct-Fired Continuous Kilns

As printed in the May 2010 Weyerhaeuser - Plymouth, NC permit application[1] and the NCDAQ Air Permit Review/Preliminary Determination document[2] unless otherwise noted below(PM)

Pollutant	Emission Factor	Reference
Criteria		
NO_X	0.28 lb/MBF	3
Total VOC	3.76 lb/MBF	4
CO	0.73 lb/MBF	5
Total PM	0.14 lb/MBF	6
Total PM_{10}	0.104 lb/MBF	6
Total $PM_{2.5}$	0.099 lb/MBF	6
SO_2	0.025 lb/MMBtu	7
Greenhouse Gases		
CO_2	206.79 lb/MMBtu	8
CH_4	7.1E-02 lb/MMBtu	8
N_2O	9.3E-03 lb/MMBtu	8
CO_2e	211.15 lb/MMBtu	9
$CO_2e_{biomass\ deferral}$	4.35 lb/MMBtu	10

1. "Final Report - Revised Air Permit Application for Energy Project," Weyerhaeuser NR Company - Lumber Technologies, Plymouth, NC, May 2010 (Permit # 06389/T19).
2. North Carolina Division of Air Quality (NCDAQ) Air Permit Review/Preliminary Determination for the Weyerhaeuser NR Company, Plymouth, NC facility permit application (May 2010), written by Jenny Kelvington of NCDAQ.
3. Provided by Dr. David Word of NCASI to the Weyerhaeuser facility.
4. Total VOC (lb/MBF)is computed based on the following equation:
VOC as terpene + methanol + formaldehyde = VOC as Carbon [lb/MBF] * 1.133 + (1 - 0.65) * Methanol [lb/MBF] + Formaldehyde [lb/MBF]

The VOC as Carbon emission factor is based on the average of unpublished and published NCASI test results as provided by Dr. David Word of NCASI to NCDAQ and published in the NCDAQ Air Permit Review/Preliminary Determination for the Weyerhaeuser application, pp. 7-8. It is multiplied by 1.133, which is the ratio of the molecular weight of pinene ($C_{10}H_{16}$, 136 amu) to the molecular weight of carbon in pinene (120 amu). The factors for methanol and formaldehyde are multiplied by the response factors, defined as the FIA response divided by the actual compound concentration. According to an NCASI study and as printed in the NCDAQ Air Permit Review/Preliminary Determination, the response factors for formaldehyde and methanol are 0% and 65%, respectively. This methodology is supported in an EPA document entitled *Interim VOC Measurement Protocol for the Wood Products Industry* (July 2007).
5. Based on the average of NCASI test results as provided via email from Dr. Word of NCASI to NCDAQ, as published in the Air Permit Review/Preliminary Determination, p. 8.
6. Based on preliminary determination for Simpson Lumber Company, LLC, the best available emission factors for particulate related emissions are based on tests conducted at Bibler Brothers Lumber Company, Russelville, AR. The Bibler Brothers data is for filterable PM only. The filterable PM emission factor is 0.068 lb/MBF. Condensable PM is based on unpublished data provided by NCASI. NCASI recommends a ratio of Condensable to Filterable PM of 1.016. The Condensable PM emission factor used is therefore 0.069 lb/MBF. Filterable PM_{10} is assumed to be 50% of filterable PM (based on Permit NO. 2421-107-0011-V-02-3 issued to Rayonier Wood Products LLC-Swainsboro Sawmill). Filterable $PM_{2.5}$ is assumed to be 87% of PM10 based on AP-42 for wood combustion. All condensable PM is assumed to be PM_{10} and $PM_{2.5}$.
8. Per U.S. EPA's AP-42, Section 1-6, *Wood Residue Combustion in Boiler* s (Sept. 2003).
9. Per 40 CFR Part 98, Subpart C, Tables C-1 and C-2. The CO_2 emission factor is the default factor for wood and wood residuals, and the CH_4 and N_2O emission factors are the default factors for all solid biomass fuels.
10. The CO_2e factor is calculated based on the emission factors for CO_2, CH_4, and N_2O and the global warming potential (GWP) for each pollutant per 40 CFR 98, Subpart A, Table A-1:

CO_2	1
CH_4	21
N_2O	310

12. Pursuant to 40 CFR Part 98.2(b)(2), biogenic carbon dioxide emissions (e.g., from biomass) are excluded.

Table B-14. NCASI Emission Factors for HAPs/TAPs from Direct-Fired Continuous Kilns

Pollutant	CAS No.	HAP?	TAP?	Emission Factor		Reference
Acetaldehyde	75-07-0	Yes	Yes	0.058	lb/MBF	1
Acetophenone	98-86-2	Yes	Yes	2.60E-07	lb/MMBtu	2
Acrolein	107-02-8	Yes	Yes	1.90E-04	lb/MMBtu	3
Antimony	7440-36-0	Yes	Yes	7.90E-06	lb/MMBtu	4
Arsenic	7440-38-2	Yes	Yes	3.70E-06	lb/MMBtu	5
Barium	7440-39-3	No	Yes	2.00E-05	lb/MMBtu	5
Benzene	71-43-2	Yes	Yes	2.70E-04	lb/MMBtu	5
Benzo(a)pyrene	50-32-8	Yes	Yes	2.60E-06	lb/MMBtu	4
Beryllium	7440-41-7	Yes	Yes	8.20E-07	lb/MMBtu	2
n-Butyraldehyde	123-72-8	No	Yes	6.10E-05	lb/MMBtu	5
Di(2-ethylhexyl)phthalate	117-81-7	Yes	Yes	4.70E-08	lb/MMBtu	2
Cadmium	7440-43-9	Yes	Yes	4.70E-06	lb/MMBtu	2
Carbon disulfide	75-15-0	Yes	Yes	1.30E-04	lb/MMBtu	5
Carbon tetrachloride	56-23-5	Yes	Yes	8.90E-07	lb/MMBtu	5
Chlorine	7782-50-5	Yes	Yes	7.90E-04	lb/MMBtu	4
Chlorobenzene	108-90-7	Yes	Yes	5.50E-10	lb/MMBtu	2
Chloroform	67-66-3	Yes	Yes	3.70E-05	lb/MMBtu	5
Chromium	7440-47-3	Yes	Yes	6.60E-06	lb/MMBtu	5
Chromium VI	18540-29-9	Yes	Yes	7.30E-06	lb/MMBtu	2, 6
Cobalt	7440-48-4	Yes	Yes	4.20E-04	lb/MMBtu	2
Copper	7440-50-8	No	Yes	1.30E-05	lb/MMBtu	5
Crotonaldehyde	4170-30-3	No	Yes	1.10E-05	lb/MMBtu	5
Cumene	98-82-8	Yes	Yes	1.80E-05	lb/MMBtu	5
Dibutylphthalate	84-74-2	Yes	Yes	3.30E-05	lb/MMBtu	2
2,4-Dinitrophenol	51-28-5	Yes	Yes	2.60E-07	lb/MMBtu	2
2,4-Dinitrotoluene	121-14-2	Yes	Yes	9.40E-07	lb/MMBtu	2
Dioxin (as 2,3,7,8-TCDD)	1746-01-6	Yes	Yes	8.60E-12	lb/MMBtu	4
Ethyl benzene	100-41-4	Yes	Yes	6.80E-06	lb/MMBtu	2
Ethylene dichloride	107-06-2	Yes	Yes	2.90E-05	lb/MMBtu	2
Formaldehyde	50-00-0	Yes	Yes	0.04	lb/MBF	3
Hexachlorobenzene	118-74-1	Yes	Yes	1.00E-06	lb/MMBtu	2
Hexane	110-54-3	Yes	Yes	2.90E-04	lb/MMBtu	5
Hydrochloric acid	7647-01-0	Yes	Yes	2.30E-03	lb/MMBtu	3
Isopropanol	67-63-0	No	Yes	3.00E-03	lb/MMBtu	5
Lead	7439-92-1	Yes	Yes	1.77E-05	lb/MMBtu	3
Manganese	7439-96-5	Yes	Yes	1.81E-03	lb/MMBtu	3
Mercury	7439-97-6	Yes	Yes	5.00E-07	lb/MMBtu	3
Methanol	67-56-1	Yes	Yes	0.16	lb/MBF	3
Methyl bromide	74-83-9	Yes	Yes	1.50E-05	lb/MMBtu	2
Methyl chloride	74-87-3	Yes	Yes	2.30E-05	lb/MMBtu	5
Methyl chloroform	71-55-6	Yes	Yes	4.20E-05	lb/MMBtu	5
Methyl ethyl ketone	78-93-3	No	Yes	2.40E-08	lb/MMBtu	2
Methyl isobutyl ketone	108-10-1	Yes	Yes	0.001	lb/MBF	7
Methylene chloride	75-09-2	Yes	Yes	3.50E-04	lb/MMBtu	5
Naphthalene	91-20-3	Yes	Yes	2.80E-05	lb/MMBtu	3
Nickel	7440-02-0	Yes	Yes	4.80E-06	lb/MMBtu	5
2-Nitrophenol	88-75-5	No	Yes	4.20E-08	lb/MMBtu	5
4-Nitrophenol	100-02-7	Yes	Yes	1.20E-07	lb/MMBtu	2
PAC	--	Yes	Yes	7.83E-05	lb/ton	8
Pentachlorophenol	87-86-5	Yes	Yes	4.80E-08	lb/MMBtu	2
Phenol	108-95-2	Yes	Yes	0.022	lb/MBF	1
Phosphorus	7723-14-0	Yes	Yes	9.90E-05	lb/MMBtu	2
POM	--	Yes	Yes	2.88E-05	lb/MMBtu	2, 4
Propionaldehyde	123-38-6	Yes	Yes	5.90E-04	lb/MMBtu	3
Propylene dichloride	78-87-5	Yes	Yes	3.30E-05	lb/MMBtu	2
Selenium	7782-49-2	Yes	Yes	6.20E-06	lb/MMBtu	2
Silver	7440-22-4	No	Yes	9.90E-07	lb/MMBtu	5
Styrene	100-42-5	Yes	Yes	3.20E-05	lb/MMBtu	5
Tetrachloroethylene	127-18-4	Yes	Yes	3.82E-05	lb/MMBtu	9
Thallium	7440-28-0	No	Yes	1.90E-06	lb/MMBtu	5
Toluene	108-88-3	Yes	Yes	0.0001	lb/MBF	7
1,2,4-Trichlorobenzene	120-82-1	Yes	Yes	5.50E-05	lb/MMBtu	2
1,1,2-Trichloroethane	79-00-5	Yes	Yes	1.20E-04	lb/MMBtu	2
Trichloroethylene	79-01-6	Yes	Yes	3.90E-05	lb/MMBtu	5
Trichlorofluoromethane	75-69-4	No	Yes	4.10E-05	lb/MMBtu	5
2,4,6-Trichlorophenol	88-06-2	Yes	Yes	2.40E-08	lb/MMBtu	2
Vinyl chloride	75-01-4	Yes	Yes	1.80E-05	lb/MMBtu	2
Xylenes	1330-20-7	Yes	Yes	2.60E-06	lb/MMBtu	2

1. Lumber-Plywood TRI Workbook 2001, Revision 2, June 2002, by Weyerhaeuser Environmental Technology and Science, as referenced in the May 20120 Weyerhaeuser Plymouth Lumber Mill Revised Air Permit Application for Energy Project.
2. Per NCASI TB No. 858, Tables 20A and 20B, February 2003, as published in the Weyerhaeuser air permit application.
3. Per NCASI SARA 313 Guidance - Wood Products - April 2009, as published in the Weyerhaeuser air permit application.
4. Per U.S. EPA's AP-42, Section 1-6, *Wood Residue Combustion in Boiler* s (Sept. 2003).
5. Per NCASI TB No. 858, Tables 20A and 20B, as used in the Title V renewal application for the West Fraser facility in Augusta, Georgia (March 2011, permit 2421-245-0047-V-04-0).
6. Based on a July 7, 1999 memo from NCDAQ, the chromium VI compounds represented are chromic acid emissions calculated in terms of the chromium VI equivalents, as referenced in the May 20120 Weyerhaeuser Plymouth Lumber Mill Revised Air Permit Application for Energy Project.
7. Per NCASI TB 845, as used in the Title V renewal application for the West Fraser facility in Augusta, Georgia (March 2011, permit 2421-245-0047-V-04-0).
8. Per the NCASI publication for Wood Products Facilities, , as used in the Title V renewal application for the West Fraser facility in Augusta, Georgia (March 2011, permit 2421-245-0047-V-04-0).
9. Value listed in "Final Report - Revised Air Permit Application for Energy Project," Weyerhaeuser NR Company - Lumber Technologies, Plymouth, NC, May 2010 (Permit # 06389/T19).

Table B-15. VOC as Carbon Emissions from Direct-Fired Drying Kilns[1]

Number	VOC as Carbon (lb/MBF)
Unpublished NCASI Test Data	
Test 1	3.66
Test 2	2.46
Test 3	2.75
Test 4	2.72
Test 5	4.99
Test 6	4.7
Test 7	3.7
Test 8	2.87
Test 9	2.42
Test 10	2.83
Test 11	3.16
Test 12	2.07
Test 13	2.89
Test 14	1.61
Test 15	2.85
Test 16	2.78
Test 17	2.82
Published NCASI Test Data	
Test 1	4.2
Test 2	4.7
Test 3	4.2
Other Unpublished NCASI Test Data	
Test 1	2.9
Test 2	3.4
Test 3	3.6
Avg. of NCASI Numbers	**3.23**
Max. of NCASI Numbers	**4.99**

1. Data taken from the NCDAQ Air Permit Review/Preliminary Determination for the Weyerhaueser application, provided to NCDAQ by Dr. David Word of NCASI. Values exclude test data that does not specify the drying of southern yellow pine.

Table B-16. Carbon Monoxide Emissions from Direct-Fired Drying Kilns[1]

Number	CO (lb/MBF)
Test 1	0.75
Test 2	0.44
Test 3	0.51
Test 4	0.57
Test 5	0.92
Test 6	1.0
Test 7	0.92
Avg. of NCASI Numbers	**0.73**
Max. of NCASI Numbers	**1.0**

1. Data taken from the NCDAQ Air Permit Review/Preliminary Determination for the Weyerhaueser application, provided to NCDAQ by Dr. David Word of NCASI.

Table B-17. Continuous Kiln Information

Kiln ID	Burner Capacity[1] (MMBtu/hr)	Fuel HHV[2] (Btu/lb)	Annual Hours of Operation (hrs/yr)	Production Capacity[3] (MBF/hr)	(MMBF/yr)
Continuous Kiln 1 (KD04)	35	4,500	8,760	12.6	110
Continuous Kiln 2 (KD05)	35	4,500	8,760	12.6	110

1. Burner capacity provided to Deanna Duram and Jake Stewart (Trinity) on April 23, 2012.
2. 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).
3. The annual production capacity is based on the projected lengths of the center chambers for the proposed kilns and a lumber production value of 1.1 MMBF/year/foot length of the center chamber. The hourly production capacity was calculated based on the annual hours of operation of the kilns.

Table B-18. Potential Emissions from Direct-Fired Continuous Kilns[1]

Pollutant	KD04 Emissions (lb/hr)	(tpy)	KD05 Emissions (lb/hr)	(tpy)	Total Kiln PTE (lb/hr)	(tpy)
Criteria [2,3]						
NO_X	3.52	15.40	3.52	15.40	**7.03**	**30.80**
Total VOC	47.15	206.53	47.15	206.53	**94.31**	**413.06**
CO	9.17	40.15	9.17	40.15	**18.33**	**80.30**
Total PM	1.73	7.59	1.73	7.59	**3.47**	**15.18**
Total PM_{10}	1.31	5.72	1.31	5.72	**2.61**	**11.44**
Total $PM_{2.5}$	1.24	5.45	1.24	5.45	**2.49**	**10.89**
SO_2	0.88	3.83	0.88	3.83	**1.75**	**7.67**
Greenhouse Gases [4]						
CO_2e	7,390	32,369	7,390	32,369	**14,780.17**	**64,737.14**
$CO_2e_{biomass\ deferral}$	152.32	667.15	152.32	667.15	**304.63**	**1,334.30**

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 [hrs/yr] / 2,000 lb/ton
2. VOC is computed as terpene + methanol + formaldehyde
3. Total $PM/PM_{10}/PM_{2.5}$ emissions are the sum of filterable and condensable particulate.
4. CO_2e based on the biomass deferral excludes biogenic CO_2 emissions (e.g., from biomass) per the Biomass Deferral published in Federal Register Vol. 76, No. 139, on July 20, 2011.

Table B-19. Potential HAP/TAP Emissions from Direct-Fired Continuous Kilns[1]

Pollutant	CAS No.	HAP?	TAP?	KD04 Emissions (lb/hr)	KD04 Emissions (tpy)	KD05 Emissions (lb/hr)	KD05 Emissions (tpy)	Total Kiln PTE (lb/hr)	Total Kiln PTE (tpy)
Acetaldehyde	75-07-0	Yes	Yes	7.28E-01	3.19E+00	7.28E-01	3.19E+00	**1.46**	**6.38**
Acetophenone	98-86-2	Yes	Yes	9.10E-06	3.99E-05	9.10E-06	3.99E-05	**1.82E-05**	**7.97E-05**
Acrolein	107-02-8	Yes	Yes	6.65E-03	2.91E-02	6.65E-03	2.91E-02	**1.33E-02**	**5.83E-02**
Antimony	7440-36-0	Yes	Yes	2.77E-04	1.21E-03	2.77E-04	1.21E-03	**5.53E-04**	**2.42E-03**
Arsenic	7440-38-2	Yes	Yes	1.30E-04	5.67E-04	1.30E-04	5.67E-04	**2.59E-04**	**1.13E-03**
Barium	7440-39-3	No	Yes	7.00E-04	3.07E-03	7.00E-04	3.07E-03	**1.40E-03**	**6.13E-03**
Benzene	71-43-2	Yes	Yes	9.45E-03	4.14E-02	9.45E-03	4.14E-02	**1.89E-02**	**8.28E-02**
Benzo(a)pyrene	50-32-8	Yes	Yes	9.10E-05	3.99E-04	9.10E-05	3.99E-04	**1.82E-04**	**7.97E-04**
Beryllium	7440-41-7	Yes	Yes	2.87E-05	1.26E-04	2.87E-05	1.26E-04	**5.74E-05**	**2.51E-04**
n-Butyraldehyde	123-72-8	No	Yes	2.14E-03	9.35E-03	2.14E-03	9.35E-03	**4.27E-03**	**1.87E-02**
Di(2-ethylhexyl)phthalate	117-81-7	Yes	Yes	1.65E-06	7.21E-06	1.65E-06	7.21E-06	**3.29E-06**	**1.44E-05**
Cadmium	7440-43-9	Yes	Yes	1.65E-04	7.21E-04	1.65E-04	7.21E-04	**3.29E-04**	**1.44E-03**
Carbon disulfide	75-15-0	Yes	Yes	4.55E-03	1.99E-02	4.55E-03	1.99E-02	**9.10E-03**	**3.99E-02**
Carbon tetrachloride	56-23-5	Yes	Yes	3.12E-05	1.36E-04	3.12E-05	1.36E-04	**6.23E-05**	**2.73E-04**
Chlorine	7782-50-5	Yes	Yes	2.77E-02	1.21E-01	2.77E-02	1.21E-01	**5.53E-02**	**2.42E-01**
Chlorobenzene	108-90-7	Yes	Yes	1.93E-08	8.43E-08	1.93E-08	8.43E-08	**3.85E-08**	**1.69E-07**
Chloroform	67-66-3	Yes	Yes	1.30E-03	5.67E-03	1.30E-03	5.67E-03	**2.59E-03**	**1.13E-02**
Chromium	7440-47-3	Yes	Yes	2.31E-04	1.01E-03	2.31E-04	1.01E-03	**4.62E-04**	**2.02E-03**
Chromium VI	18540-29-9	Yes	Yes	2.56E-04	1.12E-03	2.56E-04	1.12E-03	**5.11E-04**	**2.24E-03**
Cobalt	7440-48-4	Yes	Yes	1.47E-02	6.44E-02	1.47E-02	6.44E-02	**2.94E-02**	**1.29E-01**
Copper	7440-50-8	No	Yes	4.55E-04	1.99E-03	4.55E-04	1.99E-03	**9.10E-04**	**3.99E-03**
Crotonaldehyde	4170-30-3	No	Yes	3.85E-04	1.69E-03	3.85E-04	1.69E-03	**7.70E-04**	**3.37E-03**
Cumene	98-82-8	Yes	Yes	6.30E-04	2.76E-03	6.30E-04	2.76E-03	**1.26E-03**	**5.52E-03**
Dibutylphthalate	84-74-2	Yes	Yes	1.16E-03	5.06E-03	1.16E-03	5.06E-03	**2.31E-03**	**1.01E-02**
2,4-Dinitrophenol	51-28-5	Yes	Yes	9.10E-06	3.99E-05	9.10E-06	3.99E-05	**1.82E-05**	**7.97E-05**
2,4-Dinitrotoluene	121-14-2	Yes	Yes	3.29E-05	1.44E-04	3.29E-05	1.44E-04	**6.58E-05**	**2.88E-04**
Dioxin (as 2,3,7,8-TCDD)	1746-01-6	Yes	Yes	3.01E-10	1.32E-09	3.01E-10	1.32E-09	**6.02E-10**	**2.64E-09**
Ethyl benzene	100-41-4	Yes	Yes	2.38E-04	1.04E-03	2.38E-04	1.04E-03	**4.76E-04**	**2.08E-03**
Ethylene dichloride	107-06-2	Yes	Yes	1.02E-03	4.45E-03	1.02E-03	4.45E-03	**2.03E-03**	**8.89E-03**
Formaldehyde	50-00-0	Yes	Yes	5.02E-01	2.20E+00	5.02E-01	2.20E+00	**1.00**	**4.40**
Hexachlorobenzene	118-74-1	Yes	Yes	3.50E-05	1.53E-04	3.50E-05	1.53E-04	**7.00E-05**	**3.07E-04**
Hexane	110-54-3	Yes	Yes	1.02E-02	4.45E-02	1.02E-02	4.45E-02	**2.03E-02**	**8.89E-02**
Hydrochloric acid	7647-01-0	Yes	Yes	8.05E-02	3.53E-01	8.05E-02	3.53E-01	**1.61E-01**	**7.05E-01**
Isopropanol	67-63-0	No	Yes	1.05E-01	4.60E-01	1.05E-01	4.60E-01	**2.10E-01**	**9.20E-01**
Lead	7439-92-1	Yes	Yes	6.20E-04	2.71E-03	6.20E-04	2.71E-03	**1.24E-03**	**5.43E-03**
Manganese	7439-96-5	Yes	Yes	6.34E-02	2.77E-01	6.34E-02	2.77E-01	**1.27E-01**	**5.55E-01**
Mercury	7439-97-6	Yes	Yes	1.75E-05	7.67E-05	1.75E-05	7.67E-05	**3.50E-05**	**1.53E-04**
Methanol	67-56-1	Yes	Yes	2.01E+00	8.80E+00	2.01E+00	8.80E+00	**4.02**	**17.60**
Methyl bromide	74-83-9	Yes	Yes	5.25E-04	2.30E-03	5.25E-04	2.30E-03	**1.05E-03**	**4.60E-03**
Methyl chloride	74-87-3	Yes	Yes	8.05E-04	3.53E-03	8.05E-04	3.53E-03	**1.61E-03**	**7.05E-03**
Methyl chloroform	71-55-6	Yes	Yes	1.47E-03	6.44E-03	1.47E-03	6.44E-03	**2.94E-03**	**1.29E-02**
Methyl ethyl ketone	78-93-3	No	Yes	8.40E-07	3.68E-06	8.40E-07	3.68E-06	**1.68E-06**	**7.36E-06**
Methyl isobutyl ketone	108-10-1	Yes	Yes	1.26E-02	5.50E-02	1.26E-02	5.50E-02	**2.51E-02**	**1.10E-01**
Methylene chloride	75-09-2	Yes	Yes	1.23E-02	5.37E-02	1.23E-02	5.37E-02	**2.45E-02**	**1.07E-01**
Naphthalene	91-20-3	Yes	Yes	9.80E-04	4.29E-03	9.80E-04	4.29E-03	**1.96E-03**	**8.58E-03**
Nickel	7440-02-0	Yes	Yes	1.68E-04	7.36E-04	1.68E-04	7.36E-04	**3.36E-04**	**1.47E-03**
2-Nitrophenol	88-75-5	No	Yes	1.47E-06	6.44E-06	1.47E-06	6.44E-06	**2.94E-06**	**1.29E-05**
4-Nitrophenol	100-02-7	Yes	Yes	4.20E-06	1.84E-05	4.20E-06	1.84E-05	**8.40E-06**	**3.68E-05**
PAC	--	Yes	Yes	3.05E-04	1.33E-03	3.05E-04	1.33E-03	**6.09E-04**	**2.67E-03**
Pentachlorophenol	87-86-5	Yes	Yes	1.68E-06	7.36E-06	1.68E-06	7.36E-06	**3.36E-06**	**1.47E-05**
Phenol	108-95-2	Yes	Yes	2.76E-01	1.21E+00	2.76E-01	1.21E+00	**0.55**	**2.42**
Phosphorus	7723-14-0	Yes	Yes	3.47E-03	1.52E-02	3.47E-03	1.52E-02	**6.93E-03**	**3.04E-02**
POM	--	Yes	Yes	1.01E-03	4.42E-03	1.01E-03	4.42E-03	**2.02E-03**	**8.83E-03**
Propionaldehyde	123-38-6	Yes	Yes	2.07E-02	9.04E-02	2.07E-02	9.04E-02	**4.13E-02**	**1.81E-01**
Propylene dichloride	78-87-5	Yes	Yes	1.16E-03	5.06E-03	1.16E-03	5.06E-03	**2.31E-03**	**1.01E-02**
Selenium	7782-49-2	Yes	Yes	2.17E-04	9.50E-04	2.17E-04	9.50E-04	**4.34E-04**	**1.90E-03**
Silver	7440-22-4	No	Yes	3.47E-05	1.52E-04	3.47E-05	1.52E-04	**6.93E-05**	**3.04E-04**
Styrene	100-42-5	Yes	Yes	1.12E-03	4.91E-03	1.12E-03	4.91E-03	**2.24E-03**	**9.81E-03**
Tetrachloroethylene	127-18-4	Yes	Yes	1.34E-03	5.86E-03	1.34E-03	5.86E-03	**2.67E-03**	**1.17E-02**
Thallium	7440-28-0	No	Yes	6.65E-05	2.91E-04	6.65E-05	2.91E-04	**1.33E-04**	**5.83E-04**
Toluene	108-88-3	Yes	Yes	1.26E-03	5.50E-03	1.26E-03	5.50E-03	**2.51E-03**	**1.10E-02**
1,2,4-Trichlorobenzene	120-82-1	Yes	Yes	1.93E-03	8.43E-03	1.93E-03	8.43E-03	**3.85E-03**	**1.69E-02**
1,1,2-Trichloroethane	79-00-5	Yes	Yes	4.20E-03	1.84E-02	4.20E-03	1.84E-02	**8.40E-03**	**3.68E-02**
Trichloroethylene	79-01-6	Yes	Yes	1.37E-03	5.98E-03	1.37E-03	5.98E-03	**2.73E-03**	**1.20E-02**
Trichlorofluoromethane	75-69-4	No	Yes	1.44E-03	6.29E-03	1.44E-03	6.29E-03	**2.87E-03**	**1.26E-02**
2,4,6-Trichlorophenol	88-06-2	Yes	Yes	8.40E-07	3.68E-06	8.40E-07	3.68E-06	**1.68E-06**	**7.36E-06**
Vinyl chloride	75-01-4	Yes	Yes	6.30E-04	2.76E-03	6.30E-04	2.76E-03	**1.26E-03**	**5.52E-03**
Xylenes	1330-20-7	Yes	Yes	9.10E-05	3.99E-04	9.10E-05	3.99E-04	**1.82E-04**	**7.97E-04**
Total HAP Emissions				**3.81**	**16.67**	**3.81**	**16.67**	**7.61**	**33.35**
Maximum Individual HAP Emissions				**2.01**	**8.80**	**2.01**	**8.80**	**4.02**	**17.60**

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 [hrs/yr] / 2,000 lb/ton

Potential emissions [tpy] = Emission factor [lb/ton] * (Heat input capacity [MMBtu/hr] * 1.0E6 / Fuel HHV [Btu/lb] / 2,000 lb/ton) * Annual hours of operation [hrs/yr] / 2,000 lb/ton

Table B-20. Proposed Lumber Increases via Project

Material	Past Potential Throughput[1]	Future Potential Throughput	Throughput Increase (tpy)
Wood/Lumber (MMBF/yr)	157	220	63.00
Wood/Lumber (tpy)[2]	659,400	924,000	264,600

1. Past potential throughput is the maximum lumber drying capacity of the mill, as stated in their most recent Title V Permit No. 2421-245-0047-V-04-0, issued June 2012.
2. Wood/Lumber [tpy] = Wood/Lumber [MMBF/yr]× 4.2 tons/MBF × 1,000 MBF/MMBF. A factor of 4.2 tons/MBF was provided by the mill.

Table B-21. Emission Increases for Sawing and Debarking

Emission Source	Annual Hours of Operation	Pollutant	Emission Factor (lb/ton)	Control Efficiency[1] (%)	Potential Emissions Increase (lb/hr)[2]	(tpy)[3]
Log Sawing[4]	8,760	PM	0.350	90%	1.06	4.63
		PM_{10}[6]	0.007	90%	0.02	0.09
		$PM_{2.5}$[7]	0.007	90%	0.02	0.09
Debarking[5]	8,760	PM	0.020	90%	0.06	0.26
		PM_{10}	0.011	90%	0.03	0.15
		$PM_{2.5}$[7]	0.011	90%	0.03	0.15

1. Based on guidance by the Texas Commission on Environmental Quality (TCEQ) entitled "Rock Crushing Plants" (Feb. 2002), a control efficiency of 90% should be applied for work performed fully enclosed.

2. Potential Hourly Emissions Increase [lb/hr] = Potential Annual Emissions Increase [tpy] × 2,000 lb/ton / Annual Hours of Operation [hr/yr]
3. Potential Annual Emissions Increase [tpy] = Emission factor [lb/ton] × (1 - Control Efficiency [%]) × Associated Throughput Increase [ton/yr] / 2,000 lb/ton
4. Emission factors from EIIP Uncontrolled Emission Factors (July 2001), per the Factor Information Retrieval (FIRE) database management system, version 6.23 for SCC Code 3-07-008-02, Log Sawing.
5. Emission factors from EIIP Uncontrolled Emission Factors (July 2001), per the Factor Information Retrieval (FIRE) database management system, version 6.23 for SCC Code 3-07-008-01, Log Debarking.
6. 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%.
7. It is assumed that $PM_{10} = PM_{2.5}$.

Table B-22. Proposed Byproduct Increases via Project

Material	Past Potential Throughput[1] (tpy)	Future Potential Throughput[1] (tpy)	Increase (tpy)
Chips	191,226	267,960	76,734
Bark	39,564	55,440	15,876
Sawdust	65,940	92,400	26,460
Shavings	59,346	83,160	23,814

1. Ratios of byproduct production to lumber production are based on the mill's March 2011 Title V renewal application.

Table B-23. Emission Increases for Material Transfer Sources

Emission Source	Annual Hours of Operation	Calculated Emission Factors[1] (lb/ton)			Potential Hourly Emissions Increase[2] (lb/hr)			Potential Annual Emissions Increase[3] (tpy)		
		PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
Chip Truck Loading	8,760	3.98E-04	1.88E-04	2.85E-05	3.49E-03	1.65E-03	2.50E-04	1.53E-02	7.22E-03	1.09E-03
Bark Truck Loading	8,760	3.98E-04	1.88E-04	2.85E-05	7.21E-04	3.41E-04	5.17E-05	3.16E-03	1.49E-03	2.26E-04
Sawdust Truck Loading	8,760	3.98E-04	1.88E-04	2.85E-05	1.20E-03	5.69E-04	8.61E-05	5.27E-03	2.49E-03	3.77E-04
Shavings Truck Loading	8,760	3.98E-04	1.88E-04	2.85E-05	1.08E-03	5.12E-04	7.75E-05	4.74E-03	2.24E-03	3.39E-04
Bark Transfer	8,760	3.98E-04	1.88E-04	2.85E-05	7.21E-04	3.41E-04	5.17E-05	3.16E-03	1.49E-03	2.26E-04
Sawdust Transfer	8,760	3.98E-04	1.88E-04	2.85E-05	1.20E-03	5.69E-04	8.61E-05	5.27E-03	2.49E-03	3.77E-04
Chips Transfer	8,760	3.98E-04	1.88E-04	2.85E-05	3.49E-03	1.65E-03	2.50E-04	1.53E-02	7.22E-03	1.09E-03
Shavings Transfer	8,760	3.98E-04	1.88E-04	2.85E-05	1.08E-03	5.12E-04	7.75E-05	4.74E-03	2.24E-03	3.39E-04

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 = 6.408 mph; average wind speed for Augusta, GA from TANKS 4.0.9d
M = 9 %; material moisture content (engineering estimate, as noted in the March 2011 Title V renewal application)

2. Potential Hourly Emissions Increase [lb/hr] = Potential Annual Emissions Increase [tpy] × 2,000 lb/ton / Annual Hours of Operation [hrs/yr]
3. Potential Annual Emissions Increase [tpy] = Emission Factor [lb/ton] × Associated Throughput Increase [ton/year] / 2,000 lb/ton

Table B-24. Proposed Lumber Increases via Project

Material	Past Potential Throughput[1] (tpy)	Future Potential Throughput[1] (tpy)	Increase (tpy)
Chipper	191,226	267,960	76,734
Hogger	65,940	92,400	26,460

1. Throughputs for the chipper and hogger are based on the past potential and future potential production of chips and sawdust at the facility, respectively.

Table B-25. Emission Increases for Hogger and Chipper

Emission Source	Annual Hours of Operation	Pollutant	Emission Factor[1] (lb/ton)	Control Efficiency[2] (%)	Emissions Increase (lb/hr)[3]	Emissions Increase (tpy)[4]
Chipper	8,760	PM	0.020	90%	1.75E-02	7.67E-02
		PM_{10}	0.011	90%	9.64E-03	4.22E-02
		$PM_{2.5}$[5]	0.011	90%	9.64E-03	4.22E-02
Hogger	8,760	PM	0.020	90%	6.04E-03	2.65E-02
		PM_{10}	0.011	90%	3.32E-03	1.46E-02
		$PM_{2.5}$[5]	0.011	90%	3.32E-03	1.46E-02

1. Emission factors from EIIP Uncontrolled Emission Factors (July 2001), per the Factor Information Retrieval (FIRE) database management system, version 6.23 for SCC Code 3-07-008-01, Log Debarking.
2. Based on guidance from the Texas Commission on Environmental Quality (TCEQ) entitled "Rock Crushing Plants" (Feb. 2002), a control efficiency of 90% should be applied for work performed fully enclosed.
3. Potential Hourly Emissions Increase [lb/hr] = Potential Annual Emissions Increase [tpy] × 2,000 lb/ton / Annual Hours of Operation [hr/yr]
4. Potential Emissions Increase [tpy] = Emission factor [lb/ton] × (1 - Control Efficiency [%]) × Associated Throughput Increase [ton/yr] / 2,000 lb/ton
5. It is assumed that $PM_{10} = PM_{2.5}$.

Table B-26. Proposed Road Traffic Increases

Material	Past Potential Number of Trucks Per Year[1]	Future Potential Number of Trucks Per Year[2]	Truck Increase Per Year
Log Truck	24,500	34,331	9,831
Lumber Truck	6,800	9,529	2,729
Bark Truck	3,600	5,045	1,445
Chip Truck	17,400	24,382	6,982
Shavings Truck	5,400	7,567	2,167
Sawdust Truck	180	252	72
Forklift	7	8	1
Bobcat	2	2	0

1. Past potential number of trucks per year data from the mill's March 2011 Title V renewal application.
2. Future potential trucks per year = Past potential trucks per year × (Future potential production [MMBF/yr]/ Past potential production [MMBF/yr]).

Table B-27. Inputs for Increased Emissions from Road Travel

Source	Truck Weight Empty[1] (tons)	Truck Weight Loaded[1] (tons)	Average Weight (W) (tons)	Distance Traveled per Round Trip[1]		Events Per Year[1] (Days)	Increase in Number of Trucks Per Day	Increase in Vehicle Miles Traveled			
				Paved Roads (ft)	Unpaved Roads (ft)			Paved Roads[2] (VMT/day)	Paved Roads[2] (VMT/yr)	Unpaved Roads (VMT/day)	Unpaved Roads (VMT/yr)
Log Truck	16	43	29.5		2,640	365	26.93	-	-	13.47	4,916
Lumber Truck	16	39	27.5		2,640	365	7.48	-	-	3.74	1,364
Bark Truck	16	27	21.5		2,640	365	3.96	-	-	1.98	722
Chip Truck	16	27	21.5		2,640	365	19.13	-	-	9.56	3,491
Shavings Truck	16	27	21.5		2,640	365	5.94	-	-	2.97	1,083
Sawdust Truck	16	27	21.5		2,640	365	0.20	-	-	0.10	36.11
Forklift	-	-	16.5	N/A	-	365	0.00	109.59	40,000	-	-
Bobcat	-	-	16.5	N/A	-	365	-	0.00	0	-	-

1. Data taken from the mill's March 2011 Title V renewal application.
2. The past potential vehicle miles traveled (VMT) per year value for the forklifts and bobcats at the Augusta Mill are 198,750 VMT/yr for the all the forklifts and 25,000 VMT/yr for all the bobcats. The values were rounded up to account for the increase in production using the following equation:

Future potential vehicle miles traveled [VMT/yr] = Past potential vehicle miles traveled [VMT/yr] × (Future potential throughput [MMBF/yr] / Past potential throughput [MMBF/yr] - 1).

The values shown here represent the increase from past potential VMT/yr to future potential VMT/yr.

Table B-28. Potential Hourly Fugitive Emission Increases from Road Travel

Source	Emission Factor[1,2] (lb/VMT) PM	PM_{10}	$PM_{2.5}$	Increase in Potential Fugitive Emissions[3] Filterable PM (lb/hr)	Filterable PM_{10} (lb/hr)	Filterable $PM_{2.5}$ (lb/hr)
Paved Road Travel						
Log Truck	1.35	0.27	0.07	-	-	-
Lumber Truck	1.26	0.25	0.06	-	-	-
Bark Truck	0.98	0.20	0.05	-	-	-
Chip Truck	0.98	0.20	0.05	-	-	-
Shavings Truck	0.98	0.20	0.05	-	-	-
Sawdust Truck	0.98	0.20	0.05	-	-	-
Forklift	0.75	0.15	0.04	3.41	0.68	0.17
Bobcat	0.75	0.15	0.04	0.00	0.00	0.00
Total Paved				***3.41***	***0.68***	***0.17***
Unpaved Road Travel						
Log Truck	5.34	1.52	0.15	3.00	0.85	0.09
Lumber Truck	5.17	1.47	0.15	0.81	0.23	0.02
Bark Truck	4.63	1.32	0.13	0.38	0.11	0.01
Chip Truck	4.63	1.32	0.13	1.85	0.53	0.05
Shavings Truck	4.63	1.32	0.13	0.57	0.16	0.02
Sawdust Truck	4.63	1.32	0.13	0.02	5.44E-03	5.44E-04
Forklift	4.11	1.17	0.12	-	-	-
Bobcat	4.11	1.17	0.12	-	-	-
Total Unpaved				***6.62***	***1.89***	***0.19***
Total Road Emissions				**10.03**	**2.57**	**0.36**

1. Paved Roads Emission Factor (lb/VMT) = k (sL)^0.91 × (W)^1.02, 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) =	4.45	Based on site-specific data for silt loading from the mill's March 2011 Title V renewal application

2. Unpaved Roads Emission Factor (lb/VMT) = [k (s/12)^a × (W/3)^b] × (100% - % control efficiency), per AP-42 Section 13.2.2, Unpaved Roads (Nov. 2006), Equation 1a, 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 (%) =	8.4	Surface silt content based on median value for lumber sawmills per AP-42, Table 13.2.2-1
% control efficiency =	50.0	% control efficiency

3. Potential emissions calculated as appropriate emission factor multiplied by vehicle miles traveled per time period. Note, West Fraser conservatively estimated hourly emissions using the emission factor on a daily basis because an emission factor on an hourly basis calculated per Equation 3 results in lower potential emissions.

Table B-29. Potential Annual Fugitive Emission Increases from Road Travel

Source	Emission Factor[1,2] (lb/VMT) PM	PM_{10}	$PM_{2.5}$	Increase in Potential Fugitive Emissions[3] Filterable PM (tpy)	Filterable PM_{10} (tpy)	Filterable $PM_{2.5}$ (tpy)
Paved Road Travel						
Log Truck	1.24	0.25	0.06	-	-	-
Lumber Truck	1.15	0.23	0.06	-	-	-
Bark Truck	0.90	0.18	0.04	-	-	-
Chip Truck	0.90	0.18	0.04	-	-	-
Shavings Truck	0.90	0.18	0.04	-	-	-
Sawdust Truck	0.90	0.18	0.04	-	-	-
Forklift	0.69	0.14	0.03	13.71	2.74	0.67
Bobcat	0.69	0.14	0.03	0.00	0.00	0.00
Total Paved				***13.71***	***2.74***	***0.67***
Unpaved Road Travel						
Log Truck	3.58	1.02	0.10	8.81	2.51	0.25
Lumber Truck	3.47	0.99	0.10	2.37	0.68	0.07
Bark Truck	3.11	0.89	0.09	1.12	0.32	0.03
Chip Truck	3.11	0.89	0.09	5.43	1.55	0.15
Shavings Truck	3.11	0.89	0.09	1.68	0.48	0.05
Sawdust Truck	3.11	0.89	0.09	0.06	0.02	0.00
Forklift	2.76	0.79	0.08	-	-	-
Bobcat	2.76	0.79	0.08	-	-	-
Total Unpaved				***19.46***	***5.55***	***0.55***
Total Road Emissions				**33.17**	**8.29**	**1.23**

1. Paved Roads Emission Factor (lb/VMT) = [k (sL)^0.91 × (W)^1.02] × [1-P/(4N)], per AP-42 Section 13.2.1, *Paved Roads* (Jan. 2011), Equation 2, 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) =	4.45	Based on site-specific data for silt loading from the mill's March 2011 Title V renewal application
P =	120	No. days with rainfall greater than 0.01 inch, Per AP-42, Figure 13.2.1-2
N =	365	Days in averaging period

2. 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 (%) =	8.4	Surface silt content based on median value for lumber sawmills per AP-42, Table 13.2.2-1
P =	120	No. days with rainfall greater than 0.01 inch, Per AP-42, Figure 13.2.2-1
% control efficiency =	50.0	% control efficiency

3. Potential emissions calculated as appropriate emission factor multiplied by vehicle miles traveled per time period. Note, West Fraser conservatively estimated hourly and annual emissions using the emission factor on a daily basis because an emission factor on an hourly basis calculated per Equation 3 results in lower potential emissions.

Table B-30. Total Emissions Increase from New Units

Pollutant	Potential Emissions (tpy) KD04	KD05	Emissions Increase (tpy)
NSR Pollutants			
CO	40.15	40.15	80.30
Fluorides	N/A	N/A	N/A
H_2S	N/A	N/A	N/A
Lead	2.71E-03	2.71E-03	5.43E-03
NO_X	15.40	15.40	30.80
Reduced Sulfur Compounds (including H_2S)	N/A	N/A	N/A
SO_2	3.83	3.83	7.67
H_2SO_4	N/A	N/A	N/A
Total PM	7.59	7.59	15.18
Total PM_{10}	5.72	5.72	11.44
Total $PM_{2.5}$	5.45	5.45	10.89
Total Reduced Sulfur (including H_2S)	N/A	N/A	N/A
Total VOC	206.53	206.53	413.06
Greenhouse Gases			
$CO_2e_{biomass\ deferral}$	667.15	667.15	1,334
HAPs			
Formaldehyde	2.20	2.20	4.40
Methanol	8.80	8.80	17.60

Table B-31. Total Emissions Increase from Associated Un

Pollutant	Potential Emissions Increase (tpy)
NSR Pollutants	
CO	N/A
Fluorides	N/A
H_2S	N/A
Lead	N/A
NO_X	N/A
Reduced Sulfur Compounds (including H_2S)	N/A
SO_2	N/A
H_2SO_4	N/A
Total PM	38.23
Total PM_{10}	8.61
Total $PM_{2.5}$	1.52
Total Reduced Sulfur (including H_2S)	N/A
Total VOC	N/A
Greenhouse Gases	
$CO_2e_{biomass\ deferral}$	N/A
HAPs	
Formaldehyde	N/A
Methanol	N/A

Table B-32. Emissions Increase Over Baseline and PSD Triggering Analysis (Step 1)

Pollutant	Emissions Increase New Units (tpy)	Emissions Increase Associated Units (tpy)	Emissions Increase Total (tpy)	PSD SER Thresholds (tpy)	PSD Permitting Triggered?
NSR Pollutants					
CO	80.30	N/A	80.30	100	No
Fluorides	N/A	N/A	N/A	3	No
H_2S	N/A	N/A	N/A	10	No
Lead	5.43E-03	N/A	5.43E-03	0.6	No
NO_X	30.80	N/A	30.80	40	No
Reduced Sulfur Compounds (including H_2S)	N/A	N/A	N/A	10	No
SO_2	7.67	N/A	7.67	40	No
H_2SO_4	N/A	N/A	N/A	7	No
Total PM	15.18	38.23	53.41	25	Yes
Total PM_{10}	11.44	8.61	20.05	15	Yes
Total $PM_{2.5}$	10.89	1.52	12.41	10	Yes
Total Reduced Sulfur (including H_2S)	N/A	N/A	N/A	10	No
Total VOC	413.06	N/A	413.06	40	Yes
Greenhouse Gases					
$CO_2e_{biomass\ deferral}$	1,334	N/A	1,334	75,000	No
HAPs [1]					
Formaldehyde	4.40	N/A	4.40	N/A	N/A
Methanol	17.60	N/A	17.60	N/A	N/A

1. Formaldehyde and Methanol are shown in the netting analysis, because the pollutants were used in the Total VOC calculations. See Table B-X for total HAP emissions from the proposed continuous kilns.

Table B-33. Contemporaneous Decreases

Pollutant	Shutdown of Kilns 1-3 (tpy)
NSR Pollutants	
CO	51.80
Fluorides	N/A
H_2S	N/A
Lead	4.84E-03
NO_X	19.87
Reduced Sulfur Compounds (including H_2S)	N/A
SO_2	6.84
H_2SO_4	N/A
Total PM	28.88
Total PM_{10}	17.53
Total $PM_{2.5}$	16.04
Total Reduced Sulfur (including H_2S)	N/A
Total VOC	266.49
Greenhouse Gases	
$CO_2e_{biomass\ deferral}$	1190.84
HAPs	
Formaldehyde	2.84
Methanol	11.35

Table B-34. Netting Analysis

Pollutant	Net Emissions Change (tpy)	PSD SER Thresholds (tpy)	PSD Permitting Triggered?
NSR Pollutants			
CO	28.50	100	No
Fluorides	N/A	3	No
H_2S	N/A	10	No
Lead	0.00	0.6	No
NO_X	10.93	40	No
Reduced Sulfur Compounds (including H_2S)	N/A	10	No
SO_2	0.82	40	No
H_2SO_4	N/A	7	No
Total PM	24.53	25	No
Total PM_{10}	2.52	15	No
Total $PM_{2.5}$	-3.63	10	No
Total Reduced Sulfur (including H_2S)	N/A	10	No
Total VOC	146.57	40	Yes
Greenhouse Gases			
$CO_2e_{biomass\ deferral}$	143.45	75,000	No
HAPs [2]			
Formaldehyde	1.56	N/A	N/A
Methanol	6.25	N/A	N/A

APPENDIX C: GEORGIA 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: West Fraser – Augusta Lumber Mill

AIRS No. (if known): 04-13- 245 - 00047

Facility Location: Street: 4206 Mike Padgett Highway

City: Augusta Georgia Zip: 30906 County: Richmond

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

2. Facility Coordinates

Latitude: 33° 20' 0" **NORTH** Longitude: 81° 57' 30" **WEST**

UTM Coordinates: _____ **EAST** _____ **NORTH** **ZONE** _____

3. Facility Owner

Name of Owner: West Fraser Inc.

Owner Address Street: 4206 Mike Padgett Highway

City: Augusta State: GA Zip: 30906

4. Permitting Contact and Mailing Address

Contact Person: Lamar Youmans Title: EH&S Manager

Telephone No.: 706-793-8753 Ext. 213 Fax No.: 706-793-6738

Email Address: Lamar.youmans@westfraser.com

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

If Other: Street Address: _____

City: _____ State: _____ Zip: _____

5. Authorized Official

Name: Grant Johnson Title: Regional Operations Manager

Address of Official Street: 1900 Exeter Road, Suite 105

City: Germantown State: TN Zip: 38138

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: Grant Johnson Date: Dec 19/12

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: Justin Fickas

Telephone No.: 678-441-9977 Fax No.: 678-441-9978

Email Address: jfickas@trinityconsultants.com

Mailing Address: Street: 53 Perimeter Center East, Suite 230

City: Atlanta State: GA Zip: 30346

Describe the Consultant's Involvement:

Prepared the PSD 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
	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
1	6.00 Fugitive Emission Sources
1	7.00 Air Modeling Information

10. Construction or Modification Date

Estimated Start Date: Start of Third Quarter 2013

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

N/A

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)	78.16	78.16	80.30	80.30
Nitrogen oxides (NOx)	29.98	29.98	30.80	30.80
Particulate Matter (PM) (filterable only)*	207.5	207.5	217.33	217.33
PM <10 microns (PM10)	61.63	61.63	55.23	55.23
PM <2.5 microns (PM2.5)	31.36	31.36	19.57	19.57
Sulfur dioxide (SO_2)	10.36	10.36	7.67	7.67
Volatile Organic Compounds (VOC)	402.4	402.4	413.3	413.3
Greenhouse Gases (GHGs) (in CO2e)*	1,803	1,803	1,334	1,334
Total Hazardous Air Pollutants (HAPs)*	21.41	21.41	33.35	33.35
Individual HAPs Listed Below:				
Formaldehyde	4.28	4.28	4.40	4.40
Methanol	17.13	17.13	17.60	17.60

*PM is listed as Total PM, as the Filterable and Condensable PM emission factors for the kilns cannot be determined from the source. The sources (quoted in the emission calculations) list a Total PM factor. All fugitive sources however only emit Filterable PM (as Condensable PM from those sources is negligible).

*Biomass deferral.

* HAP for existing only includes methanol plus formaldehyde.

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.

West Fraser is submitting this application to install two continuous dual path direct fired dry kilns at the Augusta Mill which will increase the total facility-wide production limit to 220 MMBF/yr. The three existing direct batch lumber drying kilns (KD01, KD02, and KD03), including the burners associated with all three kilns, will be shut down as part of the project. The new continuous direct-fired kilns will each operate with one green sawdust gassifier burner at a heat input capacity of 35 MMBtu/hr for a total heat input capacity of 70 MMBtu/hr for the two kilns.

16. Additional information provided in attachments as listed below:

Attachment A - Facility Plot Plan and Process Flow Diagrams
Attachment B - Detailed Emission Calculations
Attachment C - Georgia SIP Permit Application Forms
Attachment D - BACT Supporting Calculations
Attachment E - RBLC Database Report
Attachment F - Toxics Modeling
Attachment G - Title V Database
Attachment H - References
Attachment I - Letters to FLM for Class I Areas

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

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

☒ Flow Diagram or date of previous submittal: _____

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:**

Facility Name: West Fraser – Augusta Lumber Mill **Date of Application:** December 2012

FORM 2.00 – EMISSION UNIT LIST

Emission Unit ID	Name	Manufacturer and Model Number	Description
KD04	Continuous Kiln 1	Custom	Continuous Dual Path Direct Fired Dry Kiln No. 1
KD05	Continuous Kiln 2	Custom	Continuous Dual Path Direct Fired Dry Kiln No. 2

Facility Name: West Fraser – Augusta Lumber Mill **Date of Application:** December 2012

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	
KD04	Green Sawdust Gassifier	Other	35	TBD	2013	2013	N/A
KD05	Green Sawdust Gassifier	Other	35	TBD	2013	2013	N/A

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

Facility Name: West Fraser – Augusta Lumber Mill **Date of Application:** December 2012

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.
KD04	**Green Sawdust**	**34,067**	**Ton/yr**	**42%**	**58%**	**7,778 lb/hr**	**7,778 lb/hr**	**4,500 Btu/lb**	**4,500 Btu/lb**	**N/A**	**N/A**	**N/A**	**N/A**
KD05	**Green Sawdust**	**34,067**	**Ton/yr**	**42%**	**58%**	**7,778 lb/hr**	**7,778 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: West Fraser – Augusta Lumber Mill **Date of Application:** December 2012

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
KD04	Continuous Kiln 2	2013	Green Sawdust	34,067 ton/yr	7,778 lb/hr	7,778 lb/hr	7,778 lb/hr
KD05	Continuous Kiln 3	2013	Green Sawdust	34,067 ton/yr	7,778 lb/hr	7,778 lb/hr	7,778 lb/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
KD04	**Dimensional Lumber**	**462,000**	**8,760**	**52.74**	**52.74**	**52.74**	**Ton/hr**
KD05	**Dimensional Lumber**	**462,000**	**8,760**	**52.74**	**52.74**	**52.74**	**Ton/hr**

Facility Name: West Fraser – Augusta Lumber Mill **Date of Application:** December 2012

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
KD04	N/A	N/A	Total PM	1.73	1.73	7.59	7.59	NCASI Factor, from publically available document
KD04	N/A	N/A	Total PM_{10}	1.31	1.31	5.72	5.72	NCASI Factor, from publically available document
KD04	N/A	N/A	Total $PM_{2.5}$	1.24	1.24	5.45	5.45	NCASI Factor, from publically available document
KD04	N/A	N/A	CO	9.17	9.17	40.15	40.15	NCASI Factor, from publically available document
KD04	N/A	N/A	NO_X	3.52	3.52	15.40	15.40	NCASI Factor, from publically available document
KD04	N/A	N/A	SO_2	0.88	0.88	3.83	3.83	AP-42
KD04	N/A	N/A	VOC	47.15	47.15	206.53	206.53	NCASI Factors, from publically available document
KD04	N/A	N/A	$CO_2e_{biomass\ deferral}$	152.32	152.32	667.15	667.15	40 CFR Part 98 Subpart C
KD04	N/A	N/A	Formaldehyde	0.50	0.50	2.20	2.20	NCASI Factor, from publically available document
KD04	N/A	N/A	Methanol	2.01	2.01	8.80	8.80	NCASI Factor, from publically available document
KD05	N/A	N/A	Total PM	1.73	1.73	7.59	7.59	NCASI Factor, from publically available document

KD05	N/A	N/A	Total PM_{10}	1.31	1.31	5.72	5.72	NCASI Factor, from publically available document
KD05	N/A	N/A	Total $PM_{2.5}$	1.24	1.24	5.45	5.45	NCASI Factor, from publically available document
KD05	N/A	N/A	CO	9.17	9.17	40.15	40.15	NCASI Factor, from publically available document
KD05	N/A	N/A	NO_X	3.52	3.52	15.40	15.40	NCASI Factor, from publically available document
KD05	N/A	N/A	SO_2	0.88	0.88	3.83	3.83	AP-42
KD05	N/A	N/A	VOC	47.15	47.15	206.53	206.53	NCASI Factors, from publically available document
KD05	N/A	N/A	$CO_2e_{biomass\ deferral}$	152.32	152.32	667.15	667.15	40 CFR Part 98 Subpart C
KD05	N/A	N/A	Formaldehyde	0.50	0.50	2.20	2.20	NCASI Factor, from publically available document
KD05	N/A	N/A	Methanol	2.01	2.01	8.80	8.80	NCASI Factor, from publically available document

Facility Name: West Fraser – Augusta Lumber Mill **Date of Application:** December 2012

FORM 6.00 – FUGITIVE EMISSION SOURCES

Fugitive Emission Source ID	Description of Source	Emission Reduction Precautions	Pot. Fugitive Emissions*	
			Amount (tpy)	Pollutant
NA	Log Sawing	N/A	16.17	PM
NA	Log Sawing	N/A	0.31	PM10/ PM2.5
NA	Debarking	N/A	0.92	PM
NA	Debarking	N/A	0.51	PM10/ PM2.5
NA	Truck Unloading	N/A	9.93E-02	PM
NA	Truck Unloading	N/A	4.70E-02	PM10
NA	Truck Unloading	N/A	7.11E-03	PM2.5
NA	Material Transfer	N/A	9.93E-02	PM
NA	Material Transfer	N/A	4.70E-02	PM10
NA	Material Transfer	N/A	7.11E-03	PM2.5
NA	Chipper	N/A	0.27	PM
NA	Chipper	N/A	0.15	PM10/ PM2.5
NA	Hogger	N/A	0.09	PM
NA	Hogger	N/A	0.05	PM10/ PM2.5
RF01/ RF02	Road Travel	Periodically spraying water on the roads	184.5	PM
RF01/ RF02	Road Travel	Periodically spraying water on the roads	42.68	PM10
RF01/ RF02	Road Travel	Periodically spraying water on the roads	7.66	PM2.5

*Note that all numbers shown are future potential emissions for the source following the project.

