TECHNICAL EVALUATION

&

PRELIMINARY DETERMINATION

APPLICANT

West Fraser, Inc.
109 Halsema Road South
Jacksonville, Florida 32220-1657

Whitehouse Lumber Mill
ARMS Facility ID No. 0310197

PROJECT

Draft Permit No. PSD-FL-430
Project No. 0310197-012-AC

Kiln Conversion Project

COUNTY

Duval County, Florida

PERMITTING AUTHORITY

Florida Department of Environmental Protection
Division of Air Resource Management
Office of Permitting and Compliance
2600 Blair Stone Road, MS#5505
Tallahassee, Florida 32399-2400

July 22, 2014

1. GENERAL PROJECT INFORMATION

1.1. Facility Description and Location

West Fraser, Inc. operates Whitehouse Lumber Mill a lumber sawmill categorized under Standard Industrial Classification Code of SIC No. 2421. The mill is located in Duval County at 109 Halsema Road South in Jacksonville, Florida. This facility consists of the following processes: a log yard; sawmill; lumber kilns and boilers; and planer mill.

The facility imports logs and stores them around the radial crane prior to processing them into lumber. Logs are delivered to the mill via trucks, where they are unloaded by radial crane and stored until needed. Logs from the log yard are first cut to length and then sent to the debarker where bark from the log is removed and separated from the log. The debarked logs are then cut into green dimensional lumber and sent to the sawmill. The sawmill generates scrap wood and sawdust. The scrap wood is passed through a chipper or "hog" to reduce the size of the chips. The wood chips and sawdust are shipped out or sent to storage and used as fuel.

The green lumber is transferred to one of three lumber kilns. The existing kilns are cyclonic wood waste or propane fired kilns for the high temperature drying of southern pine lumber and are batch style kilns, which receive a single charge of cut green lumber. The charge is pushed into the kiln and then dried and cooled. This process is then repeated with a new charge of rough cut green lumber. The mill currently operates three batch kilns that can be fueled by either propane or wood waste. The Kiln No. 1 (EU 001) and Kiln No. 2 (EU 002) have maximum heat input rates of 15 million British thermal units/hour (MMBtu/hour) of wood waste and 2.2 MMBtu/hour of propane. The Kiln No. 3 (EU 003) has a maximum heat input rate of 25 MMBtu/hour of wood waste and 2.2 MMBtu/hour of propane.

The planer mill receives dry, rough cut lumber from the lumber kilns. Dry cut lumber is passed through the planer mill to reduce surface roughness of the finished product. The process consists of a trim saw, dry hog, planer, conveying systems, and bins. Two cyclones control emissions from the planer mill and dry hog. The shavings removed by the shavings conveying system during planing are stored in the shavings bin prior to being used as fuel or sold to third party companies.

Whitehouse Lumber Mill is a lumber sawmill that is located in Duval County at 109 Halsema Road South in Jacksonville, Florida. **Figure 1** shows the location of the mill in Florida while **Figure 2** presents an aerial view of the facility. The UTM coordinates are Zone 17, 461.4 kilometers (km) East, and 3353.5 km North.

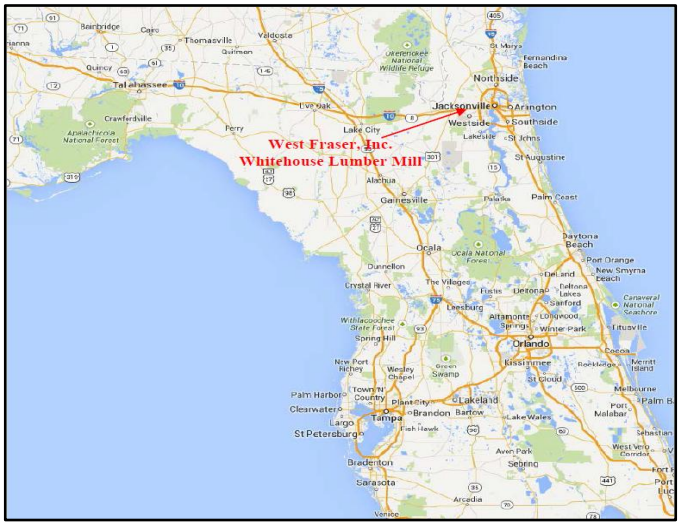


Figure 1. Location of West Fraser, Inc.