Facility Name: West Fraser – Augusta Lumber Mill **Date of Application:** December 2012

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	Maximum
CK01 A	Cont. Kiln #1 – Stack A	35	2.26	Vertical	N/A	N/A	117.89	100	12,500	12,500
CK01 B	Cont. Kiln #1 – Stack B	35	2.26	Vertical	N/A	N/A	117.89	100	12,500	12,500
CK02 A	Cont. Kiln #2 – Stack A	35	2.26	Vertical	N/A	N/A	117.89	100	12,500	12,500
CK02 B	Cont. Kiln #2 – Stack B	35	2.26	Vertical	N/A	N/A	117.89	100	12,500	12,500

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.

Facility Name: West Fraser – Augusta Lumber Mill **Date of Application:** December 2012

FORM 7.00 AIR MODELING INFORMATION: Chemicals Data

Chemical	Potential Emission Rate (lb/hr)	Toxicity	Reference	MSDS Attached
Methanol	4.02	See Attached	See Attached	☐
Formaldehyde	1.004	See Attached	See Attached	☐
Propionaldehyde	0.04	See Attached	See Attached	☐
Acetaldehyde	1.456	See Attached	See Attached	☐
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APPENDIX D: BACT SUPPORTING CALCULATIONS

Table D-1. Emission Units Subject to BACT

Unit	Max. Production Capacity
KD04	110.0 MMBF/yr
KD05	110.0 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
KD04	VOC	RTO	3.76 lb/MBF	80.0%	0.060 lb/MBF
KD05	VOC	RTO	3.76 lb/MBF	80.0%	0.060 lb/MBF
All Kilns	VOC	RTO	3.76 lb/MBF	80.0%	0.060 lb/MBF
All Kilns	VOC	Biofiltration	3.76 lb/MBF	80.0%	1.053 lb/MBF

1. VOC as terpene + methanol + formaldehyde.
2. Based on engineering estimate.

Table D-3. Cost Summary

Emission Unit	Pollutant	Technology	Control Efficiency [1,2] (%)	Baseline Emissions (tpy)	Capture Efficiency [3] (%)	Pollutant Removed (tpy)	Operating Cost ($/ton removed)
KD04	VOC	RTO	98%	206.80	80.0%	162.13	$ 14,595
KD05	VOC	RTO	98%	206.80	80.0%	162.13	$ 14,595
All Kilns	VOC	RTO	98%	413.60	80.0%	324.26	$ 14,487
All Kilns	VOC	Biofiltration	65%	413.60	80.0%	215.07	$ 14,306

1. RTO control efficiency per OAQPS Manual, Section 3.2, Chapter 2.
2. Biofiltration control efficiency based on North Carolina Department of Environment and Natural Resources Air Permit Review for Weyerhauser's Plymouth facility's continuous kiln construction application, which referenced an estimated 60 – 70% VOC control efficiency from biofiltration, based on a conversation with David Word of NCASI.
3. Based on engineering estimate.

Table D-4. Cost Analysis Supporting Information for RTO

Parameter	Kiln 4 (KD04)	Kiln 5 (KD05)	2 Kilns to 1 RTO	Units	Note(s)
Maximum Production Capacity	110	110	220	MMBF/yr	
Uncontrolled Stack Inlet Emissions (VOC)	165.44	165.44	330.88	tpy	1
Removal Efficiency	98	98	98	%	2
VOC Removed	162.13	162.13	324.26	tpy	3
Control Equip. Outlet Temperature	1,450	1,450	1,450	° F	4
Airflow	40,471	40,471	80,942	acfm	5
Airflow Capture Efficiency	50	50	50	%	6
Exhaust Temperature	130	130	130	° F	5
Air Moisture Content	13.6	13.6	13.6	%	5
Exhaust Gas Flow Rate	35,667	35,667	71,333	scfm	7
Specific Heat of Dry Air	6.85	6.85	6.85	Btu/lb-mole·°F	8
Specific Heat of Water	17.99	17.99	17.99	Btu/lb-mole·°F	8
Pressure Drop	19	19	19	inches of H_2O	9
Fan Motor Efficiency	70	70	70	%	10
Fan Electricity Usage	64.3	64.3	128.5	kW-hr	11
Energy Required From Fuel	61.44	61.44	122.88	MMBtu/hr	12
Natural Gas Heat Capacity	1,020	1,020	1,020	MMBtu/MMscf	13
Operating Labor Cost	12.0	12.0	12.0	$/hr	14
Maintenance Labor Cost	13.2	13.2	13.2	$/hr	14
Electricity Cost	0.06	0.1	0.06	$/kW-hr	15
Natural Gas Cost	3.3	3.3	3.3	$/1,000 scf	16
RTO Equipment Life	10	10	10	years	17
Interest Rate	7.0	7.0	7.0	%	17
2002 $	179.9	179.9	179.9	n/a	18
2012 $ (October)	231.3	231.3	231.3	n/a	18

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. Values based stack test performed on Bibler Brothers Lumber Company continuous lumber kiln in Russellville, AR on March 12, 2009.
6. 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.
7. 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%.
8. Standard value.
9. Based on example problem in OAQPS Manual, Section 3.2, Chapter 2, page 2-43.
10. Per OAQPS Manual, Section 3.2, Chapter 2, page 2-41, efficiency ranges from 40 to 70%. 70% is conservatively chosen.
11. Total Fan Electricity Usage based on Equation 2.42 of OAQPS Manual, Section 3.2, Chapter 2, page 2-41.
12. 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.
13. Average natural gas heating value per AP-42 Section 1.4 *Natural Gas Combustion* (July 1998).
14. Labor costs per OAQPS Manual, Section 3.1, Chapter 1, pages 1-29 and 1-37.
15. Based on OAQPS, Section 2, Chapter 3, page 3-32.
16. Based on OAQPS, Section 3.2, Chapter, 2, page 2-46
17. Based on example problem in OAQPS Manual, Section 3.2, Chapter 2, page 2-45.
18. Values based on U.S. Historical Consumer Price Index: ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt.

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

Capital Cost	Kiln 4 (KD04)	Kiln 5 (KD05)	2 Kilns to 1 RTO	OAQPS Notation[1]
Purchased Equipment Costs				
Total Equipment Cost[2]	1,605,115	1,605,115	3,210,230	A
Instrumentation	160,512	160,512	321,023	0.10 × A
Sales Tax	48,153	48,153	96,307	0.03 × A
Freight	80,256	80,256	160,512	0.05 × A
Total Purchased Equipment Costs	*1,894,036*	*1,894,036*	*3,788,071*	*B = 1.18 × A*
Direct Installation Costs				
Foundations and Supports	151,523	151,523	303,046	0.08 × B
Handling and Erection	265,165	265,165	530,330	0.14 × B
Electrical	75,761	75,761	151,523	0.04 × B
Piping	37,881	37,881	75,761	0.02 × B
Insulation	18,940	18,940	37,881	0.01 × B
Painting	18,940	18,940	37,881	0.01 × B
Site Preparation & Buildings	-	-	-	-
Additional duct work	-	-	-	-
Total Direct Installation Costs	*568,211*	*568,211*	*1,136,421*	*C = 0.30 × B*
Indirect Installation Costs				
Engineering	189,404	189,404	378,807	0.10 × B
Construction and Field Expense	94,702	94,702	189,404	0.05 × B
Contractor Fees	189,404	189,404	378,807	0.10 × B
Start-up	37,881	37,881	75,761	0.02 × B
Performance Test	18,940	18,940	37,881	0.01 × B
Process Contingencies	56,821	56,821	113,642	0.03 × B
Total Indirect Installation Costs	*587,151*	*587,151*	*1,174,302*	*D = 0.31 × B*
Total Capital Investment ($)	**3,049,398**	**3,049,398**	**6,098,795**	**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 2012 $.

Minimum regenerative thermal oxidizer cost	35	2002 dollars/scfm
Conversion from 2002 to October 2012 dollars	1.29	October 2012 dollars per 2002 dollar
Minimum regenerative incinerator cost	45.00	August 2012 dollars/scfm

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

Operating Cost	Kiln 4 (KD04)	Kiln 5 (KD05)	2 Kilns to 1 RTO	OAQPS Notation[1]
Direct Annual Costs				
Operating Labor (0.5 hr, per 8-hr shift)	6,570	6,570	6,570	E
Supervisory Labor	986	986	986	F = 0.15 × E
Maintenance Labor (0.5 hr, per 8-hr shift)	7,227	7,227	7,227	G
Maintenance Materials	7,227	7,227	7,227	H = G
Electricity	33,776	33,776	67,552	I
Natural Gas	1,741,248	1,741,248	3,482,495	J
Total Direct Annual Costs	*1,797,033*	*1,797,033*	*3,572,057*	*DAC = E + F + G + H + I + J*
Indirect Annual Costs				
Overhead	13,206	13,206	13,206	K = 0.60 × (E + F + G + H)
Administrative Charges	60,988	60,988	121,976	L = 0.02 × TCI
Property Tax	30,494	30,494	60,988	M = 0.01 × TCI
Insurance	30,494	30,494	60,988	N = 0.01 × TCI
Capital Recovery[2]	434,166	434,166	868,331	O
Total Indirect Annual Costs	*569,347*	*569,347*	*1,125,489*	*IDAC = K + L + M + N + O*
Total Annual Cost ($)	**2,366,380**	**2,366,380**	**4,697,546**	*TAC = DAC + IDAC*
Pollutant Removed (tpy)	162.13	162.13	324.26	
Cost per ton of Pollutant Removed ($)	**14,595**	**14,595**	**14,487**	*$/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.

Table D-7. Cost Analysis Supporting Information for Biofilter and Kiln Exhaust System

Parameter	All Kilns	Units	Note(s)
Maximum Production Capacity	220	MMBF/yr	
Uncontrolled Stack Inlet Emissions (VOC)	330.88	tpy	1
Removal Efficiency	65	%	2
VOC Removed	215.07	tpy	3
Airflow Capture Efficiency	80	%	4
Pressure Drop	19	inches of H_2O	5
Fan Motor Efficiency	70.00	%	6
Operating Labor Cost	12.00	$/hr	7
Maintenance Labor Cost	13.20	$/hr	7
Electricity Cost	0.06	$/kW-hr	8
Water Cost	0.00	$/gal	9
Kiln Exhaust System Equipment Life	10	years	10
Interest Rate	7.0	%	10
2010 $ (March)	217.6	n/a	11
2012 $ (October)	231.3	n/a	11

1. Potential inlet emissions based on maximum capacity and emissions, routing both kilns into one biofilter.
2. Biofiltration control efficiency based on North Carolina Department of Environment and Natural Resources Air Permit Review for Weyerhauser's Plymouth facility continuous kiln construction application, which referenced an estimated 60 – 70% VOC control efficiency from biofiltration, based on a conversation with David Word of NCASI.
3. VOC Removed (tpy) = Removal Efficiency (%) × Uncontrolled Stack Inlet Emissions (tpy). VOC as terpene + methanol + formaldehyde.
4. 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.
5. Based on example problem in OAQPS Manual, Section 3.2, Chapter 2, page 2-43.
6. Per OAQPS Manual, Section 3.2, Chapter 2, page 2-41, efficiency ranges from 40 to 70%. 70% is conservatively chosen.
7. Labor costs per OAQPS Manual, Section 3.1, Chapter 1, pages 1-29 and 1-37.
8. Based on OAQPS, Section 2, Chapter 3, page 3-32.
9. Based on OAQPS, Section 4.2, Chapter 1, page 1-39.
10. Based on example problem in OAQPS Manual, Section 3.2, Chapter 2, page 2-45.
11. Values based on U.S. Historical Consumer Price Index: ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt.

Table D-8. Capital Cost Analysis for Biofilter and Kiln Exhaust System for VOC control

Capital Cost	All Kilns	OAQPS Notation
Total Capital Investment[1]	**13,763,885**	**TCI**

1. Calculated from the North Carolina Division of Air Quality (NCDAQ) Air Permit Review/Preliminary Determination for the Weyerhaeuser NR Company, Plymouth, NC facility permit application (May 2010), written by Jenny Kelvington of NCDAQ, for the cost estimates of a biofiltration system for similar kilns to those West Fraser is proposing. The costs include a chiller that would be needed to cool the exhaust temperature to at least 110 °F, the maximum temperature that can go through the biofiltration system without killing the bugs. Reliance on this value is reasonable as the quoted unit was sized for controlling two continuous kilns as well (at a permitted throughput of 117 MMBF/yr). However, the cost was scaled up to account for the Maplesville Mill's potential production throughput of 200 MMBF/yr. All costs have been adjusted from March 2010 dollars to October 2012 dollars.

Table D-9. Operating Cost Analysis for Biofilter and Kiln Exhaust System for VOC control

Operating Cost	All Kilns	OAQPS Notation
Total Direct Annual Costs [1]	*210,633*	*DAC*
Indirect Annual Costs[1]	342,727	
Capital Recovery[2]	1,959,668	
Total Indirect Annual Costs	*2,866,155*	*IDAC*
Total Annual Cost ($)	**3,076,788**	*TAC = DAC + IDAC*
Pollutant Removed (tpy)	215.07	
Cost per ton of Pollutant Removed ($)	**14,306**	*$/ton = TAC / Pollutant Removed*

1. Calculated from the North Carolina Division of Air Quality (NCDAQ) Air Permit Review/Preliminary Determination for the Weyerhaeuser NR Company, Plymouth, NC facility permit application (May 2010), written by Jenny Kelvington of NCDAQ, for the cost estimates of a biofiltration system for similar kilns to those West Fraser is proposing. The costs include a chiller that would be needed to cool the exhaust temperature to at least 110 °F, the maximum temperature that can go through the biofiltration system without killing the bugs. Reliance on this value is reasonable as the quoted unit was sized for controlling two continuous kilns as well (at a permitted throughput of 117 MMBF/yr). However, the cost was scaled up to account for the Maplesville Mill's potential production throughput of 200 MMBF/yr. All costs have been adjusted from March 2010 dollars to October 2012 dollars.
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 CLEARING HOUSE DATABASE REPORT

RBLC Search Results for Wood Lumber Kilns - VOC Control

Company Name	Facility Name	State	Batch or Continuous Kiln?	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Averaging Period	Emission Limit 2	Emission Limit 2 Unit	Emission Limit 2 Averaging Period	Emission Limit (lb/MBF)
INTERFOR PACIFIC, INC.	GILCHRIST FACILITY	OR	Batch	5/22/2006	LUMBER DRY KILNS	-	-	-	PROPER WORK PRACTICES	1.69	LB/MBF	-	-	-	-	1.69
TIN INC	TEMPLE INLAND PINELAND MANUFACTURING COMPLEX	TX	Batch	8/12/2011	Dry studmill kilns 1 and 2	wood	156,000	boardfeet per charge	good operating practice and maintenance	2.49	LB VOC/1000 BOARDFEE	-	-	-	-	2.49
SIERRA PACIFIC INDUSTRIES	SKAGIT COUNTY LUMBER MILL	WA	Batch	1/25/2006	7 DRY KILNS	-	300	MM BOARD F/YR	COMPUTERIZED STEAM MANAGEMENT SYSTEM	378	T/YR	12 MONTH ROLLING AVERAGE	-	-	-	2.52
NORTH FLORIDA LUMBER	NORTH FLORIDA LUMBER/BRISTOL SAW MILL	FL	Batch	8/4/2009	Wood lumber kiln	steam heated	92,000,000	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	-	-	-	-	2.54
WEST FRASER (SOUTH), INC.	WEST FRASER (SOUTH), INC. - HUTTIG MILL	AR	Batch	11/7/2002	LUMBER DRYING KILN	-	230,000	MBF/YR	-	3.5	LB/MBF	Million Board Feet	91.9	LB/H	-	3.50
DELTIC TIMBER CORPORATION	WALDO	AR	Batch	1/12/2005	STEAM HEATED LUMBER DRYING KILNS	-	-	-	-	3.5	LB/MBF	-	-	-	-	3.50
POTLATCH CORPORATION	POTLATCH CORPORATION - OZAN UNIT	AR	Batch	7/26/2005	KILNS 1-4	STEAM HEATED	265	MMBF ANNUALLY	PROPER OPERATION	3.5	LB/MBF	-	119	LB/H	-	3.50
POTLATCH CORPORATION	POTLATCH CORPORATION - OZAN UNIT	AR	Batch	7/26/2005	KILNS 1-4	STEAM HEATED	265	MMBF ANNUALLY	PROPER OPERATION	3.5	LB/MBF	-	119	LB/H	-	3.50
WEST FRASER, INC.	LUMBER MILL	TX	**Continuous**	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	-	-	-	-	3.50
WEYERHAEUSER COMPANY	HOLDEN WOOD PRODUCTS MILL	LA	Batch	6/18/2003	KILN NO. 5 (1-01)	WOOD RESIDUE	44,000	MBF/YR	-	66	LB/H	HOURLY MAXIMUM	79.58	TYR	ANNUAL MAXIMUM	3.62
WEYERHAEUSER COMPANY	HOLDEN WOOD PRODUCTS MILL	LA	Batch	6/18/2003	KILN NO. 4 (1-93)	WOOD RESIDUE	33,000	MBF/YR	-	66	LB/H	HOURLY MAXIMUM	59.69	T/YR	ANNUAL MAXIMUM	3.62
WEYERHAEUSER COMPANY	HOLDEN WOOD PRODUCTS MILL	LA	Batch	6/18/2003	KILN NO. 3 (1-89)	WOOD RESIDUE	33,000	MBF/YR	-	66	LB/H	HOURLY MAXIMUM	59.69	T/YR	ANNUAL MAXIMUM	3.62
BIBLER BROTHERS LUMBER COMPANY	BIBLER BROTHERS LUMBER COMPANY	AR	**Continuous**	8/25/2008	SN-07G AND SN-13G CONTINOUS OPERATING KILNS	WOOD RESIDUE	25	MMBTU/H	-	3.8	LB/MBF VOC	-	46.50	LB VOC/H/KILN	-	3.80
SIMPSON LUMBER CO.	SIMPSON LUMBER CO, LLC MELDRIM OPERATIONS	GA	**Continuous**	4/25/2012	KILN 3	WASTE WOOD	65,000,000	BF/YR	PROPER MAINTENANCE AND OPERATION	3.83	LB/MBF	DAILY	-	-	-	3.83
SIMPSON LUMBER CO.	SIMPSON LUMBER CO, LLC MELDRIM OPERATIONS	GA	Batch	4/25/2012	KILN 4	WASTE WOOD	73,000,000	BF/YR	PROPER MAINTENANCE AND OPERATION	3.93	LB/MBF	DAILY	-	-	-	3.93
WEYERHAEUSER COMPANY	Plymouth Lumber Mill	NC	**Continuous**	2010	Direct-Fired Kilns (2)	WOOD RESIDUE	234,000	MBF/YR	Maintain the dry bulb set temperature at or below 260 °F	3.85	lb/MBF					3.85

RBLC Search Results for Wood Lumber Kilns - VOC Control

Company Name	Facility Name	State	Batch or Continuous Kiln?	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Averaging Period	Emission Limit 2	Emission Limit 2 Unit	Emission Limit 2 Averaging Period	Emission Limit (lb/MBF)
WEYERHAEUSER COMPANY	HOLDEN WOOD PRODUCTS MILL	LA	Batch	6/18/2003	KILN NO. 1 (1-79)	WOOD RESIDUE	44,000	MBF/YR	-	89.15	LB/H	HOURLY MAXIMUM	89.8	T/YR	ANNUAL MAXIMUM	4.08
WEYERHAEUSER COMPANY	HOLDEN WOOD PRODUCTS MILL	LA	Batch	6/18/2003	KILN NO. 2 (2-79)	WOOD RESIDUE	44,000	MBF/YR	-	89.15	LB/H	HOURLY MAXIMUM	89.8	T/YR	ANNUAL MAXIMUM	4.08
West Fraser, Inc.	Armour Lumber Mill	NC	**Continuous**	N/A	CDP Kiln No.1	WOOD RESIDUE	137,415	MBF/YR	Limit the drying capacity to 137,415 MBF per year, and follow either the manufacturer's recommendations or a site specific plan for proper operation and maintenance of the kiln	4.11	LB/MBF		282.4	T/YR		4.11
West Fraser, Inc.	Armour Lumber Mill	NC	**Continuous**	N/A	CDP Kiln No.2	WOOD RESIDUE	137,415	MBF/YR	Limit the drying capacity to 137,415 MBF per year, and follow either the manufacturer's recommendations or a site specific plan for proper operation and maintenance of the kiln	4.11	LB/MBF		282.4	T/YR		4.11
NEW SOUTH LUMBER COMPANY, INC.	NEW SOUTH LUMBER COMPANY, INC-CAMDEN PLANT	SC	Batch	3/7/2003	LUMBER DRYING KILNS, FIVE (5), STEAM-HEATED	WOOD WASTE	182	MMBF/YR	WORK PRACTICES AND PRODUCTION LIMIT	4.2	LB/MBF	per 1000 board ft	182.1	MMBF/YR	Production Limit	4.20
NEW SOUTH LUMBER COMPANY, INC.	NEW SOUTH LUMBER COMPANY, INC.-CONWAY PLANT	SC	Batch	9/5/2003	LUMBER DRYING KILNS	-	-	-	WORK PRACTICES	4.2	LB/1000 BF	lb/1000 board feet	363.7	T/YR	Limit for all 5 kilns	4.20
ELLIOT SAWMILLING COMPANY	ELLIOT SAWMILLING COMPANY	SC	Batch	5/23/2004	LUMBER DRYING KILN	WOOD WASTE	53	MMBFT/H	WORK PRACTICES	4.5	LB/1000 BF	-	-	-	-	4.50
Rayonier Wood Products, LLC	Swainsboro Sawmill	GA	**Continuous**	6/16/2007	Direct-fired lumber kilns (2)	Wood	220	MMBF/YR	Good combustion practices	4.6	lb/MBF					4.6
WEYERHAEUSER	WRIGHT CITY COMPLEX	OK	Batch	7/21/2006	LUMBER KILNS	-	-	-	-	4.8	LB/MBF	-	-	-	-	4.80
INTERNATIONAL PAPER COMPANY	LEOLA LUMBER MILL	AR	Batch	11/1/2002	LUMBER DRYING KILN	-	29,410	MBF/YR	-	423	LB/CHARGE	Of Lumber	88.2	T/YR	-	6.00
WEST FRASER TIMBER COMPANY, LTD	JOYCE MILL	LA	**Continuous**	8/16/2011	Lumber kilns	-	300	million board feet/yr	properly design and operation	930	T/YR	-	-	-	-	6.20
T.R. MILLER MILL COMPANY	T.R. MILLER MILL	AL	Batch	5/16/2002	LUMBER DRY KILN	-	125	MBF	GOOD ENGINEERING PRACTICES	6.78	LB/MBF	-	-	-	-	6.78

RBLC Search Results for Wood Lumber Kilns - VOC Control

Company Name	Facility Name	State	Batch or Continuous Kiln?	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Averaging Period	Emission Limit 2	Emission Limit 2 Unit	Emission Limit 2 Averaging Period	Emission Limit (lb/MBF)
COLLUM'S LUMBER MILL	COLLUM'S LUMBER MILL	SC	Batch	4/8/2002	KILN, 2 STEAM HEATED, LUMBER	WOOD WASTE	56	MMBF/YR	-	195	T/YR	total for 2 kilns	-	-	-	7.00
BOWATER, INC.	ALBERTVILLE SAWMILL	AL	Batch	6/4/2003	STEAM-HEATED LUMBER DRY KILNS, (2)	-	150	MBF	GOOD OPERATING PRACTICES, ROUTINE EQUIPMENT INSPECTIONS, RECORDKEEPING	7	LB/MBF	-	125000	MBF/YR	2 UNITS COMBINED	7.00
BOWATER (ALABAMA) INC. FOREST PRODUCT DIVISION	ALBERTVILLE SAWMILL	AL	Batch	4/9/2008	TWO 182.14 MBF, STEAM-HEADED LUMBER DRY KILNS (NORTH & SOUTH - K100/K101)	-	182	MBF	OPERATE W/ WET BULB SET POINT DRYING SCHEDULE OF LESS THAN OR EQUAL TO 185F; DAILY AND MONTHLY KILN I/M PROCEDURES	7	LB/MBF	KILN CHARGE CYCLONE (PINENE)	-	-	-	7.00
GEORGIA-PACIFIC CORP.	GEORGIA-PACIFIC CORP. - EL DORADO SAWMILL	AR	Batch	11/7/2002	LUMBER DRYING KILN	-	-	-	BACT FOR VOC EMISSIONS FROM THE KILN WOULD BE PROPER MAINTENANCE AND OPERATION OF THE DRYING KILN, SINCE ALL AVAILABLE CONTROL TECHNOLOGIES HAVE BEEN ELIMINATED DUE TO TECHNICAL INFEASIBLITY.	5,572	LB/CHARGE	Of Lumber	304	T/YR	-	--
WEST FRASER (SOUTH), INC.	JOYCE MILL	LA	Batch	7/19/2004	WOOD LUMBER KILNS (INDIRECT FIRED)	N/A	-	-	PROPER KILN DESIGN AND OPERATION	367.77	LB/H	MAXIMUM HOURLY	750	T/YR	ANNUAL MAXIMUM	--
HOOD INDUSTRIES, INC.	COUSHATTA SAWMILL	LA	Batch	7/13/2005	WOOD LUMBER KILNS (INDIRECT FIRED)	N/A	-	-	-	28	LB/H	HOURLY MAXIMUM	122.6	T/YR	ANNUAL MAXIMUM	--
TEMPLE-INLAND FOREST PRODUCTS CORPORATION	TEMPLE-INLAND DIBOLL OPERATIONS	TX	Batch	11/1/2004	EAST LUMBER KILNS 1&2 (4)	-	-	-	-	30.6	LB/H	-	85.35	T/YR	-	--
TEMPLE-INLAND FOREST PRODUCTS CORPORATION	TEMPLE-INLAND DIBOLL OPERATIONS	TX	Batch	11/1/2004	WEST LUMBER KILNS 1&2 (4)	-	-	-	-	30.6	LB/H	-	85.35	T/YR	-	--

APPENDIX F: TOXICS MODELING

Table F-1. Derivation of Acceptable Ambient Concentrations (AAC) for Georgia EPD

Pollutant	CAS No.	Formula	Mol. Wt. (g/mol)	Unit Risk[1] ($\mu g/m^3)^{-1}$	Weight of Evidence[1]	RBAC[1, 2] ($\mu g/m^3$)	Inhalation RfC[1] (mg/m^3)	Annual AAC ($\mu g/m^3$)	24-hr Rating 1. OSHA TWA[3] (ppm)	(mg/m^3)	24-hr Rating 2. ACGIH TWA[4] (ppm)	(mg/m^3)	24-hour AAC[5,6] ($\mu g/m^3$)	OSHA Ceiling[7] (ppm)	(mg/m^3)	ACGIH STEL[8] (ppm)	(mg/m^3)	NIOSH STEL[9] (ppm)	(mg/m^3)	Ceiling or STEL (mg/m^3)	15-minute AAC[10] ($\mu g/m^3$)
Methanol	67-56-1	CH4O	32.04					None	200	260	200	262	619			250	328	250	325	328	32,750
Formaldehyde	50-00-0	CH2O	30.03				-	1.11	Not Required		Not Required		NA	2	2.46	0.3	0.4			2.46	246
Propionaldehyde	123-38-6	C3H6O	58.08				0.01	8.00	Not Required		Not Required		NA							None	None
Acetaldehyde	75-07-0	C2H4O	44.05				0.009	9.00	Not Required		Not Required		NA			25	45			45	4,500

1. Unit risk and Inhalation RfC values obtained from EPA IRIS database. Annual AAC for formaldehyde based on data from Georgia EPD.
2. Risk Based Acceptable Concentration (RBAC) is calculated based on the weight of evidence of the unit risk.
3. OSHA TWA values obtained from 29 CFR 1910 Subpart Z
4. ACGIH TWA values obtained from 03-2010-CS-Adopted Threshold Limit Values.pdf
5. Adjusted for occupational exposure. Applied safety factor of 100 for pollutants which are not known human carcinogens and safety factor of 300 for known human carcinogens per GA Air Toxics Guidance (June 21, 1998).
6. Values derived assuming up to a 168 hour work week.
7. OSHA Ceiling values obtained from 29 CFR 1910 Subpart Z
8. ACGIH STEL values obtained from 03-2010-CS-Adopted Threshold Limit Values.pdf
9. NIOSH STEL values obtained from www.cdc.gov/niosh/npg
10. Adjusted by safety factor of 10 per GA Air Toxics Guidance (June 21, 1998).

Table F-2. Derivation of Long-term Acceptable Ambient Concentrations (AAC) for Georgia EPD

Pollutant	CAS No.	Formula	Mol. Wt. (g/mol)	Unit Risk[1] $(\mu g/m^3)^{-1}$	Weight of Evidence	RBAC[2] $(\mu g/m^3)$	Inhalation RfC[1] (mg/m^3)	Annual AAC $(\mu g/m^3)$	24-hour AAC Required?
Methanol	67-56-1	CH4O	32.04					None	Need 24-hr TWA
Formaldehyde	50-00-0	CH2O	30.03				-	1.11	Not Required
Propionaldehyde	123-38-6	C3H6O	58.08				0.008	8.00	Not Required
Acetaldehyde	75-07-0	C2H4O	44.05				0.009	9.00	Not Required

1. Unit risk and Inhalation RfC values obtained from EPA IRIS database.
2. Risk Based Acceptable Concentration (RBAC) is calculated based on the weight of evidence of the unit risk.
3. Formaldehyde annual AAC as prescribed by Georgia EPD.

Table F-3. Derivation of 24-hr Acceptable Ambient Concentrations (AAC) for Georgia EPD

Pollutant	24-hr AAC Required[1]?	CAS No.	Formula	Mol. Wt. (g/mol)	24-hr Rating 1. OSHA TWA (ppm)	(mg/m^3)	24-hr Rating 2. ACGIH TWA (ppm)	(mg/m^3)	24-hr Rating 3. NIOSH TWA (ppm)	(mg/m^3)	24-hr Rating 4. LD50 (rat) (mg/kg)	Rating Available 24-hour TWA (mg/m^3)	24-hour AAC[4] (µg/m^3)
Methanol	Need 24-hr TWA	67-56-1	CH4O	32.04	200	260	200	262				260	619
Formaldehyde	Not Required	50-00-0	CH2O	30.03	Not Required		Not Required					Not Required	Not Required
Propionaldehyde	Not Required	123-38-6	C3H6O	58.08	Not Required		Not Required					Not Required	Not Required
Acetaldehyde	Not Required	75-07-0	C2H4O	44.05	Not Required		Not Required					Not Required	Not Required

1. Per the *Guidelines* , one long-term value is required; TAP with an annual AAC do not require a 24-hr AAC.
2. OSHA TWA values obtained from 29 CFR 1910 Subpart Z
3. ACGIH TWA values obtained from 03-2004-TLVs.doc
4. Adjusted for occupational exposure. Applied safety factor of 100 for pollutants which are not known human carcinogens and safety factor of 300 for known human carcinogens per GA Air Toxics Guidance (June 21, 1998).

Table F-4. Derivation of 15-minute Acceptable Ambient Concentrations (AAC) for Georgia EPD

Pollutant	CAS No.	Formula	Mol. Wt. (g/mol)	OSHA Ceiling[1] (ppm)	OSHA Ceiling[1] (mg/m^3)	ACGIH STEL[2] (ppm)	ACGIH STEL[2] (mg/m^3)	NIOSH STEL[3] (ppm)	NIOSH STEL[3] (mg/m^3)	Ceiling or STEL (mg/m^3)	15-minute AAC[4] ($\mu g/m^3$)
Methanol	67-56-1	CH4O	32.04			250	328	250	325	328	32,750
Formaldehyde	50-00-0	CH2O	30.03	2	2.46	0.3	0.4			2.46	246
Propionaldehyde	123-38-6	C3H6O	58.08							None	None
Acetaldehyde	75-07-0	C2H4O	44.05			25	45.00			45	4500

1. OSHA Ceiling values obtained from 29 CFR 1910 Subpart Z
2. ACGIH STEL values obtained from 03-2004-TLVs.doc
3. NIOSH STEL values obtained from www.cdc.gov/niosh/npg
4. Adjusted by safety factor of 10 per GA Air Toxics Guidance (June 21, 1998).

APPENDIX G: TITLE V DATABASE

A - Facility Information

Facility: West Fraser Inc. Application: 2012 PSD Application for Continuous Kilns

Parent/Holding Company Name:	West Fraser Inc.
Facility Location:	4206 Mike Padgett Hwy Augusta, GA 30906- County: Richmond

Location of Center of Production Area: **UTM Zone:** 0

Latitude:	33 deg N 20 min 0 sec	**UTM Horizontal Meters:**	0
Longitude:	81 deg W 57 min 30 sec	**UTM Vertical Meters:**	0

Reason for Application Submittal:

Modification of Existing Title V Permit

Application Submitted for:

All facilities under common control at a Part 70 site.

A6 - Current Permits And Amendments (And Deferred Modifications Under State Rule 391-3-1-.03(6)(i))

Permit or Amendment Number:	**2421-245-0047-V-04-0**
Original Issue Date and Amendment Date:	June 13, 2012
Permit or Amendment Description:	Title V Renewal

All significant Processes at this Facility:

Process Overall Facility Description

Description

Lumber mill producing southern yellow pine dimension lumber

Other ID Numbers:

FEI Number:	72-148-9951
Dun and Bradstreet Number:	01834255

A8 - Required Documents:

These corresponding attachments are submitted in electronic form (.doc, .pdf, .jpg, or similar format).

Corresponding Attachments	Number Submitted

A - Facility Information

Building layout (overhead view), indicating location of emission units and stacks. (Only stacks that are listed in this application need to be located on the	0
Plant site map detailing property lines, latitude/longitude or UTM location provided in this application, any outdoor storage piles (indicating material), roads (include paved and unpaved), and areas of company property to which the public has unrestricted access.	0
General area map showing specific location of plant in relation to surrounding areas.	0
Process flow diagram(s) for the plant, including emission flow. (These do not have to include material input/output flow rates.)	0
Compliance Assurance Monitoring plans as required by 40 CFR Part 64. This document MUST be submitted in electronic form.	0

Comments: See the PSD permit application's appendices for additional figures.

A2, A3, A4 - Contact Names and Addresses by Responsibilities

Facility: West Fraser Inc. Application: 2012 PSD Application for Continuous

Legal Owner (legal actions, etc.)

Primary Contact: George Winfrey, Mill Manager
Phone: (706) 793-8753 EXT: Fax: (706) 798-2239
E-Mail: mac.winfrey@westfraser.com

Mailing Address: West Fraser - Augusta Lumber Mill
4206 Mike Padgett Hwy
Augusta, GA 30906

Facility Contact

Primary Contact: George Winfrey, Mill Manager
Phone: (706) 793-8753 EXT: Fax: (706) 798-2239
E-Mail: mac.winfrey@westfraser.com

Mailing Address: West Fraser - Augusta Lumber Mill
4206 Mike Padgett Hwy
Augusta, GA 30906

Permits (granted permits, permit amendments, etc.)

Primary Contact: George Winfrey, Mill Manager
Phone: (706) 793-8753 EXT: Fax: (706) 798-2239
E-Mail: mac.winfrey@westfraser.com

Mailing Address: West Fraser - Augusta Lumber Mill
4206 Mike Padgett Hwy
Augusta, GA 30906

Permit Applications (requests for additional information, etc.)

Primary Contact: Lamar Youmans, EHS Coordinator
Phone: (706) 793-8753 EXT: 213 Fax: (706) 798-2239
E-Mail: lamar.youmans@westfraser.com

Mailing Address: West Fraser - Augusta Lumber Mill
4206 Mike Padgett Hwy
Augusta, GA 30906

Surveys, Questionaires (emission inventories, etc.)

Primary Contact: Lamar Youmans, EHS Coordinator

A2, A3, A4 - Contact Names and Addresses by Responsibilities

Facility: West Fraser Inc. Application: 2012 PSD Application for Continuous

Phone: (706) 793-8753 EXT: 213 Fax: (706) 798-2239

E-Mail: lamar.youmans@westfraser.com

Mailing Address: West Fraser - Augusta Lumber Mill
4206 Mike Padgett Hwy
Augusta, GA 30906

Enforcement Actions (non-compliance letters, notices of violation, etc.)

Primary Contact: Lamar Youmans, EHS Coordinator

Phone: (706) 793-8753 EXT: 213 Fax: (706) 798-2239

E-Mail: lamar.youmans@westfraser.com

Mailing Address: West Fraser - Augusta Lumber Mill
4206 Mike Padgett Hwy
Augusta, GA 30906

Fees (fee manuals, fee forms, audit notices, etc.)

Primary Contact: Lamar Youmans, EHS Coordinator

Phone: (706) 793-8753 EXT: 213 Fax: (706) 798-2239

E-Mail: lamar.youmans@westfraser.com

Mailing Address: West Fraser - Augusta Lumber Mill
4206 Mike Padgett Hwy
Augusta, GA 30906

Monitoring (CEM certification applications, requests for monitoring and testing information, etc.)

Primary Contact: Lamar Youmans, EHS Coordinator

Phone: (706) 793-8753 EXT: 213 Fax: (706) 798-2239

E-Mail: lamar.youmans@westfraser.com

Mailing Address: West Fraser - Augusta Lumber Mill
4206 Mike Padgett Hwy
Augusta, GA 30906

Modification Checklist

Facility: West Fraser Inc.

Application: 2012 PSD Application for Continuous Kilns

A - Facility Information

- ☐ A1 - Facility Location
- ☑ A2 - Facility Contacts
- ☐ A3 - Facility Mailing Address
- ☑ A4 - Match Contact Names, Addresses, Responsibilities
- ☑ A6 - Current Permits
- ☐ A7 - Facility Processes
- ☑ A8 - Required Documents

☑ B1 - Potential to Emit - Criteria

☐ B2 - Potential to Emits - HAPs

☑ B3 - Facility-Wide Actual Emissions

☑ **C - Rule Applicability**

☐ D1 - Insignificant Activities Checklist

☐ D2 - Generic Emissions Groups

☐ D3 - Generic Fuel Burning Equipment

☐ D4 - Fugitive Emissions Associated with LDAR

☐ D5 - Short Term Activities

☐ D6 - Insignificant Activities based on Emission Levels

Modification Checklist

Facility: West Fraser Inc.

Application: 2012 PSD Application for Continuous Kilns

D7 - Significant Emission Units

- ☐ D7-1 Boilers, Furnaces _Other Indirect Contact Heat Generating Equipment
- ☐ D7-2 Chromium Electroplating Chromium Anodizing Tanks
- ☐ D7-3 Crushing, Milling Grinding
- ☑ D7-4 Dryers, Calciners, Kilns Ovens
- ☐ D7-5 Fiber Reinforced Plastic Manufacturing Operations
- ☐ D7-6 Internal Combustion Engines _Combustion Turbines
- ☐ D7-7 Landfills
- ☐ D7-8 Liquid Storage Vessels
- ☐ D7-9 Miscellaneous
- ☐ D7-10 Non-Reactive Bulk Mixing
- ☐ D7-11 Painting _Coating Operations
- ☐ D7-12 Perchloroethylene Dry Cleaners
- ☐ D7-13 Printing Operations
- ☐ D7-14 Reactor Vessel
- ☐ D7-15 Separation Process
- ☐ D7-16 Solid/Liquid Waste Destruction - Incineration
- ☐ D7-17 Solvent Cleaning Machines
- ☐ D7-18 Textile Coater

☑ D8 - Fugitive Emission Sources

☐ D9 - Emission Groups

D10 - Control Devices

- ☐ D10-1 Adsorber/Carbon Drum
- ☐ D10-2 Biofilter/Bioscrubber
- ☐ D10-3 Condenser/Refrigeration Unit
- ☐ D10-4 Cyclone/Multiclone/Settling Chamber
- ☐ D10-5 Electrostatic Precipitator
- ☐ D10-6 Filter Media
- ☐ D10-7 Miscellaneous Device
- ☐ D10-8 Oxidizer
- ☐ D10-9 Scrubber

☐ D11 - Associate Emission Units with Control Devices

☑ D12 - Stack and Process Vent Summary

☐ D13 - Compliance Assurance Monitoring

☑ **E - Summary Of Emissions**

☑ **F - Facility Compliance**

B - Facility Emissions

B1 - Part 70 Site Potential To Emit

Criteria Pollutant	Potential To Emit Applicability Range for the Entire Site (tons per year)
Carbon Monoxide	< 100
Hydrogen Sulfide	< 100
Nitrogen Oxides	> 25 To < 50
Particulate Matter	100 To 250
Particulate Matter <10 microns	< 100
Sulfur Dioxide	< 100
Total Hazardous Air Pollutants	25 or More
Total Reduced Sulfur (includes H2S)	< 100
Volatile Organic Compounds	250 or More

Hazardous Air Pollutant	Potential To Emit Applicability Range for the Entire Site (tons per year)
1,1,2,2-Tetrachloroethane	> 0 to < 10
1,1,2-Trichloroethane	> 0 to < 10
1,1-Dimethyl hydrazine	> 0 to < 10
1,2,4-Trichlorobenzene	> 0 to < 10
1,2-Dibromo-3-chloropropane	> 0 to < 10
1,2-Diphenylhydrazine	> 0 to < 10
1,2-Epoxybutane	> 0 to < 10
1,2-Propylenimine (2-Methyl aziridine)	> 0 to < 10
1,3-Butadiene	> 0 to < 10
1,3-Dichloropropene	> 0 to < 10
1,3-Propane sultone	> 0 to < 10
1,4-Dichlorobenzene(p)	> 0 to < 10
1,4-Dioxane (1,4-Diethyleneoxide)	> 0 to < 10
2,2,4-Trimethylpentane	> 0 to < 10

2,3,7,8-Tetrachlorodibenzo-p-dioxin	> 0 to < 10
2,4,5-Trichlorophenol	> 0 to < 10
2,4,6-Trichlorophenol	> 0 to < 10
2,4-D, salts and esters	> 0 to < 10
2,4-Dinitrophenol	> 0 to < 10
2,4-Dinitrotoluene	> 0 to < 10
2,4-Toluene diamine	> 0 to < 10
2,4-Toluene diisocyanate	> 0 to < 10
2-Acetylaminofluorine	> 0 to < 10
2-Chloroacetophenone	> 0 to < 10
2-Nitropropane	> 0 to < 10
3,3-Dichlorobenzidene	> 0 to < 10
3,3-Dimethoxybenzidine	> 0 to < 10
3,3-Dimethyl benzidine	> 0 to < 10
4,4-Methylene bis (2-Chloroaniline)	> 0 to < 10
4,4-Methylenedianiline	> 0 to < 10
4,6-Dinitro-o-cresol, and salts	> 0 to < 10
4-Aminobiphenyl	> 0 to < 10
4-Nitrobiphenyl	> 0 to < 10
4-Nitrophenol	> 0 to < 10
Acetaldehyde	> 0 to < 10
Acetamide	> 0 to < 10
Acetonitrile	> 0 to < 10
Acetophenone	> 0 to < 10
Acrolein	> 0 to < 10
Acrylamide	> 0 to < 10
Acrylic Acid	> 0 to < 10
Acrylonitrile	> 0 to < 10

Allyl chloride	> 0 to < 10
Aniline	> 0 to < 10
Antimony Compounds	> 0 to < 10
Arsenic Compounds (inorganic including arsine)	> 0 to < 10
Asbestos	> 0 to < 10
Benzene (including benzene from gasoline)	> 0 to < 10
Benzidine	> 0 to < 10
Benzotrichloride	> 0 to < 10
Benzyl chloride	> 0 to < 10
Beryllium Compounds	> 0 to < 10
beta-Propiolactone	> 0 to < 10
Biphenyl	> 0 to < 10
Bis(2-ethylhexyl)phthalate (DEHP)	> 0 to < 10
Bis(chloromethyl)ether	> 0 to < 10
Bromoform	> 0 to < 10
Cadmium Compounds	> 0 to < 10
Calcium cyanamide	> 0 to < 10
Captan	> 0 to < 10
Carbaryl	> 0 to < 10
Carbon disulfide	> 0 to < 10
Carbon tetrachloride	> 0 to < 10
Carbonyl sulfide	> 0 to < 10
Catechol	> 0 to < 10
Chloramben	> 0 to < 10
Chlordane	> 0 to < 10
Chlorine	> 0 to < 10
Chloroacetic acid	> 0 to < 10
Chlorobenzene	> 0 to < 10

Chlorobenzilate	> 0 to < 10
Chloroform	> 0 to < 10
Chloromethyl methyl ether	> 0 to < 10
Chloroprene	> 0 to < 10
Chromium Compounds	> 0 to < 10
Cobalt Compounds	> 0 to < 10
Coke Oven Emissions	> 0 to < 10
Cresols/Cresylic acid (isomers and mixture)	> 0 to < 10
Cumene	> 0 to < 10
Cyanide Compounds	> 0 to < 10
DDE	> 0 to < 10
Dibenzofurans	> 0 to < 10
Dibutylphthalate	> 0 to < 10
Dichloroethyl ether (Bis(2-chloroethyl) ether)	> 0 to < 10
Dichlorvos	> 0 to < 10
Diethanolamine	> 0 to < 10
Diethyl sulfate	> 0 to < 10
Dimethyl aminoazobenzene	> 0 to < 10
Dimethyl carbamoyl chloride	> 0 to < 10
Dimethyl formamide	> 0 to < 10
Dimethyl phthalate	> 0 to < 10
Dimethyl sulfate	> 0 to < 10
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	> 0 to < 10
Ethyl acrylate	> 0 to < 10
Ethyl benzene	> 0 to < 10
Ethyl carbamate (Urethane)	> 0 to < 10
Ethyl chloride (Chloroethane)	> 0 to < 10
Ethylene dibromide (Dibromoethane)	> 0 to < 10

Ethylene dichloride (1,2-Dichloroethane)	> 0 to < 10
Ethylene glycol	> 0 to < 10
Ethylene imine (Aziridine)	> 0 to < 10
Ethylene oxide	> 0 to < 10
Ethylene thiourea	> 0 to < 10
Ethylidene dichloride (1,1-Dichloroethane)	> 0 to < 10
Fine mineral fibers	> 0 to < 10
Formaldehyde	> 0 to < 10
Glycol ethers	> 0 to < 10
HAP Metals	> 0 to < 10
Heptachlor	> 0 to < 10
Hexachlorobenzene	> 0 to < 10
Hexachlorobutadiene	> 0 to < 10
Hexachlorocyclopentadiene	> 0 to < 10
Hexachloroethane	> 0 to < 10
Hexamethylene-1	> 0 to < 10
Hexamethylphosphoramide	> 0 to < 10
Hexane	> 0 to < 10
Hydrazine	> 0 to < 10
Hydrochloric acid	> 0 to < 10
Hydrogen fluoride (Hydrofluoric acid)	> 0 to < 10
Hydroquinone	> 0 to < 10
Isophorone	> 0 to < 10
Lead Compounds	> 0 to < 10
Lindane (all isomers)	> 0 to < 10
Maleic anhydride	> 0 to < 10
Manganese Compounds	> 0 to < 10
m-Cresol	> 0 to < 10

Mercury Compounds	> 0 to < 10
Methanol	10 To < 25
Methoxychlor	> 0 to < 10
Methyl bromide (Bromomethane)	> 0 to < 10
Methyl chloride (Chloromethane)	> 0 to < 10
Methyl chloroform (1,1,1-Trichloroethane)	> 0 to < 10
Methyl ethyl ketone (2-Butanone)	> 0 to < 10
Methyl hydrazine	> 0 to < 10
Methyl iodide (Iodomethane)	> 0 to < 10
Methyl isobutyl ketone (Hexone)	> 0 to < 10
Methyl isocyanate	> 0 to < 10
Methyl methacrylate	> 0 to < 10
Methyl tert butyl ether (MTBE)	> 0 to < 10
Methylene chloride (Dichloromethane)	> 0 to < 10
Methylene diphenye diisocyanate (MDI)	> 0 to < 10
m-Xylenes	> 0 to < 10
N,N-Diethyl aniline (N,N-Dimethylaniline)	> 0 to < 10
Napthalene	> 0 to < 10
Nickel Compounds	> 0 to < 10
Nitrobenzene	> 0 to < 10
N-Nitrosodimethylamine	> 0 to < 10
N-Nitrosomorpholine	> 0 to < 10
N-Nitroso-N-methylurea	> 0 to < 10
o-Anisidine	> 0 to < 10
o-Cresol	> 0 to < 10
o-Toluidine	> 0 to < 10
o-Xylenes	> 0 to < 10
Parathion	> 0 to < 10

p-Cresol	> 0 to < 10
Pentachloronitrobenzene (Quintobenzene)	> 0 to < 10
Pentachlorophenol	> 0 to < 10
Phenol	> 0 to < 10
Phosgene	> 0 to < 10
Phosphine	> 0 to < 10
Phosphorus	> 0 to < 10
Phthalic anhydride	> 0 to < 10
Polychlorinated biphenyls (Aroclors)	> 0 to < 10
Polycyclic Organic Matter	> 0 to < 10
p-Phenylenediamine	> 0 to < 10
Propionaldehyde	> 0 to < 10
Propoxur (Baygon)	> 0 to < 10
Propylene dichloride	> 0 to < 10
Propylene oxide	> 0 to < 10
p-Xylenes	> 0 to < 10
Quinoline	> 0 to < 10
Quinone	> 0 to < 10
Radionuclides (including radon)	> 0 to < 10
Selenium Compounds	> 0 to < 10
Styrene	> 0 to < 10
Styrene oxide	> 0 to < 10
Tetrachloroethylene (Perchloroethylene)	> 0 to < 10
Titanium tetrachloride	> 0 to < 10
Toluene	> 0 to < 10
Toxaphene (chlorinated camphene)	> 0 to < 10
Trichloroethylene	> 0 to < 10
Triethylamine	> 0 to < 10

Trifluralin	> 0 to < 10
Vinyl acetate	> 0 to < 10
Vinyl bromide	> 0 to < 10
Vinyl chloride	> 0 to < 10
Vinylidene chloride (1,1-Dichloroethylene)	> 0 to < 10
Volatile Hazardous Air Pollutants	> 0 to < 10
Xylenes (isomers and mixture)	> 0 to < 10

B2 - Facility-Wide Actual Emissions Estimates

Pollutant	Maximum Actual Annual (tons per year)	5 Year Average Actual (tons per year)
Nitrogen Oxides	30.8	30.8
Particulate Matter	217.3	217.3
Particulate Matter <10 microns	55.2	55.2
Sulfur Dioxide	7.7	7.7
Total Hazardous Air Pollutants	33.4	33.4
Volatile Organic Compounds	413.3	413.3

C - RULE APPLICABILITY

Facility: West Fraser Inc. Application: 2012 PSD Application for Continuous Kilns

C1 - Regulatory Applicability

The following regulations have been identified as APPLICABLE:

FEDERAL	40 CFR 63 Subpart A - (excluding 63.13 and 63.15(a)(2)) General Provisions [391-3-1-.02(9)(b)15]
FEDNEW	- Enter into the comment field any newly promulgated Federal regulations that is applicable or potentially applicable to your facility that has not already been listed here. ***40 CFR Part 63, Subpart DDDD - National Emission Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products. (APPLICABLE)*** ***40 CFR 60 Subpart CCCC - NSPS for Commercial and Industrial Solid Waste Incineration units for which Construction is Commenced after November 30, 1999 or for which Modification or Reconstruction is Commenced on or After June 1, 2001 (NOT APPLICABLE)*** ***40 CFR 63 Subpart DDDDD - NESHAP for Industrial, Commercial, and Institutional Boilers and Process Heaters (NOT APPLICABLE)***
SIP	391-3-1-.02(2) (b) - Visible Emissions
SIP	391-3-1-.02(2) (d) - Fuel-burning Equipment
SIP	391-3-1-.02(2) (e) - Particulate Emission from Manufacturing Processes
SIP	391-3-1-.02(2) (g) - Sulfur Dioxide
SIP	391-3-1-.02(2) (n) - Fugitive Dust
SIP	391-3-1-.02(5) - Open Burning

C1 - Regulatory Applicability

The following regulations have been identified as NOT APPLICABLE:

FEDERAL	40 CFR 60 Subpart A - General Provisions [391-3-1-.02(8)(b)1]
FEDERAL	40 CFR 60 Subpart AA - NSPS for Steel Plants: Electric Arc Furnaces [391-3-1-.02(8)(b)32]
FEDERAL	40 CFR 60 Subpart AAa - NSPS for Steel Plants. Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels Constructed After August 17 [391-3-1-.02(8)(b)33]
FEDERAL	40 CFR 60 Subpart AAAA - NSPS for Small Municipal Waste Combustion Units for Which Construction is Commenced After August 30, 1999 [391-3-1-.02(8)(b)74]
FEDERAL	40 CFR 60 Subpart BB - NSPS for Kraft Pulp Mills [391-3-1-.02(8)(b)34]
FEDERAL	40 CFR 60 Subpart BBB - NSPS for Rubber Tire Manufacturing Industry [391-3-1-.02(8)(b)53]
FEDERAL	40 CFR 60 Subpart CC - NSPS for Glass Manufacturing Plants [391-3-1-.02(8)(b)35]

FEDERAL	40 CFR 60 Subpart CCCC - NSPS for Commercial and Industrial Solid Waste Incineration Units for Which Construction is Commenced After November 30, 1999 [391-3-1-.02(8)(b)75]
FEDERAL	40 CFR 60 Subpart D - NSPS for Fossil-fuel Fired Steam Generators [391-3-1-.02(8)(b)2]
FEDERAL	40 CFR 60 Subpart Da - NSPS for Electric Utility Steam Generating Units [391-3-1-.02(8)(b)3]
FEDERAL	40 CFR 60 Subpart Db - NSPS for Industrial-Commercial-Institutional Steam Generating Units [391-3-1-.02(8)(b)4]
FEDERAL	40 CFR 60 Subpart Dc - NSPS for Small Industrial -Commercial-Institutional Steam Generating Units [391-3-1-.02(8)(b)5]
FEDERAL	40 CFR 60 Subpart DD - NSPS for Grain Elevators [391-3-1-.02(8)(b)36]
FEDERAL	40 CFR 60 Subpart DDD - NSPS for Volatile Organic Compound (VOC) Emission from Polymer Manufacturing Industry [391-3-1-.02(8)(b)54]
FEDERAL	40 CFR 60 Subpart E - NSPS for Incinerators [391-3-1-.02(8)(b)6]
FEDERAL	40 CFR 60 Subpart Ea - NSPS for Municipal Waste Combustors [391-3-1-.02(8)(b)7]
FEDERAL	40 CFR 60 Subpart Eb - NSPS for Municipal Waste Combustors for Which Construction is Commenced after September 20, 1994 [391-3-1-.02(8)(b)71]
FEDERAL	40 CFR 60 Subpart Ec - NSPS for Hospital/Medical/Infectious Waste Incinerators for which construction is commenced after June 20, 1996 [391-3-1-.02(8)(b)73]
FEDERAL	40 CFR 60 Subpart EE - NSPS for Surface Coating of Metal Furniture [391-3-1-.02(8)(b)37]
FEDERAL	40 CFR 60 Subpart F - NSPS for Portland Cement Plants [391-3-1-.02(8)(b)8]
FEDERAL	40 CFR 60 Subpart FFF - NSPS for Flexible Vinyl and Urethane Printing and Coating [391-3-1-.02(8)(b)55]
FEDERAL	40 CFR 60 Subpart G - NSPS for Nitric Acid Plants [391-3-1-.02(8)(b)9]
FEDERAL	40 CFR 60 Subpart GG - NSPS for Stationary Gas Turbines [391-3-1-.02(8)(b)38]
FEDERAL	40 CFR 60 Subpart GGG - NSPS for Equipment Leaks of VOC in Petroleum Refineries [391-3-1-.02(8)(b)56]
FEDERAL	40 CFR 60 Subpart H - NSPS for Sulfuric Acid Plants [391-3-1-.02(8)(b)10]
FEDERAL	40 CFR 60 Subpart HH - NSPS for Lime Manufacturing Plants [391-3-1-.02(8)(b)39]
FEDERAL	40 CFR 60 Subpart HHH - NSPS for Synthetic Fiber Production Facilities [391-3-1-.02(8)(b)57]
FEDERAL	40 CFR 60 Subpart I - NSPS for Asphalt Concrete Plants [391-3-1-.02(8)(b)11]
FEDERAL	40 CFR 60 Subpart III - NSPS for Volatile Organic Compounds (VOC) Emissions From the Synthetic Organic Chemical Manufacturing Industry (SOCMI) Air Oxidation Unit

	Processes [391-3-1-.02(8)(b)58]
FEDERAL	40 CFR 60 Subpart J - NSPS for Petroleum Refineries [391-3-1-.02(8)(b)12]
FEDERAL	40 CFR 60 Subpart JJJ - NSPS for Petroleum Dry Cleaners [391-3-1-.02(8)(b)59]
FEDERAL	40 CFR 60 Subpart K - NSPS for Storage Vessels for Petroleum Liquids [391-3-1-.02(8)(b)13]
FEDERAL	40 CFR 60 Subpart Ka - NSPS for Storage Vessels for Petroleum Liquids [391-3-1-.02(8)(b)14]
FEDERAL	40 CFR 60 Subpart Kb - NSPS for Volatile Organic Liquid Storage Vessels [391-3-1-.02(8)(b)15]
FEDERAL	40 CFR 60 Subpart KK - NSPS for Lead-Acid Battery Manufacturing Plants [391-3-1-.02(8)(b)40]
FEDERAL	40 CFR 60 Subpart KKK - NSPS for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants [391-3-1-.02(8)(b)60]
FEDERAL	40 CFR 60 Subpart L - NSPS for Secondary Lead Smelters [391-3-1-.02(8)(b)16]
FEDERAL	40 CFR 60 Subpart LL - NSPS for Metallic Mineral Processing Plants [391-3-1-.02(8)(b)41]
FEDERAL	40 CFR 60 Subpart LLL - NSPS for Onshore Natural Gas Processing [391-3-1-.02(8)(b)61]
FEDERAL	40 CFR 60 Subpart M - NSPS for Secondary Brass and Bronze Ingot Production Plants [391-3-1-.02(8)(b)17]
FEDERAL	40 CFR 60 Subpart MM - NSPS for Automobile and Light-Duty Truck Coating Operations [391-3-1-.02(8)(b)42]
FEDERAL	40 CFR 60 Subpart N - NSPS for Iron and Steel Plants [391-3-1-.02(8)(b)18]
FEDERAL	40 CFR 60 Subpart Na - NSPS for Secondary Emissions from Basic Oxygen Process Steelmaking Facilities for Which Construction is Commenced After January 20 [391-3-1-.02(8)(b)19]
FEDERAL	40 CFR 60 Subpart NN - NSPS for Phosphate Rock Plants [391-3-1-.02(8)(b)43]
FEDERAL	40 CFR 60 Subpart NNN - NSPS for Volatile Organic Compounds (VOC) Emissions From the Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operation [391-3-1-.02(8)(b)62]
FEDERAL	40 CFR 60 Subpart O - NSPS for Sewage Treatment Plants [391-3-1-.02(8)(b)20]
FEDERAL	40 CFR 60 Subpart OOO - NSPS for Nonmetallic Mineral Processing Plants [391-3-1-.02(8)(b)63]
FEDERAL	40 CFR 60 Subpart P - NSPS for Primary Copper Smelters [391-3-1-.02(8)(b)21]
FEDERAL	40 CFR 60 Subpart PP - NSPS for Ammonium Sulfate Manufacture [391-3-1-.02(8)(b)44]

FEDERAL	40 CFR 60 Subpart PPP - NSPS for Wool Fiberglass Insulation Manufacturing Plants [391-3-1-.02(8)(b)64]
FEDERAL	40 CFR 60 Subpart Q - NSPS for Primary Zinc Smelters [391-3-1-.02(8)(b)22]
FEDERAL	40 CFR 60 Subpart QQ - NSPS for Graphic Arts Industry: Publication Rotogravure Printing [391-3-1-.02(8)(b)45]
FEDERAL	40 CFR 60 Subpart QQQ - NSPS for VOC Emissions from Petroleum Refinery Wastewater Systems [391-3-1-.02(8)(b)65]
FEDERAL	40 CFR 60 Subpart R - NSPS for Primary Lead Smelters [391-3-1-.02(8)(b)23]
FEDERAL	40 CFR 60 Subpart RR - NSPS for Pressure Sensitive Tape and Label Surface Coating Operations [391-3-1-.02(8)(b)46]
FEDERAL	40 CFR 60 Subpart RRR - NSPS for VOC Emissions from Synthethic Organic Chemical Manufacturing Industry (SOCMI) Reactor Process [391-3-1-.02(b)66]
FEDERAL	40 CFR 60 Subpart S - NSPS for Primary Aluminum Reduction [391-3-1-.02(8)(b)24]
FEDERAL	40 CFR 60 Subpart SS - NSPS for Industrial Surface Coating: Large Appliances [391-3-1-.02(8)(b)47]
FEDERAL	40 CFR 60 Subpart SSS - NSPS for Magnetic Tape Coating [391-3-1-.02(8)(b)67]
FEDERAL	40 CFR 60 Subpart T - NSPS for the Phosphate Fertilizer Industry: Wet-Process Phosphoric Acid Plants [391-3-1-.02(8)(b)25]
FEDERAL	40 CFR 60 Subpart TT - NSPS for Metal Coil Surface Coating [391-3-1-.02(8)(b)48]
FEDERAL	40 CFR 60 Subpart TTT - NSPS for Plastic Parts for Business Machine Coatings [391-3-1-.02(8)(b)68]
FEDERAL	40 CFR 60 Subpart U - NSPS for the Phosphate Fertilizer Industry: Superphosphoric Acid Plants [391-3-1-.02(8)(b)26]
FEDERAL	40 CFR 60 Subpart UU - NSPS for Asphalt Processing and Asphalt Roofing Manufacture [391-3-1-.02(8)(b)49]
FEDERAL	40 CFR 60 Subpart UUU - NSPS for Calciners and Dryers in Mineral Industries [391-3-1-.02(8)(b)69]
FEDERAL	40 CFR 60 Subpart V - NSPS for the Phosphate Fertilizer Industry: Diammonium Phosphate Plants [391-3-1-.02(8)(b)27]
FEDERAL	40 CFR 60 Subpart VV - NSPS for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry [391-3-1-.02(8)(b)50]
FEDERAL	40 CFR 60 Subpart VVV - NSPS for Polymeric Coating of Supporting Substrates Facilities [391-3-1-.02(8)(b)70]
FEDERAL	40 CFR 60 Subpart W - NSPS for the Phosphate Fertilizer Industry: Triple Superphosphate Plants [391-3-1-.02(8)(b)28]
FEDERAL	40 CFR 60 Subpart WW - NSPS for Beverage Can Surface Coating Industry [391-3-1-.02(8)(b)51]

FEDERAL	40 CFR 60 Subpart WWW - NSPS for Municipal Solid Waste Landfills [391-3-1-.02(8)(b)72]
FEDERAL	40 CFR 60 Subpart X - NSPS for the Phosphate Fertilizer Industry: Granular Triple Superphosphate Storage Facilities [391-3-1-.02(8)(b)29]
FEDERAL	40 CFR 60 Subpart XX - NSPS for Bulk Gasoline Terminals [391-3-1-.02(8)(b)52]
FEDERAL	40 CFR 60 Subpart Y - NSPS for Coal Preparation Plants [391-3-1-.02(8)(b)30]
FEDERAL	40 CFR 60 Subpart Z - NSPS for Ferroalloy Production Facilities [391-3-1-.02(8)(b)31]
FEDERAL	40 CFR 61 Subpart BB - NESHAP for Benzene Emissions from Benzene Transfer Operations [391-3-1-.02(9)(b)13]
FEDERAL	40 CFR 61 Subpart C - NESHAP for Beryllium [391-3-1-.02(9)(b)1]
FEDERAL	40 CFR 61 Subpart D - NESHAP for Beryllium Rocket Motor Firing [391-3-1-.02(9)(b)2]
FEDERAL	40 CFR 61 Subpart E - NESHAP for Mercury [391-3-1-.02(9)(b)3]
FEDERAL	40 CFR 61 Subpart F - NESHAP for Vinyl Chloride [391-3-1-.02(9)(b)4]
FEDERAL	40 CFR 61 Subpart FF - NESHAP for Benzene Waste Operations [391-3-1-.02(9)(b)14]
FEDERAL	40 CFR 61 Subpart J - NESHAP for Equipment Leaks (Fugitive Emission Sources) of Benzene [391-3-1-.02(9)(b)5]
FEDERAL	40 CFR 61 Subpart L - NESHAP for Benzene Emissions from Coke Byproduct Recovery Plants [391-3-1-.02(9)(b)6]
FEDERAL	40 CFR 61 Subpart M - NESHAP for Asbestos (inc. work practices) [391-3-1-.02(9)(b)7]
FEDERAL	40 CFR 61 Subpart N - NESHAP for Inorganic Arsenic Emissions from Glass Manufacturing Plants [391-3-1-.02(9)(b)8]
FEDERAL	40 CFR 61 Subpart O - NESHAP for Inorganic Arsenic Emissions from Primary Copper Smelters [391-3-1-.02(9)(b)9]
FEDERAL	40 CFR 61 Subpart P - NESHAP for Inorganic Arsenic Emissions from Arsenic Trioxide and Metallic Arsenic Production Facilities [391-3-1-.02(9)(b)10]
FEDERAL	40 CFR 61 Subpart V - NESHAP for Equipment Leaks (Fugitive Emission Sources) of VHAP [391-3-1-.02(9)(b)11]
FEDERAL	40 CFR 61 Subpart Y - NESHAP for Benzene Emissions from Benzene Storage Vessels [391-3-1-.02(9)(b)12]
FEDERAL	40 CFR 63 Subpart AA - NESHAP for Phosphoric Acid Manufacturing Plants [391-3-1-.02(9)(b)41]
FEDERAL	40 CFR 63 Subpart B - Sections 63.40 through 63.44, Requirements for Control Technology Determinations for Major Sources in Accordance with the Clean Air Act sections 112(g) [391-3-1-.02(9)(b)16]
FEDERAL	40 CFR 63 Subpart B - Sections 63.50 through 63.56, Requirements for Control Technology Determinations for Major Sources in Accordance with the Clean Air Act

sections 112(g) [391-3-1-.02(9)(b)17]

FEDERAL 40 CFR 63 Subpart BB - NESHAP for Phosphate Fertilizer Production Plants [391-3-1-.02(9)(b)42]

FEDERAL 40 CFR 63 Subpart CC - NESHAP for Emission Standards for Hazardous Air Pollutants from Petroleum Refineries - 63.642(k)procedures for 63.642(g) [391-3-1-.02(9)(b)43]

FEDERAL 40 CFR 63 Subpart CCC - NESHAP for Steel Pickling – HCl Process Facilities and HCl Regeneration Plants [391-3-1-.02(9)(b)65]

FEDERAL 40 CFR 63 Subpart CCCC - NESHAP for Nutritional Yeast Manufacturing [391-3-1-.02(9)(b)91]

FEDERAL 40 CFR 63 Subpart D - Compliance Extensions for Early Reductions [391-3-1-.02(9)(b)19]

FEDERAL 40 CFR 63 Subpart DDD - NESHAP for Mineral Wool Production [391-3-1-.02(9)(b)66]

FEDERAL 40 CFR 63 Subpart EE - NESHAP for Magnetic Tape Manufacturing Operations [391-3-1-.02(9)(b)45]

FEDERAL 40 CFR 63 Subpart EEE - NESHAP for Hazardous Waste Combustors [391-3-1-.02(9)(b)67]

FEDERAL 40 CFR 63 Subpart F - NESHAP for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry [391-3-1-.02(9)(b)20]

FEDERAL 40 CFR 63 Subpart G - NESHAP for Organic Hazardous Air Pollutants from Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater. [391-3-1-.02(9)(b)21]

FEDERAL 40 CFR 63 Subpart GG - NESHAP for Emission Standards for Aerospace Manufacturing and Rework Facilities [391-3-1-.02(9)(b)47]

FEDERAL 40 CFR 63 Subpart GGG - NESHAP for Pharmaceuticals Production [391-3-1-.02(9)(b)69]

FEDERAL 40 CFR 63 Subpart GGGG - NESHAP for Vegetable Oil Production [391-3-1-.02(9)(b)95]

FEDERAL 40 CFR 63 Subpart H - NESHAP for Organic Hazardous Air Pollutants for Equipment Leaks [391-3-1-.02(9)(b)22]

FEDERAL 40 CFR 63 Subpart HH - NESHAP for Oil and Natural Gas Production Facilities [391-3-1-.02(9)(b)48]

FEDERAL 40 CFR 63 Subpart HHH - NESHAP for Natural Gas Transmission and Storage Facilities [391-3-1-.02(9)(b)70]

FEDERAL 40 CFR 63 Subpart HHHH - NESHAP for Wet Formed Fiberglass Mat Production [391-3-1-.02(9)(b)96]

FEDERAL 40 CFR 63 Subpart I - NESHAP for Organic Hazardous Air Pollutants for Certain Processes Subject to the Negotiated Regulation for Equipment Leaks [391-3-1-.02(9)(b)23]

FEDERAL 40 CFR 63 Subpart II - NESHAP for Emission Standards for Shipbuilding and

Repair(Surface Coating [391-3-1-.02(9)(b)49]

FEDERAL 40 CFR 63 Subpart III - NESHAP for Flexible Polyurethane Foam Production [391-3-1-.02(9)(b)71]

FEDERAL 40 CFR 63 Subpart J - NESHAP for Polyvinyl Chloride and Copolymers Production [391-3-1-.02(9)(b)24]

FEDERAL 40 CFR 63 Subpart JJ - NESHAP for Emission Standards for Wood Furniture Manufacturing Operations [391-3-1-.02(9)(b)50]

FEDERAL 40 CFR 63 Subpart JJJ - NESHAP for Group IV Polymers and Resins [391-3-1-.02(9)(b)72]

FEDERAL 40 CFR 63 Subpart KK - NESHAP for Printing and Publishing Operations [391-3-1-.02(9)(b)51]

FEDERAL 40 CFR 63 Subpart L - NESHAP for Coke Oven Batteries [391-3-1-.02(9)(b)26]

FEDERAL 40 CFR 63 Subpart LL - NESHAP for Primary Aluminum Reduction Plants [391-3-1-.02(9)(b)52]

FEDERAL 40 CFR 63 Subpart LLL - NESHAP for Portland Cement Manufacturing Industry [391-3-1-.02(9)(b)74]

FEDERAL 40 CFR 63 Subpart M - NESHAP Perchloroethylene Air Dry Cleaning Facilities [391-3-1-.02(9)(b)27]

FEDERAL 40 CFR 63 Subpart MM - NESHAP for Combustion Sources at Kraft, Soda, and Sulfite Pulp and Paper Mills [391-3-1-.02(9)(b)53]

FEDERAL 40 CFR 63 Subpart MMM - NESHAP for Pesticide Active Ingredient Production [391-3-1-.02(9)(b)75]

FEDERAL 40 CFR 63 Subpart N - NESHAP for Chromium Emissions from Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks [391-3-1-.02(9)(b)28]

FEDERAL 40 CFR 63 Subpart NNN - NESHAP for Wool Fiberglass Manufacturing [391-3-1-.02(9)(b)76]

FEDERAL 40 CFR 63 Subpart NNNN - NESHAP for Large Appliance Surface Coating [391-3-1-.02(9)(b)102]

FEDERAL 40 CFR 63 Subpart O - NESHAP Ethylene Oxide Sterilization Facilities [391-3-1-.02(9)(b)29]

FEDERAL 40 CFR 63 Subpart OO - NESHAP for Tanks, Level 1 [391-3-1-.02(9)(b)55]

FEDERAL 40 CFR 63 Subpart OOO - NESHAP for Amino/Phenolic Resins Production [391-3-1-.02(9)(b)77]

FEDERAL 40 CFR 63 Subpart PP - NESHAP for Containers [391-3-1-.02(9)(b)56]

FEDERAL 40 CFR 63 Subpart PPP - NESHAP for Polyether Polyols Production [391-3-1-.02(9)(b)78]

FEDERAL 40 CFR 63 Subpart Q - NESHAP for Hazardous Air Pollutants for Industrial Process Cooling Towers [391-3-1-.02(9)(b)31]

FEDERAL	40 CFR 63 Subpart QQ - NESHAP for Surface Impoundments [391-3-1-.02(9)(b)57]
FEDERAL	40 CFR 63 Subpart QQQ - NESHAP for Primary Copper Smelting [391-3-1-.02(9)(b)79]
FEDERAL	40 CFR 63 Subpart QQQQQ - NESHAP for Friction Products Manufacturing [391-3-1-.02(9)(b)131]
FEDERAL	40 CFR 63 Subpart R - NESHAP for Gasoline Distribution Facilities (Bulk Gasoline Terminals and Pipeline Breakout Stations) [391-3-1-.02(9)(b)32]
FEDERAL	40 CFR 63 Subpart RR - NESHAP for Individual Drain Systems [391-3-1-.02(9)(b)58]
FEDERAL	40 CFR 63 Subpart RRR - NESHAP for Secondary Aluminum Production [391-3-1-.02(9)(b)80]
FEDERAL	40 CFR 63 Subpart S - NESHAP for Pulp and Paper Industries [391-3-1-.02(9)(b)33]
FEDERAL	40 CFR 63 Subpart SS - NESHAP for Closed Vent Systems, Control Devices, Recovery Devices and Routing to a Fuel Gas System or a Process [391-3-1-.02(9)(b)59]
FEDERAL	40 CFR 63 Subpart SSSS - NESHAP for Metal Coil Surface Coating [391-3-1-.02(9)(b)107]
FEDERAL	40 CFR 63 Subpart T - NESHAP for Halogenated Solvent Cleaning [391-3-1-.02(9)(b)34]
FEDERAL	40 CFR 63 Subpart TT - NESHAP for Equipment Leaks, Control Level 1 [391-3-1-.02(9)(b)60]
FEDERAL	40 CFR 63 Subpart TTT - NESHAP for Primary Lead Smelting [391-3-1-.02(9)(b)82]
FEDERAL	40 CFR 63 Subpart TTTT - NESHAP for Leather Finishings Operations [391-3-1-.02(9)(b)108]
FEDERAL	40 CFR 63 Subpart U - NESHAP for Group I Polymers and Resins [391-3-1-.02(9)(b)35]
FEDERAL	40 CFR 63 Subpart UU - NESHAP for Equipment Leaks, Control Level 2 [391-3-1-.02(9)(b)61]
FEDERAL	40 CFR 63 Subpart UUU - NESHAP for Petroleum Refineries: Catalytic Cracking, Catalytic Reforming, and Sulfur Plant Units [391-3-1-.02(9)(b)83]
FEDERAL	40 CFR 63 Subpart UUUU - NESHAP for Cellulose Production Manufacturing [391-3-1-.02(9)(b)109]
FEDERAL	40 CFR 63 Subpart VV - NESHAP for Oil-Water Separators and Organic-Water Separators [391-3-1-.02(9)(b)62]
FEDERAL	40 CFR 63 Subpart VVV - NESHAP for Publicly Owned Treatment Works [391-3-1-.02(9)(b)84]
FEDERAL	40 CFR 63 Subpart VVVV - NESHAP for Boat Manufacturing [391-3-1-.02(9)(b)110]
FEDERAL	40 CFR 63 Subpart W - NESHAP for Hazardous Air Pollutants for Epoxy Resins Production and Non-Nylon Polyamides Production [391-3-1-.02(9)(b)37]
FEDERAL	40 CFR 63 Subpart WW - NESHAP for Storage Vessels (Tanks) Control Level 2 [391-3-1-.02(9)(b)63]

FEDERAL	40 CFR 63 Subpart X - NESHAP for Hazardous Air Pollutants From Secondary Lead Smelting [391-3-1-.02(9)(b)38]
FEDERAL	40 CFR 63 Subpart XXX - NESHAP for Ferroalloys Production: Ferromanganese and Silicomanganese [391-3-1-.02(9)(b)86]
FEDERAL	40 CFR 63 Subpart XXXX - NESHAP for Tire Manufacturing [391-3-1-.02(9)(b)112]
FEDERAL	40 CFR 63 Subpart Y - NESHAP for Emission Standards for Marine Tank Vessel Loading Operations [391-3-1-.02(9)(b)39]
FEDERAL	40 CFR 63 Subpart YY - NESHAP for Generic MACT Standards [391-3-1-.02(9)(b)64]
FEDERAL	40 CFR 64 - Compliance Assurance Monitoring [391-3-1-.02((11)]
FEDERAL	40 CFR 68 - Chemical Accident Prevention Provisions [391-3-1-.02(10)]
FEDERAL	40 CFR 72 - Permit Regulations [391-3-1-.13]
FEDERAL	40 CFR 73 - Allowance System
FEDERAL	40 CFR 75 - Continuous Emission Monitoring
FEDERAL	40 CFR 76 - Acid Rain Nitrogen Oxides Emission Reduction Program
FEDERAL	40 CFR 77 - Excess Emissions
FEDERAL	40 CFR 82 Subpart A - Production and Consumption Controls
FEDERAL	40 CFR 82 Subpart B - Servicing of Motor Vehicle Air Conditioners
FEDERAL	40 CFR 82 Subpart C - Ban on Nonessential Products Containing Class I Substances and Ban on Nonessential Products Containing or Manufactured with Class II Substances
FEDERAL	40 CFR 82 Subpart D - Federal Procurement
FEDERAL	40 CFR 82 Subpart E - The Labeling of Products Using Ozone Depleting Substances
FEDERAL	40 CFR 82 Subpart F - Recycling and Emissions Reduction
FEDERAL	40 CFR 82 Subpart F - Refrigerant Recycling Rule
FEDERAL	40 CFR 82 Subpart G - Significant New Alternative Program
FEDERAL	40 CFR 82 Subpart G - Significant New Alternatives Policy Program
Other	- Other regulation - List additional regulations in the Comment blank.
PBR	391-3-1-.03(11) (b)1 - Fuel-burning Equipment Burning Natural Gas/LPG and/or Distillate Oil
PBR	391-3-1-.03(11) (b)10 - Fiberglas Molding and Forming Operations
PBR	391-3-1-.03(11) (b)11 - Peanut/Nut Shelling Operation
PBR	391-3-1-.03(11) (b)2 - Fuel-burning Equipment Burning Natural Gas/LPG and/or Residual Oil

PBR	391-3-1-.03(11) (b)3 - On-Site Power Generation
PBR	391-3-1-.03(11) (b)4 - Concrete Mixing Plants
PBR	391-3-1-.03(11) (b)5 - Hot Mix Asphalt Plants
PBR	391-3-1-.03(11) (b)6 - Cotton Ginning Operations
PBR	391-3-1-.03(11) (b)7 - Coating and/or Gluing Operations
PBR	391-3-1-.03(11) (b)8 - Printing Operations
PBR	391-3-1-.03(11) (b)9 - Non-reactive Mixing Operations
SIP	391-3-1-.02(2) (aa) - VOC Emissions from Wire Coating
SIP	391-3-1-.02(2) (aaa) - Consumer and Commercial Products
SIP	391-3-1-.02(2) (bb) - Petroleum Liquid Storage
SIP	391-3-1-.02(2) (bbb) - Gasoline Marketing
SIP	391-3-1-.02(2) (c) - Incinerators
SIP	391-3-1-.02(2) (cc) - Bulk Gasoline Terminals
SIP	391-3-1-.02(2) (ccc) - VOC Emissions from Bulk Mixing Tanks
SIP	391-3-1-.02(2) (dd) - Cutback Asphalt
SIP	391-3-1-.02(2) (ddd) - VOC Emissions from Offset Lithography
SIP	391-3-1-.02(2) (ee) - Petroleum Refinery
SIP	391-3-1-.02(2) (eee) - VOC Emissions from Expanded Polystyrene Products Manufacturing
SIP	391-3-1-.02(2) (f) - Normal Superphosphate Facilities
SIP	391-3-1-.02(2) (fff) - Particulate Emissions from Yarn Spinning Operations
SIP	391-3-1-.02(2) (gg) - Kraft Pulp Mills
SIP	391-3-1-.02(2) (ggg) - Existing Municipal Solid Waste Landfills
SIP	391-3-1-.02(2) (h) - Portland Cement Plants
SIP	391-3-1-.02(2) (hh) - Petroleum Refinery Equipment Leaks
SIP	391-3-1-.02(2) (hhh) - Wood Furniture Finishing and Cleaning Operations
SIP	391-3-1-.02(2) (i) - Nitric Acid Plants
SIP	391-3-1-.02(2) (ii) - VOC Emissions from Surface Coating of Miscellaneous Metal Parts and Products
SIP	391-3-1-.02(2) (iii) - Hospital/Medical/Infectious Waste Incinerators Constructed

SIP	391-3-1-.02(2) (j) - Sulfuric Acid Plants
SIP	391-3-1-.02(2) (jj) - VOC Emissions from Surface Coating of Flat Wood Paneling
SIP	391-3-1-.02(2) (jjj) - NOx Emissions from Electric Utility Steam Generating Units
SIP	391-3-1-.02(2) (k) - Asphaltic Concrete Hot Mix Plants
SIP	391-3-1-.02(2) (kk) - VOC Emissions from Synthesized Pharmaceutical Manufacturing
SIP	391-3-1-.02(2) (kkk) - VOC Emissions from Aerospace Manufacturing and Rework Faci
SIP	391-3-1-.02(2) (l) - Conical Burners
SIP	391-3-1-.02(2) (ll) - VOC Emissions from the Manufacture of Pneumatic Rubber Tire
SIP	391-3-1-.02(2) (lll) - NOx Emissions from Fuel-burning Equipment
SIP	391-3-1-.02(2) (mm) - VOC Emissions from Graphic Arts Systems
SIP	391-3-1-.02(2) (mmm) - NOx Emissions from Stationary Gas Turbines and Stationary
SIP	391-3-1-.02(2) (nn) - VOC Emissions from External Floating Roof Tanks
SIP	391-3-1-.02(2) (nnn) - NOx Emissions from Large Stationary Gas Turbines
SIP	391-3-1-.02(2) (o) - Cupola Furnaces for Metallurgical Melting
SIP	391-3-1-.02(2) (oo) - Fiberglass Insulation Manufacturing Plants
SIP	391-3-1-.02(2) (ooo) - Heavy-Duty Diesel Engine Requirements
SIP	391-3-1-.02(2) (p) - Kaolin and Fuller's Earth Processes
SIP	391-3-1-.02(2) (pp) - Bulk Gasoline Plants
SIP	391-3-1-.02(2) (ppp) - Commercial/Industrial/Solid Waste Incinerators Constructed
SIP	391-3-1-.02(2) (q) - Cotton Gins
SIP	391-3-1-.02(2) (qq) - VOC Emissions from Large Petroleum Dry Cleaners
SIP	391-3-1-.02(2) (r) - Granular and Mixed Fertilizer Manufacturing Units
SIP	391-3-1-.02(2) (rr) - Gasoline Dispensing Facility - Stage I
SIP	391-3-1-.02(2) (ss) - Gasoline Transport Vehicles and Vapor Collection Systems
SIP	391-3-1-.02(2) (t) - VOC Emissions from Automobile and Light-Duty Truck Manufacturing
SIP	391-3-1-.02(2) (tt) - VOC Emissions From Major Sources
SIP	391-3-1-.02(2) (u) - VOC Emissions from Can Coating
SIP	391-3-1-.02(2) (uu) - Visibility Protection

SIP	391-3-1-.02(2) (v) - VOC Emissions from Coil Coating
SIP	391-3-1-.02(2) (vv) - Volatile Organic Liquid Handling and Storage
SIP	391-3-1-.02(2) (w) - VOC Emissions from Paper Coating
SIP	391-3-1-.02(2) (x) - VOC Emissions from Fabric and Vinyl Coating
SIP	391-3-1-.02(2) (y) - VOC Emissions from Metal Furniture Coating
SIP	391-3-1-.02(2) (yy) - Nitrogen Oxide Emissions From Major Sources
SIP	391-3-1-.02(2) (z) - VOC Emissions from Large Appliance Surface Coating
SIP	391-3-1-.02(2) (zz) - Gasoline Dispensing Facilities--Stage II
SIP	391-3-1-.02(3) - Sampling
SIP	391-3-1-.02(6) - Source Monitoring
SIPNEW	- Enter into the comment field any newly promulgated SIP regulations that is applicable or potentially applicable to your facility that has not already been listed here.

C1 - Regulatory Applicability

The following regulations have been identified as POTENTIALLY APPLICABLE:

FEDERAL	40 CFR 61 Subpart A - General Provisions
SIP	391-3-1-.02(2) (ff) - Solvent Metal Cleaning

C2 - Title VI Applicability

Does your facility have any air conditioners or refrigeration equipment that uses CFC's, HFC's or other stratospheric ozone-depleting substances listed in 40 CFR Part 82, Subpart A, Appendices A and B?

Yes

Does any air conditioner or any piece of refrigeration equipment contain a refrigerant charge of greater than 50 lbs?

No

Does your facility maintain, service, repair, or dispose of any motor vehicle air conditioners (MVAC's) or appliances?

No

Comments:

D1 - Insignificant Activities

Facility: West Fraser Inc.

Application: 2012 PSD Application for Continuous Kilns

Category:	Industrial Operations
Insignificant Activity:	Carving, cutting, routing, turning, drilling, machining, sawing, surface grinding, sanding, planing, buffing, shot blasting, shot peening, or polishing; ceramics, glass, leather, metals, plastics, rubber, concrete, paper stock or wood, also including roll grinding and ground wood pulping stone sharpening, provided that: Activity is performed indoors; and No significant fugitive particulate emissions enter the outdoor atmosphere; and No visible emissions enter the outdoor atmosphere.
Quantity:	1
Comment:	Various activities
Category:	Maintenance, Cleaning, and Housekeeping
Insignificant Activity:	Cold cleaners having an air/vapor interface of not more than 10 square feet and that do not use a halogenated solvent.
Quantity:	5
Comment:	
Category:	Mobile Sources
Insignificant Activity:	Cleaning and sweeping of streets and paved surfaces
Quantity:	1
Comment:	
Category:	Storage Tanks and Equipment
Insignificant Activity:	All petroleum liquid storage tanks with a capacity of less than 10,000 gallons storing a petroleum liquid.
Quantity:	14
Comment:	
Category:	Storage Tanks and Equipment
Insignificant Activity:	Portable drums, barrels and totes provided that the volume of each container does not exceed 550 gallons.
Quantity:	1
Comment:	Various

D2 - Generic Emissions Grouping

Facility: West Fraser Inc.

Application: 2012 PSD Application for Continuous Kilns

This table lists the Generic Emissions Grouping information for groups of emission units that are subject to one or more of the three Georgia Rules, 391-3-1-.02(2)(b), (e), and (n) and the potential emissions of particulate matter, based on TSP, are less than 25 tons per year per process line or unit in each group.
Any Emissions Unit subject to a NESHAP, NSPS, or any specific Air Quality Permit condition(s) is not included.

Unit ID:	**DB01**
Number of Units:	1
Number of Units in Compliance:	1
Applicable Ga Rule(b):	Yes
Applicable Ga Rule(e):	Yes
Applicable Ga Rule(n):	No
Comments:	

Unit ID:	**LC01**
Number of Units:	1
Number of Units in Compliance:	1
Applicable Ga Rule(b):	Yes
Applicable Ga Rule(e):	Yes
Applicable Ga Rule(n):	No
Comments:	

Unit ID:	**LM01**
Number of Units:	1
Number of Units in Compliance:	1
Applicable Ga Rule(b):	Yes
Applicable Ga Rule(e):	Yes
Applicable Ga Rule(n):	No
Comments:	

D2 - Generic Emissions Grouping

Facility: West Fraser Inc.

Application: 2012 PSD Application for Continuous Kilns

Unit ID:	**WH01**
Number of Units:	1
Number of Units in Compliance:	1
Applicable Ga Rule(b):	Yes
Applicable Ga Rule(e):	Yes
Applicable Ga Rule(n):	No
Comments:	

D3 - Generic Fuel Burning Equipment

Facility: West Fraser Inc.

Application: 2012 PSD Application for Continuous Kilns

This table lists the groups of fuel burning emission units indicating the number of units in each group and the number of units in compliance with Georgia Rules 391-3-1-.02(2) (d) and possibly (b):

	Number of Units	Number of Units in Compliance
Any fuel burning equipment with a rated heat input capacity of 1 million BTU/hr or less.	0	0
Fuel burning equipment with a rated heat input capacity of less than 10 million BTU/hr burning only natural gas and/or LPG.	0	0
Fuel burning equipment with a rated heat input capacity of less than 5 million BTU/hr, burning only distillate fuel oil, natural gas and/or LPG.	0	0

D6 - Insignificant Activities based on Emission Levels

Facility: West Fraser Inc. Application: 2012 PSD Application for Continuous Kilns

These Emission Units or Activities are not listed elsewhere in the application and whose potential emissions are:

1) less than 10,000 lb. per year of any regulated air pollutant; AND
2) less than 1,000 lb. per year of any regulated HAP and less than 2,500 lb. per year of any combination of regulated HAPs; AND
3) less than 5,000 lb. per year of volatile organic compounds and oxides of nitrogen in the non-attainment area; AND
4) not subject to any specific state or federal standards or permit conditions.

Activity	No. of Units
For recreational purposes or cooking food for immediate human consumption	1
Planer Mill and inherent cyclone - planes, cuts, sorts, and packages lumber	1

D7 - Significant Emission Units
Dryers, Calciners, Kilns and Ovens

Facility: West Fraser Inc.

Application: 2012 PSD Application for Continuous Kilns

Emission Unit: KD04 Continuous Kiln #1

Emission Unit

Unit ID:	KD04
Unit Name:	Continuous Kiln #1

Model Information

Manufacturer:	Custom
Model Number:	Custom
Date Manufactured or Reconstructed:	2012/2013
Installation Date:	2013
Type of Emission Unit:	Kiln

Equipment Type

This unit is a type of: Other:
Direct-fired Continuous Lumber Kiln

Description

Direct-fired Continuous Lumber Kiln

Fuels and Firing Conditions:

Fuel: Sawdust

Maximum Hourly Consumption:	7778 lbs
Maximum Annual Consumption:	34067 tons
Maximum Fuel Heating Value:	4500 Btu/lb
Maximum Heat Input:	35 MMBtu/hr
Maximum Allowable Sulfur Percentage:	2.5 %

Material: Southern Yellow Pine Lumber

Maximum Hourly Input Rate:	12600 bf/hr
Average Free Moisture Content:	50 %

Comments

Dryers, Calciners, Kilns and Ovens

Emission Unit: KD05 Continuous Kiln #2

Emission Unit

Unit ID:	KD05
Unit Name:	Continuous Kiln #2

Model Information

Manufacturer:	Custom
Model Number:	Custom
Date Manufactured or Reconstructed:	2012/2013
Installation Date:	2013
Type of Emission Unit:	Kiln

Equipment Type

This unit is a type of: Other:
Direct-fired Continuous Lumber Kiln

Description

Direct-fired Continuous Lumber Kiln

Fuels and Firing Conditions:

Fuel: Sawdust

Maximum Hourly Consumption:	7778 lbs
Maximum Annual Consumption:	34067 tons
Maximum Fuel Heating Value:	4500 Btu/lb
Maximum Heat Input:	35 MMBtu/hr
Maximum Allowable Sulfur Percentage:	2.5 %

Material: Southern Yellow Pine lumber

Maximum Hourly Input Rate:	12600 bf/hr
Average Free Moisture Content:	50 %

Comments

D8 - Fugitive Emissions

These Fugitive Emissions Sources are not listed elsewhere in this application including Insignificant Activities and Fugitive Emissions Associated with Leak Detection and Repair (LDAR).

Emission Unit ID:	**RF01**
Name of the Source:	Unpaved Road Dust
Description of the Emissions:	Fugitive dust from vehicle traffic

Emission Unit ID:	**RF02**
Name of the Source:	Paved Road Dust
Description of the Emissions:	Fugitive dust from vehicle traffic

D12 - Stack and Process Vent Summary

Facility: West Fraser Inc.

Application: 2012 PSD Application for Continuous Kilns

Stack ID	**KD04**
Stack Name	Continuous Kiln 1 - Stack A
Stack Height	35 feet
All Emission Units Exhausting throught this Stack	KD04
All Pollution Control Devices Exhuasting through this Stack	N/A

Stack ID	**KD04**
Stack Name	Continuous Kiln 1 - Stack B
Stack Height	35 feet
All Emission Units Exhausting throught this Stack	KD04
All Pollution Control Devices Exhuasting through this Stack	N/A

Stack ID	**KD05**
Stack Name	Continuous Kiln 2 - Stack A
Stack Height	35 feet
All Emission Units Exhausting throught this Stack	KD05
All Pollution Control Devices Exhuasting through this Stack	N/A

Stack ID	**KD05**
Stack Name	Continuous Kiln 2 - Stack B
Stack Height	35 feet
All Emission Units Exhausting throught this Stack	KD05
All Pollution Control Devices Exhuasting through this Stack	N/A

Summary of Emissions - Units, Groups

Facility: West Fraser Inc. Application: 2012 PSD Application for Continuous

Emission Unit: KD04 Continuous Kiln #1

Pollutant Carbon Monoxide

Numerical Emission Limit or Standard:	
Maximum Actual Emissions in Units of the Standard:	
Maximum Actual Emissions in Tons per Year:	40.15 tons/yr
Method the Emissions were determined (CEM, Stack Testing, Mass Balance, etc.):	NCASI Factor, from publically available document
Applicable Federal Standard:	
Applicable State Standard:	
Applicable Permit Condition(s):	
Is this a Proposed Voluntary Limit?	No
Is there a Work Practice or Design Standard?	No
Is this in Compliance with the Standard(s) ?	No

Emission Unit: KD04 Continuous Kiln #1

Pollutant Nitrogen Oxides

Numerical Emission Limit or Standard:	
Maximum Actual Emissions in Units of the Standard:	
Maximum Actual Emissions in Tons per Year:	15.4 tons/yr
Method the Emissions were determined (CEM, Stack Testing, Mass Balance, etc.):	NCASI Factor, from publically available document
Applicable Federal Standard:	
Applicable State Standard:	
Applicable Permit Condition(s):	
Is this a Proposed Voluntary Limit?	No
Is there a Work Practice or Design Standard?	No
Is this in Compliance with the Standard(s) ?	No

Emission Unit: KD04 Continuous Kiln #1

Pollutant Particulate Matter

Numerical Emission Limit or Standard:	0
Maximum Actual Emissions in Units of the Standard:	0
Maximum Actual Emissions in Tons per Year:	7.59 tons/yr
Method the Emissions were determined (CEM, Stack Testing, Mass Balance, etc.):	NCASI Factor, from publically available document
Applicable Federal Standard:	
Applicable State Standard:	
Applicable Permit Condition(s):	
Is this a Proposed Voluntary Limit?	No
Is there a Work Practice or Design Standard?	No
Is this in Compliance with the Standard(s) ?	No

Emission Unit: KD04 Continuous Kiln #1

Pollutant Particulate Matter <10 microns

Numerical Emission Limit or Standard:	0
Maximum Actual Emissions in Units of the Standard:	0
Maximum Actual Emissions in Tons per Year:	5.72 tons/yr
Method the Emissions were determined (CEM, Stack Testing, Mass Balance, etc.):	NCASI Factor, from publically available document
Applicable Federal Standard:	
Applicable State Standard:	
Applicable Permit Condition(s):	
Is this a Proposed Voluntary Limit?	No
Is there a Work Practice or Design Standard?	No
Is this in Compliance with the Standard(s) ?	No

Emission Unit: KD04 Continuous Kiln #1

Pollutant Sulfur Dioxide

Numerical Emission Limit or Standard:	0
Maximum Actual Emissions in Units of the Standard:	0
Maximum Actual Emissions in Tons per Year:	3.83 tons/yr
Method the Emissions were determined (CEM, Stack Testing, Mass Balance, etc.):	AP-42
Applicable Federal Standard:	
Applicable State Standard:	
Applicable Permit Condition(s):	
Is this a Proposed Voluntary Limit?	No
Is there a Work Practice or Design Standard?	No
Is this in Compliance with the Standard(s) ?	No

Emission Unit: KD04 Continuous Kiln #1

Pollutant Volatile Organic Compounds

Numerical Emission Limit or Standard:	
Maximum Actual Emissions in Units of the Standard:	0
Maximum Actual Emissions in Tons per Year:	206.53 tons/yr
Method the Emissions were determined (CEM, Stack Testing, Mass Balance, etc.):	NCASI Factor, from publically available document
Applicable Federal Standard:	
Applicable State Standard:	
Applicable Permit Condition(s):	
Is this a Proposed Voluntary Limit?	No
Is there a Work Practice or Design Standard?	No
Is this in Compliance with the Standard(s) ?	No

Emission Unit: KD05 Continuous Kiln #2

Pollutant Carbon Monoxide

Numerical Emission Limit or Standard:	
Maximum Actual Emissions in Units of the Standard:	0
Maximum Actual Emissions in Tons per Year:	40.15 tons/yr
Method the Emissions were determined (CEM, Stack Testing, Mass Balance, etc.):	NCASI Factor, from publically available document
Applicable Federal Standard:	
Applicable State Standard:	
Applicable Permit Condition(s):	
Is this a Proposed Voluntary Limit?	No
Is there a Work Practice or Design Standard?	No
Is this in Compliance with the Standard(s) ?	No

Emission Unit: KD05 Continuous Kiln #2

Pollutant Nitrogen Oxides

Numerical Emission Limit or Standard:	
Maximum Actual Emissions in Units of the Standard:	0
Maximum Actual Emissions in Tons per Year:	15.4 tons/yr
Method the Emissions were determined (CEM, Stack Testing, Mass Balance, etc.):	NCASI Factor, from publically available document
Applicable Federal Standard:	
Applicable State Standard:	
Applicable Permit Condition(s):	
Is this a Proposed Voluntary Limit?	No
Is there a Work Practice or Design Standard?	No
Is this in Compliance with the Standard(s) ?	No

Emission Unit: KD05 Continuous Kiln #2

Pollutant Particulate Matter

Numerical Emission Limit or Standard:	0
Maximum Actual Emissions in Units of the Standard:	0
Maximum Actual Emissions in Tons per Year:	7.59 tons/yr
Method the Emissions were determined (CEM, Stack Testing, Mass Balance, etc.):	NCASI Factor, from publically available document
Applicable Federal Standard:	
Applicable State Standard:	
Applicable Permit Condition(s):	
Is this a Proposed Voluntary Limit?	No
Is there a Work Practice or Design Standard?	No
Is this in Compliance with the Standard(s) ?	No

Emission Unit: KD05 Continuous Kiln #2

Pollutant Particulate Matter <10 microns

Numerical Emission Limit or Standard:	0
Maximum Actual Emissions in Units of the Standard:	0
Maximum Actual Emissions in Tons per Year:	5.72 tons/yr
Method the Emissions were determined (CEM, Stack Testing, Mass Balance, etc.):	NCASI Factor, from publically available document
Applicable Federal Standard:	
Applicable State Standard:	
Applicable Permit Condition(s):	
Is this a Proposed Voluntary Limit?	No
Is there a Work Practice or Design Standard?	No
Is this in Compliance with the Standard(s) ?	No

Emission Unit: KD05 Continuous Kiln #2

Pollutant Sulfur Dioxide

Numerical Emission Limit or Standard:	0
Maximum Actual Emissions in Units of the Standard:	0
Maximum Actual Emissions in Tons per Year:	3.83 tons/yr
Method the Emissions were determined (CEM, Stack Testing, Mass Balance, etc.):	AP-42
Applicable Federal Standard:	
Applicable State Standard:	
Applicable Permit Condition(s):	
Is this a Proposed Voluntary Limit?	No
Is there a Work Practice or Design Standard?	No
Is this in Compliance with the Standard(s) ?	No

Emission Unit: KD05 Continuous Kiln #2

Pollutant Volatile Organic Compounds

Numerical Emission Limit or Standard:	
Maximum Actual Emissions in Units of the Standard:	0
Maximum Actual Emissions in Tons per Year:	206.53 tons/yr
Method the Emissions were determined (CEM, Stack Testing, Mass Balance, etc.):	NCASI Factor, from publically available document
Applicable Federal Standard:	
Applicable State Standard:	
Applicable Permit Condition(s):	
Is this a Proposed Voluntary Limit?	No
Is there a Work Practice or Design Standard?	No
Is this in Compliance with the Standard(s) ?	No

Emission Unit: RF01 Unpaved Road Dust

Pollutant Particulate Matter

Numerical Emission Limit or Standard:	
Maximum Actual Emissions in Units of the Standard:	0
Maximum Actual Emissions in Tons per Year:	67.97 tons/yr
Method the Emissions were determined (CEM, Stack Testing, Mass Balance, etc.):	AP-42
Applicable Federal Standard:	
Applicable State Standard:	
Applicable Permit Condition(s):	
Is this a Proposed Voluntary Limit?	No
Is there a Work Practice or Design Standard?	No
Is this in Compliance with the Standard(s) ?	No

Emission Unit: RF01 Unpaved Road Dust

Pollutant Particulate Matter <10 microns

Numerical Emission Limit or Standard:	0
Maximum Actual Emissions in Units of the Standard:	0
Maximum Actual Emissions in Tons per Year:	19.37 tons/yr
Method the Emissions were determined (CEM, Stack Testing, Mass Balance, etc.):	AP-42
Applicable Federal Standard:	
Applicable State Standard:	
Applicable Permit Condition(s):	
Is this a Proposed Voluntary Limit?	No
Is there a Work Practice or Design Standard?	No
Is this in Compliance with the Standard(s) ?	No

Emission Unit: RF02 Paved Road Dust

Pollutant Particulate Matter

Numerical Emission Limit or Standard:	
Maximum Actual Emissions in Units of the Standard:	0
Maximum Actual Emissions in Tons per Year:	116.53 tons/yr
Method the Emissions were determined (CEM, Stack Testing, Mass Balance, etc.):	AP-42
Applicable Federal Standard:	
Applicable State Standard:	
Applicable Permit Condition(s):	
Is this a Proposed Voluntary Limit?	No
Is there a Work Practice or Design Standard?	No
Is this in Compliance with the Standard(s) ?	No

Emission Unit: RF02 Paved Road Dust

Pollutant Particulate Matter <10 microns

Numerical Emission Limit or Standard:	0
Maximum Actual Emissions in Units of the Standard:	0
Maximum Actual Emissions in Tons per Year:	23.31 tons/yr
Method the Emissions were determined (CEM, Stack Testing, Mass Balance, etc.):	AP-42
Applicable Federal Standard:	
Applicable State Standard:	
Applicable Permit Condition(s):	
Is this a Proposed Voluntary Limit?	No
Is there a Work Practice or Design Standard?	No
Is this in Compliance with the Standard(s) ?	No

F - Facility Compliance

Facility: West Fraser Inc.

Application: 2012 PSD Application for Continuous Kilns

The following list contains all of the emissions units and groups that have been entered for this project:

Type	ID	Emission Group Name
Facility-Wide		Facility-Wide Emissions
Emission Unit	KD05	Continuous Kiln #2
Emission Unit	KD04	Continuous Kiln #1
Fugitive Emissions Gro	RF02	Paved Road Dust
Fugitive Emissions Gro	RF01	Unpaved Road Dust

F - Facility Compliance

Facility: West Fraser Inc. Application: 2012 PSD Application for Continuous Kilns

Compliance Determination Procedures: Monitoring

Emission Unit: KD04Continuous Kiln #1	**Pollutant: Volatile Organic Compounds**
Monitoring Code:	M24
Monitoring Code Description:	Recordkeeping of production, raw material, or process input related information.
Is this Monitoring Already Taking Place and Being Performed?	No
Location Where Monitoring is Taking Place:	Lumber kiln production
Averaging Time:	1 Months
Data Acquisition Frequency:	1 Months
Description of the Types of Records Being Kept with this Monitoring:	Total Lumber Kiln production for any 12 consecutive months
Reporting Frequency:	6 Months
Regulation or Permit Condition that Requires this Monitoring:	
Comments or Other Information:	

Emission Unit: KD04Continuous Kiln #1	**Pollutant: Other**
Monitoring Code:	M25
Monitoring Code Description:	Monitoring of work practice factors [Note: For this entry, in addition to giving the code, list all work practice factors which will have specific compliance related provisions.]
Is this Monitoring Already Taking Place and Being Performed?	No
Location Where Monitoring is Taking Place:	Continuous Kiln #1
Averaging Time:	1 Days
Data Acquisition Frequency:	1 Days
Description of the Types of Records Being Kept with this Monitoring:	Work Practice and Preventative Maintenance Program for Kilns.
Reporting Frequency:	6 Months
Regulation or Permit Condition that Requires this Monitoring:	
Comments or Other Information:	Daily, weekly, monthly, semi-annual and annual routines are to be performed on two kilns.

Emission Unit: KD05Continuous Kiln #2	**Pollutant: Volatile Organic Compounds**
Monitoring Code:	M24
Monitoring Code Description:	Recordkeeping of production, raw material, or process input related information.
Is this Monitoring Already Taking Place and Being Performed?	No
Location Where Monitoring is Taking Place:	Lumber Kiln Production
Averaging Time:	1 Months
Data Acquisition Frequency:	1 Months
Description of the Types of Records Being Kept with this Monitoring:	Total Lumber Kiln production for any 12 consecutive months
Reporting Frequency:	6 Months
Regulation or Permit Condition that Requires this Monitoring:	
Comments or Other Information:	

Emission Unit: KD05Continuous Kiln #2	**Pollutant: Other**
Monitoring Code:	M25
Monitoring Code Description:	Monitoring of work practice factors [Note: For this entry, in addition to giving the code, list all work practice factors which will have specific compliance related provisions.]
Is this Monitoring Already Taking Place and Being Performed?	Yes
Location Where Monitoring is Taking Place:	Continuous Kiln #2
Averaging Time:	1 Days
Data Acquisition Frequency:	1 Days
Description of the Types of Records Being Kept with this Monitoring:	Work Practice and Preventative MaintenanceProgram for Kilns
Reporting Frequency:	6 Months
Regulation or Permit Condition that Requires this Monitoring:	
Comments or Other Information:	Daily, weekly, monthly, semi-annual and annual routines are to be performed on twol kilns.

Compliance Determination Procedures: Reference Test Methods

Compliance Plan for a non-Compliant Emission Unit or Group

4244 International Parkway
Suite 120
Atlanta, Georgia 30354-3906
404-363-7000

Certifications and Signatures

Facility Name: West Fraser Inc.

Project Name: 2012 PSD Application for Continuous Kilns

AIRS Number: 132450047

Submittal File Name: 132450047_20121217.mdb

COMPUTER DISK VIRUS EXAMINATION CERTIFICATION:
I certify that, to the best of my knowledge, the completed electronic application disk has been inspected and found free of any known viruses.

Signature: Grant Johnson Date: Dec 17/12

Name (print): Grant Johnson

Offical Title: Operations Manager

SOFTWARE USAGE CERTIFICATION:
I certify that the software used to complete the Georgia Title V application was used as provided by the Georgia Environmental Protection Division, Air Protection Branch and was unaltered in any way. I understand that the submission of a Title V (Part 70) application completed using any altered version of the provided software constitutes the submission of an incomplete application and that such action may be subject to enforcement by the Georgia Air Protection Branch and/or the US EPA.

CERTIFICATION OF COMPLIANCE:
Except as stated on the Compliance Plan For a Non-Compliant Emission Unit or Group form of this application, I hereby certify that this facility is in compliance with all applicable requirements effective as of the date of this certification and will continue to comply with such requirements. For applicable requirements promulgated as of the date of this certification, that will become effective during the permit term, I further certify that, except as stated on the Compliance Plan For a Non-Compliant Emission Unit or Group form of this application, this facility will comply with such requirements and will continue to comply with such requirements.

I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this application and all of its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Unless otherwise required by the Director, compliance certifications will be submitted to the Director at least annually.

SIGNATURE OF RESPONSIBLE OFFICIAL:

Signature: Grant Johnson Date: Dec 17/12

Name (print): Grant Johnson

Offical Title: Operations Manager.

Address: 1900 Exeter Road
Germantown TN 38138

Notary Public Certification of Responsible Official's Signature:

Alma Perlo
NOTARY PUBLIC
Columbia County, GEORGIA
My Commission Expires 12-11-15

Signature of Notary Public:

APPENDIX H: REFERENCE DOCUMENTATION

APPENDIX I: LETTERS TO FEDERAL LAND MANAGERS

53 Perimeter Center East | Suite 230 | Atlanta, GA 30346 | P (678) 441-9977 | F (678) 441-9978
trinityconsultants.com

Trinity Consultants

December, 17, 2012

Ms. Andrea Stacy
National Park Service
Air Resources Division
12795 W. Alameda Parkway
P.O. Box 25287
Denver, CO 80225
Andrea_Stacy@nps.gov

RE: West Fraser, Inc. – Augusta, GA
Notification of PSD Project in Reference to NPS Class I Areas

Dear Ms. Stacy,

Trinity Consultants (Trinity) is submitting this letter to your attention on behalf of our client West Fraser, Inc. (West Fraser) for a proposed modification at their facility located south of Augusta, Georgia (Richmond County). West Fraser intends to install two continuous dual path direct fired lumber drying kilns at the Augusta Mill which will increase total facility-wide production to a limit of 220 MMBF/yr. The existing batch kilns at the Augusta Mill will be removed as part of this project. Expected emissions from the facility are NO_X, CO, PM, PM_{10}, $PM_{2.5}$, SO_2, VOC, GHG and combustion emissions associated with lumber drying.

The proposed project requires Prevention of Significant Deterioration (PSD) permitting for VOC only. A PSD construction permit application was submitted to the Georgia Environmental Protection Division (EPD) in December2012.

As part of the PSD application process, West Fraser 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).[1] "Q" is the sum of the annual NO_X, PM_{10}, SO_2, and H_2SO_4 emissions, in tons per year (tpy)[2] and "D" is the distance, in kilometers (km), from the proposed facility to the corresponding Class I area. The total emissions for this "project" include emissions increases from all possible sources at the facility. A summary of the visibility-affecting pollutant (VAP) emissions resulting from the proposed project are shown in Table 1 using the FLAG 2010 Approach.

[1] Federal Land Managers' Air Quality Related Values Work Group (FLAG) Phase I Report – Revised 2010, *October 7, 2010*.
[2] 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.

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	2.50	10.93
Direct Particulate[1]	0.58	2.52
SO_2	0.19	0.82
Sum of Emissions (tpy)		14.27

1. Direct particulate includes all filterable and condensible PM_{10}.
2. FLAG 2010 Approach: Q = Maximum 24 hour basis * 8,760 /2000.

As shown in Table 2, eight (8) Class I areas are located within 300 km of the proposed project in Jefferson County, Georgia. The only Class I area within 300 km of the proposed facility managed by the National Park Service (NPS) is Great Smoky Mountains National Park, which is 269 kilometers away.

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

Class I Area	Responsible FLM	Minimum Distance from Site (km)*	Annualized VAP Emissions (tpy)	Q/D
Joyce Kilmer - Slick Rock Wilderness	FS	289	14.27	0.05
Cape Romain Fish & Wildlife	FWS	221	14.27	0.06
Wolf Island Fish & Wildlife	FWS	225	14.27	0.06
Shining Rock Wilderness	FS	237	14.27	0.06
Okefenokee Fish & Wildlife	FWS	253	14.27	0.06
Great Smoky Mountains National Park	NPS	269	14.27	0.05
Linville Gorge Wilderness	FS	276	14.27	0.05
Cohutta Wilderness	FS	295	14.27	0.05

Table 2 shows the results of the Q/D screening analysis for the FLAG 2010 Approach. As shown in Table 2, all of the eight Class I areas within 300 km of the project (considering source-wide emissions) have 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, West Fraser plans no AQRV analyses for the proposed project. Based on Table 2, West Fraser requests that the NPS provide written concurrence of this finding of no impact.

~~~~~~

West Fraser 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 678-441-9977 with any questions that you have.

Sincerely,
~~~~~~

TRINITY CONSULTANTS

Justin Fickas
Managing Consultant

cc: Mr. Eric Cornwell (Georgia EPD)
Mr. Bill Jackson (Forest Service)
Ms. Catherine Collins (Fish and Wildlife Service)
Mr. Mack Winfrey (West Fraser)

53 Perimeter Center East | Suite 230 | Atlanta, GA 30346 | P (678) 441-9977 | F (678) 441-9978
trinityconsultants.com

Trinity Consultants

December 17, 2012

Ms. Catherine Collins
Environmental Engineer
United States Fish and Wildlife Service (FWS)
Branch of Air Quality
7333 West Jefferson Avenue, Suite 375
Lakewood, CO 80235-2017
Catherine_Collins@fws.gov

RE: West Fraser, Inc. – Augusta, GA
Notification of PSD Project in Reference to FWS Class I Areas

Dear Ms. Collins,

Trinity Consultants (Trinity) is submitting this letter to your attention on behalf of our client West Fraser, Inc. (West Fraser) for a proposed modification at their facility located south of Augusta, Georgia (Richmond County). West Fraser intends to install two continuous dual path direct fired lumber drying kilns at the Augusta Mill which will increase total facility-wide production to a limit of 220 MMBF/yr. The existing batch kilns at the Augusta Mill will be removed as part of this project. Expected emissions from the facility are NO_X, CO, PM, PM_{10}, $PM_{2.5}$, SO_2, VOC, GHG and combustion emissions associated with lumber drying.