Figure 2. Aerial View of Whitehouse Lumber Mill.

The nearest Prevention of Significant Deterioration (PSD) Class I area is Okefenokee Wildlife Refuge, which is approximately 41 km from the proposed project. Additional Class I areas within 200 km of the project are Chassahowitzka Wilderness (187 km) and Wolf Island Fish and Wildlife (123 km).

1.2. Primary Regulatory Categories

- The facility is a major source of hazardous air pollutants (HAP).
- The facility has no units subject to the acid rain provisions of the Clean Air Act.
- The facility is a Title V major source of air pollution in accordance with Chapter 62-213, F.A.C.
- The facility will be a major stationary source in accordance with Rule 62-212.400, F.A.C. for the PSD of Air Quality.
- The facility includes units subject to applicable National Emissions Standards for Hazardous Air Pollutants (NESHAP) in Title 40, Part 63 of the Code of Federal Regulations (CFR).

1.3. Project Description

West Fraser, Inc. submitted an application for an air construction permit subject to the preconstruction review requirements of the PSD of Air Quality pursuant to Rule 62-212.400, F.A.C. The project will consist of the following modifications to the existing mill:

- Install two 80 feet long continuous dual path kilns (Kiln Nos. 4 and 5) with a production capacity of 15 thousand board feet per hour (MBF/hour), each. The two new kilns will be direct fired with dry shavings burners with heat input capacities of 40 MMBtu/hour each.
- The existing steam batch lumber drying Kiln Nos. 1 and 2 (EU 001 – EU 002) will be shut down and removed from the site as well as the three existing associated wood and propane-fired burners. Kiln No. 4 will be located in their place.
- The existing steam batch lumber drying Kiln No. 3 (EU 003) will no longer be in service as the batch kiln equipment will be removed. The structure (shell) will be modified by extending the heating chamber from 54 feet to 80 feet and will be used to house Kiln No. 5.
- The existing fuel storage silo will be replaced to increase the capacity for storing dry shavings for the kiln burners.
- The total facility potential production will increase from 110 to 170 million board feet of lumber per year (MMBF/year).

As a result of the increased annual kiln throughput, there will be an increased throughput for all of the ancillary equipment, including the hogger, chipper, saws, debarkers, cyclones, and truck traffic on mill roads.

The following existing emissions units (EU) are currently at the facility. The emission units will be affected by this project are highlighted in yellow.

EU No.	Description
001	Wood Drying Kiln No. 1 (Middle) – **Removed as a result of this project**
002	Wood Drying Kiln No. 2 (West) – **Removed as a result of this project**
003	Wood Drying Kiln No. 3 (East) – **Modified as a result of this project**
006	Planer Meter Bin and Cyclone
007	Truck Bin/Planer Silo and 2-Cyclones
008	Fuel Storage Silo

The following new emissions units will be added by this project.

EU No.	Description
009	Wood Drying Kiln No. 4
010	Wood Drying Kiln No. 5
011	Fuel Storage Silo

1.4. Processing Schedule

- May 27, 2014 Department received the application and sufficient fees for an air pollution construction permit, **application complete**.
- July 22 2014 Department issued draft PSD air construction permit package.

2. APPLICABLE REGULATIONS

2.1. State Regulations

This project is subject to the applicable environmental laws specified in Section 403 of the Florida Statutes (F.S.). The Florida Statutes authorize the Department of Environmental Protection to establish rules and regulations regarding air quality as part of the Florida Administrative Code (F.A.C.). This project is subject to the applicable rules and regulations defined in the following Chapters of the F.A.C.: 62-4 (Permitting Requirements); 62-204 (Ambient Air Quality Requirements, PSD Increments, and Federal Regulations Adopted by Reference); 62-210 (Permits Required, Public Notice, Reports, Stack Height Policy, Circumvention, Excess Emissions, and Forms); 62-212 (Preconstruction Review, PSD Review and BACT); 62-213 (Title V Air Operation Permits for Major Sources of Air Pollution); 62-296 (Emission Limiting Standards); and 62-297 (Test Methods and Procedures, Continuous Monitoring Specifications, and Alternate Sampling Procedures). PSD applicability and the preconstruction review requirements of Rule 62-212.400, F.A.C. are discussed in Section 2 of this report. Additional details of the other state regulations are provided in Section 3 of this report.