The proposed project requires Prevention of Significant Deterioration (PSD) permitting for VOC only. A PSD construction permit application was submitted to the Georgia Environmental Protection Division (EPD) in December2012.

As part of the PSD application process, West Fraser 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).[1] "Q" is the sum of the annual NO_X, PM_{10}, SO_2, and H_2SO_4 emissions, in tons per year (tpy)[2] and "D" is the distance, in kilometers (km), from the proposed facility to the corresponding Class I area. The total emissions for this "project" include emissions increases from all possible sources at the facility. A summary of the visibility-affecting pollutant (VAP) emissions resulting from the proposed project are shown in Table 1 using the FLAG 2010 Approach.

[1] Federal Land Managers' Air Quality Related Values Work Group (FLAG) Phase I Report – Revised 2010, *October 7, 2010*.
[2] 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.

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	2.50	10.93
Direct Particulate[1]	0.58	2.52
SO_2	0.19	0.82
Sum of Emissions (tpy)		14.27

1. Direct particulate includes all filterable and condensible PM_{10}.
2. FLAG 2010 Approach: Q = Maximum 24 hour basis * 8,760 /2000.

As shown in Table 2, eight (8) Class I areas are located within 300 km of the proposed project in Jefferson County, Georgia. The only Class I areas within 300 km of the proposed facility managed by the Fish and Wildlife Service (FWS) are Wolf Island, Okefenokee, and Cape Romain, which are between 221 and 253 kilometers away.

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

Class I Area	Responsible FLM	Minimum Distance from Site (km)*	Annualized VAP Emissions (tpy)	Q/D
Joyce Kilmer - Slick Rock Wilderness	FS	289	14.27	0.05
Cape Romain Fish & Wildlife	FWS	221	14.27	0.06
Wolf Island Fish & Wildlife	FWS	225	14.27	0.06
Shining Rock Wilderness	FS	237	14.27	0.06
Okefenokee Fish & Wildlife	FWS	253	14.27	0.06
Great Smoky Mountains National Park	NPS	269	14.27	0.05
Linville Gorge Wilderness	FS	276	14.27	0.05
Cohutta Wilderness	FS	295	14.27	0.05

Table 2 shows the results of the Q/D screening analysis for the FLAG 2010 Approach. As shown in Table 2, all of the eight Class I areas within 300 km of the project (considering source-wide emissions) have 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, West Fraser plans no AQRV analyses for the proposed project. Based on Table 2, West Fraser requests that the FWS provide written concurrence of this finding of no impact.

~~~~~~

West Fraser 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 678-441-9977 with any questions that you have.

Sincerely,
~~~~~~

TRINITY CONSULTANTS

Justin Fickas
Managing Consultant

cc: Mr. Eric Cornwell (Georgia EPD)
Ms. Andrea Stacy (National Park Service)
Mr. Bill Jackson (Forest Service)
Mr. Mack Winfrey (West Fraser)

53 Perimeter Center East | Suite 230 | Atlanta, GA 30346 | P (678) 441-9977 | F (678) 441-9978
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Trinity Consultants

December 17, 2012

Mr. Bill Jackson
Air Program Staff
USDA Forest Service (FS)
National Forests in North Carolina
P.O. Box 2750
Ashville, NC 28802
bjackson02@fs.fed.us

RE: West Fraser, Inc. – Augusta, 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 West Fraser, Inc. (West Fraser) for a proposed modification at their facility located south of Augusta, Georgia (Richmond County). West Fraser intends to install two continuous dual path direct fired lumber drying kilns at the Augusta Mill which will increase total facility-wide production to a limit of 220 MMBF/yr. The existing batch kilns at the Augusta Mill will be removed as part of this project. Expected emissions from the facility are NO_X, CO, PM, PM_{10}, $PM_{2.5}$, SO_2, VOC, GHG and combustion emissions associated with lumber drying.

The proposed project requires Prevention of Significant Deterioration (PSD) permitting for VOC only. A PSD construction permit application was submitted to the Georgia Environmental Protection Division (EPD) in December2012.

As part of the PSD application process, West Fraser 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).[1] "Q" is the sum of the annual NO_X, PM_{10}, SO_2, and H_2SO_4 emissions, in tons per year (tpy)[2] and "D" is the distance, in kilometers (km), from the proposed facility to the corresponding Class I area. The total emissions for this "project" include emissions increases from all possible sources at the facility. A summary of the visibility-affecting pollutant (VAP) emissions resulting from the proposed project are shown in Table 1 using the FLAG 2010 Approach.

[1] Federal Land Managers' Air Quality Related Values Work Group (FLAG) Phase I Report – Revised 2010, *October 7, 2010*.
[2] 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.

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	2.50	10.93
Direct Particulate[1]	0.58	2.52
SO_2	0.19	0.82
Sum of Emissions (tpy)		14.27

1. Direct particulate includes all filterable and condensible PM_{10}.
2. FLAG 2010 Approach: Q = Maximum 24 hour basis * 8,760 /2000.

As shown in Table 2, eight (8) Class I areas are located within 300 km of the proposed project in Richmond County, Georgia. The only Class I areas within 300 km of the proposed facility managed by the Forest Service (FS) are Shining Rock, Cohutta, Joyce Kilmer/Slickrock, and Linville Gorge, which are between 237 and 295 kilometers away.

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

Class I Area	Responsible FLM	Minimum Distance from Site (km)*	Annualized VAP Emissions (tpy)	Q/D
Joyce Kilmer - Slick Rock Wilderness	FS	289	14.27	0.05
Cape Romain Fish & Wildlife	FWS	221	14.27	0.06
Wolf Island Fish & Wildlife	FWS	225	14.27	0.06
Shining Rock Wilderness	FS	237	14.27	0.06
Okefenokee Fish & Wildlife	FWS	253	14.27	0.06
Great Smoky Mountains National Park	NPS	269	14.27	0.05
Linville Gorge Wilderness	FS	276	14.27	0.05
Cohutta Wilderness	FS	295	14.27	0.05

Table 2 shows the results of the Q/D screening analysis for the FLAG 2010 Approach. As shown in Table 2, all of the eight Class I areas within 300 km of the project (considering source-wide emissions) have 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, West Fraser plans no AQRV analyses for the proposed project. Based on Table 2, West Fraser requests that the FS provide written concurrence of this finding of no impact.

~~~~~~

West Fraser 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 678-441-9977 with any questions that you have.

Sincerely,
~~~~~~

TRINITY CONSULTANTS

Justin Fickas
Managing Consultant

cc: Mr. Eric Cornwell (Georgia EPD)
Ms. Andrea Stacy (National Park Service)
Ms. Catherine Collins (Fish and Wildlife Service)
Mr. Mack Winfrey (West Fraser)

February 1, 2013 Response

53 Perimeter Center East | Suite 230 | Atlanta, GA 30346 | P (678) 441-9977 | F (678) 441-9978
trinityconsultants.com

February 1, 2013

Ms. Susan Jenkins
Georgia Environmental Protection Division
Air Protection Branch
4244 International Parkway, Suite 120
Atlanta, Georgia 30354

RE: West Fraser, Inc. – Augusta, Georgia
PSD Permit Application – Continuous Kiln Project – Application Updated Requested by EPD

Dear Ms. Jenkins:

On January 16, 2013, Georgia Environmental Protection Division (EPD) notified Trinity Consultants (Trinity) that upon Administrative Review of the West Fraser, Inc. (West Fraser) Augusta Lumber Mill PSD Application (Assigned #21615) additional information was requested. EPD requested additional information on the scope of the stationary source in addition to requests for various diagrams that show the location of the facility/exhaust points in relation to the nearby IP Paper Mill. On behalf of our client, West Fraser, please find below and attached responses to the requested information.

The production processes at the West Fraser Augusta Lumber Mill and the IP Paper Mill are independent of each other. Also, as taken directly from the permit narrative for the facility's Title V Permit:

> *The Title V site included two plants owned by International Paper Company, Inc., a lumber mill (now operating as West Frazer- Augusta Lumber Mill) and a paper mill, which were contiguous or adjacent and under common control.*
>
> *On March 31, 2007, International Paper Company, Inc. – Augusta Lumber Mill sold this facility to West Fraser. An Amendment was submitted for an ownership and name change; the facility name changed to West Fraser – Augusta Lumber Mill by Permit No. 2421-245-0047-V-03-0, issued on April 09, 2007.*
>
> *Note that the amended permit specified that the Title V site that is subject to this permit now consists of only the Augusta Lumber Mill. Until the end of March 2007, the Title V site consisted of this lumber mill and an adjacent paper mill, both of which were then owned by International Paper Company, Inc. Though the lumber mill has been sold to West Fraser, the paper mill continues to be owned by International Paper Company, Inc. These sites are now separate with regard to Title V and New Source Review.*

Attached, please find several diagrams that provide the information EPD requested, with the exception of documentation regarding facility buildings. As only toxics modeling was required for this project, no building information was required for the modeling analysis, per the Georgia Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions (June 1998). This documentation could potentially be developed if otherwise needed by EPD, however, it should not be necessary for this particular project and application.

Please do not hesitate to contact me at (678) 441-9977 to review preliminary questions or comments concerning this submittal.

Sincerely,

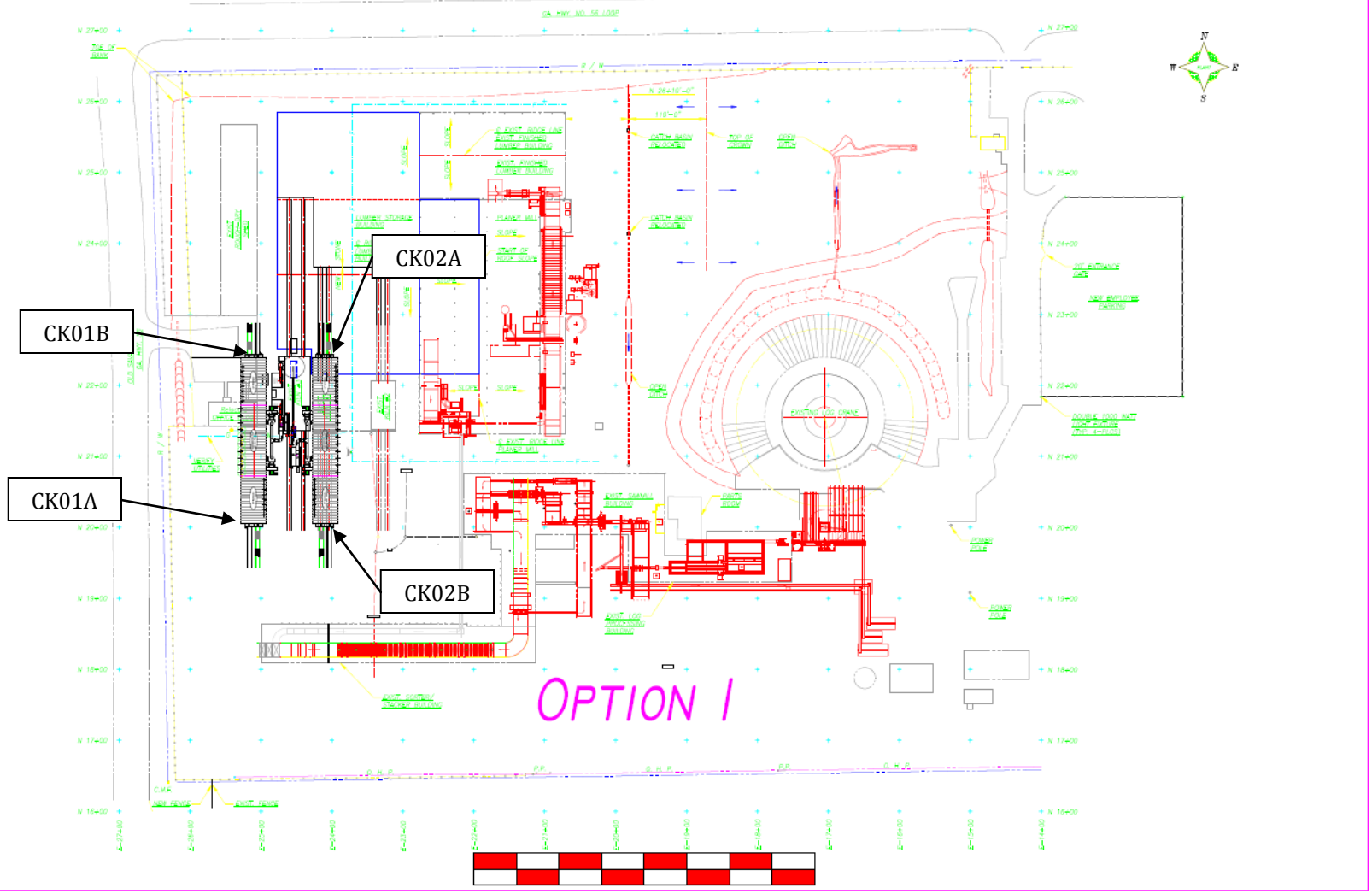
TRINITY CONSULTANTS

Justin Fickas, P.E.
Managing Consultant

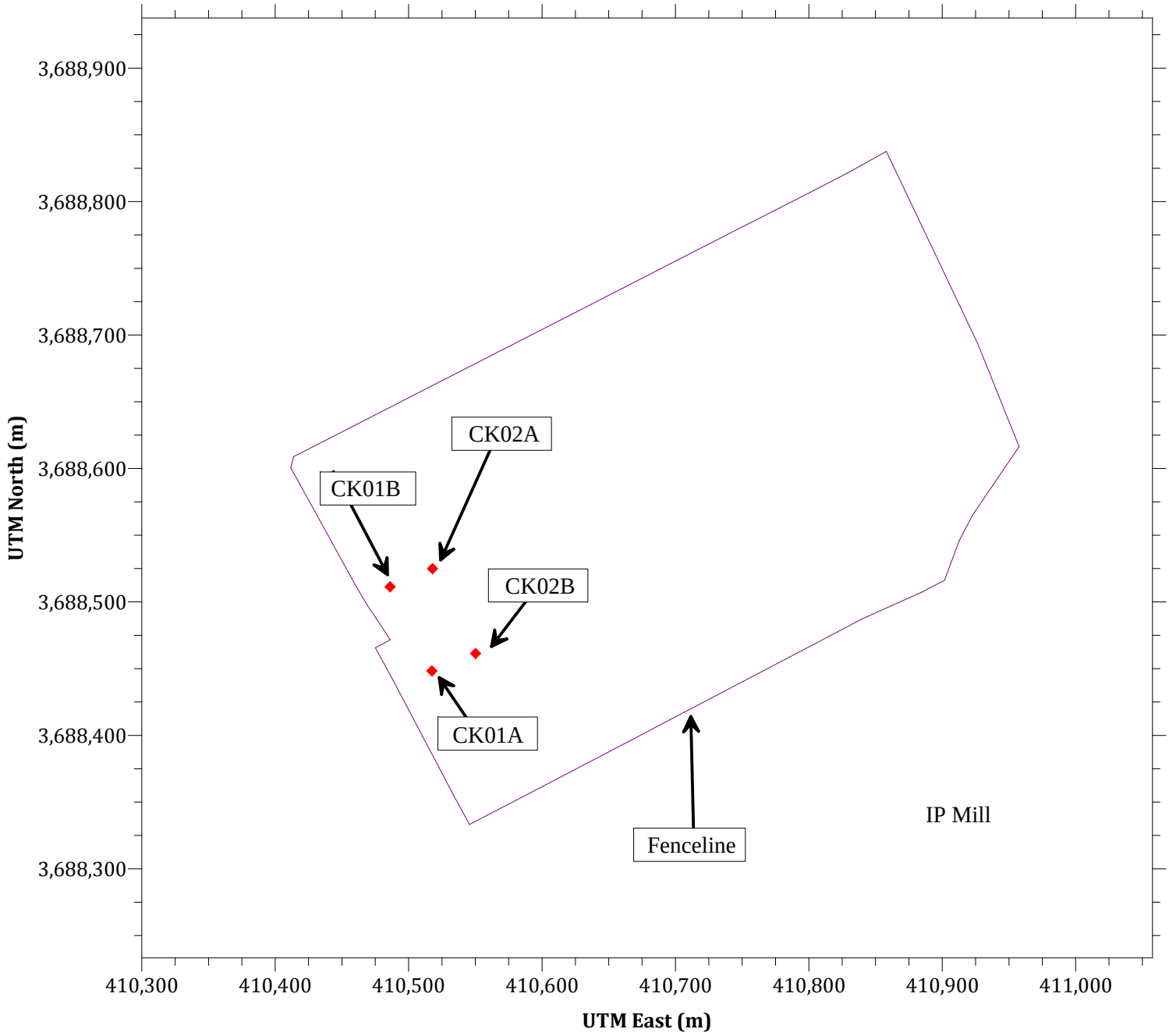
Enclosures
cc: Mr. Mack Winfrey (West Fraser)
Mr. Lamar Youmans (West Fraser)
Ms. Margaret Ndetti (EPD)

Attachments

SCALE 1" = 60 FEET - AUGUSTA MILL SITE - PROPOSED



West Fraser Augusta
Modeled Objects



March 8, 2013 Response

53 Perimeter Center East | Suite 230 | Atlanta, GA 30346 | P (678) 441-9977 | F (678) 441-9978
trinityconsultants.com

March 8, 2013

Mr. Eric Cornwell
Georgia Environmental Protection Division
Air Protection Branch
4244 International Parkway, Suite 120
Atlanta, Georgia 30354

RE: West Fraser, Inc. – Augusta, Georgia
PSD Permit Application – Continuous Kiln Project – Application Updated Requested by EPD

Dear Mr. Cornwell:

On February 20, 2013, Georgia Environmental Protection Division (EPD) notified West Fraser, Inc. (West Fraser) that technical and regulatory review of the recent application had begun and EPD offered various comments that needed clarification and/or correction. On behalf of our client, West Fraser, Trinity Consultants (Trinity) has included responses to all comments along with applicable application updates (both in hardcopy and electronic format).

Emission Calculation Methodology

The first comment provided by EPD requested that the facility use a VOC emission factor of 3.83 lb/MBF for the kilns. West Fraser agrees, and application documentation has been modified accordingly. The updated sections of the application where the old emission factor was referenced are included as attachments to this response.

EPD also requested that the PM_{10} emission factor of 0.20 lb/ton for log sawing operations be used in place of the factor submitted with the original application. Although West Fraser believes the factor presented in the original copy of the application was valid, the application materials have been updated to reflect 0.20 lb/ton for both PM_{10} and $PM_{2.5}$ emissions from sawing operations.

Toxic Air Pollutants Assessment

The Division requested an updated Toxic Impact Assessment that includes any TAPs that are emitted at a rate of more than 1% of the total TAPs emitted. The additional TAPs modeled were hydrochloric acid, isopropanol, manganese, and phenol. It is important to note that HAP emissions for the continuous kilns were updated to include a 50% control factor for particle-bound metals based on commentary from EPD in previous permitting actions.[1] Please see the updated emission calculations for the new calculation methodology.

[1] Control efficiency for particle-bound metal HAPs is based on EPD's SIP Application Review document (Application No. 19470) that states that kilns act as settling chambers and the minimum expected control for particulate emissions from kilns acting as settling chambers is 50%.

Attached Document Updates

Attached, please find the following items, which reflect updated application sections to address the items noted above:

- Updated narrative pages
  - Page 1-3: Table updated to reflect new emissions
  - Page 1-4: Table updated to reflect new emissions
  - Pages 3-5/6: Updated language on sawing emission factors
  - Page 3-7: Table updated to reflect new emissions
  - Page 3-9: Table updated to reflect new emissions
  - Page 4-2: Table updated to reflect new emissions
  - Page 5-18: Updated BACT cost number
  - Page 5-19: Updated BACT cost number
  - Page 8-2: Updated toxics analysis
  - Page 8-3: Updated toxics analysis
- Updated Appendix B calculations
- Updated Appendix D BACT calculations
- Updated Appendix F for toxic thresholds, including updated electronic modeling files
- Updated SIP forms
- Updated Title V Database

Please do not hesitate to contact me at (678) 441-9977 with any questions or comments pertaining to the materials provided.

Sincerely,

TRINITY CONSULTANTS

Justin Fickas, P.E.
Managing Consultant

Enclosures
cc: Mr. Mack Winfrey (West Fraser)
Mr. Lamar Youmans (West Fraser)
Ms. Margaret Ndetti (EPD)

Narrative Updates

Table 1-1. Proposed Project Net Emission Increases

Pollutant	Net Emissions Change (tpy)	PSD SER Thresholds (tpy)	PSD Permitting Triggered?
NSR Pollutants			
CO	28.50	100	No
Fluorides	N/A	3	No
H_2S	N/A	10	No
Lead	0.00	0.6	No
NO_X	10.93	40	No
Reduced Sulfur Compounds (including H_2S)	N/A	10	No
SO_2	0.82	40	No
H_2SO_4	N/A	7	No
Total PM	24.53	25	No
Total PM_{10}	5.08	15	No
Total $PM_{2.5}$	-1.07	10	No
Total Reduced Sulfur (including H_2S)	N/A	10	No
Total VOC	149.53	40	Yes
Greenhouse Gases			
$CO_2e_{biomass\ deferral}$	143.45	75,000	No
HAPs [2]			
Formaldehyde	-1.83	N/A	N/A
Methanol	-7.34	N/A	N/A

As detailed in Section 3.2 and summarized in Table 1-1, net emission increases from the proposed project and net emissions increases or decreases from the contemporaneous emission period, will be below the PSD major modification thresholds for all pollutants except VOC.

On May 13, 2010, the U.S. EPA issued the Tailoring Rule which establishes an approach for addressing greenhouse gases (GHGs) from stationary sources under the Clean Air Act (CAA) permitting programs (PSD and Title V).[3] Per the Tailoring Rule, as the proposed project requires NSR permitting for a criteria pollutant and the required PSD permit was not issued prior to January 2, 2011, PSD permitting for GHG for the proposed project must also be considered. On July 20, 2011, U.S. EPA published a rule making to defer GHG permitting requirements for three years for carbon dioxide (CO_2) emissions from biomass-fired and other biogenic sources.[4] Therefore, CO_2e estimates for the net emissions increase analysis only accounted for the methane (CH_4) and nitrous oxide (N_2O) component emissions of biomass combustion.

As a Title V major source, West Fraser is required to submit a Title V significant modification application as part of the PSD permitting process in Georgia. West Fraser is submitting this construction and operating application

[3] Rule was published in the Federal Register on June 3, 2010, and became effective August 2, 2010. Federal Register Vol. 75, No. 106, June 3, 2010, pages 31541 – 31608.
[4] Federal Register Vol. 76, No. 139, July 20, 2011.

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 New Source Performance Standards (NSPS), National Emissions Standards for Hazardous Air Pollutants (NESHAP), and several state regulations.

1.3. BACT DETERMINATION

West Fraser performed a BACT analysis for the only NSR-regulated pollutant that exceeded the major modification thresholds, 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, West Fraser has determined that the technology and limits presented in Table 1-2 are BACT for the proposed continuous kilns. A detailed VOC BACT analysis is presented in Section 5.4 of this application.

Table 1-2. Proposed Primary BACT Limit Summary

Pollutant	Selected BACT	Emission/ Operating Limit	Compliance Method
VOC	Proper Maintenance and Operating Practices	3.83 lb/MBF	Recordkeeping

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 NSR applicability;
- Section 4 details the federal and state regulatory applicability analysis for the proposed project;
- Section 5 contains the required BACT assessment;
- Section 6 contains the toxics modeling assessment;
- Appendix A contains an area map, facility layout, and process flow diagrams of the facility;
- Appendix B includes documentation of emissions calculations;
- Appendix C contains EPD (SIP) construction 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;
- Appendix G includes the updated Title V Database;
- Appendix H includes the reference materials used to develop the application; and

limitations and challenges in VOC testing methods. Per the methodology established, the VOC emission factor for continuous kilns is calculated using the following equation:[10,11]

$$Total\ VOC = VOC\ as\ C \times 1.133 + (1 - 0.65) \times Methanol + Formaldehyde$$

The VOC as carbon emission factor (VOC as C, generally from a Method 25/25A test method) is multiplied by 1.133, the ratio of the molecular weight of pinene ($C_{10}H_{16}$, 136 amu) to the molecular weight of the carbon in pinene (120 amu). As the Method 25/25A test method does not register oxygenated compounds well, emissions of formaldehyde and methanol must be added to appropriately account for their presence in exhaust streams from wood product facilities. Accordingly, U.S. EPA has agreed to "response factors" for these chemicals that account for what the Method 25/25A tests would observe. For example, formaldehyde is not typically "recognized" in the VOC test method. Therefore, it has a 0% response factor; whereas 65% of methanol present in an exhaust stream is captured within the VOC as C emission factor. Hence, to avoid double-counting of emissions, the speciated methanol emission factor is reduced by 65%.

The emission factors for CO_2e emissions from wood combustion were based on factors established in the Greenhouse Gas Mandatory Reporting (MRR) rule in 40 CFR 98, Table C-1 and C-2. Per the biomass deferral, the CO_2e emission factor for the combustion of biomass excludes emissions of CO_2.[12]

3.2.2. Ancillary Equipment Emission Increases

In addition to emissions from the kilns, the proposed project will result in emissions increases from ancillary equipment at the mill associated with the kilns. 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 and Debarking

Increases in fugitive PM emissions from sawing and debarking were based on the increased lumber throughput through those portions of the facility. A control efficiency of 90 percent was applied to account for the activities being performed indoors.[13] 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 factors used are from U.S. EPA's EIIP Uncontrolled Emission Factors document for the processes of sawing and debarking, respectively.[14,15]

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, West Fraser has chosen to use the 0.35 lb/ton value for conservatism, as a starting point.

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[10] U.S. EPA, document entitled, "Interim VOC Measurement Protocol for the Wood Products Industry – July 2007," page 2.
[11] Throughout the application, the terms "VOC" and "Total VOC" are used interchangeably. In all instances, the basis, for the purpose of this PSD application (including attachments) is as terpenes.
[12] Federal Register Vol. 76, No. 139 (pages 43490 – 43508).
[13] Based on guidance by the Texas Commission on Environmental Quality (TCEQ) entitled "Rock Crushing Plants" (Feb. 2002), a control efficiency of 90% should be applied for work performed fully enclosed.
[14] U.S. EPA's EIIP Uncontrolled Emission Factors (July 2001), per the Factor Information Retrieval (FIRE) database management system, version 6.23 for SCC Code 3-07-008-02, Log Sawing.
[15] U.S. EPA's EIIP Uncontrolled Emission Factors (July 2001), per the Factor Information Retrieval (FIRE) database management system, version 6.23 for SCC Code 3-07-008-01, Log Debarking.

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.*[16] This estimate is expected to be a highly conservative assessment of the potential PM emissions.

3.2.2.3. Hogger and Chipper

The increase in fugitive PM emissions from the hogger and chipper was based on the increased lumber throughput for those units. A control efficiency of 90 percent was applied to account for the activities being performed indoors. The emission factors used for both processes are from U.S. EPA's EIIP Uncontrolled Emission Factors document for debarking.[17]

3.2.2.4. 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 kilns. 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*.[18,19]

3.2.3. Project Emissions Increases

Table 3-1 shows the total emissions increase for the proposed project compared to the NSR major modification thresholds.

[16] U.S. EPA AP-42, Section 13.2.4, *Aggregate Handling and Storage Files,* November 2006.
[17] *Ibid.*
[18] U.S. EPA AP-42, Section 13.2.1, P*aved Roads*, January 2011.
[19] U.S. EPA AP-42, Section 13.2.2, *Unpaved Roads*, November 2006.

Table 3-1. Project Emissions Increase

Pollutant	Emissions Increase New Units (tpy)	Emissions Increase Associated Units (tpy)	Emissions Increase Total (tpy)	PSD SER Thresholds (tpy)	PSD Permitting Triggered?
NSR Pollutants					
CO	80.30	N/A	80.30	100	No
Fluorides	N/A	N/A	N/A	3	No
H_2S	N/A	N/A	N/A	10	No
Lead	6.20E-04	N/A	6.20E-04	0.6	No
NO_X	30.80	N/A	30.80	40	No
Reduced Sulfur Compounds (including H_2S)	N/A	N/A	N/A	10	No
SO_2	7.67	N/A	7.67	40	No
H_2SO_4	N/A	N/A	N/A	7	No
Total PM	15.18	38.23	53.41	25	Yes
Total PM_{10}	11.44	11.17	22.61	15	Yes
Total $PM_{2.5}$	10.89	4.08	14.97	10	Yes
Total Reduced Sulfur (including H_2S)	N/A	N/A	N/A	10	No
Total VOC	421.30	N/A	421.30	40	Yes
Greenhouse Gases					
$CO_2e_{biomass\ deferral}$	1,334	N/A	1,334	75,000	No
HAPs [1]					
Formaldehyde	1.00	N/A	1.00	N/A	N/A
Methanol	4.02	N/A	4.02	N/A	N/A

As illustrated in Table 3-1, the project emission increases are below the major modification thresholds for CO, H_2SO_4, Lead, NO_X, SO_2, and $CO_2e_{biomass\ deferral}$, and PSD permitting is not required for those pollutants. However, project emission increases exceed the major modification thresholds for Total PM, Total PM_{10}, Total $PM_{2.5}$, and Total VOC. Therefore, the analysis proceeds to Step (B), the contemporaneous netting analysis.

3.3. CONTEMPORANEOUS NETTING ANALYSIS

West Fraser reviewed all projects completed at the Augusta Mill within the past five years to determine the net emissions increases for Total PM, Total PM_{10}, Total $PM_{2.5}$, and Total VOC for comparison to the applicable NSR thresholds for Step (B). The five calendar year period to review includes 2008 through 2012. Any units that are shut down during the five-year calendar period preceeding the project are allowed to be used as a reduction in project net emission increase calculations provided the 10-year baseline established for that source is used. Should the total emissions increases of any pollutant within the contemporaneous period exceed the respective major modification threshold, then the proposed project is subject to NSR permitting for that pollutant.

The emission decrease from the shutdown of the current indirect fired batch kilns and burners as part of the proposed project is accounted for in the contemporaneous netting analysis. The baseline emissions for these units are provided in Appendix B. The following sections describe the emission factors for Total PM, Total PM_{10},

Table 3-2. Contemporaneous Netting Analysis

Source	Total PM (tpy)	Total PM_{10} (tpy)	Total $PM_{2.5}$ (tpy)	Total VOC (tpy)
Potential Emissions Increases				
Potential Emissions from New Units				
Continuous Direct-fired Kilns	15.18	11.44	10.89	421.30
Projected Actual Associated Emissions Increases				
Sawing and Debarking	4.90	2.79	2.79	-
Material Transfer/Chipper/Hogger	0.16	0.08	0.06	-
Roads	33.17	8.29	1.23	-
Contemporaneous Decreases				
Baseline Emissions from Decommissioned Units				
Batch Direct-fired Kilns	28.88	17.53	16.04	271.77
Total Potential Emissions Increases	53.41	22.61	14.97	421.30
Total Contemporaneous Emission Decreases	28.88	17.53	16.04	271.77
Net Emissions Increase	24.53	5.08	-1.07	149.53
PSD SER Thresholds	25	15	10	40
PSD Permitting Triggered?	No	No	No	Yes

As Table 3-2 shows, the Total PM, Total PM_{10}, Total $PM_{2.5}$ emissions are less than the applicable major modification thresholds, and thus, NSR permitting is not required for these pollutants. However, the Total VOC emissions increases exceed the applicable PSD major modification threshold, and thus NSR permitting is required for Total VOC.

Detailed calculations for the above discussed netting analysis can be found in Appendix B.

Table 4-1. Proposed Project Net Emission Increases

Pollutant	Net Emissions Change (tpy)	PSD SER Thresholds (tpy)	PSD Permitting Triggered?
NSR Pollutants			
CO	28.50	100	No
Fluorides	N/A	3	No
H_2S	N/A	10	No
Lead	0.00	0.6	No
NO_X	10.93	40	No
Reduced Sulfur Compounds (including H_2S)	N/A	10	No
SO_2	0.82	40	No
H_2SO_4	N/A	7	No
Total PM	24.53	25	No
Total PM_{10}	5.08	15	No
Total $PM_{2.5}$	-1.07	10	No
Total Reduced Sulfur (including H_2S)	N/A	10	No
Total VOC	149.53	40	Yes
Greenhouse Gases			
$CO_2e_{biomass\ deferral}$	143.45	75,000	No
HAPs [2]			
Formaldehyde	-1.83	N/A	N/A
Methanol	-7.34	N/A	N/A

As illustrated in Table 4-1, the proposed project net emission increase exceeds the major modification threshold for Total 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 tons per year (tpy) for any criteria pollutant, more than 10 tpy for any single hazardous air pollutant (HAP), and more than 25 tpy for all HAP. Additionally, 40 CFR Part 70.2 defines facilities with potential emissions greater than 100,000 tpy of CO_2e are subject to regulation under the Title V permitting program. Potential

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 kilns is a technically feasible option for minimizing the VOC emissions from the kilns and will be considered further in the future steps for BACT determination.

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, West Fraser does not concede that the use of an RTO or biofiltration on a lumber drying kiln is technically feasible; however, these control options are 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	Biofiltration [1]	65%
3	Proper Maintenance and Operating Practices	Base Case

1. Biofiltration control efficiency based on North Carolina Department of Environment and Natural Resources Air Permit Review for Weyerhauser's Plymouth facility continuous kiln construction application, which referenced an estimated 60-70% VOC control efficiency from biofilitration, based on a conversation with David Word of NCASI.

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 $14,222 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.

West Fraser has determined that an RTO is not BACT for the kilns based on the technical feasibility, environmental, energy, and economic analyses. Detailed cost calculations can be found in Appendix D.

5.4.4.2. Biofiltration

Even if the use of biofiltration was technically feasible on a lumber drying kiln, the cost of biofiltration exceeds the benefit of the VOC reduction it offers. The cost of controlling VOC with biofiltration is estimated at approximately $14,044 per ton of VOC removed. Despite the conservative assumption that biofiltration is technically feasible, it is not cost effective, and therefore is not BACT for the kilns.

5.4.4.3. Proper Maintenance and Operating Practices

The only remaining technology is proper maintenance and operating practices of the kilns, a logical option since a properly maintained and operated kiln can effectively minimize VOC formation. This control option is considered BACT for VOC for the continuous kilns.

5.4.5. Selection of BACT (Step 5)

Based on steps 1 through 4 of the BACT analysis, West Fraser has determined that proper maintenance and good operating practices are the only controls technically and economically feasible for the proposed continuous lumber drying kilns. All other potential control technologies were eliminated in earlier steps of the process. Therefore, West Fraser proposes the emission rate of 3.76 lb Total VOC (as terpene + methanol + formaldehyde)/MBF as BACT, calculated from the equation described in Section 3.2.1 and reproduced below.

$$Total\ VOC = VOC\ as\ C \times 1.133 + (1 - 0.65) \times Methanol + Formaldehyde$$

The basis for the VOC factor is adjusted per EPA protocol from the traditional VOC as carbon to a total mass VOC basis. In order to comply with BACT, West Fraser will develop an operating and maintenance plan for the new continuous kilns.

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.

168 hours per week for continuous operation. Second, the adjusted TWA is divided by a safety factor to account for human carcinogenicity: 100 for pollutants that are not known human carcinogens, 300 for pollutants that are known human carcinogens. The resultant value is adopted as a 24-hour AAC. Per the *Guideline*, if a toxic air pollutant has an annual AAC, then the derivation of and comparison to a 24-hour standard is not required.

An additional standard must be met if a given pollutant has listed a Short Term Exposure Limit (STEL) or Ceiling (C) in any one of the above-named resources. A STEL is a 15-minute weighted average concentration that should not be exceeded at any time during the workday. A C value is a concentration that should not be exceeded at any time during occupational exposure. These values have been established for pollutants that are acute sensory irritants and apply as a 15-minute standard, also adjusted by a safety factor of 10 as recommended by the *Guideline*. No other adjustment factor is applied to STEL or C values. A 15-minute average standard, if applicable, must be met in addition to an annual average and/or 24-hour average standard. The *Guideline* clearly states that each of annual, 24-hour, and 15-minute AAC should be derived if the appropriate toxicity information is provided in any of the listed resources.

West Fraser has evaluated the available reference material to determine the applicable AAC standards for TAP identified as being emitted at the facility. TAPs modeled as part of this assessment were based on the worst-case TAPs as determined for previous continuous kiln installation projects accepted by EPD along with a follow-up request by EPD sent to West Fraser on February 20, 2013. The TAPs modeled as part of this assessment include:

- Acetaldehyde
- Formaldehyde
- Propionaldehyde
- Methanol
- Hydrochloric Acid
- Isopropanol
- Manganese
- Phenol

The tables in Appendix F summarize the derivation methodology for the annual, 24-hour and 15-minute AACs for the pollutants potentially emitted by the proposed facility.

8.2. DETERMINATION OF TOXIC AIR POLLUTION IMPACT

West Fraser completed refined modeling for the four toxic air pollutants listed above using the ISC dispersion model. Table 8-1 presents the modeled emission source parameters and Table 8-2 presents the modeled emission rates.

Table 8-1. Modeled Source Parameters

ID	Description	UTM E (m)	UTM N (m)	Elevation (m)	Height (m)	Temp. (F)	Velocity (m/s)	Diameter (m)
CK01A	Continuous Kiln #1 - Stack A	410,518.7	3,688,446.2	42.19	10.67	100	35.93	0.69
CK01B	Continuous Kiln #1 - Stack B	410,487.9	3,688,510.1	43.08	10.67	100	35.93	0.69
CK02A	Continuous Kiln #2 - Stack A	410,551.5	3,688,460.2	42.07	10.67	100	35.93	0.69
CK02B	Continuous Kiln #2 - Stack B	410,519.0	3,688,523.3	42.96	10.67	100	35.93	0.69

For the purposes of this application, it is assumed that 100 percent of all TAP emissions from the lumber drying process will be emitted from the two stacks that handle exhaust on each end of each continuous kiln. Induced flow is created at the outlet of each kiln in order to exhaust all emissions through the stacks. It is also assumed that the abort stacks that are present on each of the continuous kilns will not be involved with the release of the TAP that are being considered for this project. These TAP emissions are exclusively considered during wood drying periods and are focused on only the stacks present at the end of each kiln.

Table 8-2. Modeled TAP Emission Rates

ID	Modeled Emission Rate (lb/hr)							
	Methanol	Formaldehyde	Propionaldehyde	Acetaldehyde	Hydrochloric Acid	Isopropanol	Manganese	Phenol
CK01A	1.005	0.251	0.010	0.364	0.040	0.053	0.016	0.138
CK01B	1.005	0.251	0.010	0.364	0.040	0.053	0.016	0.138
CK02A	1.005	0.251	0.010	0.364	0.040	0.053	0.016	0.138
CK02B	1.005	0.251	0.010	0.364	0.040	0.053	0.016	0.138

The pollutants modeled for this analysis are consistent with those modeled for other similar applications that have been provided to EPD. Total kiln TAP pollutant emissions are shown in Table B-19.

8.2.1. ISC Modeling Results

Table 8-3 presents the results for each pollutant and averaging period. Note that the maximum 15-minute impact is based on the maximum 1-hour predicted impact multiplied by 1.32.

Table 8-3. Summary of Modeling Analysis

Pollutant	CAS	Maximum 1-Hour Impact[1] (µg/m^3)	Maximum 15-Min Impact[2] (µg/m^3)	15-min AAC (µg/m3)	Maximum 24-hr Impact[1] (µg/m3)	24-hr AAC (µg/m3)	Maximum Annual Impact[1] (µg/m3)	Annual AAC (µg/m3)	Exceed Standard?
Methanol	67-56-1	57.49	75.89	32,750	26	619	None		No
Formaldehyde	50-00-0	16.87	22.27	246	Not Required		0.50	1.11	No
Propionaldehyde	123-38-6	0.69	None		Not Required		0.02	8.00	No
Acetaldehyde	75-07-0	24.46	32.29	4,500	Not Required		0.73	9.00	No
Hydrochloric Acid	7647-01-0	2.70	3.57	700	Not Required		0.08	20.00	No
Isopropanol	67-63-0	3.53	4.66	98,400	1.36	2333	None		No
Manganese	7439-96-5	1.06	1.40	500	Not Required		0.0317	0.0500	No
Phenol	108-95-2	9.28	12.25	1,900	3.58	45	None		No

1. First-high modeled impact over the five years of meteorological data.
2. Modeled 1-hour concentration multiplied by 1.32 to convert to 15-minute impact per GA Air Toxics Guidance (June 21, 1998).

As shown in the table above, impacts of all TAP from the proposed facility are below the respective AACs

Appendix B Updates

Table B-1. Current Operating Capacities for Direct-Fired Batch Kilns

Kiln	Operating Capacity[1] MMBtu/hr	BF/hr
Kiln No. 1	15.05	3,889
Kiln No. 2	30.10	7,778
Kiln No. 3	49.45	12,778

1. Operating Capacity (MMBtu/hr) from the facility's Title V renewal application review narrative (application received by EPD on October 25, 2004). Operating Capacity (BF/hr) copied during the Augusta Lumber Mill site visit on March 06, 2012 by Deanna Duram and Jake Stewart (Trinity), titled "West Fraser Augusta Permit Renewal Forms" (dated March 8, 2011).

Table B-2. Heating Value for Wood Combustion

Heating Value[1]	4,500	Btu/lb

1. From US EPA AP-42 Paragraph 1.6.1 (Sept. 2003).

Table B-3. Production Information for Direct-Fired Batch Kilns[1,2]

Month	Kiln 1 Production BF	Wood Waste Combusted tons	Kiln 2 Production BF	Wood Waste Combusted tons	Kiln 3 Production BF	Wood Waste Combusted tons	Total Kiln Production BF	Total Wood Waste Combusted tons
Jan-02	1,706,304	698.5	3,500,306	1,432.9	5,835,928	2,389.1	11,042,538	4,520.5
Feb-02	1,625,948	665.6	3,019,816	1,236.2	5,417,098	2,217.6	10,062,862	4,119.5
Mar-02	1,775,590	726.9	3,073,496	1,258.2	6,083,500	2,490.4	10,932,586	4,475.5
Apr-02	1,537,570	629.4	3,534,065	1,446.8	5,680,540	2,325.5	10,752,175	4,401.7
May-02	1,450,910	594.0	3,749,151	1,534.8	6,354,532	2,601.4	11,554,593	4,730.1
Jun-02	1,862,890	762.6	3,485,824	1,427.0	5,888,368	2,410.5	11,237,082	4,600.2
Jul-02	2,183,410	893.8	2,323,696	951.3	5,625,018	2,302.7	10,132,124	4,147.8
Aug-02	1,807,482	739.9	4,243,642	1,737.2	5,894,604	2,413.1	11,945,728	4,890.3
Sep-02	1,866,752	764.2	3,527,562	1,444.1	4,827,056	1,976.1	10,221,370	4,184.4
Oct-02	2,095,534	857.9	3,353,356	1,372.8	5,428,046	2,222.1	10,876,936	4,452.7
Nov-02	2,244,542	918.9	3,254,944	1,332.5	5,449,068	2,230.7	10,948,554	4,482.0
Dec-02	1,662,376	680.5	2,254,438	922.9	4,593,146	1,880.3	8,509,960	3,483.8
Jan-03	2,146,652	909.8	2,705,212	1,146.5	6,813,514	2,887.7	11,665,378	4,944.0
Feb-03	2,371,888	1,005.2	3,017,326	1,278.8	5,638,221	2,389.6	11,027,435	4,673.6
Mar-03	2,207,468	935.6	3,040,506	1,288.6	4,816,522	2,041.3	10,064,496	4,265.5
Apr-03	2,031,600	861.0	2,681,492	1,136.5	5,001,580	2,119.7	9,714,672	4,117.2
May-03	2,441,344	1,034.7	3,746,540	1,587.8	5,633,999	2,387.8	11,821,883	5,010.3
Jun-03	1,722,426	730.0	3,452,784	1,463.3	5,229,500	2,216.3	10,404,710	4,409.7
Jul-03	1,747,278	740.5	3,541,492	1,500.9	4,349,668	1,843.5	9,638,438	4,084.9
Aug-03	1,995,400	845.7	3,015,438	1,278.0	5,877,926	2,491.2	10,888,764	4,614.8
Sep-03	1,843,282	781.2	2,915,530	1,235.6	5,675,664	2,405.4	10,434,476	4,422.3
Oct-03	2,267,162	960.9	1,937,386	821.1	5,911,816	2,505.5	10,116,364	4,287.5
Nov-03	1,680,946	712.4	3,592,858	1,522.7	4,853,120	2,056.8	10,126,924	4,291.9
Dec-03	1,820,894	771.7	1,981,298	839.7	5,167,128	2,189.9	8,969,320	3,801.3
Jan-04	1,853,986	757.3	2,930,912	1,197.1	6,123,336	2,501.1	10,908,234	4,455.5
Feb-04	1,597,760	652.6	2,712,414	1,107.9	5,210,972	2,128.4	9,521,146	3,888.9
Mar-04	1,401,452	572.4	4,065,630	1,660.6	5,083,346	2,076.3	10,550,428	4,309.3
Apr-04	1,709,896	698.4	3,063,816	1,251.4	5,970,034	2,438.5	10,743,746	4,388.3
May-04	1,530,864	625.3	4,281,953	1,749.0	5,102,926	2,084.3	10,915,743	4,458.5
Jun-04	1,829,738	747.4	3,181,436	1,299.5	6,104,291	2,493.3	11,115,465	4,540.1
Jul-04	756,880	309.1	1,617,994	660.9	2,325,608	949.9	4,700,482	1,919.9
Aug-04	2,657,206	1,085.3	3,880,670	1,585.1	660,192	269.7	7,198,068	2,940.0
Sep-04	2,201,086	899.0	2,327,848	950.8	5,232,316	2,137.1	9,761,250	3,987.0
Oct-04	2,363,645	965.4	3,451,140	1,409.6	5,657,126	2,310.6	11,471,911	4,685.7
Nov-04	2,195,334	896.7	2,902,298	1,185.4	4,783,126	1,953.7	9,880,758	4,035.8
Dec-04	2,427,570	991.5	3,421,188	1,397.4	5,156,958	2,106.4	11,005,716	4,495.3
Jan-05	2,409,290	988.7	3,089,728	1,268.0	5,453,806	2,238.1	10,952,824	4,494.8
Feb-05	2,336,156	958.7	2,316,298	950.6	5,232,222	2,147.2	9,884,676	4,056.5
Mar-05	2,559,012	1,050.2	3,936,476	1,615.4	5,811,080	2,384.7	12,306,568	5,050.4
Apr-05	2,437,168	1,000.2	3,900,888	1,600.8	6,498,880	2,667.0	12,836,936	5,268.0
May-05	2,499,247	1,025.6	3,540,382	1,452.9	7,133,632	2,927.5	13,173,261	5,406.0
Jun-05	2,017,093	827.8	3,679,018	1,509.8	5,463,328	2,242.0	11,159,439	4,579.6
Jul-05	2,402,774	986.0	3,925,004	1,610.7	6,820,098	2,798.8	13,147,876	5,395.6
Aug-05	2,518,210	1,033.4	3,495,898	1,434.6	6,576,574	2,698.9	12,590,682	5,167.0
Sep-05	2,511,306	1,030.6	3,372,864	1,384.2	6,563,740	2,693.6	12,447,910	5,108.4
Oct-05	2,491,870	1,022.6	3,190,974	1,309.5	6,256,514	2,567.5	11,939,358	4,899.7
Nov-05	2,288,540	939.2	2,593,756	1,064.4	5,222,020	2,143.0	10,104,316	4,146.6
Dec-05	2,858,442	1,173.0	3,528,420	1,448.0	7,214,870	2,960.8	13,601,732	5,581.9
Jan-06	2,555,874	937.1	2,891,330	1,060.1	6,048,860	2,217.8	11,496,064	4,214.9
Feb-06	1,945,764	713.4	2,821,958	1,034.7	5,226,860	1,916.4	9,994,582	3,664.4
Mar-06	3,193,118	1,170.7	4,010,188	1,470.3	7,397,490	2,712.2	14,600,796	5,353.3
Apr-06	2,407,108	882.5	4,006,922	1,469.1	5,865,858	2,150.7	12,279,888	4,502.3
May-06	2,816,904	1,032.8	3,568,262	1,308.3	7,400,710	2,713.4	13,785,876	5,054.5
Jun-06	2,641,028	968.3	3,534,416	1,295.9	6,291,696	2,306.8	12,467,140	4,571.0
Jul-06	2,694,274	987.8	2,862,368	1,049.5	6,744,888	2,473.0	12,301,530	4,510.3
Aug-06	2,445,014	896.4	2,339,514	857.8	5,862,330	2,149.4	10,646,858	3,903.6
Sep-06	2,516,562	922.7	966,782	354.5	5,922,546	2,171.5	9,405,890	3,448.6
Oct-06	2,233,781	819.0	1,647,306	604.0	4,593,054	1,684.0	8,474,141	3,107.0
Nov-06	1,921,870	704.6	2,465,380	903.9	5,015,288	1,838.8	9,402,538	3,447.4
Dec-06	1,707,114	625.9	1,204,904	441.8	4,978,026	1,825.2	7,890,044	2,892.8
Jan-07	2,027,982	508.0	2,779,818	1,734.6	5,237,284	1,311.9	10,045,084	3,554.6
Feb-07	1,637,807	410.3	2,575,524	1,607.1	5,212,020	1,305.6	9,425,351	3,323.0
Mar-07	1,667,218	417.6	2,368,914	1,478.2	5,468,112	1,369.8	9,504,244	3,265.6
Apr-07	1,515,324	379.6	3,526,046	2,200.3	5,451,454	1,365.6	10,492,824	3,945.5
May-07	2,297,662	575.6	861,126	537.3	7,385,806	1,850.2	10,544,594	2,963.1
Jun-07	1,867,886	467.9	3,294,152	2,055.6	6,542,706	1,639.0	11,704,744	4,162.4
Jul-07	1,976,868	495.2	3,434,446	2,143.1	6,571,054	1,646.1	11,982,368	4,284.4
Aug-07	3,005,236	752.8	2,183,506	1,362.5	7,621,556	1,909.2	12,810,298	4,024.5
Sep-07	1,663,814	416.8	3,601,340	2,247.2	5,223,760	1,308.6	10,488,914	3,972.6
Oct-07	1,693,582	424.2	3,313,472	2,067.6	6,092,654	1,526.2	11,099,708	4,018.1
Nov-07	1,039,554	260.4	1,798,646	1,122.4	6,498,108	1,627.8	9,336,308	3,010.6
Dec-07	1,310,152	328.2	2,776,514	1,732.6	4,147,038	1,038.8	8,233,704	3,099.6
Jan-08	639,662	174.4	3,159,501	3,352.4	6,126,142	1,670.6	9,925,305	5,197.4
Feb-08	1,314,024	358.3	1,837,270	1,949.4	5,020,256	1,369.0	8,171,550	3,676.8
Mar-08	578,720	157.8	2,457,044	2,607.1	4,989,436	1,360.6	8,025,200	4,125.5
Apr-08	2,108,386	575.0	0	0.0	5,853,086	1,596.1	7,961,472	2,171.1
May-08	2,224,620	606.7	0	0.0	6,478,364	1,766.7	8,702,984	2,373.3
Jun-08	1,872,784	510.7	0	0.0	6,101,118	1,663.8	7,973,902	2,174.5
Jul-08	2,162,420	589.7	0	0.0	7,174,114	1,956.4	9,336,534	2,546.1
Aug-08	2,693,958	734.6	0	0.0	8,059,982	2,198.0	10,753,940	2,932.6
Sep-08	943,454	257.3	2,475,900	2,627.1	6,348,000	1,731.1	9,767,354	4,615.4
Oct-08	866,952	236.4	2,905,210	3,082.6	5,000,798	1,363.7	8,772,960	4,682.7
Nov-08	1,990,380	542.8	931,510	988.4	5,452,104	1,486.8	8,373,994	3,018.0
Dec-08	1,485,202	405.0	834,581	885.5	3,722,596	1,015.2	6,042,379	2,305.7
Jan-09	1,285,454	372.5	555,450	617.7	3,869,904	1,121.6	5,710,808	2,111.8
Feb-09	1,552,726	450.0	0	0.0	4,341,464	1,258.2	5,894,190	1,708.2
Mar-09	1,930,246	559.4	2,219,730	2,468.5	6,108,386	1,770.3	10,258,362	4,798.3
Apr-09	2,296,366	665.5	1,665,982	1,852.7	6,990,298	2,025.9	10,952,646	4,544.1
May-09	1,724,148	499.7	1,940,418	2,157.9	5,886,528	1,706.0	9,551,094	4,363.6
Jun-09	1,816,076	526.3	2,357,946	2,622.3	5,887,494	1,706.3	10,061,516	4,854.9
Jul-09	2,089,273	605.5	1,111,038	1,235.6	6,146,106	1,781.2	9,346,417	3,622.3
Aug-09	2,143,720	621.3	2,082,558	2,316.0	5,479,244	1,588.0	9,705,522	4,525.3
Sep-09	1,713,254	496.5	1,247,658	1,387.5	4,826,182	1,398.7	7,787,094	3,282.7
Oct-09	2,138,356	619.7	1,828,316	2,033.3	6,365,940	1,844.9	10,332,612	4,497.9
Nov-09	1,731,756	501.9	1,116,190	1,241.3	5,465,399	1,584.0	8,313,345	3,327.2
Dec-09	1,556,778	451.2	972,302	1,081.3	5,027,248	1,457.0	7,556,328	2,989.4
Jan-10	1,850,166	598.5	622,978	793.0	5,657,172	1,830.1	8,130,316	3,221.7
Feb-10	1,107,634	358.3	1,116,926	1,421.8	3,271,198	1,058.3	5,495,758	2,838.4
Mar-10	2,044,838	661.5	3,197,276	4,070.0	4,789,566	1,549.5	10,031,680	6,281.0
Apr-10	2,223,732	719.4	1,673,434	2,130.2	7,451,862	2,410.7	11,349,028	5,260.4
May-10	2,138,494	691.8	2,099,302	2,672.3	6,767,750	2,189.4	11,005,546	5,553.6
Jun-10	2,264,715	732.7	0	0.0	6,746,038	2,182.4	9,010,753	2,915.0
Jul-10	2,431,560	786.6	1,093,972	1,392.6	6,572,572	2,126.3	10,098,104	4,305.5
Aug-10	0	0.0	3,346,362	4,259.8	6,115,102	1,978.3	9,461,464	6,238.1
Sep-10	1,254,604	405.9	2,361,088	3,005.6	6,095,276	1,971.9	9,710,968	5,383.3
Oct-10	2,379,136	769.7	2,902,186	3,694.4	5,720,928	1,850.8	11,002,250	6,314.8
Nov-10	1,765,756	571.2	1,813,182	2,308.1	4,562,648	1,476.1	8,141,586	4,355.4
Dec-10	1,679,417	543.3	2,625,496	3,342.2	6,158,300	1,992.3	10,463,213	5,877.7
Jan-11	1,998,332	830.9	1,651,446	1,800.9	5,680,724	2,362.1	9,330,502	4,993.9
Feb-11	1,843,680	766.6	2,974,682	3,243.9	5,497,046	2,285.7	10,315,408	6,296.3
Mar-11	2,387,748	992.8	3,286,792	3,584.3	5,739,248	2,386.4	11,413,788	6,963.6
Apr-11	2,655,948	1,104.4	2,766,302	3,016.7	6,151,488	2,557.8	11,573,738	6,678.9
May-11	2,791,096	1,160.6	2,349,128	2,561.8	6,400,992	2,661.6	11,541,216	6,383.9
Jun-11	2,309,108	960.1	2,854,806	3,113.2	5,698,848	2,369.6	10,862,762	6,443.0
Jul-11	1,859,964	773.4	1,644,684	1,793.6	5,060,736	2,104.3	8,565,384	4,671.2
Aug-11	2,371,806	986.2	1,062,922	1,159.1	5,698,618	2,369.5	9,133,346	4,514.9
Sep-11	1,559,492	648.4	693,266	756.0	4,381,500	1,821.9	6,634,258	3,226.3
Oct-11	2,078,556	864.3	2,175,018	2,371.9	5,715,776	2,376.7	9,969,350	5,612.8
Nov-11	1,025,524	426.4	828,276	903.2	2,632,718	1,094.7	4,486,518	2,424.4
Dec-11	2,077,340	863.8	1,507,742	1,644.2	5,661,864	2,354.2	9,246,946	4,862.2

1. Monthly kiln production data from select years are from the file "Monthly Kiln Volume-2004-2012.pdf" copied during the Augusta Lumber Mill site visit on March 06, 2012 by Deanna Duram and Jake Stewart (Trinity). The remaining month's prooduction data were taken from documents on file at Georgia EPD in Atlanta, Georgia.