2.2. Federal Regulations

The Environmental Protection Agency (EPA) establishes air quality regulations in Title 40 of the Code of Federal Regulations (CFR). Part 60 identifies New Source Performance Standards (NSPS) for a variety of industrial activities. Part 61 specifies NESHAP based on specific pollutants. Part 63 specifies NESHAP provisions based on the Maximum Achievable Control Technology (MACT) for given source categories. Federal regulations are adopted in Rule 62-204.800, F.A.C. Additional details of the applicable federal regulations are provided in Section 3 of this report.

3. PSD APPLICABILITY REVIEW

3.1. General PSD Applicability

The Department regulates major stationary sources in accordance with Florida's PSD program pursuant to Rule 62-212.400, F.A.C. PSD preconstruction review is required in areas that are currently in attainment with the state and federal ambient air quality standards (AAQS) or areas designated as "unclassifiable" for these regulated pollutants. Commonly addressed PSD pollutants in the power industry include: carbon monoxide (CO), NO_X, particulate matter (PM), PM with a mean diameter of 10 microns or less (PM_{10}), PM with a mean diameter of 2.5 microns or less ($PM_{2.5}$), sulfur dioxide (SO_2), volatile organic compounds (VOC), lead (Pb), fluorides (F), sulfuric acid mist (SAM), and mercury (Hg). According to state and federal rules, six greenhouse gases (GHG), are also subject to PSD review.

Additional PSD pollutants that are more common to certain other industries include: hydrogen sulfide (H_2S), TRS including H_2S, reduced sulfur compounds (RSC) including H_2S, municipal waste combustor (MWC) organics measured as total tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans (dioxin/furan), MWC metals measured as PM; MWC acid gases measured as SO_2 and HCl, and MSW landfill emissions as non-methane organic compounds (NMOC).

As defined in Rule 62-210.200(189)(a)1, F.A.C., a stationary source is a "major stationary source" (major PSD source) if it emits or has the potential to emit (PTE):

- 250 tons per year (TPY) or more of any PSD pollutant; <u>or</u>
- 100 TPY or more of any PSD pollutant <u>and</u> the facility belongs to one of the 28 listed PSD major facility categories.

The list given in the citation does not include the category of "lumber and wood products". The Whitehouse Lumber Mill is a major stationary source based on actual emissions of and potential to emit 250 TPY or more of

VOC emissions.

For major stationary sources such as the Whitehouse Lumber Mill, PSD applicability for modification projects is based on thresholds known as the significant emission rates (SER) as defined in Rule 62-210.200(274), F.A.C. Any "net emissions increase" as defined in Rule 62-210.200(204), F.A.C. of a PSD pollutant from the project that equals or exceeds the respective SER is considered "significant". SER also means any emissions rate or any net emissions increase of a PSD pollutant associated with a major stationary source or major modification which would construct within 10 km of a Class I area and have an impact on such area equal to or greater than 1 gram per cubic meter, 24-hour average.

Although a facility may be "major" (i.e. emits or has the potential to emit 100 or 250 TPY as applicable) for only one PSD pollutant, a project must include BACT controls for any PSD pollutant that exceeds the corresponding SER given in **Table 1**.

TABLE 1 – LIST OF SER BY PSD-POLLUTANT. [1]

Pollutant	SER (TPY)	Pollutant	SER (TPY)
CO	100	NO_X	40
$PM/PM_{10}/PM_{2.5}$	25/15/10	Ozone (VOC) [2]	40
$PM_{2.5}$ (NO_X)	40	$PM_{2.5}$ (SO_2)	40
Ozone (NO_X) [2]	40	SAM	7
SO_2	40	Pb	0.6
Hg	0.1	GHGs	0 [3]

1. Excluding fluoride and pollutants specific to the Pulp and Paper industry, MWCs, MSW landfills.
2. Ozone (O_3) is regulated by its precursors (VOC and NO_X). PSD for $PM_{2.5}$ can be triggered by its precursors (NO_X and SO_2).
3. Pursuant to 40 CFR 52.21(b)(23)(ii), pollutants with no SER listed at 40 CFR 52.21(b)(23)(i) have a SER of zero tons/year.