2. Annual data for wood waste combusted was provided via email from West Fraser to Trinity on April 9, 2012. The annual values were converted to monthly values by taking the ratio of the lumber produced in a given month to the amount of lumber produced in the entire year.

Table B-4. Emission Factors for Direct-Fired Batch Kilns

Pollutant	Emission Factor		Reference
NSR Pollutants			
CO	0.73	lb/MBF	1
Fluorides	N/A	N/A	2
H_2S	N/A	N/A	2
Lead	1.77E-05	lb/MMBtu	3
NO_X	0.28	lb/MBF	4
Reduced Sulfur Compounds (including H_2S)	N/A	N/A	2
SO_2	0.025	lb/MMBtu	5
H_2SO_4	N/A	N/A	2
Total PM	0.41	lb/MBF	6
Total PM_{10}	0.25	lb/MBF	6, 7
Total $PM_{2.5}$	0.226	lb/MBF	6, 8
Total Reduced Sulfur (including H_2S)	N/A	N/A	2
Total VOC	3.83	lb/MBF	9
Greenhouse Gases			
CO_2	206.79	lb/MMBtu	10
CH_4	7.1E-02	lb/MMBtu	10
N_2O	9.3E-03	lb/MMBtu	10
CO_2e	211.15	lb/MMBtu	11
$CO_2e_{biomass\ deferral}$	4.35	lb/MMBtu	12
HAPs			
Formaldehyde	0.04	lb/MBF	3
Methanol	0.16	lb/MBF	3

1. Based on the average of NCASI test results as provided via email from Dr. Word of NCASI to the North Carolina Department of Air Quality (NCDAQ), published in the Air Permit Review/Preliminary Determination, p. 8 for the Weyerhaeuser NR Lumber Mill (Plymouth, N.C.) application submitted in May 2010 entitled "Final Report - Revised Air Permit Applicatin for Energy Project."

2. Emissions of these pollutants are not expected at the West Fraser Augusta, GA site.

3. Per NCASI SARA 313 Guidance - Wood Products - April 2009, as published in the Weyerhaeuser NR Lumber Mill (Plymouth, N.C.) revised air permit application entitled "Final Report - Revised Air Permit Applicatin for Energy Project," dated May 2010.

4. Provided by Dr. David Word of NCASI to the Weyerhaeuser facility in February 2008, as published in the Air Permit Review/Preliminary Determination, p. 5 for the Weyerhaeuser NR Lumber Mill (Plymouth, N.C.) for the May 2010 permit application.

5. Per U.S. EPA's AP-42, Section 1.6, Table 1.6-2, *Wood Residue Combustion in Boilers* (September 2003).

6. Based on unpublished NCASI values for direct-fired kilns, provided in the NCDAQ Air Permit Review/Preliminary Determination, p. 9, for the Weyerhaeuser NR Lumber Mill (Plymouth, N.C.) May 2010 permit application. Total PM/PM_{10}/$PM_{2.5}$ emissions are the sum of filterable and condensable particulate.

7. Based on the air permit document for Bibler Brother, dated May 2008, which used EPA's "PM Calculator" software for the ratio of PM to PM_{10} for various wood dryer source classification codes, as published in the Air Permit Review/Preliminary Determination, p.9, for the Weyerhaeuser NR Lumber Mill (Plymouth, N.C.) May 2010 permit application.

8. Based on Weyerhaeuser's Particulate Matter Estimating Guide, 2003, as referenced in the May 20120 Weyerhaeuser Plymouth Lumber Mill Revised Air Permit Application for Energy Project. Information published in the Air Permit Review/Preliminary Determination, p.9, for the Weyerhaeuser NR Lumber Mill (Plymouth, N.C.) May 2010 permit application.

9. Total VOC (lb/MBF) as requested by EPD.

10. Per 40 CFR Part 98, Subpart C, Tables C-1 and C-2. The CO_2 emission factor is the default factor for wood and wood residuals, and the CH_4 and N_2O emission factors are the default factors for all solid biomass fuels.

11. The CO_2e factor is calculated based on the emission factors for CO_2, CH_4, and N_2O and the global warming potential (GWP) for each pollutant per 40 CFR 98, Subpart A, Table A-1:

CO_2	1
CH_4	21
N_2O	310

12. Pursuant to 40 CFR Part 98.2(b)(2), biogenic carbon dioxide emissions (e.g., from biomass) are excluded from the combustion of biomass.

Table B-5. Baseline Monthly Emissions for Kiln 1 (tons per month)

Month	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Jan-02	0.62	N/A	N/A	5.56E-05	0.24	N/A	0.08	N/A	0.35	0.21	0.19	N/A	3.27	13.68	0.03	**0.14**
Feb-02	0.59	N/A	N/A	5.30E-05	0.23	N/A	0.07	N/A	0.33	0.20	0.18	N/A	3.11	13.04	0.03	**0.13**
Mar-02	0.65	N/A	N/A	5.79E-05	0.25	N/A	0.08	N/A	0.36	0.22	0.20	N/A	3.40	14.23	0.04	**0.14**
Apr-02	0.56	N/A	N/A	5.01E-05	0.22	N/A	0.07	N/A	0.31	0.19	0.17	N/A	2.94	12.33	0.03	**0.12**
May-02	0.53	N/A	N/A	4.73E-05	0.20	N/A	0.07	N/A	0.30	0.18	0.16	N/A	2.78	11.63	0.03	**0.12**
Jun-02	0.68	N/A	N/A	6.07E-05	0.26	N/A	0.09	N/A	0.38	0.23	0.21	N/A	3.57	14.93	0.04	**0.15**
Jul-02	0.80	N/A	N/A	7.12E-05	0.31	N/A	0.10	N/A	0.44	0.27	0.25	N/A	4.18	17.50	0.04	**0.17**
Aug-02	0.66	N/A	N/A	5.89E-05	0.25	N/A	0.08	N/A	0.37	0.22	0.20	N/A	3.46	14.49	0.04	**0.14**
Sep-02	0.68	N/A	N/A	6.09E-05	0.26	N/A	0.09	N/A	0.38	0.23	0.21	N/A	3.57	14.97	0.04	**0.15**
Oct-02	0.76	N/A	N/A	6.83E-05	0.29	N/A	0.10	N/A	0.43	0.26	0.24	N/A	4.01	16.80	0.04	**0.17**
Nov-02	0.82	N/A	N/A	7.32E-05	0.31	N/A	0.10	N/A	0.46	0.28	0.25	N/A	4.30	17.99	0.04	**0.18**
Dec-02	0.61	N/A	N/A	5.42E-05	0.23	N/A	0.08	N/A	0.34	0.21	0.19	N/A	3.18	13.33	0.03	**0.13**
Jan-03	0.78	N/A	N/A	7.25E-05	0.30	N/A	0.10	N/A	0.44	0.27	0.24	N/A	4.11	17.82	0.04	**0.17**
Feb-03	0.87	N/A	N/A	8.01E-05	0.33	N/A	0.11	N/A	0.48	0.29	0.27	N/A	4.54	19.69	0.05	**0.19**
Mar-03	0.81	N/A	N/A	7.45E-05	0.31	N/A	0.11	N/A	0.45	0.27	0.25	N/A	4.23	18.32	0.04	**0.18**
Apr-03	0.74	N/A	N/A	6.86E-05	0.28	N/A	0.10	N/A	0.41	0.25	0.23	N/A	3.89	16.86	0.04	**0.16**
May-03	0.89	N/A	N/A	8.24E-05	0.34	N/A	0.12	N/A	0.50	0.30	0.28	N/A	4.68	20.26	0.05	**0.20**
Jun-03	0.63	N/A	N/A	5.81E-05	0.24	N/A	0.08	N/A	0.35	0.21	0.19	N/A	3.30	14.30	0.03	**0.14**
Jul-03	0.64	N/A	N/A	5.90E-05	0.24	N/A	0.08	N/A	0.36	0.22	0.20	N/A	3.35	14.50	0.03	**0.14**
Aug-03	0.73	N/A	N/A	6.74E-05	0.28	N/A	0.10	N/A	0.41	0.25	0.23	N/A	3.82	16.56	0.04	**0.16**
Sep-03	0.67	N/A	N/A	6.22E-05	0.26	N/A	0.09	N/A	0.38	0.23	0.21	N/A	3.53	15.30	0.04	**0.15**
Oct-03	0.83	N/A	N/A	7.65E-05	0.32	N/A	0.11	N/A	0.46	0.28	0.26	N/A	4.34	18.82	0.05	**0.18**
Nov-03	0.61	N/A	N/A	5.67E-05	0.24	N/A	0.08	N/A	0.34	0.21	0.19	N/A	3.22	13.95	0.03	**0.13**
Dec-03	0.66	N/A	N/A	6.15E-05	0.25	N/A	0.09	N/A	0.37	0.22	0.21	N/A	3.49	15.11	0.04	**0.15**
Jan-04	0.68	N/A	N/A	6.03E-05	0.26	N/A	0.09	N/A	0.38	0.23	0.21	N/A	3.55	14.83	0.04	**0.15**
Feb-04	0.58	N/A	N/A	5.20E-05	0.22	N/A	0.07	N/A	0.33	0.20	0.18	N/A	3.06	12.78	0.03	**0.13**
Mar-04	0.51	N/A	N/A	4.56E-05	0.20	N/A	0.06	N/A	0.29	0.17	0.16	N/A	2.68	11.21	0.03	**0.11**
Apr-04	0.62	N/A	N/A	5.56E-05	0.24	N/A	0.08	N/A	0.35	0.21	0.19	N/A	3.27	13.68	0.03	**0.14**
May-04	0.56	N/A	N/A	4.98E-05	0.21	N/A	0.07	N/A	0.31	0.19	0.17	N/A	2.93	12.25	0.03	**0.12**
Jun-04	0.67	N/A	N/A	5.95E-05	0.26	N/A	0.08	N/A	0.37	0.23	0.21	N/A	3.50	14.64	0.04	**0.15**
Jul-04	0.28	N/A	N/A	2.46E-05	0.11	N/A	0.03	N/A	0.15	0.09	0.09	N/A	1.45	6.05	0.02	**0.06**
Aug-04	0.97	N/A	N/A	8.64E-05	0.37	N/A	0.12	N/A	0.54	0.33	0.30	N/A	5.09	21.25	0.05	**0.21**
Sep-04	0.80	N/A	N/A	7.16E-05	0.31	N/A	0.10	N/A	0.45	0.27	0.25	N/A	4.22	17.61	0.04	**0.18**
Oct-04	0.86	N/A	N/A	7.69E-05	0.33	N/A	0.11	N/A	0.48	0.29	0.27	N/A	4.53	18.91	0.05	**0.19**
Nov-04	0.80	N/A	N/A	7.14E-05	0.31	N/A	0.10	N/A	0.45	0.27	0.25	N/A	4.20	17.56	0.04	**0.18**
Dec-04	0.89	N/A	N/A	7.90E-05	0.34	N/A	0.11	N/A	0.49	0.30	0.27	N/A	4.65	19.42	0.05	**0.19**
Jan-05	0.88	N/A	N/A	7.88E-05	0.34	N/A	0.11	N/A	0.49	0.30	0.27	N/A	4.61	19.36	0.05	**0.19**
Feb-05	0.85	N/A	N/A	7.64E-05	0.33	N/A	0.11	N/A	0.48	0.29	0.26	N/A	4.47	18.78	0.05	**0.19**
Mar-05	0.93	N/A	N/A	8.36E-05	0.36	N/A	0.12	N/A	0.52	0.32	0.29	N/A	4.90	20.57	0.05	**0.20**
Apr-05	0.89	N/A	N/A	7.97E-05	0.34	N/A	0.11	N/A	0.50	0.30	0.28	N/A	4.67	19.59	0.05	**0.19**
May-05	0.91	N/A	N/A	8.17E-05	0.35	N/A	0.12	N/A	0.51	0.31	0.28	N/A	4.79	20.09	0.05	**0.20**
Jun-05	0.74	N/A	N/A	6.59E-05	0.28	N/A	0.09	N/A	0.41	0.25	0.23	N/A	3.86	16.21	0.04	**0.16**
Jul-05	0.88	N/A	N/A	7.85E-05	0.34	N/A	0.11	N/A	0.49	0.30	0.27	N/A	4.60	19.31	0.05	**0.19**
Aug-05	0.92	N/A	N/A	8.23E-05	0.35	N/A	0.12	N/A	0.51	0.31	0.28	N/A	4.82	20.24	0.05	**0.20**
Sep-05	0.92	N/A	N/A	8.21E-05	0.35	N/A	0.12	N/A	0.51	0.31	0.28	N/A	4.81	20.18	0.05	**0.20**
Oct-05	0.91	N/A	N/A	8.15E-05	0.35	N/A	0.12	N/A	0.51	0.31	0.28	N/A	4.77	20.03	0.05	**0.20**
Nov-05	0.84	N/A	N/A	7.48E-05	0.32	N/A	0.11	N/A	0.47	0.28	0.26	N/A	4.38	18.39	0.05	**0.18**
Dec-05	1.04	N/A	N/A	9.34E-05	0.40	N/A	0.13	N/A	0.58	0.35	0.32	N/A	5.47	22.97	0.06	**0.23**

Table B-5. Baseline Monthly Emissions for Kiln 1 (tons per month)

Month	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Jan-06	0.93	N/A	N/A	7.46E-05	0.36	N/A	0.11	N/A	0.52	0.32	0.29	N/A	4.89	18.35	0.05	**0.20**
Feb-06	0.71	N/A	N/A	5.68E-05	0.27	N/A	0.08	N/A	0.40	0.24	0.22	N/A	3.73	13.97	0.04	**0.16**
Mar-06	1.17	N/A	N/A	9.32E-05	0.45	N/A	0.13	N/A	0.65	0.39	0.36	N/A	6.11	22.93	0.06	**0.26**
Apr-06	0.88	N/A	N/A	7.03E-05	0.34	N/A	0.10	N/A	0.49	0.30	0.27	N/A	4.61	17.28	0.05	**0.19**
May-06	1.03	N/A	N/A	8.23E-05	0.39	N/A	0.12	N/A	0.57	0.35	0.32	N/A	5.39	20.23	0.06	**0.23**
Jun-06	0.96	N/A	N/A	7.71E-05	0.37	N/A	0.11	N/A	0.54	0.33	0.30	N/A	5.06	18.96	0.05	**0.21**
Jul-06	0.98	N/A	N/A	7.87E-05	0.38	N/A	0.11	N/A	0.55	0.33	0.30	N/A	5.16	19.35	0.05	**0.22**
Aug-06	0.89	N/A	N/A	7.14E-05	0.34	N/A	0.10	N/A	0.50	0.30	0.28	N/A	4.68	17.56	0.05	**0.20**
Sep-06	0.92	N/A	N/A	7.35E-05	0.35	N/A	0.10	N/A	0.51	0.31	0.28	N/A	4.82	18.07	0.05	**0.20**
Oct-06	0.82	N/A	N/A	6.52E-05	0.31	N/A	0.09	N/A	0.45	0.28	0.25	N/A	4.28	16.04	0.04	**0.18**
Nov-06	0.70	N/A	N/A	5.61E-05	0.27	N/A	0.08	N/A	0.39	0.24	0.22	N/A	3.68	13.80	0.04	**0.15**
Dec-06	0.62	N/A	N/A	4.99E-05	0.24	N/A	0.07	N/A	0.35	0.21	0.19	N/A	3.27	12.26	0.03	**0.14**
Jan-07	0.74	N/A	N/A	4.05E-05	0.28	N/A	0.06	N/A	0.41	0.25	0.23	N/A	3.88	9.95	0.04	**0.16**
Feb-07	0.60	N/A	N/A	3.27E-05	0.23	N/A	0.05	N/A	0.33	0.20	0.19	N/A	3.14	8.03	0.03	**0.13**
Mar-07	0.61	N/A	N/A	3.33E-05	0.23	N/A	0.05	N/A	0.34	0.21	0.19	N/A	3.19	8.18	0.03	**0.13**
Apr-07	0.55	N/A	N/A	3.02E-05	0.21	N/A	0.04	N/A	0.31	0.19	0.17	N/A	2.90	7.43	0.03	**0.12**
May-07	0.84	N/A	N/A	4.58E-05	0.32	N/A	0.06	N/A	0.47	0.28	0.26	N/A	4.40	11.27	0.05	**0.18**
Jun-07	0.68	N/A	N/A	3.73E-05	0.26	N/A	0.05	N/A	0.38	0.23	0.21	N/A	3.58	9.16	0.04	**0.15**
Jul-07	0.72	N/A	N/A	3.94E-05	0.28	N/A	0.06	N/A	0.40	0.24	0.22	N/A	3.79	9.70	0.04	**0.16**
Aug-07	1.10	N/A	N/A	6.00E-05	0.42	N/A	0.08	N/A	0.61	0.37	0.34	N/A	5.76	14.74	0.06	**0.24**
Sep-07	0.61	N/A	N/A	3.32E-05	0.23	N/A	0.05	N/A	0.34	0.21	0.19	N/A	3.19	8.16	0.03	**0.13**
Oct-07	0.62	N/A	N/A	3.38E-05	0.24	N/A	0.05	N/A	0.34	0.21	0.19	N/A	3.24	8.31	0.03	**0.14**
Nov-07	0.38	N/A	N/A	2.07E-05	0.15	N/A	0.03	N/A	0.21	0.13	0.12	N/A	1.99	5.10	0.02	**0.08**
Dec-07	0.48	N/A	N/A	2.61E-05	0.18	N/A	0.04	N/A	0.27	0.16	0.15	N/A	2.51	6.43	0.03	**0.10**
Jan-08	0.23	N/A	N/A	1.39E-05	0.09	N/A	0.02	N/A	0.13	0.08	0.07	N/A	1.22	3.42	0.01	**0.05**
Feb-08	0.48	N/A	N/A	2.85E-05	0.18	N/A	0.04	N/A	0.27	0.16	0.15	N/A	2.52	7.02	0.03	**0.11**
Mar-08	0.21	N/A	N/A	1.26E-05	0.08	N/A	0.02	N/A	0.12	0.07	0.07	N/A	1.11	3.09	0.01	**0.05**
Apr-08	0.77	N/A	N/A	4.58E-05	0.30	N/A	0.06	N/A	0.43	0.26	0.24	N/A	4.04	11.26	0.04	**0.17**
May-08	0.81	N/A	N/A	4.83E-05	0.31	N/A	0.07	N/A	0.45	0.27	0.25	N/A	4.26	11.88	0.04	**0.18**
Jun-08	0.68	N/A	N/A	4.07E-05	0.26	N/A	0.06	N/A	0.38	0.23	0.21	N/A	3.59	10.00	0.04	**0.15**
Jul-08	0.79	N/A	N/A	4.70E-05	0.30	N/A	0.07	N/A	0.44	0.27	0.24	N/A	4.14	11.55	0.04	**0.17**
Aug-08	0.98	N/A	N/A	5.85E-05	0.38	N/A	0.08	N/A	0.55	0.33	0.30	N/A	5.16	14.39	0.05	**0.22**
Sep-08	0.34	N/A	N/A	2.05E-05	0.13	N/A	0.03	N/A	0.19	0.12	0.11	N/A	1.81	5.04	0.02	**0.08**
Oct-08	0.32	N/A	N/A	1.88E-05	0.12	N/A	0.03	N/A	0.18	0.11	0.10	N/A	1.66	4.63	0.02	**0.07**
Nov-08	0.73	N/A	N/A	4.32E-05	0.28	N/A	0.06	N/A	0.41	0.25	0.22	N/A	3.81	10.63	0.04	**0.16**
Dec-08	0.54	N/A	N/A	3.23E-05	0.21	N/A	0.05	N/A	0.30	0.18	0.17	N/A	2.84	7.93	0.03	**0.12**
Jan-09	0.47	N/A	N/A	2.97E-05	0.18	N/A	0.04	N/A	0.26	0.16	0.15	N/A	2.46	7.30	0.03	**0.10**
Feb-09	0.57	N/A	N/A	3.58E-05	0.22	N/A	0.05	N/A	0.32	0.19	0.18	N/A	2.97	8.81	0.03	**0.12**
Mar-09	0.70	N/A	N/A	4.46E-05	0.27	N/A	0.06	N/A	0.39	0.24	0.22	N/A	3.70	10.96	0.04	**0.15**
Apr-09	0.84	N/A	N/A	5.30E-05	0.32	N/A	0.07	N/A	0.47	0.28	0.26	N/A	4.40	13.03	0.05	**0.18**
May-09	0.63	N/A	N/A	3.98E-05	0.24	N/A	0.06	N/A	0.35	0.21	0.19	N/A	3.30	9.79	0.03	**0.14**
Jun-09	0.66	N/A	N/A	4.19E-05	0.25	N/A	0.06	N/A	0.37	0.22	0.21	N/A	3.48	10.31	0.04	**0.15**
Jul-09	0.76	N/A	N/A	4.82E-05	0.29	N/A	0.07	N/A	0.43	0.26	0.24	N/A	4.00	11.86	0.04	**0.17**
Aug-09	0.78	N/A	N/A	4.95E-05	0.30	N/A	0.07	N/A	0.44	0.26	0.24	N/A	4.11	12.17	0.04	**0.17**
Sep-09	0.63	N/A	N/A	3.95E-05	0.24	N/A	0.06	N/A	0.35	0.21	0.19	N/A	3.28	9.72	0.03	**0.14**
Oct-09	0.78	N/A	N/A	4.94E-05	0.30	N/A	0.07	N/A	0.44	0.26	0.24	N/A	4.09	12.14	0.04	**0.17**
Nov-09	0.63	N/A	N/A	4.00E-05	0.24	N/A	0.06	N/A	0.35	0.21	0.20	N/A	3.32	9.83	0.03	**0.14**

Table B-5. Baseline Monthly Emissions for Kiln 1 (tons per month)

Month	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Dec-09	0.57	N/A	N/A	3.59E-05	0.22	N/A	0.05	N/A	0.32	0.19	0.18	N/A	2.98	8.84	0.03	**0.12**
Jan-10	0.68	N/A	N/A	4.77E-05	0.26	N/A	0.07	N/A	0.38	0.23	0.21	N/A	3.54	11.72	0.04	**0.15**
Feb-10	0.40	N/A	N/A	2.85E-05	0.16	N/A	0.04	N/A	0.23	0.14	0.13	N/A	2.12	7.02	0.02	**0.09**
Mar-10	0.75	N/A	N/A	5.27E-05	0.29	N/A	0.07	N/A	0.42	0.25	0.23	N/A	3.92	12.95	0.04	**0.16**
Apr-10	0.81	N/A	N/A	5.73E-05	0.31	N/A	0.08	N/A	0.45	0.27	0.25	N/A	4.26	14.09	0.04	**0.18**
May-10	0.78	N/A	N/A	5.51E-05	0.30	N/A	0.08	N/A	0.44	0.26	0.24	N/A	4.10	13.55	0.04	**0.17**
Jun-10	0.83	N/A	N/A	5.84E-05	0.32	N/A	0.08	N/A	0.46	0.28	0.26	N/A	4.34	14.35	0.05	**0.18**
Jul-10	0.89	N/A	N/A	6.27E-05	0.34	N/A	0.09	N/A	0.49	0.30	0.27	N/A	4.66	15.41	0.05	**0.19**
Aug-10	0.00	N/A	N/A	0.00E+00	0.00	N/A	0.00	N/A	0.00	0.00	0.00	N/A	0.00	0.00	0.00	**0.00**
Sep-10	0.46	N/A	N/A	3.23E-05	0.18	N/A	0.05	N/A	0.26	0.15	0.14	N/A	2.40	7.95	0.03	**0.10**
Oct-10	0.87	N/A	N/A	6.13E-05	0.33	N/A	0.09	N/A	0.48	0.29	0.27	N/A	4.56	15.07	0.05	**0.19**
Nov-10	0.64	N/A	N/A	4.55E-05	0.25	N/A	0.06	N/A	0.36	0.22	0.20	N/A	3.38	11.19	0.04	**0.14**
Dec-10	0.61	N/A	N/A	4.33E-05	0.24	N/A	0.06	N/A	0.34	0.21	0.19	N/A	3.22	10.64	0.03	**0.13**
Jan-11	0.73	N/A	N/A	6.62E-05	0.28	N/A	0.09	N/A	0.41	0.25	0.23	N/A	3.83	16.27	0.04	**0.16**
Feb-11	0.67	N/A	N/A	6.11E-05	0.26	N/A	0.09	N/A	0.38	0.23	0.21	N/A	3.53	15.01	0.04	**0.15**
Mar-11	0.87	N/A	N/A	7.91E-05	0.33	N/A	0.11	N/A	0.49	0.29	0.27	N/A	4.57	19.44	0.05	**0.19**
Apr-11	0.97	N/A	N/A	8.80E-05	0.37	N/A	0.12	N/A	0.54	0.33	0.30	N/A	5.09	21.63	0.05	**0.21**
May-11	1.02	N/A	N/A	9.24E-05	0.39	N/A	0.13	N/A	0.57	0.34	0.32	N/A	5.34	22.73	0.06	**0.22**
Jun-11	0.84	N/A	N/A	7.65E-05	0.32	N/A	0.11	N/A	0.47	0.29	0.26	N/A	4.42	18.80	0.05	**0.18**
Jul-11	0.68	N/A	N/A	6.16E-05	0.26	N/A	0.09	N/A	0.38	0.23	0.21	N/A	3.56	15.15	0.04	**0.15**
Aug-11	0.87	N/A	N/A	7.86E-05	0.33	N/A	0.11	N/A	0.48	0.29	0.27	N/A	4.54	19.31	0.05	**0.19**
Sep-11	0.57	N/A	N/A	5.16E-05	0.22	N/A	0.07	N/A	0.32	0.19	0.18	N/A	2.99	12.70	0.03	**0.12**
Oct-11	0.76	N/A	N/A	6.88E-05	0.29	N/A	0.10	N/A	0.42	0.26	0.23	N/A	3.98	16.93	0.04	**0.17**
Nov-11	0.37	N/A	N/A	3.40E-05	0.14	N/A	0.05	N/A	0.21	0.13	0.12	N/A	1.96	8.35	0.02	**0.08**
Dec-11	0.76	N/A	N/A	6.88E-05	0.29	N/A	0.10	N/A	0.42	0.26	0.23	N/A	3.98	16.92	0.04	**0.17**

1. Baseline monthly emissions are calculated two ways depending on the units of the emission factor of interest.
   If the emission factor is in units of lb/MBF, the following derivation is used: Actual Emissions [ton/month] = Emission Factor [lb/MBF] * Monthly Kiln Production [BF/month] / 2,000 lb/ton / 1,000 BF/MBF
   If the emission factor is in units of lb/MMBtu, the following derivation is used: Actual Emissions [ton/month] = Emission Factor [lb/MMBtu] * Monthly Wood Combusted [tons/month] * Heating Value [4,500 Btu/lb wood combusted] / 1,000,000 Btu/MMBtu

Table B-6. Total 24-Month Rolling Average Actual Annual Emissions for Kilns 1 (tpy)

24 Month Period	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Jan-02 - Dec-03	8.41	N/A	N/A	7.65E-04	3.23	N/A	1.08	N/A	4.69	2.85	2.60	N/A	44.14	188.21	0.46	1.84
Feb-02 - Jan-04	8.44	N/A	N/A	7.68E-04	3.24	N/A	1.08	N/A	4.71	2.86	2.61	N/A	44.28	188.78	0.46	1.85
Mar-02 - Feb-04	8.43	N/A	N/A	7.67E-04	3.24	N/A	1.08	N/A	4.70	2.85	2.61	N/A	44.25	188.66	0.46	1.85
Apr-02 - Mar-04	8.37	N/A	N/A	7.61E-04	3.21	N/A	1.08	N/A	4.66	2.83	2.59	N/A	43.89	187.14	0.46	1.83
May-02 - Apr-04	8.40	N/A	N/A	7.64E-04	3.22	N/A	1.08	N/A	4.68	2.84	2.60	N/A	44.06	187.82	0.46	1.84
Jun-02 - May-04	8.41	N/A	N/A	7.65E-04	3.23	N/A	1.08	N/A	4.69	2.85	2.60	N/A	44.13	188.13	0.46	1.84
Jul-02 - Jun-04	8.41	N/A	N/A	7.65E-04	3.22	N/A	1.08	N/A	4.69	2.84	2.60	N/A	44.10	187.98	0.46	1.84
Aug-02 - Jul-04	8.15	N/A	N/A	7.41E-04	3.12	N/A	1.05	N/A	4.54	2.76	2.52	N/A	42.74	182.25	0.45	1.79
Sep-02 - Aug-04	8.30	N/A	N/A	7.55E-04	3.18	N/A	1.07	N/A	4.63	2.81	2.57	N/A	43.55	185.63	0.45	1.82
Oct-02 - Sep-04	8.36	N/A	N/A	7.60E-04	3.21	N/A	1.07	N/A	4.66	2.83	2.59	N/A	43.87	186.95	0.46	1.83
Nov-02 - Oct-04	8.41	N/A	N/A	7.65E-04	3.23	N/A	1.08	N/A	4.69	2.85	2.60	N/A	44.13	188.01	0.46	1.84
Dec-02 - Nov-04	8.40	N/A	N/A	7.64E-04	3.22	N/A	1.08	N/A	4.68	2.84	2.60	N/A	44.08	187.79	0.46	1.84
Jan-03 - Dec-04	8.54	N/A	N/A	7.76E-04	3.28	N/A	1.10	N/A	4.76	2.89	2.64	N/A	44.81	190.83	0.47	1.87
Feb-03 - Jan-05	8.59	N/A	N/A	7.79E-04	3.29	N/A	1.10	N/A	4.79	2.91	2.66	N/A	45.06	191.61	0.47	1.88
Mar-03 - Feb-05	8.58	N/A	N/A	7.77E-04	3.29	N/A	1.10	N/A	4.79	2.90	2.66	N/A	45.03	191.15	0.47	1.88
Apr-03 - Mar-05	8.65	N/A	N/A	7.82E-04	3.32	N/A	1.10	N/A	4.82	2.93	2.68	N/A	45.37	192.27	0.47	1.90
May-03 - Apr-05	8.72	N/A	N/A	7.88E-04	3.35	N/A	1.11	N/A	4.86	2.95	2.70	N/A	45.75	193.64	0.48	1.91
Jun-03 - May-05	8.73	N/A	N/A	7.87E-04	3.35	N/A	1.11	N/A	4.87	2.95	2.70	N/A	45.81	193.55	0.48	1.91
Jul-03 - Jun-05	8.79	N/A	N/A	7.91E-04	3.37	N/A	1.12	N/A	4.90	2.97	2.72	N/A	46.09	194.51	0.48	1.93
Aug-03 - Jul-05	8.90	N/A	N/A	8.01E-04	3.42	N/A	1.13	N/A	4.96	3.01	2.76	N/A	46.72	196.91	0.49	1.95
Sep-03 - Aug-05	9.00	N/A	N/A	8.08E-04	3.45	N/A	1.14	N/A	5.02	3.05	2.79	N/A	47.22	198.75	0.49	1.97
Oct-03 - Sep-05	9.12	N/A	N/A	8.18E-04	3.50	N/A	1.16	N/A	5.09	3.09	2.82	N/A	47.86	201.19	0.50	2.00
Nov-03 - Oct-05	9.16	N/A	N/A	8.21E-04	3.51	N/A	1.16	N/A	5.11	3.10	2.84	N/A	48.08	201.79	0.50	2.01
Dec-03 - Nov-05	9.27	N/A	N/A	8.30E-04	3.56	N/A	1.17	N/A	5.17	3.14	2.87	N/A	48.66	204.01	0.51	2.03
Jan-04 - Dec-05	9.46	N/A	N/A	8.46E-04	3.63	N/A	1.19	N/A	5.28	3.20	2.93	N/A	49.65	207.94	0.52	2.07
Feb-04 - Jan-06	9.59	N/A	N/A	8.53E-04	3.68	N/A	1.20	N/A	5.35	3.25	2.97	N/A	50.32	209.71	0.53	2.10
Mar-04 - Feb-06	9.66	N/A	N/A	8.55E-04	3.70	N/A	1.21	N/A	5.38	3.27	2.99	N/A	50.66	210.30	0.53	2.12
Apr-04 - Mar-06	9.98	N/A	N/A	8.79E-04	3.83	N/A	1.24	N/A	5.57	3.38	3.09	N/A	52.37	216.16	0.55	2.19
May-04 - Apr-06	10.11	N/A	N/A	8.86E-04	3.88	N/A	1.25	N/A	5.64	3.42	3.13	N/A	53.04	217.96	0.55	2.22
Jun-04 - May-06	10.34	N/A	N/A	9.03E-04	3.97	N/A	1.28	N/A	5.77	3.50	3.20	N/A	54.27	221.95	0.57	2.27
Jul-04 - Jun-06	10.49	N/A	N/A	9.12E-04	4.02	N/A	1.29	N/A	5.85	3.55	3.25	N/A	55.05	224.12	0.57	2.30
Aug-04 - Jul-06	10.85	N/A	N/A	9.39E-04	4.16	N/A	1.33	N/A	6.05	3.67	3.36	N/A	56.90	230.76	0.59	2.38
Sep-04 - Aug-06	10.81	N/A	N/A	9.31E-04	4.15	N/A	1.32	N/A	6.03	3.66	3.35	N/A	56.70	228.91	0.59	2.37
Oct-04 - Sep-06	10.86	N/A	N/A	9.32E-04	4.17	N/A	1.32	N/A	6.06	3.68	3.36	N/A	57.00	229.14	0.60	2.38
Nov-04 - Oct-06	10.84	N/A	N/A	9.26E-04	4.16	N/A	1.31	N/A	6.04	3.67	3.36	N/A	56.88	227.71	0.59	2.38
Dec-04 - Nov-06	10.79	N/A	N/A	9.18E-04	4.14	N/A	1.30	N/A	6.02	3.65	3.34	N/A	56.62	225.83	0.59	2.37
Jan-05 - Dec-06	10.66	N/A	N/A	9.04E-04	4.09	N/A	1.28	N/A	5.94	3.61	3.30	N/A	55.93	222.25	0.58	2.34
Feb-05 - Jan-07	10.59	N/A	N/A	8.85E-04	4.06	N/A	1.25	N/A	5.90	3.58	3.28	N/A	55.56	217.54	0.58	2.32
Mar-05 - Feb-07	10.46	N/A	N/A	8.63E-04	4.01	N/A	1.22	N/A	5.83	3.54	3.24	N/A	54.89	212.17	0.57	2.29
Apr-05 - Mar-07	10.30	N/A	N/A	8.38E-04	3.95	N/A	1.18	N/A	5.74	3.48	3.19	N/A	54.04	205.98	0.56	2.26
May-05 - Apr-07	10.13	N/A	N/A	8.13E-04	3.89	N/A	1.15	N/A	5.65	3.43	3.14	N/A	53.15	199.90	0.56	2.22
Jun-05 - May-07	10.09	N/A	N/A	7.95E-04	3.87	N/A	1.12	N/A	5.63	3.42	3.13	N/A	52.96	195.50	0.55	2.21
Jul-05 - Jun-07	10.07	N/A	N/A	7.81E-04	3.86	N/A	1.10	N/A	5.61	3.41	3.12	N/A	52.82	191.97	0.55	2.21
Aug-05 - Jul-07	9.99	N/A	N/A	7.61E-04	3.83	N/A	1.08	N/A	5.57	3.38	3.09	N/A	52.41	187.17	0.55	2.19
Sep-05 - Aug-07	10.08	N/A	N/A	7.50E-04	3.87	N/A	1.06	N/A	5.62	3.41	3.12	N/A	52.88	184.42	0.55	2.21
Oct-05 - Sep-07	9.92	N/A	N/A	7.26E-04	3.81	N/A	1.02	N/A	5.53	3.36	3.07	N/A	52.07	178.41	0.54	2.18
Nov-05 - Oct-07	9.78	N/A	N/A	7.02E-04	3.75	N/A	0.99	N/A	5.45	3.31	3.03	N/A	51.30	172.55	0.54	2.14
Dec-05 - Nov-07	9.55	N/A	N/A	6.75E-04	3.66	N/A	0.95	N/A	5.32	3.23	2.96	N/A	50.11	165.90	0.52	2.09

Table B-6. Total 24-Month Rolling Average Actual Annual Emissions for Kilns 1 (tpy)

24 Month Period	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Jan-06 - Dec-07	9.27	N/A	N/A	6.41E-04	3.55	N/A	0.91	N/A	5.17	3.14	2.87	N/A	48.62	157.63	0.51	2.03
Feb-06 - Jan-08	8.92	N/A	N/A	6.11E-04	3.42	N/A	0.86	N/A	4.97	3.02	2.76	N/A	46.79	150.16	0.49	1.95
Mar-06 - Feb-08	8.80	N/A	N/A	5.97E-04	3.38	N/A	0.84	N/A	4.91	2.98	2.73	N/A	46.18	146.68	0.48	1.93
Apr-06 - Mar-08	8.33	N/A	N/A	5.56E-04	3.19	N/A	0.79	N/A	4.64	2.82	2.58	N/A	43.68	136.77	0.46	1.82
May-06 - Apr-08	8.27	N/A	N/A	5.44E-04	3.17	N/A	0.77	N/A	4.61	2.80	2.56	N/A	43.39	133.75	0.45	1.81
Jun-06 - May-08	8.16	N/A	N/A	5.27E-04	3.13	N/A	0.74	N/A	4.55	2.76	2.53	N/A	42.83	129.58	0.45	1.79
Jul-06 - Jun-08	8.02	N/A	N/A	5.09E-04	3.08	N/A	0.72	N/A	4.47	2.71	2.48	N/A	42.09	125.10	0.44	1.76
Aug-06 - Jul-08	7.93	N/A	N/A	4.93E-04	3.04	N/A	0.70	N/A	4.42	2.68	2.45	N/A	41.58	121.20	0.43	1.74
Sep-06 - Aug-08	7.97	N/A	N/A	4.87E-04	3.06	N/A	0.69	N/A	4.44	2.70	2.47	N/A	41.82	119.62	0.44	1.75
Oct-06 - Sep-08	7.68	N/A	N/A	4.60E-04	2.95	N/A	0.65	N/A	4.28	2.60	2.38	N/A	40.31	113.10	0.42	1.68
Nov-06 - Oct-08	7.43	N/A	N/A	4.37E-04	2.85	N/A	0.62	N/A	4.14	2.52	2.30	N/A	39.01	107.40	0.41	1.63
Dec-06 - Nov-08	7.45	N/A	N/A	4.30E-04	2.86	N/A	0.61	N/A	4.15	2.52	2.31	N/A	39.07	105.81	0.41	1.63
Jan-07 - Dec-08	7.41	N/A	N/A	4.22E-04	2.84	N/A	0.60	N/A	4.13	2.51	2.29	N/A	38.86	103.65	0.41	1.62
Feb-07 - Jan-09	7.27	N/A	N/A	4.16E-04	2.79	N/A	0.59	N/A	4.05	2.46	2.25	N/A	38.15	102.32	0.40	1.59
Mar-07 - Feb-09	7.26	N/A	N/A	4.18E-04	2.78	N/A	0.59	N/A	4.05	2.45	2.25	N/A	38.07	102.71	0.40	1.59
Apr-07 - Mar-09	7.30	N/A	N/A	4.23E-04	2.80	N/A	0.60	N/A	4.07	2.47	2.26	N/A	38.32	104.10	0.40	1.60
May-07 - Apr-09	7.45	N/A	N/A	4.35E-04	2.86	N/A	0.61	N/A	4.15	2.52	2.31	N/A	39.07	106.90	0.41	1.63
Jun-07 - May-09	7.34	N/A	N/A	4.32E-04	2.82	N/A	0.61	N/A	4.09	2.48	2.27	N/A	38.52	106.16	0.40	1.61
Jul-07 - Jun-09	7.33	N/A	N/A	4.34E-04	2.81	N/A	0.61	N/A	4.09	2.48	2.27	N/A	38.47	106.73	0.40	1.61
Aug-07 - Jul-09	7.35	N/A	N/A	4.38E-04	2.82	N/A	0.62	N/A	4.10	2.49	2.28	N/A	38.57	107.81	0.40	1.61
Sep-07 - Aug-09	7.20	N/A	N/A	4.33E-04	2.76	N/A	0.61	N/A	4.01	2.43	2.23	N/A	37.75	106.52	0.39	1.58
Oct-07 - Sep-09	7.20	N/A	N/A	4.36E-04	2.76	N/A	0.62	N/A	4.02	2.44	2.23	N/A	37.80	107.30	0.39	1.58
Nov-07 - Oct-09	7.29	N/A	N/A	4.44E-04	2.79	N/A	0.63	N/A	4.06	2.47	2.26	N/A	38.22	109.22	0.40	1.60
Dec-07 - Nov-09	7.41	N/A	N/A	4.54E-04	2.84	N/A	0.64	N/A	4.13	2.51	2.29	N/A	38.89	111.58	0.41	1.62
Jan-08 - Dec-09	7.46	N/A	N/A	4.59E-04	2.86	N/A	0.65	N/A	4.16	2.52	2.31	N/A	39.12	112.79	0.41	1.63
Feb-08 - Jan-10	7.68	N/A	N/A	4.76E-04	2.94	N/A	0.67	N/A	4.28	2.60	2.38	N/A	40.28	116.94	0.42	1.68
Mar-08 - Feb-10	7.64	N/A	N/A	4.76E-04	2.93	N/A	0.67	N/A	4.26	2.59	2.37	N/A	40.08	116.94	0.42	1.67
Apr-08 - Mar-10	7.91	N/A	N/A	4.96E-04	3.03	N/A	0.70	N/A	4.41	2.68	2.45	N/A	41.49	121.87	0.43	1.73
May-08 - Apr-10	7.93	N/A	N/A	5.01E-04	3.04	N/A	0.71	N/A	4.42	2.68	2.45	N/A	41.60	123.28	0.43	1.74
Jun-08 - May-10	7.91	N/A	N/A	5.05E-04	3.04	N/A	0.71	N/A	4.41	2.68	2.45	N/A	41.52	124.12	0.43	1.73
Jul-08 - Jun-10	7.98	N/A	N/A	5.14E-04	3.06	N/A	0.73	N/A	4.45	2.70	2.47	N/A	41.89	126.29	0.44	1.75
Aug-08 - Jul-10	8.03	N/A	N/A	5.21E-04	3.08	N/A	0.74	N/A	4.48	2.72	2.49	N/A	42.15	128.22	0.44	1.76
Sep-08 - Aug-10	7.54	N/A	N/A	4.92E-04	2.89	N/A	0.70	N/A	4.20	2.55	2.33	N/A	39.57	121.03	0.41	1.65
Oct-08 - Sep-10	7.60	N/A	N/A	4.98E-04	2.91	N/A	0.70	N/A	4.24	2.57	2.35	N/A	39.87	122.48	0.42	1.67
Nov-08 - Oct-10	7.87	N/A	N/A	5.19E-04	3.02	N/A	0.73	N/A	4.39	2.66	2.44	N/A	41.31	127.70	0.43	1.73
Dec-08 - Nov-10	7.83	N/A	N/A	5.21E-04	3.00	N/A	0.74	N/A	4.37	2.65	2.43	N/A	41.10	127.98	0.43	1.72
Jan-09 - Dec-10	7.87	N/A	N/A	5.26E-04	3.02	N/A	0.74	N/A	4.39	2.66	2.44	N/A	41.29	129.34	0.43	1.72
Feb-09 - Jan-11	8.00	N/A	N/A	5.44E-04	3.07	N/A	0.77	N/A	4.46	2.71	2.48	N/A	41.97	133.82	0.44	1.75
Mar-09 - Feb-11	8.05	N/A	N/A	5.57E-04	3.09	N/A	0.79	N/A	4.49	2.72	2.49	N/A	42.25	136.92	0.44	1.76
Apr-09 - Mar-11	8.14	N/A	N/A	5.74E-04	3.12	N/A	0.81	N/A	4.54	2.75	2.52	N/A	42.68	141.17	0.45	1.78
May-09 - Apr-11	8.20	N/A	N/A	5.92E-04	3.15	N/A	0.84	N/A	4.57	2.77	2.54	N/A	43.03	145.47	0.45	1.80
Jun-09 - May-11	8.40	N/A	N/A	6.18E-04	3.22	N/A	0.87	N/A	4.68	2.84	2.60	N/A	44.05	151.94	0.46	1.84
Jul-09 - Jun-11	8.49	N/A	N/A	6.35E-04	3.25	N/A	0.90	N/A	4.73	2.87	2.63	N/A	44.52	156.18	0.46	1.86
Aug-09 - Jul-11	8.44	N/A	N/A	6.42E-04	3.24	N/A	0.91	N/A	4.71	2.86	2.61	N/A	44.30	157.83	0.46	1.85
Sep-09 - Aug-11	8.49	N/A	N/A	6.56E-04	3.25	N/A	0.93	N/A	4.73	2.87	2.63	N/A	44.52	161.40	0.46	1.86
Oct-09 - Sep-11	8.46	N/A	N/A	6.62E-04	3.24	N/A	0.94	N/A	4.72	2.86	2.62	N/A	44.37	162.89	0.46	1.85
Nov-09 - Oct-11	8.45	N/A	N/A	6.72E-04	3.24	N/A	0.95	N/A	4.71	2.86	2.62	N/A	44.32	165.28	0.46	1.85
Dec-09 - Nov-11	8.32	N/A	N/A	6.69E-04	3.19	N/A	0.95	N/A	4.64	2.81	2.58	N/A	43.64	164.54	0.46	1.82
Jan-10 - Dec-11	8.41	N/A	N/A	6.86E-04	3.23	N/A	0.97	N/A	4.69	2.85	2.60	N/A	44.14	168.58	0.46	1.84

Table B-7. Baseline Monthly Emissions for Kiln 2 (tons per month)

Month	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Jan-02	1.28	N/A	N/A	1.14E-04	0.49	N/A	0.16	N/A	0.71	0.43	0.40	N/A	6.70	28.06	0.07	0.28
Feb-02	1.10	N/A	N/A	9.85E-05	0.42	N/A	0.14	N/A	0.61	0.37	0.34	N/A	5.78	24.21	0.06	0.24
Mar-02	1.12	N/A	N/A	1.00E-04	0.43	N/A	0.14	N/A	0.63	0.38	0.35	N/A	5.89	24.64	0.06	0.25
Apr-02	1.29	N/A	N/A	1.15E-04	0.49	N/A	0.16	N/A	0.72	0.44	0.40	N/A	6.77	28.33	0.07	0.28
May-02	1.37	N/A	N/A	1.22E-04	0.52	N/A	0.17	N/A	0.76	0.46	0.42	N/A	7.18	30.06	0.07	0.30
Jun-02	1.27	N/A	N/A	1.14E-04	0.49	N/A	0.16	N/A	0.71	0.43	0.39	N/A	6.68	27.95	0.07	0.28
Jul-02	0.85	N/A	N/A	7.58E-05	0.33	N/A	0.11	N/A	0.47	0.29	0.26	N/A	4.45	18.63	0.05	0.19
Aug-02	1.55	N/A	N/A	1.38E-04	0.59	N/A	0.20	N/A	0.86	0.52	0.48	N/A	8.13	34.02	0.08	0.34
Sep-02	1.29	N/A	N/A	1.15E-04	0.49	N/A	0.16	N/A	0.72	0.44	0.40	N/A	6.76	28.28	0.07	0.28
Oct-02	1.22	N/A	N/A	1.09E-04	0.47	N/A	0.15	N/A	0.68	0.41	0.38	N/A	6.42	26.88	0.07	0.27
Nov-02	1.19	N/A	N/A	1.06E-04	0.46	N/A	0.15	N/A	0.66	0.40	0.37	N/A	6.23	26.09	0.07	0.26
Dec-02	0.82	N/A	N/A	7.35E-05	0.32	N/A	0.10	N/A	0.46	0.28	0.25	N/A	4.32	18.07	0.05	0.18
Jan-03	0.99	N/A	N/A	9.13E-05	0.38	N/A	0.13	N/A	0.55	0.33	0.31	N/A	5.18	22.45	0.05	0.22
Feb-03	1.10	N/A	N/A	1.02E-04	0.42	N/A	0.14	N/A	0.61	0.37	0.34	N/A	5.78	25.04	0.06	0.24
Mar-03	1.11	N/A	N/A	1.03E-04	0.43	N/A	0.14	N/A	0.62	0.38	0.34	N/A	5.82	25.24	0.06	0.24
Apr-03	0.98	N/A	N/A	9.05E-05	0.38	N/A	0.13	N/A	0.55	0.33	0.30	N/A	5.14	22.26	0.05	0.21
May-03	1.37	N/A	N/A	1.26E-04	0.52	N/A	0.18	N/A	0.76	0.46	0.42	N/A	7.17	31.10	0.07	0.30
Jun-03	1.26	N/A	N/A	1.17E-04	0.48	N/A	0.16	N/A	0.70	0.43	0.39	N/A	6.61	28.66	0.07	0.28
Jul-03	1.29	N/A	N/A	1.20E-04	0.50	N/A	0.17	N/A	0.72	0.44	0.40	N/A	6.78	29.39	0.07	0.28
Aug-03	1.10	N/A	N/A	1.02E-04	0.42	N/A	0.14	N/A	0.61	0.37	0.34	N/A	5.77	25.03	0.06	0.24
Sep-03	1.06	N/A	N/A	9.84E-05	0.41	N/A	0.14	N/A	0.59	0.36	0.33	N/A	5.58	24.20	0.06	0.23
Oct-03	0.71	N/A	N/A	6.54E-05	0.27	N/A	0.09	N/A	0.39	0.24	0.22	N/A	3.71	16.08	0.04	0.15
Nov-03	1.31	N/A	N/A	1.21E-04	0.50	N/A	0.17	N/A	0.73	0.44	0.41	N/A	6.88	29.82	0.07	0.29
Dec-03	0.72	N/A	N/A	6.69E-05	0.28	N/A	0.09	N/A	0.40	0.24	0.22	N/A	3.79	16.44	0.04	0.16
Jan-04	1.07	N/A	N/A	9.54E-05	0.41	N/A	0.13	N/A	0.60	0.36	0.33	N/A	5.61	23.44	0.06	0.23
Feb-04	0.99	N/A	N/A	8.82E-05	0.38	N/A	0.12	N/A	0.55	0.33	0.31	N/A	5.19	21.70	0.05	0.22
Mar-04	1.48	N/A	N/A	1.32E-04	0.57	N/A	0.19	N/A	0.83	0.50	0.46	N/A	7.79	32.52	0.08	0.33
Apr-04	1.12	N/A	N/A	9.97E-05	0.43	N/A	0.14	N/A	0.62	0.38	0.35	N/A	5.87	24.51	0.06	0.25
May-04	1.56	N/A	N/A	1.39E-04	0.60	N/A	0.20	N/A	0.87	0.53	0.48	N/A	8.20	34.25	0.09	0.34
Jun-04	1.16	N/A	N/A	1.04E-04	0.45	N/A	0.15	N/A	0.65	0.39	0.36	N/A	6.09	25.45	0.06	0.25
Jul-04	0.59	N/A	N/A	5.26E-05	0.23	N/A	0.07	N/A	0.33	0.20	0.18	N/A	3.10	12.94	0.03	0.13
Aug-04	1.42	N/A	N/A	1.26E-04	0.54	N/A	0.18	N/A	0.79	0.48	0.44	N/A	7.43	31.04	0.08	0.31
Sep-04	0.85	N/A	N/A	7.57E-05	0.33	N/A	0.11	N/A	0.47	0.29	0.26	N/A	4.46	18.62	0.05	0.19
Oct-04	1.26	N/A	N/A	1.12E-04	0.48	N/A	0.16	N/A	0.70	0.43	0.39	N/A	6.61	27.61	0.07	0.28
Nov-04	1.06	N/A	N/A	9.44E-05	0.41	N/A	0.13	N/A	0.59	0.36	0.33	N/A	5.56	23.22	0.06	0.23
Dec-04	1.25	N/A	N/A	1.11E-04	0.48	N/A	0.16	N/A	0.70	0.42	0.39	N/A	6.55	27.37	0.07	0.27
Jan-05	1.13	N/A	N/A	1.01E-04	0.43	N/A	0.14	N/A	0.63	0.38	0.35	N/A	5.92	24.83	0.06	0.25
Feb-05	0.85	N/A	N/A	7.57E-05	0.32	N/A	0.11	N/A	0.47	0.29	0.26	N/A	4.44	18.62	0.05	0.19
Mar-05	1.44	N/A	N/A	1.29E-04	0.55	N/A	0.18	N/A	0.80	0.49	0.44	N/A	7.54	31.64	0.08	0.31
Apr-05	1.42	N/A	N/A	1.28E-04	0.55	N/A	0.18	N/A	0.79	0.48	0.44	N/A	7.47	31.35	0.08	0.31
May-05	1.29	N/A	N/A	1.16E-04	0.50	N/A	0.16	N/A	0.72	0.44	0.40	N/A	6.78	28.45	0.07	0.28
Jun-05	1.34	N/A	N/A	1.20E-04	0.52	N/A	0.17	N/A	0.75	0.45	0.42	N/A	7.05	29.57	0.07	0.29
Jul-05	1.43	N/A	N/A	1.28E-04	0.55	N/A	0.18	N/A	0.80	0.48	0.44	N/A	7.52	31.54	0.08	0.31
Aug-05	1.28	N/A	N/A	1.14E-04	0.49	N/A	0.16	N/A	0.71	0.43	0.40	N/A	6.69	28.10	0.07	0.28

Table B-7. Baseline Monthly Emissions for Kiln 2 (tons per month)

Month	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Sep-05	1.23	N/A	N/A	1.10E-04	0.47	N/A	0.16	N/A	0.69	0.42	0.38	N/A	6.46	27.11	0.07	0.27
Oct-05	1.16	N/A	N/A	1.04E-04	0.45	N/A	0.15	N/A	0.65	0.39	0.36	N/A	6.11	25.64	0.06	0.26
Nov-05	0.95	N/A	N/A	8.48E-05	0.36	N/A	0.12	N/A	0.53	0.32	0.29	N/A	4.97	20.85	0.05	0.21
Dec-05	1.29	N/A	N/A	1.15E-04	0.49	N/A	0.16	N/A	0.72	0.44	0.40	N/A	6.76	28.36	0.07	0.28
Jan-06	1.06	N/A	N/A	8.44E-05	0.40	N/A	0.12	N/A	0.59	0.36	0.33	N/A	5.54	20.76	0.06	0.23
Feb-06	1.03	N/A	N/A	8.24E-05	0.40	N/A	0.12	N/A	0.57	0.35	0.32	N/A	5.40	20.26	0.06	0.23
Mar-06	1.46	N/A	N/A	1.17E-04	0.56	N/A	0.17	N/A	0.82	0.50	0.45	N/A	7.68	28.79	0.08	0.32
Apr-06	1.46	N/A	N/A	1.17E-04	0.56	N/A	0.17	N/A	0.82	0.49	0.45	N/A	7.67	28.77	0.08	0.32
May-06	1.30	N/A	N/A	1.04E-04	0.50	N/A	0.15	N/A	0.73	0.44	0.40	N/A	6.83	25.62	0.07	0.29
Jun-06	1.29	N/A	N/A	1.03E-04	0.49	N/A	0.15	N/A	0.72	0.44	0.40	N/A	6.77	25.38	0.07	0.28
Jul-06	1.04	N/A	N/A	8.36E-05	0.40	N/A	0.12	N/A	0.58	0.35	0.32	N/A	5.48	20.55	0.06	0.23
Aug-06	0.85	N/A	N/A	6.83E-05	0.33	N/A	0.10	N/A	0.48	0.29	0.26	N/A	4.48	16.80	0.05	0.19
Sep-06	0.35	N/A	N/A	2.82E-05	0.14	N/A	0.04	N/A	0.20	0.12	0.11	N/A	1.85	6.94	0.02	0.08
Oct-06	0.60	N/A	N/A	4.81E-05	0.23	N/A	0.07	N/A	0.34	0.20	0.19	N/A	3.15	11.83	0.03	0.13
Nov-06	0.90	N/A	N/A	7.20E-05	0.35	N/A	0.10	N/A	0.50	0.30	0.28	N/A	4.72	17.70	0.05	0.20
Dec-06	0.44	N/A	N/A	3.52E-05	0.17	N/A	0.05	N/A	0.25	0.15	0.14	N/A	2.31	8.65	0.02	0.10
Jan-07	1.01	N/A	N/A	1.38E-04	0.39	N/A	0.20	N/A	0.57	0.34	0.31	N/A	5.32	33.97	0.06	0.22
Feb-07	0.94	N/A	N/A	1.28E-04	0.36	N/A	0.18	N/A	0.52	0.32	0.29	N/A	4.93	31.47	0.05	0.21
Mar-07	0.86	N/A	N/A	1.18E-04	0.33	N/A	0.17	N/A	0.48	0.29	0.27	N/A	4.54	28.95	0.05	0.19
Apr-07	1.29	N/A	N/A	1.75E-04	0.49	N/A	0.25	N/A	0.72	0.44	0.40	N/A	6.75	43.09	0.07	0.28
May-07	0.31	N/A	N/A	4.28E-05	0.12	N/A	0.06	N/A	0.18	0.11	0.10	N/A	1.65	10.52	0.02	0.07
Jun-07	1.20	N/A	N/A	1.64E-04	0.46	N/A	0.23	N/A	0.67	0.41	0.37	N/A	6.31	40.26	0.07	0.26
Jul-07	1.25	N/A	N/A	1.71E-04	0.48	N/A	0.24	N/A	0.70	0.42	0.39	N/A	6.58	41.97	0.07	0.27
Aug-07	0.80	N/A	N/A	1.09E-04	0.31	N/A	0.15	N/A	0.44	0.27	0.25	N/A	4.18	26.68	0.04	0.17
Sep-07	1.31	N/A	N/A	1.79E-04	0.50	N/A	0.25	N/A	0.73	0.44	0.41	N/A	6.90	44.01	0.07	0.29
Oct-07	1.21	N/A	N/A	1.65E-04	0.46	N/A	0.23	N/A	0.67	0.41	0.37	N/A	6.35	40.49	0.07	0.27
Nov-07	0.66	N/A	N/A	8.94E-05	0.25	N/A	0.13	N/A	0.37	0.22	0.20	N/A	3.44	21.98	0.04	0.14
Dec-07	1.01	N/A	N/A	1.38E-04	0.39	N/A	0.19	N/A	0.57	0.34	0.31	N/A	5.32	33.93	0.06	0.22
Jan-08	1.15	N/A	N/A	2.67E-04	0.44	N/A	0.38	N/A	0.64	0.39	0.36	N/A	6.05	65.65	0.06	0.25
Feb-08	0.67	N/A	N/A	1.55E-04	0.26	N/A	0.22	N/A	0.37	0.23	0.21	N/A	3.52	38.18	0.04	0.15
Mar-08	0.90	N/A	N/A	2.08E-04	0.34	N/A	0.29	N/A	0.50	0.30	0.28	N/A	4.71	51.06	0.05	0.20
Apr-08	0.00	N/A	N/A	0.00E+00	0.00	N/A	0.00	N/A	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00
May-08	0.00	N/A	N/A	0.00E+00	0.00	N/A	0.00	N/A	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00
Jun-08	0.00	N/A	N/A	0.00E+00	0.00	N/A	0.00	N/A	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00
Jul-08	0.00	N/A	N/A	0.00E+00	0.00	N/A	0.00	N/A	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00
Aug-08	0.00	N/A	N/A	0.00E+00	0.00	N/A	0.00	N/A	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00
Sep-08	0.90	N/A	N/A	2.09E-04	0.35	N/A	0.30	N/A	0.50	0.31	0.28	N/A	4.74	51.45	0.05	0.20
Oct-08	1.06	N/A	N/A	2.46E-04	0.41	N/A	0.35	N/A	0.59	0.36	0.33	N/A	5.56	60.37	0.06	0.23
Nov-08	0.34	N/A	N/A	7.87E-05	0.13	N/A	0.11	N/A	0.19	0.12	0.11	N/A	1.78	19.36	0.02	0.07
Dec-08	0.30	N/A	N/A	7.05E-05	0.12	N/A	0.10	N/A	0.17	0.10	0.09	N/A	1.60	17.34	0.02	0.07
Jan-09	0.20	N/A	N/A	4.92E-05	0.08	N/A	0.07	N/A	0.11	0.07	0.06	N/A	1.06	12.10	0.01	0.04
Feb-09	0.00	N/A	N/A	0.00E+00	0.00	N/A	0.00	N/A	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00
Mar-09	0.81	N/A	N/A	1.97E-04	0.31	N/A	0.28	N/A	0.45	0.27	0.25	N/A	4.25	48.34	0.04	0.18
Apr-09	0.61	N/A	N/A	1.48E-04	0.23	N/A	0.21	N/A	0.34	0.21	0.19	N/A	3.19	36.28	0.03	0.13
May-09	0.71	N/A	N/A	1.72E-04	0.27	N/A	0.24	N/A	0.39	0.24	0.22	N/A	3.72	42.26	0.04	0.16
Jun-09	0.86	N/A	N/A	2.09E-04	0.33	N/A	0.30	N/A	0.48	0.29	0.27	N/A	4.52	51.35	0.05	0.19
Jul-09	0.41	N/A	N/A	9.84E-05	0.16	N/A	0.14	N/A	0.23	0.14	0.13	N/A	2.13	24.20	0.02	0.09
Aug-09	0.76	N/A	N/A	1.84E-04	0.29	N/A	0.26	N/A	0.42	0.26	0.24	N/A	3.99	45.36	0.04	0.17

Table B-7. Baseline Monthly Emissions for Kiln 2 (tons per month)

Month	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Sep-09	0.46	N/A	N/A	1.11E-04	0.17	N/A	0.16	N/A	0.25	0.15	0.14	N/A	2.39	27.17	0.02	0.10
Oct-09	0.67	N/A	N/A	1.62E-04	0.26	N/A	0.23	N/A	0.37	0.23	0.21	N/A	3.50	39.82	0.04	0.15
Nov-09	0.41	N/A	N/A	9.89E-05	0.16	N/A	0.14	N/A	0.23	0.14	0.13	N/A	2.14	24.31	0.02	0.09
Dec-09	0.35	N/A	N/A	8.61E-05	0.14	N/A	0.12	N/A	0.20	0.12	0.11	N/A	1.86	21.18	0.02	0.08
Jan-10	0.23	N/A	N/A	6.32E-05	0.09	N/A	0.09	N/A	0.13	0.08	0.07	N/A	1.19	15.53	0.01	0.05
Feb-10	0.41	N/A	N/A	1.13E-04	0.16	N/A	0.16	N/A	0.23	0.14	0.13	N/A	2.14	27.84	0.02	0.09
Mar-10	1.17	N/A	N/A	3.24E-04	0.45	N/A	0.46	N/A	0.65	0.39	0.36	N/A	6.12	79.71	0.06	0.26
Apr-10	0.61	N/A	N/A	1.70E-04	0.23	N/A	0.24	N/A	0.34	0.21	0.19	N/A	3.20	41.72	0.03	0.13
May-10	0.77	N/A	N/A	2.13E-04	0.29	N/A	0.30	N/A	0.43	0.26	0.24	N/A	4.02	52.33	0.04	0.17
Jun-10	0.00	N/A	N/A	0.00E+00	0.00	N/A	0.00	N/A	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00
Jul-10	0.40	N/A	N/A	1.11E-04	0.15	N/A	0.16	N/A	0.22	0.14	0.12	N/A	2.09	27.27	0.02	0.09
Aug-10	1.22	N/A	N/A	3.39E-04	0.47	N/A	0.48	N/A	0.68	0.41	0.38	N/A	6.41	83.42	0.07	0.27
Sep-10	0.86	N/A	N/A	2.39E-04	0.33	N/A	0.34	N/A	0.48	0.29	0.27	N/A	4.52	58.86	0.05	0.19
Oct-10	1.06	N/A	N/A	2.94E-04	0.41	N/A	0.42	N/A	0.59	0.36	0.33	N/A	5.56	72.35	0.06	0.23
Nov-10	0.66	N/A	N/A	1.84E-04	0.25	N/A	0.26	N/A	0.37	0.22	0.20	N/A	3.47	45.20	0.04	0.15
Dec-10	0.96	N/A	N/A	2.66E-04	0.37	N/A	0.38	N/A	0.53	0.32	0.30	N/A	5.03	65.45	0.05	0.21
Jan-11	0.60	N/A	N/A	1.43E-04	0.23	N/A	0.20	N/A	0.34	0.20	0.19	N/A	3.16	35.27	0.03	0.13
Feb-11	1.09	N/A	N/A	2.58E-04	0.42	N/A	0.36	N/A	0.61	0.37	0.34	N/A	5.70	63.53	0.06	0.24
Mar-11	1.20	N/A	N/A	2.85E-04	0.46	N/A	0.40	N/A	0.67	0.41	0.37	N/A	6.29	70.19	0.07	0.26
Apr-11	1.01	N/A	N/A	2.40E-04	0.39	N/A	0.34	N/A	0.56	0.34	0.31	N/A	5.30	59.08	0.06	0.22
May-11	0.86	N/A	N/A	2.04E-04	0.33	N/A	0.29	N/A	0.48	0.29	0.27	N/A	4.50	50.17	0.05	0.19
Jun-11	1.04	N/A	N/A	2.48E-04	0.40	N/A	0.35	N/A	0.58	0.35	0.32	N/A	5.47	60.97	0.06	0.23
Jul-11	0.60	N/A	N/A	1.43E-04	0.23	N/A	0.20	N/A	0.33	0.20	0.19	N/A	3.15	35.12	0.03	0.13
Aug-11	0.39	N/A	N/A	9.23E-05	0.15	N/A	0.13	N/A	0.22	0.13	0.12	N/A	2.04	22.70	0.02	0.09
Sep-11	0.25	N/A	N/A	6.02E-05	0.10	N/A	0.09	N/A	0.14	0.09	0.08	N/A	1.33	14.81	0.01	0.06
Oct-11	0.79	N/A	N/A	1.89E-04	0.30	N/A	0.27	N/A	0.44	0.27	0.25	N/A	4.17	46.45	0.04	0.17
Nov-11	0.30	N/A	N/A	7.19E-05	0.12	N/A	0.10	N/A	0.17	0.10	0.09	N/A	1.59	17.69	0.02	0.07
Dec-11	0.55	N/A	N/A	1.31E-04	0.21	N/A	0.18	N/A	0.31	0.19	0.17	N/A	2.89	32.20	0.03	0.12

1. Baseline monthly emissions are calculated two ways depending on the units of the emission factor of interest.
   If the emission factor is in units of lb/MBF, the following derivation is used: Actual Emissions [ton/month] = Emission Factor [lb/MBF] * Monthly Kiln Production [BF/month] / 2,000 lb/ton / 1,000 BF/MBF
   If the emission factor is in units of lb/MMBtu, the following derivation is used: Actual Emissions [ton/month] = Emission Factor [lb/MMBtu] * Monthly Wood Combusted [tons/month] * Heating Value [4,500 Btu/lb wood combusted] / 1,000,000 Btu/MMBtu

Table B-8. Total 24-Month Rolling Average Actual Annual Emissions for Kiln 2 (tpy)

24 Month Period	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Jan-02 - Dec-03	13.68	N/A	N/A	1.24E-03	5.25	N/A	1.75	N/A	7.63	4.63	4.23	N/A	71.76	305.47	0.75	3.00
Feb-02 - Jan-04	13.57	N/A	N/A	1.23E-03	5.21	N/A	1.74	N/A	7.57	4.59	4.20	N/A	71.22	303.16	0.74	2.98
Mar-02 - Feb-04	13.52	N/A	N/A	1.23E-03	5.18	N/A	1.73	N/A	7.54	4.57	4.19	N/A	70.92	301.90	0.74	2.96
Apr-02 - Mar-04	13.70	N/A	N/A	1.24E-03	5.25	N/A	1.76	N/A	7.64	4.64	4.24	N/A	71.87	305.84	0.75	3.00
May-02 - Apr-04	13.61	N/A	N/A	1.24E-03	5.22	N/A	1.75	N/A	7.59	4.61	4.21	N/A	71.42	303.93	0.75	2.98
Jun-02 - May-04	13.71	N/A	N/A	1.24E-03	5.26	N/A	1.76	N/A	7.64	4.64	4.24	N/A	71.93	306.03	0.75	3.01
Jul-02 - Jun-04	13.65	N/A	N/A	1.24E-03	5.24	N/A	1.75	N/A	7.61	4.62	4.23	N/A	71.64	304.78	0.75	2.99
Aug-02 - Jul-04	13.53	N/A	N/A	1.23E-03	5.19	N/A	1.73	N/A	7.54	4.58	4.19	N/A	70.97	301.94	0.74	2.96
Sep-02 - Aug-04	13.46	N/A	N/A	1.22E-03	5.16	N/A	1.73	N/A	7.50	4.55	4.17	N/A	70.62	300.45	0.74	2.95
Oct-02 - Sep-04	13.24	N/A	N/A	1.20E-03	5.08	N/A	1.70	N/A	7.38	4.48	4.10	N/A	69.47	295.61	0.73	2.90
Nov-02 - Oct-04	13.26	N/A	N/A	1.20E-03	5.09	N/A	1.70	N/A	7.39	4.49	4.10	N/A	69.56	295.98	0.73	2.91
Dec-02 - Nov-04	13.19	N/A	N/A	1.20E-03	5.06	N/A	1.69	N/A	7.36	4.46	4.08	N/A	69.23	294.54	0.72	2.89
Jan-03 - Dec-04	13.41	N/A	N/A	1.22E-03	5.14	N/A	1.72	N/A	7.48	4.54	4.15	N/A	70.34	299.18	0.73	2.94
Feb-03 - Jan-05	13.48	N/A	N/A	1.22E-03	5.17	N/A	1.73	N/A	7.51	4.56	4.17	N/A	70.71	300.37	0.74	2.95
Mar-03 - Feb-05	13.35	N/A	N/A	1.21E-03	5.12	N/A	1.71	N/A	7.44	4.52	4.13	N/A	70.04	297.16	0.73	2.93
Apr-03 - Mar-05	13.51	N/A	N/A	1.22E-03	5.18	N/A	1.73	N/A	7.53	4.57	4.18	N/A	70.90	300.36	0.74	2.96
May-03 - Apr-05	13.74	N/A	N/A	1.24E-03	5.27	N/A	1.75	N/A	7.66	4.65	4.25	N/A	72.07	304.90	0.75	3.01
Jun-03 - May-05	13.70	N/A	N/A	1.23E-03	5.25	N/A	1.74	N/A	7.64	4.63	4.24	N/A	71.87	303.58	0.75	3.00
Jul-03 - Jun-05	13.74	N/A	N/A	1.24E-03	5.27	N/A	1.75	N/A	7.66	4.65	4.25	N/A	72.08	304.04	0.75	3.01
Aug-03 - Jul-05	13.81	N/A	N/A	1.24E-03	5.30	N/A	1.75	N/A	7.70	4.67	4.28	N/A	72.45	305.11	0.76	3.03
Sep-03 - Aug-05	13.90	N/A	N/A	1.25E-03	5.33	N/A	1.76	N/A	7.75	4.70	4.30	N/A	72.91	306.65	0.76	3.05
Oct-03 - Sep-05	13.98	N/A	N/A	1.25E-03	5.36	N/A	1.77	N/A	7.79	4.73	4.33	N/A	73.35	308.10	0.77	3.06
Nov-03 - Oct-05	14.21	N/A	N/A	1.27E-03	5.45	N/A	1.80	N/A	7.92	4.81	4.40	N/A	74.55	312.88	0.78	3.11
Dec-03 - Nov-05	14.03	N/A	N/A	1.25E-03	5.38	N/A	1.77	N/A	7.82	4.75	4.34	N/A	73.59	308.40	0.77	3.07
Jan-04 - Dec-05	14.31	N/A	N/A	1.28E-03	5.49	N/A	1.81	N/A	7.98	4.84	4.43	N/A	75.07	314.35	0.78	3.14
Feb-04 - Jan-06	14.30	N/A	N/A	1.27E-03	5.49	N/A	1.80	N/A	7.97	4.84	4.43	N/A	75.04	313.01	0.78	3.13
Mar-04 - Feb-06	14.32	N/A	N/A	1.27E-03	5.49	N/A	1.79	N/A	7.99	4.85	4.43	N/A	75.14	312.29	0.78	3.14
Apr-04 - Mar-06	14.31	N/A	N/A	1.26E-03	5.49	N/A	1.78	N/A	7.98	4.84	4.43	N/A	75.09	310.43	0.78	3.14
May-04 - Apr-06	14.48	N/A	N/A	1.27E-03	5.56	N/A	1.80	N/A	8.08	4.90	4.48	N/A	75.99	312.56	0.79	3.17
Jun-04 - May-06	14.35	N/A	N/A	1.25E-03	5.51	N/A	1.77	N/A	8.00	4.86	4.44	N/A	75.31	308.25	0.79	3.15
Jul-04 - Jun-06	14.42	N/A	N/A	1.25E-03	5.53	N/A	1.77	N/A	8.04	4.88	4.46	N/A	75.65	308.21	0.79	3.16
Aug-04 - Jul-06	14.65	N/A	N/A	1.27E-03	5.62	N/A	1.79	N/A	8.17	4.96	4.53	N/A	76.84	312.02	0.80	3.21
Sep-04 - Aug-06	14.36	N/A	N/A	1.24E-03	5.51	N/A	1.75	N/A	8.01	4.86	4.45	N/A	75.36	304.90	0.79	3.15
Oct-04 - Sep-06	14.12	N/A	N/A	1.22E-03	5.41	N/A	1.72	N/A	7.87	4.78	4.37	N/A	74.06	299.06	0.77	3.09
Nov-04 - Oct-06	13.79	N/A	N/A	1.18E-03	5.29	N/A	1.67	N/A	7.69	4.66	4.27	N/A	72.33	291.17	0.76	3.02
Dec-04 - Nov-06	13.71	N/A	N/A	1.17E-03	5.26	N/A	1.66	N/A	7.64	4.64	4.24	N/A	71.91	288.41	0.75	3.00
Jan-05 - Dec-06	13.30	N/A	N/A	1.13E-03	5.10	N/A	1.60	N/A	7.42	4.50	4.12	N/A	69.79	279.05	0.73	2.92
Feb-05 - Jan-07	13.25	N/A	N/A	1.15E-03	5.08	N/A	1.63	N/A	7.38	4.48	4.10	N/A	69.49	283.62	0.73	2.90
Mar-05 - Feb-07	13.29	N/A	N/A	1.18E-03	5.10	N/A	1.67	N/A	7.41	4.50	4.12	N/A	69.74	290.05	0.73	2.91
Apr-05 - Mar-07	13.01	N/A	N/A	1.17E-03	4.99	N/A	1.66	N/A	7.25	4.40	4.03	N/A	68.24	288.71	0.71	2.85
May-05 - Apr-07	12.94	N/A	N/A	1.20E-03	4.96	N/A	1.69	N/A	7.21	4.38	4.01	N/A	67.88	294.58	0.71	2.84
Jun-05 - May-07	12.45	N/A	N/A	1.16E-03	4.78	N/A	1.64	N/A	6.94	4.21	3.85	N/A	65.32	285.61	0.68	2.73
Jul-05 - Jun-07	12.38	N/A	N/A	1.18E-03	4.75	N/A	1.67	N/A	6.90	4.19	3.83	N/A	64.95	290.96	0.68	2.71
Aug-05 - Jul-07	12.29	N/A	N/A	1.20E-03	4.71	N/A	1.70	N/A	6.85	4.16	3.80	N/A	64.48	296.17	0.67	2.69
Sep-05 - Aug-07	12.05	N/A	N/A	1.20E-03	4.62	N/A	1.70	N/A	6.72	4.08	3.73	N/A	63.22	295.46	0.66	2.64
Oct-05 - Sep-07	12.09	N/A	N/A	1.24E-03	4.64	N/A	1.75	N/A	6.74	4.09	3.74	N/A	63.44	303.91	0.66	2.65
Nov-05 - Oct-07	12.11	N/A	N/A	1.27E-03	4.65	N/A	1.79	N/A	6.75	4.10	3.75	N/A	63.56	311.34	0.66	2.66
Dec-05 - Nov-07	11.97	N/A	N/A	1.27E-03	4.59	N/A	1.79	N/A	6.67	4.05	3.71	N/A	62.80	311.90	0.66	2.62

Table B-8. Total 24-Month Rolling Average Actual Annual Emissions for Kiln 2 (tpy)

24 Month Period	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Jan-06 - Dec-07	11.83	N/A	N/A	1.28E-03	4.54	N/A	1.81	N/A	6.60	4.00	3.66	N/A	62.08	314.69	0.65	2.59
Feb-06 - Jan-08	11.88	N/A	N/A	1.37E-03	4.56	N/A	1.94	N/A	6.62	4.02	3.68	N/A	62.33	337.14	0.65	2.60
Mar-06 - Feb-08	11.70	N/A	N/A	1.41E-03	4.49	N/A	1.99	N/A	6.52	3.96	3.62	N/A	61.39	346.09	0.64	2.56
Apr-06 - Mar-08	11.42	N/A	N/A	1.45E-03	4.38	N/A	2.05	N/A	6.37	3.86	3.53	N/A	59.90	357.23	0.63	2.50
May-06 - Apr-08	10.69	N/A	N/A	1.39E-03	4.10	N/A	1.97	N/A	5.96	3.62	3.31	N/A	56.07	342.84	0.59	2.34
Jun-06 - May-08	10.04	N/A	N/A	1.34E-03	3.85	N/A	1.90	N/A	5.60	3.40	3.11	N/A	52.65	330.03	0.55	2.20
Jul-06 - Jun-08	9.39	N/A	N/A	1.29E-03	3.60	N/A	1.82	N/A	5.24	3.18	2.91	N/A	49.27	317.34	0.51	2.06
Aug-06 - Jul-08	8.87	N/A	N/A	1.25E-03	3.40	N/A	1.76	N/A	4.94	3.00	2.75	N/A	46.53	307.06	0.49	1.94
Sep-06 - Aug-08	8.44	N/A	N/A	1.21E-03	3.24	N/A	1.72	N/A	4.71	2.86	2.61	N/A	44.29	298.67	0.46	1.85
Oct-06 - Sep-08	8.72	N/A	N/A	1.31E-03	3.34	N/A	1.84	N/A	4.86	2.95	2.70	N/A	45.73	320.92	0.48	1.91
Nov-06 - Oct-08	8.95	N/A	N/A	1.40E-03	3.43	N/A	1.98	N/A	4.99	3.03	2.77	N/A	46.94	345.19	0.49	1.96
Dec-06 - Nov-08	8.67	N/A	N/A	1.41E-03	3.32	N/A	1.99	N/A	4.83	2.93	2.68	N/A	45.47	346.02	0.47	1.90
Jan-07 - Dec-08	8.60	N/A	N/A	1.42E-03	3.30	N/A	2.01	N/A	4.79	2.91	2.66	N/A	45.11	350.36	0.47	1.88
Feb-07 - Jan-09	8.19	N/A	N/A	1.38E-03	3.14	N/A	1.95	N/A	4.57	2.77	2.54	N/A	42.98	339.42	0.45	1.80
Mar-07 - Feb-09	7.72	N/A	N/A	1.32E-03	2.96	N/A	1.86	N/A	4.31	2.61	2.39	N/A	40.52	323.69	0.42	1.69
Apr-07 - Mar-09	7.70	N/A	N/A	1.36E-03	2.95	N/A	1.92	N/A	4.29	2.60	2.38	N/A	40.37	333.39	0.42	1.69
May-07 - Apr-09	7.36	N/A	N/A	1.34E-03	2.82	N/A	1.90	N/A	4.10	2.49	2.28	N/A	38.59	329.98	0.40	1.61
Jun-07 - May-09	7.55	N/A	N/A	1.41E-03	2.90	N/A	1.99	N/A	4.21	2.56	2.34	N/A	39.63	345.85	0.41	1.66
Jul-07 - Jun-09	7.38	N/A	N/A	1.43E-03	2.83	N/A	2.02	N/A	4.12	2.50	2.29	N/A	38.73	351.40	0.40	1.62
Aug-07 - Jul-09	6.96	N/A	N/A	1.39E-03	2.67	N/A	1.97	N/A	3.88	2.35	2.15	N/A	36.50	342.51	0.38	1.53
Sep-07 - Aug-09	6.94	N/A	N/A	1.43E-03	2.66	N/A	2.02	N/A	3.87	2.35	2.15	N/A	36.41	351.85	0.38	1.52
Oct-07 - Sep-09	6.51	N/A	N/A	1.40E-03	2.50	N/A	1.97	N/A	3.63	2.20	2.02	N/A	34.15	343.43	0.36	1.43
Nov-07 - Oct-09	6.24	N/A	N/A	1.40E-03	2.39	N/A	1.97	N/A	3.48	2.11	1.93	N/A	32.73	343.09	0.34	1.37
Dec-07 - Nov-09	6.11	N/A	N/A	1.40E-03	2.35	N/A	1.98	N/A	3.41	2.07	1.89	N/A	32.08	344.26	0.34	1.34
Jan-08 - Dec-09	5.78	N/A	N/A	1.37E-03	2.22	N/A	1.94	N/A	3.23	1.96	1.79	N/A	30.35	337.88	0.32	1.27
Feb-08 - Jan-10	5.32	N/A	N/A	1.27E-03	2.04	N/A	1.80	N/A	2.97	1.80	1.65	N/A	27.92	312.82	0.29	1.17
Mar-08 - Feb-10	5.19	N/A	N/A	1.25E-03	1.99	N/A	1.77	N/A	2.89	1.76	1.61	N/A	27.23	307.65	0.28	1.14
Apr-08 - Mar-10	5.33	N/A	N/A	1.31E-03	2.04	N/A	1.85	N/A	2.97	1.80	1.65	N/A	27.94	321.98	0.29	1.17
May-08 - Apr-10	5.63	N/A	N/A	1.39E-03	2.16	N/A	1.97	N/A	3.14	1.91	1.74	N/A	29.54	342.84	0.31	1.23
Jun-08 - May-10	6.01	N/A	N/A	1.50E-03	2.31	N/A	2.12	N/A	3.35	2.03	1.86	N/A	31.55	369.01	0.33	1.32
Jul-08 - Jun-10	6.01	N/A	N/A	1.50E-03	2.31	N/A	2.12	N/A	3.35	2.03	1.86	N/A	31.55	369.01	0.33	1.32
Aug-08 - Jul-10	6.21	N/A	N/A	1.56E-03	2.38	N/A	2.20	N/A	3.46	2.10	1.92	N/A	32.60	382.64	0.34	1.36
Sep-08 - Aug-10	6.82	N/A	N/A	1.73E-03	2.62	N/A	2.44	N/A	3.80	2.31	2.11	N/A	35.81	424.35	0.37	1.50
Oct-08 - Sep-10	6.80	N/A	N/A	1.74E-03	2.61	N/A	2.46	N/A	3.79	2.30	2.11	N/A	35.70	428.06	0.37	1.49
Nov-08 - Oct-10	6.80	N/A	N/A	1.77E-03	2.61	N/A	2.49	N/A	3.79	2.30	2.11	N/A	35.69	434.05	0.37	1.49
Dec-08 - Nov-10	6.96	N/A	N/A	1.82E-03	2.67	N/A	2.57	N/A	3.88	2.36	2.16	N/A	36.54	446.97	0.38	1.53
Jan-09 - Dec-10	7.29	N/A	N/A	1.92E-03	2.80	N/A	2.71	N/A	4.06	2.47	2.26	N/A	38.25	471.03	0.40	1.60
Feb-09 - Jan-11	7.49	N/A	N/A	1.96E-03	2.87	N/A	2.77	N/A	4.18	2.53	2.32	N/A	39.30	482.61	0.41	1.64
Mar-09 - Feb-11	8.03	N/A	N/A	2.09E-03	3.08	N/A	2.95	N/A	4.48	2.72	2.49	N/A	42.15	514.38	0.44	1.76
Apr-09 - Mar-11	8.23	N/A	N/A	2.14E-03	3.16	N/A	3.02	N/A	4.59	2.78	2.55	N/A	43.17	525.30	0.45	1.80
May-09 - Apr-11	8.43	N/A	N/A	2.18E-03	3.23	N/A	3.08	N/A	4.70	2.85	2.61	N/A	44.22	536.70	0.46	1.85
Jun-09 - May-11	8.50	N/A	N/A	2.20E-03	3.26	N/A	3.11	N/A	4.74	2.88	2.63	N/A	44.62	540.65	0.47	1.86
Jul-09 - Jun-11	8.59	N/A	N/A	2.22E-03	3.30	N/A	3.13	N/A	4.79	2.91	2.66	N/A	45.09	545.46	0.47	1.88
Aug-09 - Jul-11	8.69	N/A	N/A	2.24E-03	3.33	N/A	3.16	N/A	4.85	2.94	2.69	N/A	45.60	550.93	0.48	1.91
Sep-09 - Aug-11	8.51	N/A	N/A	2.19E-03	3.26	N/A	3.10	N/A	4.74	2.88	2.63	N/A	44.63	539.60	0.47	1.86
Oct-09 - Sep-11	8.40	N/A	N/A	2.17E-03	3.22	N/A	3.06	N/A	4.69	2.84	2.60	N/A	44.10	533.41	0.46	1.84
Nov-09 - Oct-11	8.47	N/A	N/A	2.18E-03	3.25	N/A	3.08	N/A	4.72	2.87	2.62	N/A	44.43	536.73	0.46	1.86
Dec-09 - Nov-11	8.42	N/A	N/A	2.17E-03	3.23	N/A	3.06	N/A	4.69	2.85	2.61	N/A	44.15	533.42	0.46	1.84
Jan-10 - Dec-11	8.51	N/A	N/A	2.19E-03	3.27	N/A	3.10	N/A	4.75	2.88	2.64	N/A	44.66	538.93	0.47	1.87

Table B-9. Baseline Monthly Emissions for Kiln 3 (tons per month)

Month	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Jan-02	2.13	N/A	N/A	1.90E-04	0.82	N/A	0.27	N/A	1.19	0.72	0.66	N/A	11.18	46.79	0.12	0.47
Feb-02	1.98	N/A	N/A	1.77E-04	0.76	N/A	0.25	N/A	1.10	0.67	0.61	N/A	10.37	43.43	0.11	0.43
Mar-02	2.22	N/A	N/A	1.98E-04	0.85	N/A	0.28	N/A	1.24	0.75	0.69	N/A	11.65	48.77	0.12	0.49
Apr-02	2.07	N/A	N/A	1.85E-04	0.80	N/A	0.26	N/A	1.16	0.70	0.64	N/A	10.88	45.54	0.11	0.45
May-02	2.32	N/A	N/A	2.07E-04	0.89	N/A	0.29	N/A	1.29	0.78	0.72	N/A	12.17	50.94	0.13	0.51
Jun-02	2.15	N/A	N/A	1.92E-04	0.82	N/A	0.27	N/A	1.20	0.73	0.67	N/A	11.28	47.21	0.12	0.47
Jul-02	2.05	N/A	N/A	1.83E-04	0.79	N/A	0.26	N/A	1.14	0.69	0.64	N/A	10.77	45.10	0.11	0.45
Aug-02	2.15	N/A	N/A	1.92E-04	0.83	N/A	0.27	N/A	1.20	0.73	0.67	N/A	11.29	47.26	0.12	0.47
Sep-02	1.76	N/A	N/A	1.57E-04	0.68	N/A	0.22	N/A	0.98	0.60	0.55	N/A	9.24	38.70	0.10	0.39
Oct-02	1.98	N/A	N/A	1.77E-04	0.76	N/A	0.25	N/A	1.10	0.67	0.61	N/A	10.39	43.52	0.11	0.43
Nov-02	1.99	N/A	N/A	1.78E-04	0.76	N/A	0.25	N/A	1.11	0.67	0.62	N/A	10.43	43.69	0.11	0.44
Dec-02	1.68	N/A	N/A	1.50E-04	0.64	N/A	0.21	N/A	0.93	0.57	0.52	N/A	8.80	36.82	0.09	0.37
Jan-03	2.49	N/A	N/A	2.30E-04	0.95	N/A	0.32	N/A	1.39	0.84	0.77	N/A	13.05	56.55	0.14	0.55
Feb-03	2.06	N/A	N/A	1.90E-04	0.79	N/A	0.27	N/A	1.15	0.70	0.64	N/A	10.80	46.80	0.11	0.45
Mar-03	1.76	N/A	N/A	1.63E-04	0.67	N/A	0.23	N/A	0.98	0.59	0.54	N/A	9.22	39.98	0.10	0.39
Apr-03	1.83	N/A	N/A	1.69E-04	0.70	N/A	0.24	N/A	1.02	0.62	0.57	N/A	9.58	41.51	0.10	0.40
May-03	2.06	N/A	N/A	1.90E-04	0.79	N/A	0.27	N/A	1.15	0.70	0.64	N/A	10.79	46.76	0.11	0.45
Jun-03	1.91	N/A	N/A	1.77E-04	0.73	N/A	0.25	N/A	1.06	0.65	0.59	N/A	10.01	43.40	0.10	0.42
Jul-03	1.59	N/A	N/A	1.47E-04	0.61	N/A	0.21	N/A	0.89	0.54	0.49	N/A	8.33	36.10	0.09	0.35
Aug-03	2.15	N/A	N/A	1.98E-04	0.82	N/A	0.28	N/A	1.20	0.73	0.66	N/A	11.26	48.79	0.12	0.47
Sep-03	2.07	N/A	N/A	1.92E-04	0.79	N/A	0.27	N/A	1.15	0.70	0.64	N/A	10.87	47.11	0.11	0.45
Oct-03	2.16	N/A	N/A	2.00E-04	0.83	N/A	0.28	N/A	1.20	0.73	0.67	N/A	11.32	49.07	0.12	0.47
Nov-03	1.77	N/A	N/A	1.64E-04	0.68	N/A	0.23	N/A	0.99	0.60	0.55	N/A	9.29	40.28	0.10	0.39
Dec-03	1.89	N/A	N/A	1.74E-04	0.72	N/A	0.25	N/A	1.05	0.64	0.58	N/A	9.90	42.89	0.10	0.41
Jan-04	2.24	N/A	N/A	1.99E-04	0.86	N/A	0.28	N/A	1.25	0.76	0.69	N/A	11.73	48.98	0.12	0.49
Feb-04	1.90	N/A	N/A	1.70E-04	0.73	N/A	0.24	N/A	1.06	0.64	0.59	N/A	9.98	41.68	0.10	0.42
Mar-04	1.86	N/A	N/A	1.65E-04	0.71	N/A	0.23	N/A	1.03	0.63	0.57	N/A	9.73	40.66	0.10	0.41
Apr-04	2.18	N/A	N/A	1.94E-04	0.84	N/A	0.27	N/A	1.21	0.74	0.67	N/A	11.43	47.75	0.12	0.48
May-04	1.86	N/A	N/A	1.66E-04	0.71	N/A	0.23	N/A	1.04	0.63	0.58	N/A	9.77	40.82	0.10	0.41
Jun-04	2.23	N/A	N/A	1.99E-04	0.85	N/A	0.28	N/A	1.24	0.75	0.69	N/A	11.69	48.83	0.12	0.49
Jul-04	0.85	N/A	N/A	7.57E-05	0.33	N/A	0.11	N/A	0.47	0.29	0.26	N/A	4.45	18.60	0.05	0.19
Aug-04	0.24	N/A	N/A	2.15E-05	0.09	N/A	0.03	N/A	0.13	0.08	0.07	N/A	1.26	5.28	0.01	0.05
Sep-04	1.91	N/A	N/A	1.70E-04	0.73	N/A	0.24	N/A	1.06	0.65	0.59	N/A	10.02	41.85	0.10	0.42
Oct-04	2.06	N/A	N/A	1.84E-04	0.79	N/A	0.26	N/A	1.15	0.70	0.64	N/A	10.83	45.25	0.11	0.45
Nov-04	1.75	N/A	N/A	1.56E-04	0.67	N/A	0.22	N/A	0.97	0.59	0.54	N/A	9.16	38.26	0.10	0.38
Dec-04	1.88	N/A	N/A	1.68E-04	0.72	N/A	0.24	N/A	1.05	0.64	0.58	N/A	9.88	41.25	0.10	0.41
Jan-05	1.99	N/A	N/A	1.78E-04	0.76	N/A	0.25	N/A	1.11	0.67	0.62	N/A	10.44	43.83	0.11	0.44
Feb-05	1.91	N/A	N/A	1.71E-04	0.73	N/A	0.24	N/A	1.06	0.65	0.59	N/A	10.02	42.05	0.10	0.42
Mar-05	2.12	N/A	N/A	1.90E-04	0.81	N/A	0.27	N/A	1.18	0.72	0.66	N/A	11.13	46.70	0.12	0.46
Apr-05	2.37	N/A	N/A	2.12E-04	0.91	N/A	0.30	N/A	1.32	0.80	0.73	N/A	12.45	52.23	0.13	0.52
May-05	2.60	N/A	N/A	2.33E-04	1.00	N/A	0.33	N/A	1.45	0.88	0.81	N/A	13.66	57.33	0.14	0.57
Jun-05	1.99	N/A	N/A	1.79E-04	0.76	N/A	0.25	N/A	1.11	0.67	0.62	N/A	10.46	43.91	0.11	0.44
Jul-05	2.49	N/A	N/A	2.23E-04	0.95	N/A	0.31	N/A	1.39	0.84	0.77	N/A	13.06	54.81	0.14	0.55
Aug-05	2.40	N/A	N/A	2.15E-04	0.92	N/A	0.30	N/A	1.34	0.81	0.74	N/A	12.59	52.85	0.13	0.53
Sep-05	2.40	N/A	N/A	2.15E-04	0.92	N/A	0.30	N/A	1.34	0.81	0.74	N/A	12.57	52.75	0.13	0.53

Table B-9. Baseline Monthly Emissions for Kiln 3 (tons per month)

Month	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Oct-05	2.28	N/A	N/A	2.05E-04	0.88	N/A	0.29	N/A	1.27	0.77	0.71	N/A	11.98	50.28	0.13	0.50
Nov-05	1.91	N/A	N/A	1.71E-04	0.73	N/A	0.24	N/A	1.06	0.64	0.59	N/A	10.00	41.97	0.10	0.42
Dec-05	2.63	N/A	N/A	2.36E-04	1.01	N/A	0.33	N/A	1.47	0.89	0.82	N/A	13.82	57.98	0.14	0.58
Jan-06	2.21	N/A	N/A	1.77E-04	0.85	N/A	0.25	N/A	1.23	0.75	0.68	N/A	11.58	43.43	0.12	0.48
Feb-06	1.91	N/A	N/A	1.53E-04	0.73	N/A	0.22	N/A	1.06	0.65	0.59	N/A	10.01	37.53	0.10	0.42
Mar-06	2.70	N/A	N/A	2.16E-04	1.04	N/A	0.31	N/A	1.51	0.91	0.84	N/A	14.17	53.12	0.15	0.59
Apr-06	2.14	N/A	N/A	1.71E-04	0.82	N/A	0.24	N/A	1.19	0.72	0.66	N/A	11.23	42.12	0.12	0.47
May-06	2.70	N/A	N/A	2.16E-04	1.04	N/A	0.31	N/A	1.51	0.91	0.84	N/A	14.17	53.14	0.15	0.59
Jun-06	2.30	N/A	N/A	1.84E-04	0.88	N/A	0.26	N/A	1.28	0.78	0.71	N/A	12.05	45.18	0.13	0.50
Jul-06	2.46	N/A	N/A	1.97E-04	0.94	N/A	0.28	N/A	1.37	0.83	0.76	N/A	12.92	48.43	0.13	0.54
Aug-06	2.14	N/A	N/A	1.71E-04	0.82	N/A	0.24	N/A	1.19	0.72	0.66	N/A	11.23	42.09	0.12	0.47
Sep-06	2.16	N/A	N/A	1.73E-04	0.83	N/A	0.24	N/A	1.21	0.73	0.67	N/A	11.34	42.53	0.12	0.47
Oct-06	1.68	N/A	N/A	1.34E-04	0.64	N/A	0.19	N/A	0.93	0.57	0.52	N/A	8.80	32.98	0.09	0.37
Nov-06	1.83	N/A	N/A	1.46E-04	0.70	N/A	0.21	N/A	1.02	0.62	0.57	N/A	9.60	36.01	0.10	0.40
Dec-06	1.82	N/A	N/A	1.45E-04	0.70	N/A	0.21	N/A	1.01	0.61	0.56	N/A	9.53	35.74	0.10	0.40
Jan-07	1.91	N/A	N/A	1.04E-04	0.73	N/A	0.15	N/A	1.07	0.65	0.59	N/A	10.03	25.69	0.10	0.42
Feb-07	1.90	N/A	N/A	1.04E-04	0.73	N/A	0.15	N/A	1.06	0.64	0.59	N/A	9.98	25.57	0.10	0.42
Mar-07	2.00	N/A	N/A	1.09E-04	0.77	N/A	0.15	N/A	1.11	0.68	0.62	N/A	10.47	26.83	0.11	0.44
Apr-07	1.99	N/A	N/A	1.09E-04	0.76	N/A	0.15	N/A	1.11	0.67	0.62	N/A	10.44	26.74	0.11	0.44
May-07	2.70	N/A	N/A	1.47E-04	1.03	N/A	0.21	N/A	1.50	0.91	0.83	N/A	14.14	36.23	0.15	0.59
Jun-07	2.39	N/A	N/A	1.31E-04	0.92	N/A	0.18	N/A	1.33	0.81	0.74	N/A	12.53	32.10	0.13	0.52
Jul-07	2.40	N/A	N/A	1.31E-04	0.92	N/A	0.19	N/A	1.34	0.81	0.74	N/A	12.58	32.24	0.13	0.53
Aug-07	2.78	N/A	N/A	1.52E-04	1.07	N/A	0.21	N/A	1.55	0.94	0.86	N/A	14.60	37.39	0.15	0.61
Sep-07	1.91	N/A	N/A	1.04E-04	0.73	N/A	0.15	N/A	1.06	0.65	0.59	N/A	10.00	25.63	0.10	0.42
Oct-07	2.22	N/A	N/A	1.22E-04	0.85	N/A	0.17	N/A	1.24	0.75	0.69	N/A	11.67	29.89	0.12	0.49
Nov-07	2.37	N/A	N/A	1.30E-04	0.91	N/A	0.18	N/A	1.32	0.80	0.73	N/A	12.44	31.88	0.13	0.52
Dec-07	1.51	N/A	N/A	8.27E-05	0.58	N/A	0.12	N/A	0.84	0.51	0.47	N/A	7.94	20.34	0.08	0.33
Jan-08	2.24	N/A	N/A	1.33E-04	0.86	N/A	0.19	N/A	1.25	0.76	0.69	N/A	11.73	32.72	0.12	0.49
Feb-08	1.83	N/A	N/A	1.09E-04	0.70	N/A	0.15	N/A	1.02	0.62	0.57	N/A	9.61	26.81	0.10	0.40
Mar-08	1.82	N/A	N/A	1.08E-04	0.70	N/A	0.15	N/A	1.02	0.62	0.56	N/A	9.55	26.65	0.10	0.40
Apr-08	2.14	N/A	N/A	1.27E-04	0.82	N/A	0.18	N/A	1.19	0.72	0.66	N/A	11.21	31.26	0.12	0.47
May-08	2.36	N/A	N/A	1.41E-04	0.91	N/A	0.20	N/A	1.32	0.80	0.73	N/A	12.41	34.60	0.13	0.52
Jun-08	2.23	N/A	N/A	1.33E-04	0.85	N/A	0.19	N/A	1.24	0.75	0.69	N/A	11.68	32.58	0.12	0.49
Jul-08	2.62	N/A	N/A	1.56E-04	1.00	N/A	0.22	N/A	1.46	0.89	0.81	N/A	13.74	38.31	0.14	0.57
Aug-08	2.94	N/A	N/A	1.75E-04	1.13	N/A	0.25	N/A	1.64	1.00	0.91	N/A	15.43	43.04	0.16	0.64
Sep-08	2.32	N/A	N/A	1.38E-04	0.89	N/A	0.19	N/A	1.29	0.78	0.72	N/A	12.16	33.90	0.13	0.51
Oct-08	1.83	N/A	N/A	1.09E-04	0.70	N/A	0.15	N/A	1.02	0.62	0.57	N/A	9.58	26.71	0.10	0.40
Nov-08	1.99	N/A	N/A	1.18E-04	0.76	N/A	0.17	N/A	1.11	0.67	0.62	N/A	10.44	29.12	0.11	0.44
Dec-08	1.36	N/A	N/A	8.09E-05	0.52	N/A	0.11	N/A	0.76	0.46	0.42	N/A	7.13	19.88	0.07	0.30
Jan-09	1.41	N/A	N/A	8.93E-05	0.54	N/A	0.13	N/A	0.79	0.48	0.44	N/A	7.41	21.96	0.08	0.31
Feb-09	1.58	N/A	N/A	1.00E-04	0.61	N/A	0.14	N/A	0.88	0.54	0.49	N/A	8.31	24.64	0.09	0.35
Mar-09	2.23	N/A	N/A	1.41E-04	0.86	N/A	0.20	N/A	1.24	0.75	0.69	N/A	11.70	34.67	0.12	0.49
Apr-09	2.55	N/A	N/A	1.61E-04	0.98	N/A	0.23	N/A	1.42	0.86	0.79	N/A	13.39	39.67	0.14	0.56
May-09	2.15	N/A	N/A	1.36E-04	0.82	N/A	0.19	N/A	1.20	0.73	0.67	N/A	11.27	33.41	0.12	0.47
Jun-09	2.15	N/A	N/A	1.36E-04	0.82	N/A	0.19	N/A	1.20	0.73	0.67	N/A	11.27	33.42	0.12	0.47
Jul-09	2.24	N/A	N/A	1.42E-04	0.86	N/A	0.20	N/A	1.25	0.76	0.69	N/A	11.77	34.88	0.12	0.49
Aug-09	2.00	N/A	N/A	1.26E-04	0.77	N/A	0.18	N/A	1.12	0.68	0.62	N/A	10.49	31.10	0.11	0.44
Sep-09	1.76	N/A	N/A	1.11E-04	0.68	N/A	0.16	N/A	0.98	0.60	0.55	N/A	9.24	27.39	0.10	0.39
Oct-09	2.32	N/A	N/A	1.47E-04	0.89	N/A	0.21	N/A	1.30	0.79	0.72	N/A	12.19	36.13	0.13	0.51
Nov-09	1.99	N/A	N/A	1.26E-04	0.77	N/A	0.18	N/A	1.11	0.67	0.62	N/A	10.47	31.02	0.11	0.44

Table B-9. Baseline Monthly Emissions for Kiln 3 (tons per month)

Month	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Dec-09	1.83	N/A	N/A	1.16E-04	0.70	N/A	0.16	N/A	1.02	0.62	0.57	N/A	9.63	28.53	0.10	0.40
Jan-10	2.06	N/A	N/A	1.46E-04	0.79	N/A	0.21	N/A	1.15	0.70	0.64	N/A	10.83	35.84	0.11	0.45
Feb-10	1.19	N/A	N/A	8.43E-05	0.46	N/A	0.12	N/A	0.67	0.40	0.37	N/A	6.26	20.72	0.07	0.26
Mar-10	1.75	N/A	N/A	1.23E-04	0.67	N/A	0.17	N/A	0.97	0.59	0.54	N/A	9.17	30.34	0.10	0.38
Apr-10	2.72	N/A	N/A	1.92E-04	1.04	N/A	0.27	N/A	1.52	0.92	0.84	N/A	14.27	47.21	0.15	0.60
May-10	2.47	N/A	N/A	1.74E-04	0.95	N/A	0.25	N/A	1.38	0.84	0.76	N/A	12.96	42.88	0.14	0.54
Jun-10	2.46	N/A	N/A	1.74E-04	0.94	N/A	0.25	N/A	1.37	0.83	0.76	N/A	12.92	42.74	0.13	0.54
Jul-10	2.40	N/A	N/A	1.69E-04	0.92	N/A	0.24	N/A	1.34	0.81	0.74	N/A	12.59	41.64	0.13	0.53
Aug-10	2.23	N/A	N/A	1.58E-04	0.86	N/A	0.22	N/A	1.24	0.76	0.69	N/A	11.71	38.74	0.12	0.49
Sep-10	2.22	N/A	N/A	1.57E-04	0.85	N/A	0.22	N/A	1.24	0.75	0.69	N/A	11.67	38.62	0.12	0.49
Oct-10	2.09	N/A	N/A	1.47E-04	0.80	N/A	0.21	N/A	1.16	0.71	0.65	N/A	10.96	36.24	0.11	0.46
Nov-10	1.67	N/A	N/A	1.18E-04	0.64	N/A	0.17	N/A	0.93	0.56	0.52	N/A	8.74	28.91	0.09	0.37
Dec-10	2.25	N/A	N/A	1.59E-04	0.86	N/A	0.22	N/A	1.25	0.76	0.70	N/A	11.79	39.02	0.12	0.49
Jan-11	2.07	N/A	N/A	1.88E-04	0.80	N/A	0.27	N/A	1.16	0.70	0.64	N/A	10.88	46.26	0.11	0.45
Feb-11	2.01	N/A	N/A	1.82E-04	0.77	N/A	0.26	N/A	1.12	0.68	0.62	N/A	10.53	44.76	0.11	0.44
Mar-11	2.09	N/A	N/A	1.90E-04	0.80	N/A	0.27	N/A	1.17	0.71	0.65	N/A	10.99	46.73	0.11	0.46
Apr-11	2.25	N/A	N/A	2.04E-04	0.86	N/A	0.29	N/A	1.25	0.76	0.70	N/A	11.78	50.09	0.12	0.49
May-11	2.34	N/A	N/A	2.12E-04	0.90	N/A	0.30	N/A	1.30	0.79	0.72	N/A	12.26	52.12	0.13	0.51
Jun-11	2.08	N/A	N/A	1.89E-04	0.80	N/A	0.27	N/A	1.16	0.70	0.64	N/A	10.91	46.41	0.11	0.46
Jul-11	1.85	N/A	N/A	1.68E-04	0.71	N/A	0.24	N/A	1.03	0.63	0.57	N/A	9.69	41.21	0.10	0.40
Aug-11	2.08	N/A	N/A	1.89E-04	0.80	N/A	0.27	N/A	1.16	0.70	0.64	N/A	10.91	46.40	0.11	0.46
Sep-11	1.60	N/A	N/A	1.45E-04	0.61	N/A	0.20	N/A	0.89	0.54	0.50	N/A	8.39	35.68	0.09	0.35
Oct-11	2.09	N/A	N/A	1.89E-04	0.80	N/A	0.27	N/A	1.16	0.71	0.65	N/A	10.95	46.54	0.11	0.46
Nov-11	0.96	N/A	N/A	8.72E-05	0.37	N/A	0.12	N/A	0.54	0.33	0.30	N/A	5.04	21.44	0.05	0.21
Dec-11	2.07	N/A	N/A	1.88E-04	0.79	N/A	0.26	N/A	1.15	0.70	0.64	N/A	10.84	46.10	0.11	0.45

1. Baseline monthly emissions are calculated two ways depending on the units of the emission factor of interest.
   If the emission factor is in units of lb/MBF, the following derivation is used: Actual Emissions [ton/month] = Emission Factor [lb/MBF] * Monthly Kiln Production [BF/month] / 2,000 lb/ton / 1,000 BF/MBF
   If the emission factor is in units of lb/MMBtu, the following derivation is used: Actual Emissions [ton/month] = Emission Factor [lb/MMBtu] * Monthly Wood Combusted [tons/month] * Heating Value [4,500 Btu/lb wood combusted] / 1,000,000 Btu/MMBtu

Table B-10. Total 24-Month Rolling Average Actual Annual Emissions for Kiln 3 (tpy)

24 Month Period	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Jan-02 - Dec-03	24.10	N/A	N/A	2.19E-03	9.24	N/A	3.09	N/A	13.44	8.15	7.46	N/A	126.43	538.49	1.32	5.28
Feb-02 - Jan-04	24.15	N/A	N/A	2.19E-03	9.26	N/A	3.10	N/A	13.46	8.17	7.48	N/A	126.71	539.59	1.32	5.29
Mar-02 - Feb-04	24.11	N/A	N/A	2.19E-03	9.25	N/A	3.09	N/A	13.44	8.16	7.47	N/A	126.51	538.72	1.32	5.29
Apr-02 - Mar-04	23.93	N/A	N/A	2.17E-03	9.18	N/A	3.07	N/A	13.34	8.10	7.41	N/A	125.55	534.66	1.31	5.25
May-02 - Apr-04	23.98	N/A	N/A	2.18E-03	9.20	N/A	3.08	N/A	13.37	8.11	7.43	N/A	125.83	535.77	1.31	5.26
Jun-02 - May-04	23.76	N/A	N/A	2.16E-03	9.11	N/A	3.05	N/A	13.24	8.04	7.35	N/A	124.63	530.70	1.30	5.21
Jul-02 - Jun-04	23.79	N/A	N/A	2.16E-03	9.13	N/A	3.05	N/A	13.27	8.05	7.37	N/A	124.84	531.52	1.30	5.22
Aug-02 - Jul-04	23.19	N/A	N/A	2.11E-03	8.90	N/A	2.98	N/A	12.93	7.85	7.18	N/A	121.68	518.27	1.27	5.08
Sep-02 - Aug-04	22.24	N/A	N/A	2.02E-03	8.53	N/A	2.86	N/A	12.40	7.52	6.88	N/A	116.67	497.28	1.22	4.87
Oct-02 - Sep-04	22.31	N/A	N/A	2.03E-03	8.56	N/A	2.87	N/A	12.44	7.55	6.91	N/A	117.06	498.86	1.22	4.89
Nov-02 - Oct-04	22.35	N/A	N/A	2.03E-03	8.57	N/A	2.87	N/A	12.46	7.56	6.92	N/A	117.28	499.72	1.22	4.90
Dec-02 - Nov-04	22.23	N/A	N/A	2.02E-03	8.53	N/A	2.86	N/A	12.39	7.52	6.88	N/A	116.64	497.01	1.22	4.87
Jan-03 - Dec-04	22.33	N/A	N/A	2.03E-03	8.57	N/A	2.87	N/A	12.45	7.56	6.91	N/A	117.18	499.23	1.22	4.90
Feb-03 - Jan-05	22.09	N/A	N/A	2.00E-03	8.47	N/A	2.83	N/A	12.31	7.47	6.84	N/A	115.88	492.86	1.21	4.84
Mar-03 - Feb-05	22.01	N/A	N/A	1.99E-03	8.44	N/A	2.82	N/A	12.27	7.45	6.81	N/A	115.49	490.49	1.21	4.82
Apr-03 - Mar-05	22.19	N/A	N/A	2.01E-03	8.51	N/A	2.84	N/A	12.37	7.51	6.87	N/A	116.44	493.85	1.22	4.86
May-03 - Apr-05	22.47	N/A	N/A	2.03E-03	8.62	N/A	2.87	N/A	12.53	7.60	6.96	N/A	117.87	499.21	1.23	4.92
Jun-03 - May-05	22.74	N/A	N/A	2.05E-03	8.72	N/A	2.90	N/A	12.68	7.69	7.04	N/A	119.31	504.50	1.25	4.98
Jul-03 - Jun-05	22.78	N/A	N/A	2.05E-03	8.74	N/A	2.90	N/A	12.70	7.71	7.05	N/A	119.53	504.75	1.25	4.99
Aug-03 - Jul-05	23.23	N/A	N/A	2.09E-03	8.91	N/A	2.95	N/A	12.95	7.86	7.19	N/A	121.90	514.10	1.27	5.09
Sep-03 - Aug-05	23.36	N/A	N/A	2.10E-03	8.96	N/A	2.97	N/A	13.02	7.90	7.23	N/A	122.57	516.14	1.28	5.12
Oct-03 - Sep-05	23.52	N/A	N/A	2.11E-03	9.02	N/A	2.98	N/A	13.12	7.96	7.28	N/A	123.42	518.96	1.29	5.16
Nov-03 - Oct-05	23.59	N/A	N/A	2.11E-03	9.05	N/A	2.98	N/A	13.15	7.98	7.30	N/A	123.75	519.57	1.29	5.17
Dec-03 - Nov-05	23.65	N/A	N/A	2.12E-03	9.07	N/A	2.99	N/A	13.19	8.00	7.32	N/A	124.10	520.41	1.30	5.18
Jan-04 - Dec-05	24.03	N/A	N/A	2.15E-03	9.22	N/A	3.03	N/A	13.40	8.13	7.44	N/A	126.06	527.96	1.32	5.27
Feb-04 - Jan-06	24.01	N/A	N/A	2.14E-03	9.21	N/A	3.02	N/A	13.39	8.13	7.43	N/A	125.99	525.19	1.32	5.26
Mar-04 - Feb-06	24.02	N/A	N/A	2.13E-03	9.21	N/A	3.01	N/A	13.39	8.13	7.44	N/A	126.01	523.11	1.32	5.26
Apr-04 - Mar-06	24.44	N/A	N/A	2.15E-03	9.37	N/A	3.04	N/A	13.63	8.27	7.57	N/A	128.22	529.34	1.34	5.36
May-04 - Apr-06	24.42	N/A	N/A	2.14E-03	9.37	N/A	3.02	N/A	13.62	8.26	7.56	N/A	128.12	526.52	1.34	5.35
Jun-04 - May-06	24.84	N/A	N/A	2.17E-03	9.53	N/A	3.06	N/A	13.85	8.40	7.69	N/A	130.32	532.68	1.36	5.44
Jul-04 - Jun-06	24.87	N/A	N/A	2.16E-03	9.54	N/A	3.05	N/A	13.87	8.42	7.70	N/A	130.50	530.85	1.36	5.45
Aug-04 - Jul-06	25.68	N/A	N/A	2.22E-03	9.85	N/A	3.14	N/A	14.32	8.69	7.95	N/A	134.73	545.77	1.41	5.63
Sep-04 - Aug-06	26.63	N/A	N/A	2.29E-03	10.21	N/A	3.24	N/A	14.85	9.01	8.24	N/A	139.71	564.17	1.46	5.84
Oct-04 - Sep-06	26.76	N/A	N/A	2.30E-03	10.26	N/A	3.24	N/A	14.92	9.05	8.28	N/A	140.37	564.51	1.47	5.86
Nov-04 - Oct-06	26.56	N/A	N/A	2.27E-03	10.19	N/A	3.21	N/A	14.81	8.99	8.22	N/A	139.36	558.37	1.46	5.82
Dec-04 - Nov-06	26.60	N/A	N/A	2.27E-03	10.20	N/A	3.20	N/A	14.83	9.00	8.24	N/A	139.58	557.25	1.46	5.83
Jan-05 - Dec-06	26.57	N/A	N/A	2.26E-03	10.19	N/A	3.19	N/A	14.81	8.99	8.23	N/A	139.41	554.50	1.46	5.82
Feb-05 - Jan-07	26.53	N/A	N/A	2.22E-03	10.18	N/A	3.13	N/A	14.79	8.98	8.21	N/A	139.20	545.43	1.45	5.82
Mar-05 - Feb-07	26.53	N/A	N/A	2.18E-03	10.18	N/A	3.09	N/A	14.79	8.98	8.21	N/A	139.18	537.19	1.45	5.81
Apr-05 - Mar-07	26.47	N/A	N/A	2.14E-03	10.15	N/A	3.03	N/A	14.76	8.95	8.19	N/A	138.85	527.25	1.45	5.80
May-05 - Apr-07	26.27	N/A	N/A	2.09E-03	10.08	N/A	2.96	N/A	14.65	8.89	8.13	N/A	137.85	514.50	1.44	5.76
Jun-05 - May-07	26.32	N/A	N/A	2.05E-03	10.10	N/A	2.90	N/A	14.67	8.91	8.15	N/A	138.09	503.96	1.44	5.77
Jul-05 - Jun-07	26.52	N/A	N/A	2.03E-03	10.17	N/A	2.86	N/A	14.78	8.97	8.21	N/A	139.12	498.05	1.45	5.81
Aug-05 - Jul-07	26.47	N/A	N/A	1.98E-03	10.15	N/A	2.80	N/A	14.76	8.96	8.20	N/A	138.89	486.76	1.45	5.80
Sep-05 - Aug-07	26.66	N/A	N/A	1.95E-03	10.23	N/A	2.75	N/A	14.87	9.02	8.25	N/A	139.89	479.03	1.46	5.84
Oct-05 - Sep-07	26.42	N/A	N/A	1.89E-03	10.13	N/A	2.67	N/A	14.73	8.94	8.18	N/A	138.60	465.47	1.45	5.79
Nov-05 - Oct-07	26.39	N/A	N/A	1.85E-03	10.12	N/A	2.62	N/A	14.71	8.93	8.17	N/A	138.45	455.27	1.45	5.78
Dec-05 - Nov-07	26.62	N/A	N/A	1.83E-03	10.21	N/A	2.59	N/A	14.84	9.01	8.24	N/A	139.67	450.23	1.46	5.83

Table B-10. Total 24-Month Rolling Average Actual Annual Emissions for Kiln 3 (tpy)

24 Month Period	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Formaldehyde	Methanol
Jan-06 - Dec-07	26.06	N/A	N/A	1.75E-03	10.00	N/A	2.48	N/A	14.53	8.82	8.07	N/A	136.73	431.41	1.43	5.71
Feb-06 - Jan-08	26.07	N/A	N/A	1.73E-03	10.00	N/A	2.45	N/A	14.54	8.82	8.07	N/A	136.80	426.05	1.43	5.72
Mar-06 - Feb-08	26.04	N/A	N/A	1.71E-03	9.99	N/A	2.42	N/A	14.52	8.81	8.06	N/A	136.61	420.69	1.43	5.71
Apr-06 - Mar-08	25.60	N/A	N/A	1.66E-03	9.82	N/A	2.34	N/A	14.27	8.66	7.92	N/A	134.30	407.45	1.40	5.61
May-06 - Apr-08	25.60	N/A	N/A	1.64E-03	9.82	N/A	2.31	N/A	14.27	8.66	7.92	N/A	134.29	402.02	1.40	5.61
Jun-06 - May-08	25.43	N/A	N/A	1.60E-03	9.75	N/A	2.26	N/A	14.18	8.60	7.87	N/A	133.41	392.75	1.39	5.57
Jul-06 - Jun-08	25.39	N/A	N/A	1.57E-03	9.74	N/A	2.22	N/A	14.16	8.59	7.86	N/A	133.22	386.46	1.39	5.57
Aug-06 - Jul-08	25.47	N/A	N/A	1.55E-03	9.77	N/A	2.19	N/A	14.20	8.62	7.89	N/A	133.63	381.40	1.40	5.58
Sep-06 - Aug-08	25.87	N/A	N/A	1.55E-03	9.92	N/A	2.19	N/A	14.42	8.75	8.01	N/A	135.74	381.87	1.42	5.67
Oct-06 - Sep-08	25.95	N/A	N/A	1.54E-03	9.95	N/A	2.17	N/A	14.47	8.78	8.03	N/A	136.15	377.56	1.42	5.69
Nov-06 - Oct-08	26.02	N/A	N/A	1.52E-03	9.98	N/A	2.15	N/A	14.51	8.81	8.06	N/A	136.54	374.43	1.43	5.70
Dec-06 - Nov-08	26.10	N/A	N/A	1.51E-03	10.01	N/A	2.13	N/A	14.55	8.83	8.08	N/A	136.95	370.98	1.43	5.72
Jan-07 - Dec-08	25.87	N/A	N/A	1.48E-03	9.92	N/A	2.09	N/A	14.43	8.75	8.01	N/A	135.75	363.05	1.42	5.67
Feb-07 - Jan-09	25.62	N/A	N/A	1.47E-03	9.83	N/A	2.07	N/A	14.29	8.67	7.93	N/A	134.44	361.18	1.40	5.62
Mar-07 - Feb-09	25.47	N/A	N/A	1.47E-03	9.77	N/A	2.07	N/A	14.20	8.62	7.88	N/A	133.61	360.72	1.40	5.58
Apr-07 - Mar-09	25.58	N/A	N/A	1.48E-03	9.81	N/A	2.09	N/A	14.26	8.66	7.92	N/A	134.22	364.64	1.40	5.61
May-07 - Apr-09	25.86	N/A	N/A	1.51E-03	9.92	N/A	2.13	N/A	14.42	8.75	8.01	N/A	135.70	371.11	1.42	5.67
Jun-07 - May-09	25.59	N/A	N/A	1.50E-03	9.82	N/A	2.12	N/A	14.27	8.66	7.92	N/A	134.26	369.70	1.40	5.61
Jul-07 - Jun-09	25.47	N/A	N/A	1.51E-03	9.77	N/A	2.13	N/A	14.20	8.62	7.89	N/A	133.63	370.36	1.40	5.58
Aug-07 - Jul-09	25.39	N/A	N/A	1.51E-03	9.74	N/A	2.14	N/A	14.16	8.59	7.86	N/A	133.23	371.68	1.39	5.57
Sep-07 - Aug-09	25.00	N/A	N/A	1.50E-03	9.59	N/A	2.12	N/A	13.94	8.46	7.74	N/A	131.17	368.53	1.37	5.48
Oct-07 - Sep-09	24.93	N/A	N/A	1.50E-03	9.56	N/A	2.12	N/A	13.90	8.44	7.72	N/A	130.79	369.42	1.37	5.46
Nov-07 - Oct-09	24.98	N/A	N/A	1.52E-03	9.58	N/A	2.14	N/A	13.93	8.45	7.73	N/A	131.06	372.54	1.37	5.47
Dec-07 - Nov-09	24.79	N/A	N/A	1.51E-03	9.51	N/A	2.14	N/A	13.82	8.39	7.67	N/A	130.07	372.11	1.36	5.43
Jan-08 - Dec-09	24.95	N/A	N/A	1.53E-03	9.57	N/A	2.16	N/A	13.91	8.44	7.72	N/A	130.91	376.20	1.37	5.47
Feb-08 - Jan-10	24.87	N/A	N/A	1.54E-03	9.54	N/A	2.17	N/A	13.86	8.41	7.70	N/A	130.46	377.76	1.36	5.45
Mar-08 - Feb-10	24.55	N/A	N/A	1.52E-03	9.42	N/A	2.15	N/A	13.69	8.31	7.60	N/A	128.79	374.72	1.35	5.38
Apr-08 - Mar-10	24.51	N/A	N/A	1.53E-03	9.40	N/A	2.16	N/A	13.67	8.29	7.59	N/A	128.59	376.57	1.34	5.37
May-08 - Apr-10	24.80	N/A	N/A	1.56E-03	9.51	N/A	2.21	N/A	13.83	8.39	7.68	N/A	130.13	384.55	1.36	5.44
Jun-08 - May-10	24.85	N/A	N/A	1.58E-03	9.53	N/A	2.23	N/A	13.86	8.41	7.69	N/A	130.40	388.69	1.36	5.45
Jul-08 - Jun-10	24.97	N/A	N/A	1.60E-03	9.58	N/A	2.26	N/A	13.92	8.45	7.73	N/A	131.02	393.76	1.37	5.47
Aug-08 - Jul-10	24.86	N/A	N/A	1.61E-03	9.54	N/A	2.27	N/A	13.86	8.41	7.70	N/A	130.44	395.43	1.36	5.45
Sep-08 - Aug-10	24.51	N/A	N/A	1.60E-03	9.40	N/A	2.26	N/A	13.66	8.29	7.59	N/A	128.58	393.28	1.34	5.37
Oct-08 - Sep-10	24.46	N/A	N/A	1.61E-03	9.38	N/A	2.27	N/A	13.64	8.28	7.57	N/A	128.34	395.63	1.34	5.36
Nov-08 - Oct-10	24.59	N/A	N/A	1.63E-03	9.43	N/A	2.30	N/A	13.71	8.32	7.61	N/A	129.03	400.40	1.35	5.39
Dec-08 - Nov-10	24.43	N/A	N/A	1.63E-03	9.37	N/A	2.30	N/A	13.62	8.27	7.56	N/A	128.18	400.30	1.34	5.35
Jan-09 - Dec-10	24.88	N/A	N/A	1.67E-03	9.54	N/A	2.35	N/A	13.87	8.42	7.70	N/A	130.51	409.87	1.36	5.45
Feb-09 - Jan-11	25.21	N/A	N/A	1.72E-03	9.67	N/A	2.42	N/A	14.05	8.53	7.80	N/A	132.24	422.01	1.38	5.52
Mar-09 - Feb-11	25.42	N/A	N/A	1.76E-03	9.75	N/A	2.48	N/A	14.17	8.60	7.87	N/A	133.35	432.07	1.39	5.57
Apr-09 - Mar-11	25.35	N/A	N/A	1.78E-03	9.72	N/A	2.52	N/A	14.13	8.58	7.85	N/A	133.00	438.11	1.39	5.56
May-09 - Apr-11	25.20	N/A	N/A	1.80E-03	9.66	N/A	2.55	N/A	14.05	8.53	7.80	N/A	132.19	443.32	1.38	5.52
Jun-09 - May-11	25.29	N/A	N/A	1.84E-03	9.70	N/A	2.60	N/A	14.10	8.56	7.83	N/A	132.69	452.67	1.39	5.54
Jul-09 - Jun-11	25.26	N/A	N/A	1.87E-03	9.69	N/A	2.64	N/A	14.08	8.55	7.82	N/A	132.51	459.17	1.38	5.54
Aug-09 - Jul-11	25.06	N/A	N/A	1.88E-03	9.61	N/A	2.66	N/A	13.97	8.48	7.76	N/A	131.47	462.33	1.37	5.49
Sep-09 - Aug-11	25.10	N/A	N/A	1.91E-03	9.63	N/A	2.70	N/A	13.99	8.49	7.77	N/A	131.68	469.98	1.38	5.50
Oct-09 - Sep-11	25.02	N/A	N/A	1.93E-03	9.60	N/A	2.72	N/A	13.95	8.46	7.74	N/A	131.25	474.13	1.37	5.48
Nov-09 - Oct-11	24.90	N/A	N/A	1.95E-03	9.55	N/A	2.75	N/A	13.88	8.42	7.71	N/A	130.63	479.33	1.36	5.46
Dec-09 - Nov-11	24.38	N/A	N/A	1.93E-03	9.35	N/A	2.73	N/A	13.59	8.25	7.55	N/A	127.92	474.54	1.34	5.34
Jan-10 - Dec-11	24.50	N/A	N/A	1.97E-03	9.40	N/A	2.78	N/A	13.66	8.29	7.58	N/A	128.52	483.33	1.34	5.37

Table B-11. Total 24-Month Rolling Average Actual Annual Emissions for All Kilns (tpy)

24 Month Period	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Form-aldehyde	Methanol
Jan-02 - Dec-03	46.19	N/A	N/A	4.20E-03	17.72	N/A	5.93	N/A	25.75	15.63	14.30	N/A	242.33	1,032.17	2.53	10.12
Feb-02 - Jan-04	46.16	N/A	N/A	4.20E-03	17.71	N/A	5.93	N/A	25.74	15.62	14.29	N/A	242.20	1,031.53	2.53	10.12
Mar-02 - Feb-04	46.07	N/A	N/A	4.19E-03	17.67	N/A	5.91	N/A	25.68	15.59	14.26	N/A	241.69	1,029.28	2.52	10.10
Apr-02 - Mar-04	46.00	N/A	N/A	4.18E-03	17.64	N/A	5.90	N/A	25.64	15.56	14.24	N/A	241.32	1,027.65	2.52	10.08
May-02 - Apr-04	45.99	N/A	N/A	4.18E-03	17.64	N/A	5.90	N/A	25.64	15.56	14.24	N/A	241.31	1,027.52	2.52	10.08
Jun-02 - May-04	45.88	N/A	N/A	4.17E-03	17.60	N/A	5.89	N/A	25.58	15.52	14.20	N/A	240.70	1,024.86	2.51	10.06
Jul-02 - Jun-04	45.86	N/A	N/A	4.17E-03	17.59	N/A	5.88	N/A	25.57	15.52	14.20	N/A	240.58	1,024.27	2.51	10.05
Aug-02 - Jul-04	44.86	N/A	N/A	4.08E-03	17.21	N/A	5.76	N/A	25.01	15.18	13.89	N/A	235.38	1,002.45	2.46	9.83
Sep-02 - Aug-04	44.00	N/A	N/A	4.00E-03	16.88	N/A	5.65	N/A	24.53	14.89	13.62	N/A	230.84	983.36	2.41	9.64
Oct-02 - Sep-04	43.91	N/A	N/A	3.99E-03	16.84	N/A	5.64	N/A	24.48	14.86	13.60	N/A	230.40	981.43	2.41	9.62
Nov-02 - Oct-04	44.02	N/A	N/A	4.00E-03	16.89	N/A	5.65	N/A	24.54	14.90	13.63	N/A	230.97	983.71	2.41	9.65
Dec-02 - Nov-04	43.83	N/A	N/A	3.98E-03	16.81	N/A	5.63	N/A	24.44	14.83	13.57	N/A	229.94	979.34	2.40	9.61
Jan-03 - Dec-04	44.28	N/A	N/A	4.02E-03	16.99	N/A	5.68	N/A	24.69	14.98	13.71	N/A	232.33	989.24	2.43	9.71
Feb-03 - Jan-05	44.15	N/A	N/A	4.01E-03	16.94	N/A	5.66	N/A	24.62	14.94	13.67	N/A	231.65	984.84	2.42	9.68
Mar-03 - Feb-05	43.94	N/A	N/A	3.98E-03	16.86	N/A	5.62	N/A	24.50	14.87	13.60	N/A	230.56	978.80	2.41	9.63
Apr-03 - Mar-05	44.35	N/A	N/A	4.01E-03	17.01	N/A	5.67	N/A	24.73	15.01	13.73	N/A	232.70	986.49	2.43	9.72
May-03 - Apr-05	44.92	N/A	N/A	4.06E-03	17.23	N/A	5.73	N/A	25.05	15.20	13.91	N/A	235.69	997.75	2.46	9.85
Jun-03 - May-05	45.17	N/A	N/A	4.07E-03	17.33	N/A	5.75	N/A	25.18	15.28	13.98	N/A	236.99	1,001.63	2.48	9.90
Jul-03 - Jun-05	45.31	N/A	N/A	4.08E-03	17.38	N/A	5.76	N/A	25.26	15.33	14.03	N/A	237.71	1,003.29	2.48	9.93
Aug-03 - Jul-05	45.95	N/A	N/A	4.13E-03	17.62	N/A	5.84	N/A	25.62	15.55	14.23	N/A	241.07	1,016.13	2.52	10.07
Sep-03 - Aug-05	46.26	N/A	N/A	4.15E-03	17.74	N/A	5.87	N/A	25.79	15.65	14.32	N/A	242.70	1,021.53	2.53	10.14
Oct-03 - Sep-05	46.63	N/A	N/A	4.18E-03	17.88	N/A	5.91	N/A	26.00	15.78	14.43	N/A	244.63	1,028.25	2.55	10.22
Nov-03 - Oct-05	46.96	N/A	N/A	4.21E-03	18.01	N/A	5.94	N/A	26.18	15.89	14.54	N/A	246.37	1,034.25	2.57	10.29
Dec-03 - Nov-05	46.95	N/A	N/A	4.20E-03	18.01	N/A	5.93	N/A	26.18	15.89	14.54	N/A	246.35	1,032.82	2.57	10.29
Jan-04 - Dec-05	47.80	N/A	N/A	4.27E-03	18.33	N/A	6.03	N/A	26.65	16.17	14.80	N/A	250.79	1,050.26	2.62	10.48
Feb-04 - Jan-06	47.91	N/A	N/A	4.26E-03	18.38	N/A	6.02	N/A	26.71	16.21	14.83	N/A	251.35	1,047.90	2.63	10.50
Mar-04 - Feb-06	47.99	N/A	N/A	4.25E-03	18.41	N/A	6.01	N/A	26.76	16.24	14.86	N/A	251.80	1,045.70	2.63	10.52
Apr-04 - Mar-06	48.73	N/A	N/A	4.29E-03	18.69	N/A	6.07	N/A	27.17	16.49	15.09	N/A	255.68	1,055.93	2.67	10.68
May-04 - Apr-06	49.01	N/A	N/A	4.30E-03	18.80	N/A	6.07	N/A	27.33	16.58	15.17	N/A	257.15	1,057.04	2.69	10.74
Jun-04 - May-06	49.54	N/A	N/A	4.32E-03	19.00	N/A	6.11	N/A	27.62	16.76	15.34	N/A	259.90	1,062.88	2.71	10.86
Jul-04 - Jun-06	49.78	N/A	N/A	4.32E-03	19.10	N/A	6.11	N/A	27.76	16.84	15.41	N/A	261.19	1,063.18	2.73	10.91
Aug-04 - Jul-06	51.17	N/A	N/A	4.43E-03	19.63	N/A	6.25	N/A	28.53	17.31	15.84	N/A	268.47	1,088.55	2.80	11.22
Sep-04 - Aug-06	**51.80**	N/A	N/A	4.47E-03	**19.87**	N/A	6.31	N/A	**28.88**	**17.53**	**16.04**	N/A	**271.77**	1,097.98	**2.84**	**11.35**
Oct-04 - Sep-06	51.74	N/A	N/A	4.44E-03	19.84	N/A	6.28	N/A	28.84	17.51	16.02	N/A	271.43	1,092.71	2.83	11.34
Nov-04 - Oct-06	51.19	N/A	N/A	4.38E-03	19.63	N/A	6.19	N/A	28.54	17.32	15.85	N/A	268.56	1,077.25	2.80	11.22
Dec-04 - Nov-06	51.10	N/A	N/A	4.36E-03	19.60	N/A	6.16	N/A	28.49	17.29	15.82	N/A	268.11	1,071.49	2.80	11.20
Jan-05 - Dec-06	50.53	N/A	N/A	4.29E-03	19.38	N/A	6.07	N/A	28.17	17.10	15.64	N/A	265.12	1,055.80	2.77	11.08
Feb-05 - Jan-07	50.37	N/A	N/A	4.26E-03	19.32	N/A	6.01	N/A	28.08	17.04	15.59	N/A	264.25	1,046.59	2.76	11.04
Mar-05 - Feb-07	50.28	N/A	N/A	4.23E-03	19.29	N/A	5.97	N/A	28.03	17.01	15.57	N/A	263.81	1,039.41	2.76	11.02
Apr-05 - Mar-07	49.77	N/A	N/A	4.16E-03	19.09	N/A	5.87	N/A	27.75	16.84	15.41	N/A	261.13	1,021.93	2.73	10.91
May-05 - Apr-07	49.34	N/A	N/A	4.10E-03	18.93	N/A	5.80	N/A	27.51	16.70	15.28	N/A	258.89	1,008.98	2.70	10.82
Jun-05 - May-07	48.86	N/A	N/A	4.01E-03	18.74	N/A	5.66	N/A	27.24	16.53	15.13	N/A	256.37	985.06	2.68	10.71
Jul-05 - Jun-07	48.96	N/A	N/A	3.99E-03	18.78	N/A	5.64	N/A	27.30	16.57	15.16	N/A	256.89	980.98	2.68	10.73
Aug-05 - Jul-07	48.75	N/A	N/A	3.95E-03	18.70	N/A	5.57	N/A	27.18	16.50	15.09	N/A	255.78	970.10	2.67	10.69
Sep-05 - Aug-07	48.79	N/A	N/A	3.90E-03	18.71	N/A	5.51	N/A	27.20	16.51	15.11	N/A	255.99	958.91	2.67	10.69
Oct-05 - Sep-07	48.43	N/A	N/A	3.85E-03	18.58	N/A	5.44	N/A	27.00	16.39	14.99	N/A	254.11	947.79	2.65	10.62
Nov-05 - Oct-07	48.28	N/A	N/A	3.82E-03	18.52	N/A	5.40	N/A	26.92	16.34	14.95	N/A	253.31	939.16	2.65	10.58
Dec-05 - Nov-07	48.14	N/A	N/A	3.77E-03	18.46	N/A	5.33	N/A	26.84	16.29	14.90	N/A	252.57	928.03	2.64	10.55

Table B-11. Total 24-Month Rolling Average Actual Annual Emissions for All Kilns (tpy)

24 Month Period	CO	Fluorides	H_2S	Lead	NO_X	Reduced Sulfur Compounds (including H_2S)	SO_2	H_2SO_4	Total PM	Total PM_{10}	Total $PM_{2.5}$	Total Reduced Sulfur (including H_2S)	Total VOC	$CO_2e_{biomass\ deferral}$	Form-aldehyde	Methanol
Jan-06 - Dec-07	47.16	N/A	N/A	3.68E-03	18.09	N/A	5.19	N/A	26.29	15.96	14.60	N/A	247.43	903.73	2.58	10.34
Feb-06 - Jan-08	46.87	N/A	N/A	3.71E-03	17.98	N/A	5.25	N/A	26.13	15.86	14.51	N/A	245.93	913.35	2.57	10.27
Mar-06 - Feb-08	46.54	N/A	N/A	3.72E-03	17.85	N/A	5.25	N/A	25.95	15.75	14.41	N/A	244.18	913.47	2.55	10.20
Apr-06 - Mar-08	45.34	N/A	N/A	3.67E-03	17.39	N/A	5.18	N/A	25.28	15.34	14.04	N/A	237.89	901.45	2.48	9.94
May-06 - Apr-08	44.55	N/A	N/A	3.57E-03	17.09	N/A	5.05	N/A	24.84	15.07	13.79	N/A	233.75	878.62	2.44	9.77
Jun-06 - May-08	43.63	N/A	N/A	3.47E-03	16.73	N/A	4.90	N/A	24.32	14.76	13.51	N/A	228.88	852.37	2.39	9.56
Jul-06 - Jun-08	42.81	N/A	N/A	3.37E-03	16.42	N/A	4.76	N/A	23.87	14.48	13.25	N/A	224.58	828.90	2.35	9.38
Aug-06 - Jul-08	42.26	N/A	N/A	3.29E-03	16.21	N/A	4.65	N/A	23.56	14.30	13.08	N/A	221.74	809.67	2.32	9.26
Sep-06 - Aug-08	42.28	N/A	N/A	3.25E-03	16.22	N/A	4.60	N/A	23.57	14.31	13.09	N/A	221.84	800.16	2.32	9.27
Oct-06 - Sep-08	42.35	N/A	N/A	3.30E-03	16.24	N/A	4.66	N/A	23.61	14.33	13.11	N/A	222.19	811.58	2.32	9.28
Nov-06 - Oct-08	42.40	N/A	N/A	3.36E-03	16.26	N/A	4.75	N/A	23.64	14.35	13.13	N/A	222.48	827.01	2.32	9.29
Dec-06 - Nov-08	42.22	N/A	N/A	3.35E-03	16.19	N/A	4.73	N/A	23.54	14.28	13.07	N/A	221.49	822.81	2.31	9.25
Jan-07 - Dec-08	41.88	N/A	N/A	3.32E-03	16.06	N/A	4.69	N/A	23.35	14.17	12.97	N/A	219.72	817.06	2.29	9.18
Feb-07 - Jan-09	41.09	N/A	N/A	3.27E-03	15.76	N/A	4.61	N/A	22.91	13.90	12.72	N/A	215.57	802.93	2.25	9.01
Mar-07 - Feb-09	40.44	N/A	N/A	3.20E-03	15.51	N/A	4.52	N/A	22.55	13.68	12.52	N/A	212.19	787.12	2.22	8.86
Apr-07 - Mar-09	40.58	N/A	N/A	3.26E-03	15.57	N/A	4.61	N/A	22.63	13.73	12.56	N/A	212.91	802.13	2.22	8.89
May-07 - Apr-09	40.67	N/A	N/A	3.29E-03	15.60	N/A	4.64	N/A	22.67	13.76	12.59	N/A	213.35	807.99	2.23	8.91
Jun-07 - May-09	40.48	N/A	N/A	3.34E-03	15.53	N/A	4.72	N/A	22.57	13.70	12.53	N/A	212.40	821.70	2.22	8.87
Jul-07 - Jun-09	40.18	N/A	N/A	3.37E-03	15.41	N/A	4.76	N/A	22.40	13.60	12.44	N/A	210.83	828.48	2.20	8.81
Aug-07 - Jul-09	39.70	N/A	N/A	3.34E-03	15.23	N/A	4.72	N/A	22.14	13.43	12.29	N/A	208.31	822.00	2.18	8.70
Sep-07 - Aug-09	39.14	N/A	N/A	3.36E-03	15.01	N/A	4.75	N/A	21.82	13.24	12.12	N/A	205.33	826.90	2.14	8.58
Oct-07 - Sep-09	38.64	N/A	N/A	3.34E-03	14.82	N/A	4.71	N/A	21.55	13.08	11.96	N/A	202.75	820.15	2.12	8.47
Nov-07 - Oct-09	38.50	N/A	N/A	3.35E-03	14.77	N/A	4.74	N/A	21.47	13.03	11.92	N/A	202.01	824.85	2.11	8.44
Dec-07 - Nov-09	38.32	N/A	N/A	3.37E-03	14.70	N/A	4.76	N/A	21.36	12.96	11.86	N/A	201.03	827.95	2.10	8.40
Jan-08 - Dec-09	38.19	N/A	N/A	3.36E-03	14.65	N/A	4.75	N/A	21.29	12.92	11.82	N/A	200.38	826.87	2.09	8.37
Feb-08 - Jan-10	37.87	N/A	N/A	3.28E-03	14.52	N/A	4.64	N/A	21.11	12.81	11.72	N/A	198.66	807.52	2.07	8.30
Mar-08 - Feb-10	37.38	N/A	N/A	3.25E-03	14.34	N/A	4.59	N/A	20.84	12.65	11.57	N/A	196.10	799.31	2.05	8.19
Apr-08 - Mar-10	37.74	N/A	N/A	3.34E-03	14.48	N/A	4.71	N/A	21.04	12.77	11.68	N/A	198.02	820.42	2.07	8.27
May-08 - Apr-10	38.36	N/A	N/A	3.46E-03	14.71	N/A	4.89	N/A	21.39	12.98	11.88	N/A	201.27	850.67	2.10	8.41
Jun-08 - May-10	38.78	N/A	N/A	3.59E-03	14.88	N/A	5.07	N/A	21.62	13.12	12.01	N/A	203.47	881.81	2.13	8.50
Jul-08 - Jun-10	38.97	N/A	N/A	3.62E-03	14.95	N/A	5.11	N/A	21.73	13.19	12.07	N/A	204.46	889.06	2.14	8.54
Aug-08 - Jul-10	39.11	N/A	N/A	3.69E-03	15.00	N/A	5.21	N/A	21.81	13.23	12.11	N/A	205.19	906.29	2.14	8.57
Sep-08 - Aug-10	38.87	N/A	N/A	3.82E-03	14.91	N/A	5.39	N/A	21.67	13.15	12.04	N/A	203.96	938.66	2.13	8.52
Oct-08 - Sep-10	38.86	N/A	N/A	3.85E-03	14.91	N/A	5.44	N/A	21.67	13.15	12.03	N/A	203.90	946.18	2.13	8.52
Nov-08 - Oct-10	39.27	N/A	N/A	3.91E-03	15.06	N/A	5.53	N/A	21.89	13.29	12.16	N/A	206.04	962.16	2.15	8.61
Dec-08 - Nov-10	39.23	N/A	N/A	3.97E-03	15.05	N/A	5.60	N/A	21.87	13.27	12.14	N/A	205.81	975.25	2.15	8.60
Jan-09 - Dec-10	40.04	N/A	N/A	4.11E-03	15.36	N/A	5.80	N/A	22.32	13.55	12.39	N/A	210.05	1,010.23	2.19	8.77
Feb-09 - Jan-11	40.70	N/A	N/A	4.22E-03	15.61	N/A	5.97	N/A	22.69	13.77	12.60	N/A	213.51	1,038.45	2.23	8.92
Mar-09 - Feb-11	41.50	N/A	N/A	4.41E-03	15.92	N/A	6.22	N/A	23.14	14.04	12.85	N/A	217.75	1,083.38	2.27	9.10
Apr-09 - Mar-11	41.71	N/A	N/A	4.49E-03	16.00	N/A	6.35	N/A	23.26	14.11	12.91	N/A	218.85	1,104.58	2.29	9.14
May-09 - Apr-11	41.83	N/A	N/A	4.58E-03	16.04	N/A	6.47	N/A	23.32	14.15	12.95	N/A	219.45	1,125.48	2.29	9.17
Jun-09 - May-11	42.19	N/A	N/A	4.66E-03	16.18	N/A	6.58	N/A	23.52	14.28	13.06	N/A	221.35	1,145.26	2.31	9.25
Jul-09 - Jun-11	42.34	N/A	N/A	4.72E-03	16.24	N/A	6.67	N/A	23.60	14.32	13.11	N/A	222.12	1,160.81	2.32	9.28
Aug-09 - Jul-11	42.19	N/A	N/A	4.76E-03	16.18	N/A	6.73	N/A	23.52	14.28	13.06	N/A	221.37	1,171.08	2.31	9.25
Sep-09 - Aug-11	42.09	N/A	N/A	4.76E-03	16.14	N/A	6.73	N/A	23.47	14.24	13.03	N/A	220.82	1,170.98	2.31	9.23
Oct-09 - Sep-11	41.88	N/A	N/A	4.76E-03	16.06	N/A	6.72	N/A	23.35	14.17	12.97	N/A	219.72	1,170.43	2.29	9.18
Nov-09 - Oct-11	41.81	N/A	N/A	4.80E-03	16.04	N/A	6.79	N/A	23.31	14.15	12.94	N/A	219.37	1,181.35	2.29	9.16
Dec-09 - Nov-11	41.11	N/A	N/A	4.77E-03	15.77	N/A	6.74	N/A	22.92	13.91	12.73	N/A	215.71	1,172.51	2.25	9.01
Jan-10 - Dec-11	41.42	N/A	N/A	**4.84E-03**	15.89	N/A	**6.84**	N/A	23.09	14.02	12.82	N/A	217.33	**1,190.84**	2.27	9.08

Table B-12. Summary of Selected Baseline Periods and Emissions

Pollutant	Total Emissions for Kilns 1 - 3 Baseline Period Start Month	End Month	Baseline Emissions (tpy)
NSR Pollutants			
CO	Sep-05	Aug-06	51.80
Fluorides	N/A	N/A	N/A
H_2S	N/A	N/A	N/A
Lead	Jan-10	Dec-11	4.84E-03
NO_X	Sep-05	Aug-06	19.87
Reduced Sulfur Compounds (including H_2S)	N/A	N/A	N/A
SO_2	Jan-10	Dec-11	6.84
H_2SO_4	N/A	N/A	N/A
Total PM	Sep-05	Aug-06	28.88
Total PM_{10}	Sep-05	Aug-06	17.53
Total $PM_{2.5}$	Sep-05	Aug-06	16.04
Total Reduced Sulfur (including H_2S)	N/A	N/A	N/A
Total VOC	Sep-05	Aug-06	271.77
Greenhouse Gases			
$CO_2e_{biomass\ deferral}$	Jan-10	Dec-11	1190.84
HAPs			
Formaldehyde	Sep-05	Aug-06	2.84
Methanol	Sep-05	Aug-06	11.35

Table B-13. NCASI Emission Factors for Direct-Fired Continuous Kilns

As printed in the May 2010 Weyerhaeuser - Plymouth, NC permit application[1] and the NCDAQ Air Permit Review/Preliminary Determination document[2]

Pollutant	Emission Factor	Reference
Criteria		
NO_X	0.28 lb/MBF	3
Total VOC	3.83 lb/MBF	4
CO	0.73 lb/MBF	5
Total PM	0.14 lb/MBF	6
Total PM_{10}	0.104 lb/MBF	6
Total $PM_{2.5}$	0.099 lb/MBF	6
SO_2	0.025 lb/MMBtu	7
Greenhouse Gases		
CO_2	206.79 lb/MMBtu	8
CH_4	7.1E-02 lb/MMBtu	8
N_2O	9.3E-03 lb/MMBtu	8
CO_2e	211.15 lb/MMBtu	9
$CO_2e_{biomass\ deferral}$	4.35 lb/MMBtu	10

1. "Final Report - Revised Air Permit Application for Energy Project," Weyerhaeuser NR Company - Lumber Technologies, Plymouth, NC, May 2010 (Permit # 06389/T19).
2. North Carolina Division of Air Quality (NCDAQ) Air Permit Review/Preliminary Determination for the Weyerhaeuser NR Company, Plymouth, NC facility permit application (May 2010), written by Jenny Kelvington of NCDAQ.
3. Provided by Dr. David Word of NCASI to the Weyerhaeuser facility.
4. Total VOC (lb/MBF)as requested by EPD.
5. Based on the average of NCASI test results as provided via email from Dr. Word of NCASI to NCDAQ, as published in the Air Permit Review/Preliminary Determination, p. 8.
6. Based on preliminary determination for Simpson Lumber Company, LLC, the best available emission factors for particulate related emissions are based on tests conducted at Bibler Brothers Lumber Company, Russelville, AR. The Bibler Brothers data is for filterable PM only. The filterable PM emission factor is 0.068 lb/MBF. Condensable PM is based on unpublished data provided by NCASI. NCASI recommends a ratio of Condensable to Filterable PM of 1.016. The Condensable PM emission factor used is therefore 0.069 lb/MBF. Filterable PM_{10} is assumed to be 50% of filterable PM (based on Permit NO. 2421-107-0011-V-02-3 issued to Rayonier Wood Products LLC-Swainsboro Sawmill). Filterable $PM_{2.5}$ is assumed to be 87% of PM10 based on AP-42 for wood combustion. All condensable PM is assumed to be PM_{10} and $PM_{2.5}$.
8. Per U.S. EPA's AP-42, Section 1-6, *Wood Residue Combustion in Boiler* s (Sept. 2003).
9. Per 40 CFR Part 98, Subpart C, Tables C-1 and C-2. The CO_2 emission factor is the default factor for wood and wood residuals, and the CH_4 and N_2O emission factors are the default factors for all solid biomass fuels.
10. The CO_2e factor is calculated based on the emission factors for CO_2, CH_4, and N_2O and the global warming potential (GWP) for each pollutant per 40 CFR 98, Subpart A, Table A-1:

CO_2	1
CH_4	21
N_2O	310

12. Pursuant to 40 CFR Part 98.2(b)(2), biogenic carbon dioxide emissions (e.g., from biomass) are excluded.

Table B-14. NCASI Emission Factors for HAPs/TAPs from Direct-Fired Continuous Kilns

Pollutant	CAS No.	HAP?	TAP?	Emission Factor		Reference
Acetaldehyde	75-07-0	Yes	Yes	0.058	lb/MBF	1
Acetophenone	98-86-2	Yes	Yes	2.60E-07	lb/MMBtu	2
Acrolein	107-02-8	Yes	Yes	1.90E-04	lb/MMBtu	3
Antimony	7440-36-0	Yes	Yes	7.90E-06	lb/MMBtu	4
Arsenic	7440-38-2	Yes	Yes	3.70E-06	lb/MMBtu	5
Barium	7440-39-3	No	Yes	2.00E-05	lb/MMBtu	5
Benzene	71-43-2	Yes	Yes	2.70E-04	lb/MMBtu	5
Benzo(a)pyrene	50-32-8	Yes	Yes	2.60E-06	lb/MMBtu	4
Beryllium	7440-41-7	Yes	Yes	8.20E-07	lb/MMBtu	2
n-Butyraldehyde	123-72-8	No	Yes	6.10E-05	lb/MMBtu	5
Di(2-ethylhexyl)phthalate	117-81-7	Yes	Yes	4.70E-08	lb/MMBtu	2
Cadmium	7440-43-9	Yes	Yes	4.70E-06	lb/MMBtu	2
Carbon disulfide	75-15-0	Yes	Yes	1.30E-04	lb/MMBtu	5
Carbon tetrachloride	56-23-5	Yes	Yes	8.90E-07	lb/MMBtu	5
Chlorine	7782-50-5	Yes	Yes	7.90E-04	lb/MMBtu	4
Chlorobenzene	108-90-7	Yes	Yes	5.50E-10	lb/MMBtu	2
Chloroform	67-66-3	Yes	Yes	3.70E-05	lb/MMBtu	5
Chromium	7440-47-3	Yes	Yes	6.60E-06	lb/MMBtu	5
Chromium VI	18540-29-9	Yes	Yes	7.30E-06	lb/MMBtu	2, 6
Cobalt	7440-48-4	Yes	Yes	4.20E-04	lb/MMBtu	2
Copper	7440-50-8	No	Yes	1.30E-05	lb/MMBtu	5
Crotonaldehyde	4170-30-3	No	Yes	1.10E-05	lb/MMBtu	5
Cumene	98-82-8	Yes	Yes	1.80E-05	lb/MMBtu	5
Dibutylphthalate	84-74-2	Yes	Yes	3.30E-05	lb/MMBtu	2
2,4-Dinitrophenol	51-28-5	Yes	Yes	2.60E-07	lb/MMBtu	2
2,4-Dinitrotoluene	121-14-2	Yes	Yes	9.40E-07	lb/MMBtu	2
Dioxin (as 2,3,7,8-TCDD)	1746-01-6	Yes	Yes	8.60E-12	lb/MMBtu	4
Ethyl benzene	100-41-4	Yes	Yes	6.80E-06	lb/MMBtu	2
Ethylene dichloride	107-06-2	Yes	Yes	2.90E-05	lb/MMBtu	2
Formaldehyde	50-00-0	Yes	Yes	0.04	lb/MBF	3
Hexachlorobenzene	118-74-1	Yes	Yes	1.00E-06	lb/MMBtu	2
Hexane	110-54-3	Yes	Yes	2.90E-04	lb/MMBtu	5
Hydrochloric acid	7647-01-0	Yes	Yes	2.30E-03	lb/MMBtu	3
Isopropanol	67-63-0	No	Yes	3.00E-03	lb/MMBtu	5
Lead	7439-92-1	Yes	Yes	1.77E-05	lb/MMBtu	3
Manganese	7439-96-5	Yes	Yes	1.81E-03	lb/MMBtu	3
Mercury	7439-97-6	Yes	Yes	5.00E-07	lb/MMBtu	3
Methanol	67-56-1	Yes	Yes	0.16	lb/MBF	3
Methyl bromide	74-83-9	Yes	Yes	1.50E-05	lb/MMBtu	2
Methyl chloride	74-87-3	Yes	Yes	2.30E-05	lb/MMBtu	5
Methyl chloroform	71-55-6	Yes	Yes	4.20E-05	lb/MMBtu	5
Methyl ethyl ketone	78-93-3	No	Yes	2.40E-08	lb/MMBtu	2
Methyl isobutyl ketone	108-10-1	Yes	Yes	0.001	lb/MBF	7
Methylene chloride	75-09-2	Yes	Yes	3.50E-04	lb/MMBtu	5
Naphthalene	91-20-3	Yes	Yes	2.80E-05	lb/MMBtu	3
Nickel	7440-02-0	Yes	Yes	4.80E-06	lb/MMBtu	5
2-Nitrophenol	88-75-5	No	Yes	4.20E-08	lb/MMBtu	5
4-Nitrophenol	100-02-7	Yes	Yes	1.20E-07	lb/MMBtu	2
PAC	--	Yes	Yes	7.83E-05	lb/ton	8
Pentachlorophenol	87-86-5	Yes	Yes	4.80E-08	lb/MMBtu	2
Phenol	108-95-2	Yes	Yes	0.022	lb/MBF	1
Phosphorus	7723-14-0	Yes	Yes	9.90E-05	lb/MMBtu	2
POM	--	Yes	Yes	2.88E-05	lb/MMBtu	2, 4
Propionaldehyde	123-38-6	Yes	Yes	5.90E-04	lb/MMBtu	3
Propylene dichloride	78-87-5	Yes	Yes	3.30E-05	lb/MMBtu	2
Selenium	7782-49-2	Yes	Yes	6.20E-06	lb/MMBtu	2
Silver	7440-22-4	No	Yes	9.90E-07	lb/MMBtu	5
Styrene	100-42-5	Yes	Yes	3.20E-05	lb/MMBtu	5
Tetrachloroethylene	127-18-4	Yes	Yes	3.82E-05	lb/MMBtu	9
Thallium	7440-28-0	No	Yes	1.90E-06	lb/MMBtu	5
Toluene	108-88-3	Yes	Yes	0.0001	lb/MBF	7
1,2,4-Trichlorobenzene	120-82-1	Yes	Yes	5.50E-05	lb/MMBtu	2
1,1,2-Trichloroethane	79-00-5	Yes	Yes	1.20E-04	lb/MMBtu	2
Trichloroethylene	79-01-6	Yes	Yes	3.90E-05	lb/MMBtu	5
Trichlorofluoromethane	75-69-4	No	Yes	4.10E-05	lb/MMBtu	5
2,4,6-Trichlorophenol	88-06-2	Yes	Yes	2.40E-08	lb/MMBtu	2
Vinyl chloride	75-01-4	Yes	Yes	1.80E-05	lb/MMBtu	2
Xylenes	1330-20-7	Yes	Yes	2.60E-06	lb/MMBtu	2

1. Lumber-Plywood TRI Workbook 2001, Revision 2, June 2002, by Weyerhaeuser Environmental Technology and Science, as referenced in the May 20120 Weyerhaeuser Plymouth Lumber Mill Revised Air Permit Application for Energy Project.
2. Per NCASI TB No. 858, Tables 20A and 20B, February 2003, as published in the Weyerhaeuser air permit application.
3. Per NCASI SARA 313 Guidance - Wood Products - April 2009, as published in the Weyerhaeuser air permit application.
4. Per U.S. EPA's AP-42, Section 1-6, *Wood Residue Combustion in Boiler* s (Sept. 2003).
5. Per NCASI TB No. 858, Tables 20A and 20B, as used in the Title V renewal application for the West Fraser facility in Augusta, Georgia (March 2011, permit 2421-245-0047-V-04-0).
6. Based on a July 7, 1999 memo from NCDAQ, the chromium VI compounds represented are chromic acid emissions calculated in terms of the chromium VI equivalents, as referenced in the May 20120 Weyerhaeuser Plymouth Lumber Mill Revised Air Permit Application for Energy Project.
7. Per NCASI TB 845, as used in the Title V renewal application for the West Fraser facility in Augusta, Georgia (March 2011, permit 2421-245-0047-V-04-0).
8. Per the NCASI publication for Wood Products Facilities, , as used in the Title V renewal application for the West Fraser facility in Augusta, Georgia (March 2011, permit 2421-245-0047-V-04-0).
9. Value listed in "Final Report - Revised Air Permit Application for Energy Project," Weyerhaeuser NR Company - Lumber Technologies, Plymouth, NC, May 2010 (Permit # 06389/T19).

Table B-15. VOC as Carbon Emissions from Direct-Fired Drying Kilns[1]

Number	VOC as Carbon (lb/MBF)
Unpublished NCASI Test Data	
Test 1	3.66
Test 2	2.46
Test 3	2.75
Test 4	2.72
Test 5	4.99
Test 6	4.7
Test 7	3.7
Test 8	2.87
Test 9	2.42
Test 10	2.83
Test 11	3.16
Test 12	2.07
Test 13	2.89
Test 14	1.61
Test 15	2.85
Test 16	2.78
Test 17	2.82
Published NCASI Test Data	
Test 1	4.2
Test 2	4.7
Test 3	4.2
Other Unpublished NCASI Test Data	
Test 1	2.9
Test 2	3.4
Test 3	3.6
Avg. of NCASI Numbers	**3.23**
Max. of NCASI Numbers	**4.99**

1. Data taken from the NCDAQ Air Permit Review/Preliminary Determination for the Weyerhaueser application, provided to NCDAQ by Dr. David Word of NCASI. Values exclude test data that does not specify the drying of southern yellow pine.

Table B-16. Carbon Monoxide Emissions from Direct-Fired Drying Kilns[1]

Number	CO (lb/MBF)
Test 1	0.75
Test 2	0.44
Test 3	0.51
Test 4	0.57
Test 5	0.92
Test 6	1.0
Test 7	0.92
Avg. of NCASI Numbers	**0.73**
Max. of NCASI Numbers	**1.0**

1. Data taken from the NCDAQ Air Permit Review/Preliminary Determination for the Weyerhaueser application, provided to NCDAQ by Dr. David Word of NCASI.

Table B-17. Continuous Kiln Information

Kiln ID	Burner Capacity[1] (MMBtu/hr)	Fuel HHV[2] (Btu/lb)	Annual Hours of Operation (hrs/yr)	Production Capacity[3] (MBF/hr)	(MMBF/yr)
Continuous Kiln 1 (KD04)	35	4,500	8,760	12.6	110
Continuous Kiln 2 (KD05)	35	4,500	8,760	12.6	110

1. Burner capacity provided to Deanna Duram and Jake Stewart (Trinity) on April 23, 2012.
2. 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).
3. The annual production capacity is based on the projected lengths of the center chambers for the proposed kilns and a lumber production value of 1.1 MMBF/year/foot length of the center chamber. The hourly production capacity was calculated based on the annual hours of operation of the kilns.

Table B-18. Potential Emissions from Direct-Fired Continuous Kilns[1]

Pollutant	KD04 Emissions (lb/hr)	(tpy)	KD05 Emissions (lb/hr)	(tpy)	Total Kiln PTE (lb/hr)	(tpy)
Criteria[2,3]						
NO_X	3.52	15.40	3.52	15.40	**7.03**	**30.80**
Total VOC	48.09	210.65	48.09	210.65	**96.19**	**421.30**
CO	9.17	40.15	9.17	40.15	**18.33**	**80.30**
Total PM	1.73	7.59	1.73	7.59	**3.47**	**15.18**
Total PM_{10}	1.31	5.72	1.31	5.72	**2.61**	**11.44**
Total $PM_{2.5}$	1.24	5.45	1.24	5.45	**2.49**	**10.89**
SO_2	0.88	3.83	0.88	3.83	**1.75**	**7.67**
Greenhouse Gases[4]						
CO_2e	7,390	32,369	7,390	32,369	**14,780.17**	**64,737.14**
$CO_2e_{biomass\ deferral}$	152.32	667.15	152.32	667.15	**304.63**	**1,334.30**

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 [hrs/yr] / 2,000 lb/ton
2. VOC is computed as terpene + methanol + formaldehyde
3. Total $PM/PM_{10}/PM_{2.5}$ emissions are the sum of filterable and condensable particulate.
4. CO_2e based on the biomass deferral excludes biogenic CO_2 emissions (e.g., from biomass) per the Biomass Deferral published in Federal Register Vol. 76, No. 139, on July 20, 2011.

Table B-19. Potential HAP/TAP Emissions from Direct-Fired Continuous Kilns[1]

Pollutant	CAS No.	HAP?	TAP?	Control Efficiency[2]	KD04 Emissions (lb/hr)	KD04 Emissions (tpy)	KD05 Emissions (lb/hr)	KD05 Emissions (tpy)	Total Kiln PTE (lb/hr)	Total Kiln PTE (tpy)
Acetaldehyde	75-07-0	Yes	Yes	-	7.28E-01	3.19E+00	7.28E-01	3.19E+00	**1.46**	**6.38**
Acetophenone	98-86-2	Yes	Yes	-	9.10E-06	3.99E-05	9.10E-06	3.99E-05	**1.82E-05**	**7.97E-05**
Acrolein	107-02-8	Yes	Yes	-	6.65E-03	2.91E-02	6.65E-03	2.91E-02	**1.33E-02**	**5.83E-02**
Antimony	7440-36-0	Yes	Yes	50%	1.38E-04	6.06E-04	1.38E-04	6.06E-04	**2.77E-04**	**1.21E-03**
Arsenic	7440-38-2	Yes	Yes	50%	6.48E-05	2.84E-04	6.48E-05	2.84E-04	**1.30E-04**	**5.67E-04**
Barium	7440-39-3	No	Yes	50%	3.50E-04	1.53E-03	3.50E-04	1.53E-03	**7.00E-04**	**3.07E-03**
Benzene	71-43-2	Yes	Yes	-	9.45E-03	4.14E-02	9.45E-03	4.14E-02	**1.89E-02**	**8.28E-02**
Benzo(a)pyrene	50-32-8	Yes	Yes	-	9.10E-05	3.99E-04	9.10E-05	3.99E-04	**1.82E-04**	**7.97E-04**
Beryllium	7440-41-7	Yes	Yes	50%	1.44E-05	6.29E-05	1.44E-05	6.29E-05	**2.87E-05**	**1.26E-04**
n-Butyraldehyde	123-72-8	No	Yes	-	2.14E-03	9.35E-03	2.14E-03	9.35E-03	**4.27E-03**	**1.87E-02**
Di(2-ethylhexyl)phthalate	117-81-7	Yes	Yes	-	1.65E-06	7.21E-06	1.65E-06	7.21E-06	**3.29E-06**	**1.44E-05**
Cadmium	7440-43-9	Yes	Yes	50%	8.23E-05	3.60E-04	8.23E-05	3.60E-04	**1.65E-04**	**7.21E-04**
Carbon disulfide	75-15-0	Yes	Yes	-	4.55E-03	1.99E-02	4.55E-03	1.99E-02	**9.10E-03**	**3.99E-02**
Carbon tetrachloride	56-23-5	Yes	Yes	-	3.12E-05	1.36E-04	3.12E-05	1.36E-04	**6.23E-05**	**2.73E-04**
Chlorine	7782-50-5	Yes	Yes	-	2.77E-02	1.21E-01	2.77E-02	1.21E-01	**5.53E-02**	**2.42E-01**
Chlorobenzene	108-90-7	Yes	Yes	-	1.93E-08	8.43E-08	1.93E-08	8.43E-08	**3.85E-08**	**1.69E-07**
Chloroform	67-66-3	Yes	Yes	-	1.30E-03	5.67E-03	1.30E-03	5.67E-03	**2.59E-03**	**1.13E-02**
Chromium	7440-47-3	Yes	Yes	50%	1.16E-04	5.06E-04	1.16E-04	5.06E-04	**2.31E-04**	**1.01E-03**
Chromium VI	18540-29-9	Yes	Yes	50%	1.28E-04	5.60E-04	1.28E-04	5.60E-04	**2.56E-04**	**1.12E-03**
Cobalt	7440-48-4	Yes	Yes	50%	7.35E-03	3.22E-02	7.35E-03	3.22E-02	**1.47E-02**	**6.44E-02**
Copper	7440-50-8	No	Yes	50%	2.28E-04	9.96E-04	2.28E-04	9.96E-04	**4.55E-04**	**1.99E-03**
Crotonaldehyde	4170-30-3	No	Yes	-	3.85E-04	1.69E-03	3.85E-04	1.69E-03	**7.70E-04**	**3.37E-03**
Cumene	98-82-8	Yes	Yes	-	6.30E-04	2.76E-03	6.30E-04	2.76E-03	**1.26E-03**	**5.52E-03**
Dibutylphthalate	84-74-2	Yes	Yes	-	1.16E-03	5.06E-03	1.16E-03	5.06E-03	**2.31E-03**	**1.01E-02**
2,4-Dinitrophenol	51-28-5	Yes	Yes	-	9.10E-06	3.99E-05	9.10E-06	3.99E-05	**1.82E-05**	**7.97E-05**
2,4-Dinitrotoluene	121-14-2	Yes	Yes	-	3.29E-05	1.44E-04	3.29E-05	1.44E-04	**6.58E-05**	**2.88E-04**
Dioxin (as 2,3,7,8-TCDD)	1746-01-6	Yes	Yes	-	3.01E-10	1.32E-09	3.01E-10	1.32E-09	**6.02E-10**	**2.64E-09**
Ethyl benzene	100-41-4	Yes	Yes	-	2.38E-04	1.04E-03	2.38E-04	1.04E-03	**4.76E-04**	**2.08E-03**
Ethylene dichloride	107-06-2	Yes	Yes	-	1.02E-03	4.45E-03	1.02E-03	4.45E-03	**2.03E-03**	**8.89E-03**
Formaldehyde	50-00-0	Yes	Yes	-	5.02E-01	2.20E+00	5.02E-01	2.20E+00	**1.00**	**4.40**
Hexachlorobenzene	118-74-1	Yes	Yes	-	3.50E-05	1.53E-04	3.50E-05	1.53E-04	**7.00E-05**	**3.07E-04**
Hexane	110-54-3	Yes	Yes	-	1.02E-02	4.45E-02	1.02E-02	4.45E-02	**2.03E-02**	**8.89E-02**
Hydrochloric acid	7647-01-0	Yes	Yes	-	8.05E-02	3.53E-01	8.05E-02	3.53E-01	**1.61E-01**	**7.05E-01**
Isopropanol	67-63-0	No	Yes	-	1.05E-01	4.60E-01	1.05E-01	4.60E-01	**2.10E-01**	**9.20E-01**
Lead	7439-92-1	Yes	Yes	50%	3.10E-04	1.36E-03	3.10E-04	1.36E-03	**6.20E-04**	**2.71E-03**
Manganese	7439-96-5	Yes	Yes	50%	3.17E-02	1.39E-01	3.17E-02	1.39E-01	**6.34E-02**	**2.77E-01**
Mercury	7439-97-6	Yes	Yes	-	1.75E-05	7.67E-05	1.75E-05	7.67E-05	**3.50E-05**	**1.53E-04**
Methanol	67-56-1	Yes	Yes	-	2.01E+00	8.80E+00	2.01E+00	8.80E+00	**4.02**	**17.60**
Methyl bromide	74-83-9	Yes	Yes	-	5.25E-04	2.30E-03	5.25E-04	2.30E-03	**1.05E-03**	**4.60E-03**
Methyl chloride	74-87-3	Yes	Yes	-	8.05E-04	3.53E-03	8.05E-04	3.53E-03	**1.61E-03**	**7.05E-03**
Methyl chloroform	71-55-6	Yes	Yes	-	1.47E-03	6.44E-03	1.47E-03	6.44E-03	**2.94E-03**	**1.29E-02**
Methyl ethyl ketone	78-93-3	No	Yes	-	8.40E-07	3.68E-06	8.40E-07	3.68E-06	**1.68E-06**	**7.36E-06**
Methyl isobutyl ketone	108-10-1	Yes	Yes	-	1.26E-02	5.50E-02	1.26E-02	5.50E-02	**2.51E-02**	**1.10E-01**
Methylene chloride	75-09-2	Yes	Yes	-	1.23E-02	5.37E-02	1.23E-02	5.37E-02	**2.45E-02**	**1.07E-01**
Naphthalene	91-20-3	Yes	Yes	-	9.80E-04	4.29E-03	9.80E-04	4.29E-03	**1.96E-03**	**8.58E-03**
Nickel	7440-02-0	Yes	Yes	50%	8.40E-05	3.68E-04	8.40E-05	3.68E-04	**1.68E-04**	**7.36E-04**
2-Nitrophenol	88-75-5	No	Yes	-	1.47E-06	6.44E-06	1.47E-06	6.44E-06	**2.94E-06**	**1.29E-05**
4-Nitrophenol	100-02-7	Yes	Yes	-	4.20E-06	1.84E-05	4.20E-06	1.84E-05	**8.40E-06**	**3.68E-05**
PAC	--	Yes	Yes	-	3.05E-04	1.33E-03	3.05E-04	1.33E-03	**6.09E-04**	**2.67E-03**
Pentachlorophenol	87-86-5	Yes	Yes	-	1.68E-06	7.36E-06	1.68E-06	7.36E-06	**3.36E-06**	**1.47E-05**
Phenol	108-95-2	Yes	Yes	-	2.76E-01	1.21E+00	2.76E-01	1.21E+00	**0.55**	**2.42**
Phosphorus	7723-14-0	Yes	Yes	-	3.47E-03	1.52E-02	3.47E-03	1.52E-02	**6.93E-03**	**3.04E-02**
POM	--	Yes	Yes	-	1.01E-03	4.42E-03	1.01E-03	4.42E-03	**2.02E-03**	**8.83E-03**
Propionaldehyde	123-38-6	Yes	Yes	-	2.07E-02	9.04E-02	2.07E-02	9.04E-02	**4.13E-02**	**1.81E-01**
Propylene dichloride	78-87-5	Yes	Yes	-	1.16E-03	5.06E-03	1.16E-03	5.06E-03	**2.31E-03**	**1.01E-02**
Selenium	7782-49-2	Yes	Yes	-	2.17E-04	9.50E-04	2.17E-04	9.50E-04	**4.34E-04**	**1.90E-03**
Silver	7440-22-4	No	Yes	50%	1.73E-05	7.59E-05	1.73E-05	7.59E-05	**3.47E-05**	**1.52E-04**
Styrene	100-42-5	Yes	Yes	-	1.12E-03	4.91E-03	1.12E-03	4.91E-03	**2.24E-03**	**9.81E-03**
Tetrachloroethylene	127-18-4	Yes	Yes	-	1.34E-03	5.86E-03	1.34E-03	5.86E-03	**2.67E-03**	**1.17E-02**
Thallium	7440-28-0	No	Yes	-	6.65E-05	2.91E-04	6.65E-05	2.91E-04	**1.33E-04**	**5.83E-04**
Toluene	108-88-3	Yes	Yes	-	1.26E-03	5.50E-03	1.26E-03	5.50E-03	**2.51E-03**	**1.10E-02**
1,2,4-Trichlorobenzene	120-82-1	Yes	Yes	-	1.93E-03	8.43E-03	1.93E-03	8.43E-03	**3.85E-03**	**1.69E-02**
1,1,2-Trichloroethane	79-00-5	Yes	Yes	-	4.20E-03	1.84E-02	4.20E-03	1.84E-02	**8.40E-03**	**3.68E-02**
Trichloroethylene	79-01-6	Yes	Yes	-	1.37E-03	5.98E-03	1.37E-03	5.98E-03	**2.73E-03**	**1.20E-02**
Trichlorofluoromethane	75-69-4	No	Yes	-	1.44E-03	6.29E-03	1.44E-03	6.29E-03	**2.87E-03**	**1.26E-02**
2,4,6-Trichlorophenol	88-06-2	Yes	Yes	-	8.40E-07	3.68E-06	8.40E-07	3.68E-06	**1.68E-06**	**7.36E-06**
Vinyl chloride	75-01-4	Yes	Yes	-	6.30E-04	2.76E-03	6.30E-04	2.76E-03	**1.26E-03**	**5.52E-03**
Xylenes	1330-20-7	Yes	Yes	-	9.10E-05	3.99E-04	9.10E-05	3.99E-04	**1.82E-04**	**7.97E-04**
Total HAP Emissions					**3.77**	**16.50**	**3.77**	**16.50**	**7.53**	**33.00**
Maximum Individual HAP Emissions					**2.01**	**8.80**	**2.01**	**8.80**	**4.02**	**17.60**

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 [hrs/yr] / 2,000 lb/ton
Potential emissions [tpy] = Emission factor [lb/ton] * (Heat input capacity [MMBtu/hr] * 1.0E6 / Fuel HHV [Btu/lb] / 2,000 lb/ton) * Annual hours of operation [hrs/yr] / 2,000 lb/ton
2. Control efficiency for particle-bound metal HAPs is applied based on EPD's SIP Application Review document (Application No. 19470) that states that kilns act as settling chambers and the minimum expected control for particulate emissions from kilns acting as settling chambers is 50%.
3. Selenium and Mercury were not included as metal bound HAPs due to their ability to exist outside of particle bound formations.

Table B-20. Proposed Lumber Increases via Project

Material	Past Potential Throughput[1]	Future Potential Throughput	Throughput Increase (tpy)
Wood/Lumber (MMBF/yr)	157	220	63.00
Wood/Lumber (tpy)[2]	659,400	924,000	264,600

1. Past potential throughput is the maximum lumber drying capacity of the mill, as stated in their most recent Title V Permit No. 2421-245-0047-V-04-0, issued June 2012.
2. Wood/Lumber [tpy] = Wood/Lumber [MMBF/yr]× 4.2 tons/MBF × 1,000 MBF/MMBF. A factor of 4.2 tons/MBF was provided by the mill.

Table B-21. Emission Increases for Sawing and Debarking

Emission Source	Annual Hours of Operation	Pollutant	Emission Factor (lb/ton)	Control Efficiency[1] (%)	Potential Emissions Increase (lb/hr)[2]	(tpy)[3]
Log Sawing[4]	8,760	PM	0.350	90%	1.06	4.63
		PM_{10}	0.200	90%	0.60	2.65
		$PM_{2.5}$[6]	0.200	90%	0.60	2.65
Debarking[5]	8,760	PM	0.020	90%	0.06	0.26
		PM_{10}	0.011	90%	0.03	0.15
		$PM_{2.5}$[6]	0.011	90%	0.03	0.15

1. Based on guidance by the Texas Commission on Environmental Quality (TCEQ) entitled "Rock Crushing Plants" (Feb. 2002), a control efficiency of 90% should be applied for work performed fully enclosed.

2. Potential Hourly Emissions Increase [lb/hr] = Potential Annual Emissions Increase [tpy] × 2,000 lb/ton / Annual Hours of Operation [hr/yr]
3. Potential Annual Emissions Increase [tpy] = Emission factor [lb/ton] × (1 - Control Efficiency [%]) × Associated Throughput Increase [ton/yr] / 2,000 lb/ton
4. Emission factors from EIIP Uncontrolled Emission Factors (July 2001), per the Factor Information Retrieval (FIRE) database management system, version 6.23 for SCC Code 3-07-008-02, Log Sawing.
5. Emission factors from EIIP Uncontrolled Emission Factors (July 2001), per the Factor Information Retrieval (FIRE) database management system, version 6.23 for SCC Code 3-07-008-01, Log Debarking.
6. It is assumed that PM_{10} = $PM_{2.5}$.

Table B-22. Proposed Byproduct Increases via Project

Material	Past Potential Throughput[1] (tpy)	Future Potential Throughput[1] (tpy)	Increase (tpy)
Chips	191,226	267,960	76,734
Bark	39,564	55,440	15,876
Sawdust	65,940	92,400	26,460
Shavings	59,346	83,160	23,814

1. Ratios of byproduct production to lumber production are based on the mill's March 2011 Title V renewal application.

Table B-23. Emission Increases for Material Transfer Sources

Emission Source	Annual Hours of Operation	Calculated Emission Factors[1] (lb/ton)			Potential Hourly Emissions Increase[2] (lb/hr)			Potential Annual Emissions Increase[3] (tpy)		
		PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
Chip Truck Loading	8,760	3.98E-04	1.88E-04	2.85E-05	3.49E-03	1.65E-03	2.50E-04	1.53E-02	7.22E-03	1.09E-03
Bark Truck Loading	8,760	3.98E-04	1.88E-04	2.85E-05	7.21E-04	3.41E-04	5.17E-05	3.16E-03	1.49E-03	2.26E-04
Sawdust Truck Loading	8,760	3.98E-04	1.88E-04	2.85E-05	1.20E-03	5.69E-04	8.61E-05	5.27E-03	2.49E-03	3.77E-04
Shavings Truck Loading	8,760	3.98E-04	1.88E-04	2.85E-05	1.08E-03	5.12E-04	7.75E-05	4.74E-03	2.24E-03	3.39E-04
Bark Transfer	8,760	3.98E-04	1.88E-04	2.85E-05	7.21E-04	3.41E-04	5.17E-05	3.16E-03	1.49E-03	2.26E-04
Sawdust Transfer	8,760	3.98E-04	1.88E-04	2.85E-05	1.20E-03	5.69E-04	8.61E-05	5.27E-03	2.49E-03	3.77E-04
Chips Transfer	8,760	3.98E-04	1.88E-04	2.85E-05	3.49E-03	1.65E-03	2.50E-04	1.53E-02	7.22E-03	1.09E-03
Shavings Transfer	8,760	3.98E-04	1.88E-04	2.85E-05	1.08E-03	5.12E-04	7.75E-05	4.74E-03	2.24E-03	3.39E-04

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 = 6.408 mph; average wind speed for Augusta, GA from TANKS 4.0.9d
M = 9 %; material moisture content (engineering estimate, as noted in the March 2011 Title V renewal application)

2. Potential Hourly Emissions Increase [lb/hr] = Potential Annual Emissions Increase [tpy] × 2,000 lb/ton / Annual Hours of Operation [hrs/yr]
3. Potential Annual Emissions Increase [tpy] = Emission Factor [lb/ton] × Associated Throughput Increase [ton/year] / 2,000 lb/ton

Table B-24. Proposed Lumber Increases via Project

Material	Past Potential Throughput[1] (tpy)	Future Potential Throughput[1] (tpy)	Increase (tpy)
Chipper	191,226	267,960	76,734
Hogger	65,940	92,400	26,460

1. Throughputs for the chipper and hogger are based on the past potential and future potential production of chips and sawdust at the facility, respectively.

Table B-25. Emission Increases for Hogger and Chipper

Emission Source	Annual Hours of Operation	Pollutant	Emission Factor[1] (lb/ton)	Control Efficiency[2] (%)	Emissions Increase (lb/hr)[3]	Emissions Increase (tpy)[4]
Chipper	8,760	PM	0.020	90%	1.75E-02	7.67E-02
		PM_{10}	0.011	90%	9.64E-03	4.22E-02
		$PM_{2.5}$[5]	0.011	90%	9.64E-03	4.22E-02
Hogger	8,760	PM	0.020	90%	6.04E-03	2.65E-02
		PM_{10}	0.011	90%	3.32E-03	1.46E-02
		$PM_{2.5}$[5]	0.011	90%	3.32E-03	1.46E-02

1. Emission factors from EIIP Uncontrolled Emission Factors (July 2001), per the Factor Information Retrieval (FIRE) database management system, version 6.23 for SCC Code 3-07-008-01, Log Debarking.
2. Based on guidance from the Texas Commission on Environmental Quality (TCEQ) entitled "Rock Crushing Plants" (Feb. 2002), a control efficiency of 90% should be applied for work performed fully enclosed.
3. Potential Hourly Emissions Increase [lb/hr] = Potential Annual Emissions Increase [tpy] × 2,000 lb/ton / Annual Hours of Operation [hr/yr]
4. Potential Emissions Increase [tpy] = Emission factor [lb/ton] × (1 - Control Efficiency [%]) × Associated Throughput Increase [ton/yr] / 2,000 lb/ton
5. It is assumed that $PM_{10} = PM_{2.5}$.

Table B-26. Proposed Road Traffic Increases

Material	Past Potential Number of Trucks Per Year[1]	Future Potential Number of Trucks Per Year[2]	Truck Increase Per Year
Log Truck	24,500	34,331	9,831
Lumber Truck	6,800	9,529	2,729
Bark Truck	3,600	5,045	1,445
Chip Truck	17,400	24,382	6,982
Shavings Truck	5,400	7,567	2,167
Sawdust Truck	180	252	72
Forklift	7	8	1
Bobcat	2	2	0

1. Past potential number of trucks per year data from the mill's March 2011 Title V renewal application.
2. Future potential trucks per year = Past potential trucks per year × (Future potential production [MMBF/yr]/ Past potential production [MMBF/yr]).

Table B-27. Inputs for Increased Emissions from Road Travel

Source	Truck Weight Empty[1] (tons)	Truck Weight Loaded[1] (tons)	Average Weight (W) (tons)	Distance Traveled per Round Trip[1]		Events Per Year[1] (Days)	Increase in Number of Trucks Per Day	Increase in Vehicle Miles Traveled			
				Paved Roads (ft)	Unpaved Roads (ft)			Paved Roads[2] (VMT/day)	Paved Roads[2] (VMT/yr)	Unpaved Roads (VMT/day)	Unpaved Roads (VMT/yr)
Log Truck	16	43	29.5		2,640	365	26.93	-	-	13.47	4,916
Lumber Truck	16	39	27.5		2,640	365	7.48	-	-	3.74	1,364
Bark Truck	16	27	21.5		2,640	365	3.96	-	-	1.98	722
Chip Truck	16	27	21.5		2,640	365	19.13	-	-	9.56	3,491
Shavings Truck	16	27	21.5		2,640	365	5.94	-	-	2.97	1,083
Sawdust Truck	16	27	21.5		2,640	365	0.20	-	-	0.10	36.11
Forklift	-	-	16.5	N/A	-	365	0.00	109.59	40,000	-	-
Bobcat	-	-	16.5	N/A	-	365	-	0.00	0	-	-

1. Data taken from the mill's March 2011 Title V renewal application.
2. The past potential vehicle miles traveled (VMT) per year value for the forklifts and bobcats at the Augusta Mill are 198,750 VMT/yr for the all the forklifts and 25,000 VMT/yr for all the bobcats. The values were rounded up to account for the increase in production using the following equation:

Future potential vehicle miles traveled [VMT/yr] = Past potential vehicle miles traveled [VMT/yr] × (Future potential throughput [MMBF/yr] / Past potential throughput [MMBF/yr] - 1).

The values shown here represent the increase from past potential VMT/yr to future potential VMT/yr.

Table B-28. Potential Hourly Fugitive Emission Increases from Road Travel

Source	Emission Factor[1,2] (lb/VMT) PM	PM_{10}	$PM_{2.5}$	Increase in Potential Fugitive Emissions[3] Filterable PM (lb/hr)	Filterable PM_{10} (lb/hr)	Filterable $PM_{2.5}$ (lb/hr)
Paved Road Travel						
Log Truck	1.35	0.27	0.07	-	-	-
Lumber Truck	1.26	0.25	0.06	-	-	-
Bark Truck	0.98	0.20	0.05	-	-	-
Chip Truck	0.98	0.20	0.05	-	-	-
Shavings Truck	0.98	0.20	0.05	-	-	-
Sawdust Truck	0.98	0.20	0.05	-	-	-
Forklift	0.75	0.15	0.04	3.41	0.68	0.17
Bobcat	0.75	0.15	0.04	0.00	0.00	0.00
Total Paved				***3.41***	***0.68***	***0.17***
Unpaved Road Travel						
Log Truck	5.34	1.52	0.15	3.00	0.85	0.09
Lumber Truck	5.17	1.47	0.15	0.81	0.23	0.02
Bark Truck	4.63	1.32	0.13	0.38	0.11	0.01
Chip Truck	4.63	1.32	0.13	1.85	0.53	0.05
Shavings Truck	4.63	1.32	0.13	0.57	0.16	0.02
Sawdust Truck	4.63	1.32	0.13	0.02	5.44E-03	5.44E-04
Forklift	4.11	1.17	0.12	-	-	-
Bobcat	4.11	1.17	0.12	-	-	-
Total Unpaved				***6.62***	***1.89***	***0.19***
Total Road Emissions				**10.03**	**2.57**	**0.36**

1. Paved Roads Emission Factor (lb/VMT) = k (sL)^0.91 × (W)^1.02, 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) =	4.45	Based on site-specific data for silt loading from the mill's March 2011 Title V renewal application

2. Unpaved Roads Emission Factor (lb/VMT) = [k (s/12)^a × (W/3)^b] × (100% - % control efficiency), per AP-42 Section 13.2.2, Unpaved Roads (Nov. 2006), Equation 1a, 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 (%) =	8.4	Surface silt content based on median value for lumber sawmills per AP-42, Table 13.2.2-1
% control efficiency =	50.0	% control efficiency

3. Potential emissions calculated as appropriate emission factor multiplied by vehicle miles traveled per time period. Note, West Fraser conservatively estimated hourly emissions using the emission factor on a daily basis because an emission factor on an hourly basis calculated per Equation 3 results in lower potential emissions.

Table B-29. Potential Annual Fugitive Emission Increases from Road Travel

Source	Emission Factor[1,2] (lb/VMT) PM	PM_{10}	$PM_{2.5}$	Increase in Potential Fugitive Emissions[3] Filterable PM (tpy)	Filterable PM_{10} (tpy)	Filterable $PM_{2.5}$ (tpy)
Paved Road Travel						
Log Truck	1.24	0.25	0.06	-	-	-
Lumber Truck	1.15	0.23	0.06	-	-	-
Bark Truck	0.90	0.18	0.04	-	-	-
Chip Truck	0.90	0.18	0.04	-	-	-
Shavings Truck	0.90	0.18	0.04	-	-	-
Sawdust Truck	0.90	0.18	0.04	-	-	-
Forklift	0.69	0.14	0.03	13.71	2.74	0.67
Bobcat	0.69	0.14	0.03	0.00	0.00	0.00
Total Paved				***13.71***	***2.74***	***0.67***
Unpaved Road Travel						
Log Truck	3.58	1.02	0.10	8.81	2.51	0.25
Lumber Truck	3.47	0.99	0.10	2.37	0.68	0.07
Bark Truck	3.11	0.89	0.09	1.12	0.32	0.03
Chip Truck	3.11	0.89	0.09	5.43	1.55	0.15
Shavings Truck	3.11	0.89	0.09	1.68	0.48	0.05
Sawdust Truck	3.11	0.89	0.09	0.06	0.02	0.00
Forklift	2.76	0.79	0.08	-	-	-
Bobcat	2.76	0.79	0.08	-	-	-
Total Unpaved				***19.46***	***5.55***	***0.55***
Total Road Emissions				**33.17**	**8.29**	**1.23**

1. Paved Roads Emission Factor (lb/VMT) = [k (sL)^0.91 × (W)^1.02] × [1-P/(4N)], per AP-42 Section 13.2.1, *Paved Roads* (Jan. 2011), Equation 2, 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) =	4.45	Based on site-specific data for silt loading from the mill's March 2011 Title V renewal application
P =	120	No. days with rainfall greater than 0.01 inch, Per AP-42, Figure 13.2.1-2
N =	365	Days in averaging period

2. 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 (%) =	8.4	Surface silt content based on median value for lumber sawmills per AP-42, Table 13.2.2-1
P =	120	No. days with rainfall greater than 0.01 inch, Per AP-42, Figure 13.2.2-1
% control efficiency =	50.0	% control efficiency

3. Potential emissions calculated as appropriate emission factor multiplied by vehicle miles traveled per time period. Note, West Fraser conservatively estimated hourly and annual emissions using the emission factor on a daily basis because an emission factor on an hourly basis calculated per Equation 3 results in lower potential emissions.

Table B-30. Total Emissions Increase from New Units

Pollutant	Potential Emissions (tpy) KD04	KD05	Emissions Increase (tpy)
NSR Pollutants			
CO	40.15	40.15	80.30
Fluorides	N/A	N/A	N/A
H_2S	N/A	N/A	N/A
Lead	3.10E-04	3.10E-04	6.20E-04
NO_X	15.40	15.40	30.80
Reduced Sulfur Compounds (including H_2S)	N/A	N/A	N/A
SO_2	3.83	3.83	7.67
H_2SO_4	N/A	N/A	N/A
Total PM	7.59	7.59	15.18
Total PM_{10}	5.72	5.72	11.44
Total $PM_{2.5}$	5.45	5.45	10.89
Total Reduced Sulfur (including H_2S)	N/A	N/A	N/A
Total VOC	210.65	210.65	421.30
Greenhouse Gases			
$CO_2e_{biomass\ deferral}$	667.15	667.15	1,334
HAPs			
Formaldehyde	0.50	0.50	1.00
Methanol	2.01	2.01	4.02

Table B-31. Total Emissions Increase from Associated Un

Pollutant	Potential Emissions Increase (tpy)
NSR Pollutants	
CO	N/A
Fluorides	N/A
H_2S	N/A
Lead	N/A
NO_X	N/A
Reduced Sulfur Compounds (including H_2S)	N/A
SO_2	N/A
H_2SO_4	N/A
Total PM	38.23
Total PM_{10}	11.17
Total $PM_{2.5}$	4.08
Total Reduced Sulfur (including H_2S)	N/A
Total VOC	N/A
Greenhouse Gases	
$CO_2e_{biomass\ deferral}$	N/A
HAPs	
Formaldehyde	N/A
Methanol	N/A

Table B-32. Emissions Increase Over Baseline and PSD Triggering Analysis (Step 1)

Pollutant	Emissions Increase New Units (tpy)	Emissions Increase Associated Units (tpy)	Emissions Increase Total (tpy)	PSD SER Thresholds (tpy)	PSD Permitting Triggered?
NSR Pollutants					
CO	80.30	N/A	80.30	100	No
Fluorides	N/A	N/A	N/A	3	No
H_2S	N/A	N/A	N/A	10	No
Lead	6.20E-04	N/A	6.20E-04	0.6	No
NO_X	30.80	N/A	30.80	40	No
Reduced Sulfur Compounds (including H_2S)	N/A	N/A	N/A	10	No
SO_2	7.67	N/A	7.67	40	No
H_2SO_4	N/A	N/A	N/A	7	No
Total PM	15.18	38.23	53.41	25	Yes
Total PM_{10}	11.44	11.17	22.61	15	Yes
Total $PM_{2.5}$	10.89	4.08	14.97	10	Yes
Total Reduced Sulfur (including H_2S)	N/A	N/A	N/A	10	No
Total VOC	421.30	N/A	421.30	40	Yes
Greenhouse Gases					
$CO_2e_{biomass\ deferral}$	1,334	N/A	1,334	75,000	No
HAPs [1]					
Formaldehyde	1.00	N/A	1.00	N/A	N/A
Methanol	4.02	N/A	4.02	N/A	N/A

1. Formaldehyde and Methanol are shown in the netting analysis, because the pollutants were used in the Total VOC calculations. See Table B-X for total HAP emissions from the proposed continuous kilns.

Table B-33. Contemporaneous Decreases

Pollutant	Shutdown of Kilns 1-3 (tpy)
NSR Pollutants	
CO	51.80
Fluorides	N/A
H_2S	N/A
Lead	4.84E-03
NO_X	19.87
Reduced Sulfur Compounds (including H_2S)	N/A
SO_2	6.84
H_2SO_4	N/A
Total PM	28.88
Total PM_{10}	17.53
Total $PM_{2.5}$	16.04
Total Reduced Sulfur (including H_2S)	N/A
Total VOC	271.77
Greenhouse Gases	
$CO_2e_{biomass\ deferral}$	1190.84
HAPs	
Formaldehyde	2.84
Methanol	11.35

Table B-34. Netting Analysis

Pollutant	Net Emissions Change (tpy)	PSD SER Thresholds (tpy)	PSD Permitting Triggered?
NSR Pollutants			
CO	28.50	100	No
Fluorides	N/A	3	No
H_2S	N/A	10	No
Lead	0.00	0.6	No
NO_X	10.93	40	No
Reduced Sulfur Compounds (including H_2S)	N/A	10	No
SO_2	0.82	40	No
H_2SO_4	N/A	7	No
Total PM	24.53	25	No
Total PM_{10}	5.08	15	No
Total $PM_{2.5}$	-1.07	10	No
Total Reduced Sulfur (including H_2S)	N/A	10	No
Total VOC	149.53	40	Yes
Greenhouse Gases			
$CO_2e_{biomass\ deferral}$	143.45	75,000	No
HAPs [2]			
Formaldehyde	-1.83	N/A	N/A
Methanol	-7.34	N/A	N/A

Appendix D Updates

Table D-1. Emission Units Subject to BACT

Unit	Max. Production Capacity
KD04	110.0 MMBF/yr
KD05	110.0 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
KD04	VOC	RTO	3.83 lb/MBF	80.0%	0.061 lb/MBF
KD05	VOC	RTO	3.83 lb/MBF	80.0%	0.061 lb/MBF
All Kilns	VOC	RTO	3.83 lb/MBF	80.0%	0.061 lb/MBF
All Kilns	VOC	Biofiltration	3.83 lb/MBF	80.0%	1.072 lb/MBF

1. VOC as terpene + methanol + formaldehyde.
2. Based on engineering estimate.

Table D-3. Cost Summary

Emission Unit	Pollutant	Technology	Control Efficiency [1,2] (%)	Baseline Emissions (tpy)	Capture Efficiency [3] (%)	Pollutant Removed (tpy)	Operating Cost ($/ton removed)
KD04	VOC	RTO	98%	210.65	80.0%	165.15	$ 14,329
KD05	VOC	RTO	98%	210.65	80.0%	165.15	$ 14,329
All Kilns	VOC	RTO	98%	421.30	80.0%	330.30	$ 14,222
All Kilns	VOC	Biofiltration	65%	421.30	80.0%	219.08	$ 14,044

1. RTO control efficiency per OAQPS Manual, Section 3.2, Chapter 2.
2. Biofiltration control efficiency based on North Carolina Department of Environment and Natural Resources Air Permit Review for Weyerhauser's Plymouth facility's continuous kiln construction application, which referenced an estimated 60 – 70% VOC control efficiency from biofiltration, based on a conversation with David Word of NCASI.
3. Based on engineering estimate.

Table D-4. Cost Analysis Supporting Information for RTO

Parameter	Kiln 4 (KD04)	Kiln 5 (KD05)	2 Kilns to 1 RTO	Units	Note(s)
Maximum Production Capacity	110	110	220	MMBF/yr	
Uncontrolled Stack Inlet Emissions (VOC)	168.52	168.52	337.04	tpy	1
Removal Efficiency	98	98	98	%	2
VOC Removed	165.15	165.15	330.30	tpy	3
Control Equip. Outlet Temperature	1,450	1,450	1,450	° F	4
Airflow	40,471	40,471	80,942	acfm	5
Airflow Capture Efficiency	50	50	50	%	6
Exhaust Temperature	130	130	130	° F	5
Air Moisture Content	13.6	13.6	13.6	%	5
Exhaust Gas Flow Rate	35,667	35,667	71,333	scfm	7
Specific Heat of Dry Air	6.85	6.85	6.85	Btu/lb-mole·°F	8
Specific Heat of Water	17.99	17.99	17.99	Btu/lb-mole·°F	8
Pressure Drop	19	19	19	inches of H_2O	9
Fan Motor Efficiency	70	70	70	%	10
Fan Electricity Usage	64.3	64.3	128.5	kW-hr	11
Energy Required From Fuel	61.44	61.44	122.88	MMBtu/hr	12
Natural Gas Heat Capacity	1,020	1,020	1,020	MMBtu/MMscf	13
Operating Labor Cost	12.0	12.0	12.0	$/hr	14
Maintenance Labor Cost	13.2	13.2	13.2	$/hr	14
Electricity Cost	0.06	0.1	0.06	$/kW-hr	15
Natural Gas Cost	3.3	3.3	3.3	$/1,000 scf	16
RTO Equipment Life	10	10	10	years	17
Interest Rate	7.0	7.0	7.0	%	17
2002 $	179.9	179.9	179.9	n/a	18
2012 $ (October)	231.3	231.3	231.3	n/a	18

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. Values based stack test performed on Bibler Brothers Lumber Company continuous lumber kiln in Russellville, AR on March 12, 2009.
6. 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.
7. 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%.
8. Standard value.
9. Based on example problem in OAQPS Manual, Section 3.2, Chapter 2, page 2-43.
10. Per OAQPS Manual, Section 3.2, Chapter 2, page 2-41, efficiency ranges from 40 to 70%. 70% is conservatively chosen.
11. Total Fan Electricity Usage based on Equation 2.42 of OAQPS Manual, Section 3.2, Chapter 2, page 2-41.
12. 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.
13. Average natural gas heating value per AP-42 Section 1.4 *Natural Gas Combustion* (July 1998).
14. Labor costs per OAQPS Manual, Section 3.1, Chapter 1, pages 1-29 and 1-37.
15. Based on OAQPS, Section 2, Chapter 3, page 3-32.
16. Based on OAQPS, Section 3.2, Chapter, 2, page 2-46
17. Based on example problem in OAQPS Manual, Section 3.2, Chapter 2, page 2-45.
18. Values based on U.S. Historical Consumer Price Index: ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt.

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

Capital Cost	Kiln 4 (KD04)	Kiln 5 (KD05)	2 Kilns to 1 RTO	OAQPS Notation[1]
Purchased Equipment Costs				
Total Equipment Cost[2]	1,605,115	1,605,115	3,210,230	A
Instrumentation	160,512	160,512	321,023	0.10 × A
Sales Tax	48,153	48,153	96,307	0.03 × A
Freight	80,256	80,256	160,512	0.05 × A
Total Purchased Equipment Costs	*1,894,036*	*1,894,036*	*3,788,071*	*B = 1.18 × A*
Direct Installation Costs				
Foundations and Supports	151,523	151,523	303,046	0.08 × B
Handling and Erection	265,165	265,165	530,330	0.14 × B
Electrical	75,761	75,761	151,523	0.04 × B
Piping	37,881	37,881	75,761	0.02 × B
Insulation	18,940	18,940	37,881	0.01 × B
Painting	18,940	18,940	37,881	0.01 × B
Site Preparation & Buildings	-	-	-	-
Additional duct work	-	-	-	-
Total Direct Installation Costs	*568,211*	*568,211*	*1,136,421*	*C = 0.30 × B*
Indirect Installation Costs				
Engineering	189,404	189,404	378,807	0.10 × B
Construction and Field Expense	94,702	94,702	189,404	0.05 × B
Contractor Fees	189,404	189,404	378,807	0.10 × B
Start-up	37,881	37,881	75,761	0.02 × B
Performance Test	18,940	18,940	37,881	0.01 × B
Process Contingencies	56,821	56,821	113,642	0.03 × B
Total Indirect Installation Costs	*587,151*	*587,151*	*1,174,302*	*D = 0.31 × B*
Total Capital Investment ($)	**3,049,398**	**3,049,398**	**6,098,795**	**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 2012 $.

Minimum regenerative thermal oxidizer cost	35	2002 dollars/scfm
Conversion from 2002 to October 2012 dollars	1.29	October 2012 dollars per 2002 dollar
Minimum regenerative incinerator cost	45.00	August 2012 dollars/scfm

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

Operating Cost	Kiln 4 (KD04)	Kiln 5 (KD05)	2 Kilns to 1 RTO	OAQPS Notation[1]
Direct Annual Costs				
Operating Labor (0.5 hr, per 8-hr shift)	6,570	6,570	6,570	E
Supervisory Labor	986	986	986	F = 0.15 × E
Maintenance Labor (0.5 hr, per 8-hr shift)	7,227	7,227	7,227	G
Maintenance Materials	7,227	7,227	7,227	H = G
Electricity	33,776	33,776	67,552	I
Natural Gas	1,741,248	1,741,248	3,482,495	J
Total Direct Annual Costs	*1,797,033*	*1,797,033*	*3,572,057*	*DAC = E + F + G + H + I + J*
Indirect Annual Costs				
Overhead	13,206	13,206	13,206	K = 0.60 × (E + F + G + H)
Administrative Charges	60,988	60,988	121,976	L = 0.02 × TCI
Property Tax	30,494	30,494	60,988	M = 0.01 × TCI
Insurance	30,494	30,494	60,988	N = 0.01 × TCI
Capital Recovery[2]	434,166	434,166	868,331	O
Total Indirect Annual Costs	*569,347*	*569,347*	*1,125,489*	*IDAC = K + L + M + N + O*
Total Annual Cost ($)	**2,366,380**	**2,366,380**	**4,697,546**	*TAC = DAC + IDAC*
Pollutant Removed (tpy)	165.15	165.15	330.30	
Cost per ton of Pollutant Removed ($)	**14,329**	**14,329**	**14,222**	*$/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.

Table D-7. Cost Analysis Supporting Information for Biofilter and Kiln Exhaust System

Parameter	All Kilns	Units	Note(s)
Maximum Production Capacity	220	MMBF/yr	
Uncontrolled Stack Inlet Emissions (VOC)	337.04	tpy	1
Removal Efficiency	65	%	2
VOC Removed	219.08	tpy	3
Airflow Capture Efficiency	80	%	4
Pressure Drop	19	inches of H_2O	5
Fan Motor Efficiency	70.00	%	6
Operating Labor Cost	12.00	$/hr	7
Maintenance Labor Cost	13.20	$/hr	7
Electricity Cost	0.06	$/kW-hr	8
Water Cost	0.00	$/gal	9
Kiln Exhaust System Equipment Life	10	years	10
Interest Rate	7.0	%	10
2010 $ (March)	217.6	n/a	11
2012 $ (October)	231.3	n/a	11

1. Potential inlet emissions based on maximum capacity and emissions, routing both kilns into one biofilter.
2. Biofiltration control efficiency based on North Carolina Department of Environment and Natural Resources Air Permit Review for Weyerhauser's Plymouth facility continuous kiln construction application, which referenced an estimated 60 – 70% VOC control efficiency from biofiltration, based on a conversation with David Word of NCASI.
3. VOC Removed (tpy) = Removal Efficiency (%) × Uncontrolled Stack Inlet Emissions (tpy). VOC as terpene + methanol + formaldehyde.
4. 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.
5. Based on example problem in OAQPS Manual, Section 3.2, Chapter 2, page 2-43.
6. Per OAQPS Manual, Section 3.2, Chapter 2, page 2-41, efficiency ranges from 40 to 70%. 70% is conservatively chosen.
7. Labor costs per OAQPS Manual, Section 3.1, Chapter 1, pages 1-29 and 1-37.
8. Based on OAQPS, Section 2, Chapter 3, page 3-32.
9. Based on OAQPS, Section 4.2, Chapter 1, page 1-39.
10. Based on example problem in OAQPS Manual, Section 3.2, Chapter 2, page 2-45.
11. Values based on U.S. Historical Consumer Price Index: ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt.

Table D-8. Capital Cost Analysis for Biofilter and Kiln Exhaust System for VOC control

Capital Cost	All Kilns	OAQPS Notation
Total Capital Investment[1]	**13,763,885**	**TCI**

1. Calculated from the North Carolina Division of Air Quality (NCDAQ) Air Permit Review/Preliminary Determination for the Weyerhaeuser NR Company, Plymouth, NC facility permit application (May 2010), written by Jenny Kelvington of NCDAQ, for the cost estimates of a biofiltration system for similar kilns to those West Fraser is proposing. The costs include a chiller that would be needed to cool the exhaust temperature to at least 110 °F, the maximum temperature that can go through the biofiltration system without killing the bugs. Reliance on this value is reasonable as the quoted unit was sized for controlling two continuous kilns as well (at a permitted throughput of 117 MMBF/yr). However, the cost was scaled up to account for the Maplesville Mill's potential production throughput of 200 MMBF/yr. All costs have been adjusted from March 2010 dollars to October 2012 dollars.

Table D-9. Operating Cost Analysis for Biofilter and Kiln Exhaust System for VOC control

Operating Cost	All Kilns	OAQPS Notation
Total Direct Annual Costs [1]	*210,633*	*DAC*
Indirect Annual Costs[1]	342,727	
Capital Recovery[2]	1,959,668	
Total Indirect Annual Costs	*2,866,155*	*IDAC*
Total Annual Cost ($)	**3,076,788**	*TAC = DAC + IDAC*
Pollutant Removed (tpy)	219.08	
Cost per ton of Pollutant Removed ($)	**14,044**	*$/ton = TAC / Pollutant Removed*

1. Calculated from the North Carolina Division of Air Quality (NCDAQ) Air Permit Review/Preliminary Determination for the Weyerhaeuser NR Company, Plymouth, NC facility permit application (May 2010), written by Jenny Kelvington of NCDAQ, for the cost estimates of a biofiltration system for similar kilns to those West Fraser is proposing. The costs include a chiller that would be needed to cool the exhaust temperature to at least 110 °F, the maximum temperature that can go through the biofiltration system without killing the bugs. Reliance on this value is reasonable as the quoted unit was sized for controlling two continuous kilns as well (at a permitted throughput of 117 MMBF/yr). However, the cost was scaled up to account for the Maplesville Mill's potential production throughput of 200 MMBF/yr. All costs have been adjusted from March 2010 dollars to October 2012 dollars.
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 F Updates

Table F-1. Derivation of Acceptable Ambient Concentrations (AAC) for Georgia EPD

Pollutant	CAS No.	Formula	Mol. Wt. (g/mol)	Unit Risk[1] ($\mu g/m^3)^{-1}$	Weight of Evidence[1]	RBAC[1, 2] ($\mu g/m^3$)	Inhalation RfC[1] (mg/m^3)	Annual AAC ($\mu g/m^3$)	24-hr Rating 1. OSHA TWA[3] (ppm)	(mg/m^3)	24-hr Rating 2. ACGIH TWA[4] (ppm)	(mg/m^3)	24-hour AAC[5,6] ($\mu g/m^3$)	OSHA Ceiling[7] (ppm)	(mg/m^3)	ACGIH STEL[8] (ppm)	(mg/m^3)	NIOSH STEL[9] (ppm)	(mg/m^3)	Ceiling or STEL (mg/m^3)	15-minute AAC[10] ($\mu g/m^3$)
Methanol	67-56-1	CH4O	32.04					None	200	260	200	262	619			250	328	250	325	328	32,750
Formaldehyde	50-00-0	CH2O	30.03				-	1.11	Not Required		Not Required		NA	2	2.46	0.3	0.4			2.46	246
Propionaldehyde	123-38-6	C3H6O	58.08				0.01	8.00	Not Required		Not Required		NA							None	None
Acetaldehyde	75-07-0	C2H4O	44.05				0.009	9.00	Not Required		Not Required		NA			25	45			45	4,500
Hydrochloric Acid	7647-01-0	HCl	36.46				0.020	20.00	Not Required		Not Required		NA			5	7	5	7	7	700
Isopropanol	67-63-0	C3H8O	60.09					None	400	980	200	492	2333			400	984	400	325	984	98,400
Manganese	7439-96-5	Mn	54.94				0.00005	0.05	Not Required		Not Required		NA						1	1	100
Phenol	108-95-2	C6H6O	94.11					None	5	19	5	19	45					5	19	19	1,900

1. Unit risk and Inhalation RfC values obtained from EPA IRIS database. Annual AAC for formaldehyde based on data from Georgia EPD.
2. Risk Based Acceptable Concentration (RBAC) is calculated based on the weight of evidence of the unit risk.
3. OSHA TWA values obtained from 29 CFR 1910 Subpart Z
4. ACGIH TWA values obtained from 03-2010-CS-Adopted Threshold Limit Values.pdf
5. Adjusted for occupational exposure. Applied safety factor of 100 for pollutants which are not known human carcinogens and safety factor of 300 for known human carcinogens per GA Air Toxics Guidance (June 21, 1998).
6. Values derived assuming up to a 168 hour work week.
7. OSHA Ceiling values obtained from 29 CFR 1910 Subpart Z
8. ACGIH STEL values obtained from 03-2010-CS-Adopted Threshold Limit Values.pdf
9. NIOSH STEL values obtained from www.cdc.gov/niosh/npg
10. Adjusted by safety factor of 10 per GA Air Toxics Guidance (June 21, 1998).

Table F-2. Derivation of Long-term Acceptable Ambient Concentrations (AAC) for Georgia EPD

Pollutant	CAS No.	Formula	Mol. Wt. (g/mol)	Unit Risk[1] $(\mu g/m^3)^{-1}$	Weight of Evidence	RBAC[2] $(\mu g/m^3)$	Inhalation RfC[1] (mg/m^3)	Annual AAC $(\mu g/m^3)$	24-hour AAC Required?
Methanol	67-56-1	CH4O	32.04					None	Need 24-hr TWA
Formaldehyde	50-00-0	CH2O	30.03				-	1.11	Not Required
Propionaldehyde	123-38-6	C3H6O	58.08				0.008	8.00	Not Required
Acetaldehyde	75-07-0	C2H4O	44.05				0.009	9.00	Not Required
Hydrochloric Acid	75-09-2	HCl	36.46				0.020	20.00	Not Required
Isopropanol	75-09-2	C3H8O	60.09					None	Need 24-hr TWA
Manganese	75-09-2	Mn	54.94				0.00005	0.05	Not Required
Phenol	75-09-2	C6H6O	94.11					None	Need 24-hr TWA

1. Unit risk and Inhalation RfC values obtained from EPA IRIS database.
2. Risk Based Acceptable Concentration (RBAC) is calculated based on the weight of evidence of the unit risk.
3. Formaldehyde annual AAC as prescribed by Georgia EPD.

Table F-3. Derivation of 24-hr Acceptable Ambient Concentrations (AAC) for Georgia EPD

Pollutant	24-hr AAC Required[1]?	CAS No.	Formula	Mol. Wt. (g/mol)	24-hr Rating 1. OSHA TWA (ppm)	(mg/m^3)	24-hr Rating 2. ACGIH TWA (ppm)	(mg/m^3)	24-hr Rating 3. NIOSH TWA (ppm)	(mg/m^3)	24-hr Rating 4. LD50 (rat) (mg/kg)	Rating Available 24-hour TWA (mg/m^3)	24-hour AAC[4] (µg/m^3)
Methanol	Need 24-hr TWA	67-56-1	CH4O	32.04	200	260	200	262				260	619
Formaldehyde	Not Required	50-00-0	CH2O	30.03	Not Required		Not Required					Not Required	Not Required
Propionaldehyde	Not Required	123-38-6	C3H6O	58.08	Not Required		Not Required					Not Required	Not Required
Acetaldehyde	Not Required	75-07-0	C2H4O	44.05	Not Required		Not Required					Not Required	Not Required
Hydrochloric Acid	Not Required	7647-01-0	HCl	36.46	Not Required		Not Required					Not Required	Not Required
Isopropanol	Need 24-hr TWA	67-63-0	C3H8O	60.09	400	980	200	492				980	2333
Manganese	Not Required	7439-96-5	Mn	54.94	Not Required		Not Required					None	None
Phenol	Need 24-hr TWA	108-95-2	C6H6O	94.11	5	19	5	19				19	45

1. Per the *Guidelines* , one long-term value is required; TAP with an annual AAC do not require a 24-hr AAC.
2. OSHA TWA values obtained from 29 CFR 1910 Subpart Z
3. ACGIH TWA values obtained from 03-2004-TLVs.doc
4. Adjusted for occupational exposure. Applied safety factor of 100 for pollutants which are not known human carcinogens and safety factor of 300 for known human carcinogens per GA Air Toxics Guidance (June 21, 1998).

Table F-4. Derivation of 15-minute Acceptable Ambient Concentrations (AAC) for Georgia EPD

Pollutant	CAS No.	Formula	Mol. Wt. (g/mol)	OSHA Ceiling[1] (ppm)	OSHA Ceiling[1] (mg/m^3)	ACGIH STEL[2] (ppm)	ACGIH STEL[2] (mg/m^3)	NIOSH STEL[3] (ppm)	NIOSH STEL[3] (mg/m^3)	Ceiling or STEL (mg/m^3)	15-minute AAC[4] ($\mu g/m^3$)
Methanol	67-56-1	CH4O	32.04			250	328	250	325	328	32,750
Formaldehyde	50-00-0	CH2O	30.03	2	2.46	0.3	0.4			2.46	246
Propionaldehyde	123-38-6	C3H6O	58.08							None	None
Acetaldehyde	75-07-0	C2H4O	44.05			25	45.00			45	4500
Hydrochloric Acid	7647-01-0	HCl	36.46			5	7.00	5	7	7	700
Isopropanol	67-63-0	C3H8O	60.09			400	984.00	400	325	984	98400
Manganese	7439-96-5	Mn	54.94		5				1	5	500
Phenol	108-95-2	C6H6O	94.11					5	19	19	1900

1. OSHA Ceiling values obtained from 29 CFR 1910 Subpart Z
2. ACGIH STEL values obtained from 03-2004-TLVs.doc
3. NIOSH STEL values obtained from www.cdc.gov/niosh/npg
4. Adjusted by safety factor of 10 per GA Air Toxics Guidance (June 21, 1998).

SIP Form Updates

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)	78.16	78.16	80.30	80.30
Nitrogen oxides (NOx)	29.98	29.98	30.80	30.80
Particulate Matter (PM) (filterable only)*	207.5	207.5	217.33	217.33
PM <10 microns (PM10)	68.0	68.0	64.16	64.16
PM <2.5 microns (PM2.5)	37.74	37.74	28.51	28.51
Sulfur dioxide (SO_2)	10.36	10.36	7.67	7.67
Volatile Organic Compounds (VOC)	410.35	410.35	421.6	421.6
Greenhouse Gases (GHGs) (in CO2e)*	1,803	1,803	1,334	1,334
Total Hazardous Air Pollutants (HAPs)*	21.41	21.41	33.35	33.35
Individual HAPs Listed Below:				
Formaldehyde	4.28	4.28	4.40	4.40
Methanol	17.13	17.13	17.60	17.60

*PM is listed as Total PM, as the Filterable and Condensable PM emission factors for the kilns cannot be determined from the source. The sources (quoted in the emission calculations) list a Total PM factor. All fugitive sources however only emit Filterable PM (as Condensable PM from those sources is negligible).
*Biomass deferral.
* HAP for existing only includes methanol plus formaldehyde.

Facility Name: West Fraser – Augusta Lumber Mill **Date of Application:** Revised March 2013

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
KD04	N/A	N/A	Total PM	1.73	1.73	7.59	7.59	NCASI Factor, from publically available document
KD04	N/A	N/A	Total PM_{10}	1.31	1.31	5.72	5.72	NCASI Factor, from publically available document
KD04	N/A	N/A	Total $PM_{2.5}$	1.24	1.24	5.45	5.45	NCASI Factor, from publically available document
KD04	N/A	N/A	CO	9.17	9.17	40.15	40.15	NCASI Factor, from publically available document
KD04	N/A	N/A	NO_X	3.52	3.52	15.40	15.40	NCASI Factor, from publically available document
KD04	N/A	N/A	SO_2	0.88	0.88	3.83	3.83	AP-42
KD04	N/A	N/A	VOC	48.09	48.09	210.65	210.65	NCASI Factors, from publically available document
KD04	N/A	N/A	$CO_2e_{biomass\ deferral}$	152.32	152.32	667.15	667.15	40 CFR Part 98 Subpart C
KD04	N/A	N/A	Formaldehyde	0.50	0.50	2.20	2.20	NCASI Factor, from publically available document
KD04	N/A	N/A	Methanol	2.01	2.01	8.80	8.80	NCASI Factor, from publically available document
KD05	N/A	N/A	Total PM	1.73	1.73	7.59	7.59	NCASI Factor, from publically available document

KD05	N/A	N/A	Total PM_{10}	1.31	1.31	5.72	5.72	NCASI Factor, from publically available document
KD05	N/A	N/A	Total $PM_{2.5}$	1.24	1.24	5.45	5.45	NCASI Factor, from publically available document
KD05	N/A	N/A	CO	9.17	9.17	40.15	40.15	NCASI Factor, from publically available document
KD05	N/A	N/A	NO_X	3.52	3.52	15.40	15.40	NCASI Factor, from publically available document
KD05	N/A	N/A	SO_2	0.88	0.88	3.83	3.83	AP-42
KD05	N/A	N/A	VOC	48.09	48.09	210.65	210.65	NCASI Factors, from publically available document
KD05	N/A	N/A	$CO_2e_{biomass\ deferral}$	152.32	152.32	667.15	667.15	40 CFR Part 98 Subpart C
KD05	N/A	N/A	Formaldehyde	0.50	0.50	2.20	2.20	NCASI Factor, from publically available document
KD05	N/A	N/A	Methanol	2.01	2.01	8.80	8.80	NCASI Factor, from publically available document

Facility Name: West Fraser – Augusta Lumber Mill **Date of Application:** Revised March 2013

FORM 6.00 – FUGITIVE EMISSION SOURCES

Fugitive Emission Source ID	Description of Source	Emission Reduction Precautions	Pot. Fugitive Emissions*	
			Amount (tpy)	Pollutant
NA	Log Sawing	N/A	16.17	PM
NA	Log Sawing	N/A	9.24	PM10/ PM2.5
NA	Debarking	N/A	0.92	PM
NA	Debarking	N/A	0.51	PM10/ PM2.5
NA	Truck Unloading	N/A	9.93E-02	PM
NA	Truck Unloading	N/A	4.70E-02	PM10
NA	Truck Unloading	N/A	7.11E-03	PM2.5
NA	Material Transfer	N/A	9.93E-02	PM
NA	Material Transfer	N/A	4.70E-02	PM10
NA	Material Transfer	N/A	7.11E-03	PM2.5
NA	Chipper	N/A	0.27	PM
NA	Chipper	N/A	0.15	PM10/ PM2.5
NA	Hogger	N/A	0.09	PM
NA	Hogger	N/A	0.05	PM10/ PM2.5
RF01/ RF02	Road Travel	Periodically spraying water on the roads	184.5	PM
RF01/ RF02	Road Travel	Periodically spraying water on the roads	42.68	PM10
RF01/ RF02	Road Travel	Periodically spraying water on the roads	7.66	PM2.5

*Note that all numbers shown are future potential emissions for the source following the project.

Facility Name: West Fraser – Augusta Lumber Mill **Date of Application:** Revised March 2013

FORM 7.00 AIR MODELING INFORMATION: Chemicals Data

Chemical	Potential Emission Rate (lb/hr)	Toxicity	Reference	MSDS Attached
Methanol	4.02	See Attached	See Attached	☐
Formaldehyde	1.004	See Attached	See Attached	☐
Propionaldehyde	0.04	See Attached	See Attached	☐
Acetaldehyde	1.456	See Attached	See Attached	☐
Hydrochloric Acid	0.16	See Attached	See Attached	☐
Isopropanol	0.21	See Attached	See Attached	☐
Manganese	0.0634	See Attached	See Attached	☐
Phenol	0.55	See Attached	See Attached	☐
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Title V Database Updates

State of Georgia
Department of Natural Resources
Environmental Protection Division
Air Protection Branch
Major Source Operating Permit Application

4244 International Parkway
Suite 120
Atlanta, Georgia 30354-3906
404-363-7000

Certifications and Signatures

Facility Name: West Fraser Inc.

Project Name: 2012 PSD Application for Continuous Kilns

AIRS Number: 132450047

Submittal File Name: 132450047_20130307.mdb

COMPUTER DISK VIRUS EXAMINATION CERTIFICATION:
I certify that, to the best of my knowledge, the completed electronic application disk has been inspected and found free of any known viruses.

Signature: _____ Date: 3/8/13

Name (print): Justin Fickas

Offical Title: Trinity Consultants - Managing Consultant

SOFTWARE USAGE CERTIFICATION:
I certify that the software used to complete the Georgia Title V application was used as provided by the Georgia Environmental Protection Division, Air Protection Branch and was unaltered in any way. I understand that the submission of a Title V (Part 70) application completed using any altered version of the provided software constitutes the submission of an incomplete application and that such action may be subject to enforcement by the Georgia Air Protection Branch and/or the US EPA.

CERTIFICATION OF COMPLIANCE:
Except as stated on the Compliance Plan For a Non-Compliant Emission Unit or Group form of this application, I hereby certify that this facility is in compliance with all applicable requirements effective as of the date of this certification and will continue to comply with such requirements. For applicable requirements promulgated as of the date of this certification, that will become effective during the permit term, I further certify that, except as stated on the Compliance Plan For a Non-Compliant Emission Unit or Group form of this application, this facility will comply with such requirements and will continue to comply with such requirements.

I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this application and all of its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Unless otherwise required by the Director, compliance certifications will be submitted to the Director at least annually.

SIGNATURE OF RESPONSIBLE OFFICIAL:

Signature: _____ Date: 3/8/13

Name (print): George M Winfrey

Offical Title: Manager

Address: 4206 Mike Padgett Hwy
Augusta, GA 30906

Notary Public Certification of Responsible Official's Signature:

Alma Perlo
NOTARY PUBLIC
Columbia County, GEORGIA
My Commission Expires 12-11-15

Signature of Notary Public: _____

Printed on: 3/7/2013

Trifluralin	> 0 to < 10
Vinyl acetate	> 0 to < 10
Vinyl bromide	> 0 to < 10
Vinyl chloride	> 0 to < 10
Vinylidene chloride (1,1-Dichloroethylene)	> 0 to < 10
Volatile Hazardous Air Pollutants	> 0 to < 10
Xylenes (isomers and mixture)	> 0 to < 10

B2 - Facility-Wide Actual Emissions Estimates

Pollutant	Maximum Actual Annual (tons per year)	5 Year Average Actual (tons per year)
Nitrogen Oxides	30.8	30.8
Particulate Matter	217.3	217.3
Particulate Matter <10 microns	64.2	64.2
Sulfur Dioxide	7.7	7.7
Total Hazardous Air Pollutants	33.4	33.4
Volatile Organic Compounds	421.6	421.6

Emission Unit: KD04 Continuous Kiln #1

Pollutant Sulfur Dioxide

Numerical Emission Limit or Standard:	0
Maximum Actual Emissions in Units of the Standard:	0
Maximum Actual Emissions in Tons per Year:	3.83 tons/yr
Method the Emissions were determined (CEM, Stack Testing, Mass Balance, etc.):	AP-42
Applicable Federal Standard:	
Applicable State Standard:	
Applicable Permit Condition(s):	
Is this a Proposed Voluntary Limit?	No
Is there a Work Practice or Design Standard?	No
Is this in Compliance with the Standard(s) ?	No

Emission Unit: KD04 Continuous Kiln #1

Pollutant Volatile Organic Compounds

Numerical Emission Limit or Standard:	
Maximum Actual Emissions in Units of the Standard:	0
Maximum Actual Emissions in Tons per Year:	210.65 tons/yr
Method the Emissions were determined (CEM, Stack Testing, Mass Balance, etc.):	As requested by GA EPD.
Applicable Federal Standard:	
Applicable State Standard:	
Applicable Permit Condition(s):	
Is this a Proposed Voluntary Limit?	No
Is there a Work Practice or Design Standard?	No
Is this in Compliance with the Standard(s) ?	No

Emission Unit: KD05 Continuous Kiln #2

Pollutant Sulfur Dioxide

Numerical Emission Limit or Standard:	0
Maximum Actual Emissions in Units of the Standard:	0
Maximum Actual Emissions in Tons per Year:	3.83 tons/yr
Method the Emissions were determined (CEM, Stack Testing, Mass Balance, etc.):	AP-42
Applicable Federal Standard:	
Applicable State Standard:	
Applicable Permit Condition(s):	
Is this a Proposed Voluntary Limit?	No
Is there a Work Practice or Design Standard?	No
Is this in Compliance with the Standard(s) ?	No

Emission Unit: KD05 Continuous Kiln #2

Pollutant Volatile Organic Compounds

Numerical Emission Limit or Standard:	
Maximum Actual Emissions in Units of the Standard:	0
Maximum Actual Emissions in Tons per Year:	210.65 tons/yr
Method the Emissions were determined (CEM, Stack Testing, Mass Balance, etc.):	As requested by GA EPD.
Applicable Federal Standard:	
Applicable State Standard:	
Applicable Permit Condition(s):	
Is this a Proposed Voluntary Limit?	No
Is there a Work Practice or Design Standard?	No
Is this in Compliance with the Standard(s) ?	No