3.2. PSD Applicability Analysis

The project is located in Duval County, which is in an area that is currently in attainment with the AAQS or otherwise designated as unclassifiable. The facility emits or has the potential to emit 250 TPY or more of at least one PSD pollutant. Therefore, the facility is a major stationary source and the project is subject to a PSD applicability review. **Table 2.** summarizes the annual emissions from the project as defined in the application. The table compares these emissions to the PSD significant emission rates.

TABLE 2. ANNUAL EMISSION SUMMARY AND PSD APPLICABILITY

Pollutant	Potential to Emit, TPY [a, d]			Significant Emissions Rate (TPY)	Subject to PSD?
	New Kilns [b]	Associated Units [c]	Total Increase		
CO	62.1	---	62.1	100	No
NO_X	23.8	---	23.8	40	No
PM [d]	13.6	8.0	21.6	25	No
PM_{10} [d]	9.6	2.6	12.2	15	No
$PM_{2.5}$ [d]	8.8	1.1	9.9	10	No
SO_2	8.8	---	8.8	40	No
VOC [e]	319.2	---	319.2	40	**Yes**
GHG	74,045	---	74,045	75,000	No

a. The potential emission were based on the worst-case scenario operating the new kilns at maximum production 8,760 hours/year. The associated units includes the new fuel storage silo operating 8,760 hours/year and the increase in the emissions from the ancillary equipment and processes associated with the increase in production.
b. Emission factors used for the new kilns for all of the pollutants except SO_2 and GHG (CO_2e) were based on National Council for Air and Stream Improvement (NCASI) Reference. Emission factor used for SO_2 emissions were based on AP-42, Section 1-6 and for GHG emissions, 40 CFR 98.
c. Emission Factors from AP-42 were used in calculating $PM/PM_{10}/PM_{2.5}$ for the ancillary equipment and processes associated with the increase in production.

d. The applicant requested the following emissions and operational limits to avoid PSD review for $PM/PM_{10}/PM_{2.5}$: $PM/PM_{10}/PM_{2.5}$ emissions limit of 0.015/0.006/0.003 grains/dry standard cubic feet (gr/dscf) for the new fuel storage silo, the planer meter bin and truck bin/planer silo; and, a limit on the hours of operation for the planer meter bin and truck bin/planer silo of 6,200 hours/year.
e. Emissions of VOC from the new kilns = terpene + methanol + formaldehyde (NCASI test results).

As shown in **Table 2**, the kiln conversion project is subject to PSD preconstruction review for VOC emission in accordance with the provisions of Rule 62-212.400, F.A.C. Therefore, a BACT determination is required for VOC emissions.

4. DEPARTMENT'S PROJECT REVIEW AND PSD ANALYSIS

The facility is currently a minor source with respect to new source review and will become a major source after the completion of the project since the potential emissions of 319.2 TPY of VOC for the new kilns exceeded the 250 TPY major source threshold. The application states that the existing Kiln Nos. 1 - 3 (EU 001 – EU 003), three existing associated wood and propane-fired burners, and the existing fuel storage silo (EU 008) will be shut down and removed from the site. However, since the existing source is minor, the emission reductions for the equipment being removed from the site is not considered for PSD applicability purposes. Consequently, PSD applies to the new units because the emissions increase for VOC emission itself is major. Consideration of contemporaneous emissions changes is allowed only in cases involving existing major sources. In other words, minor sources are not eligible to net emissions changes.

Emission sources associated with this facility include the two new direct-fired continuous kilns, a new fuel storage silo and ancillary equipment.

4.1. Process Description

The Whitehouse Lumber Mill produces dimensioned lumber from logs. As shown in **Figure 3** the mill consists of the following four main process areas: log yard (storage pile and debarker); sawmill; lumber kilns; and planer mill. Logs imported from offsite are unloaded and stored either around the radial crane until processed. The tree-length logs are first cut to length, debarked, and then processed into lumber. Currently, the sawmill produces rough cut lumber that is stacked and stored onsite until ready for drying in the lumber kilns. The dried lumber is then processed through the planer mill where it is dressed to produce finished lumber. The finished lumber is packaged and stored onsite until shipped offsite.

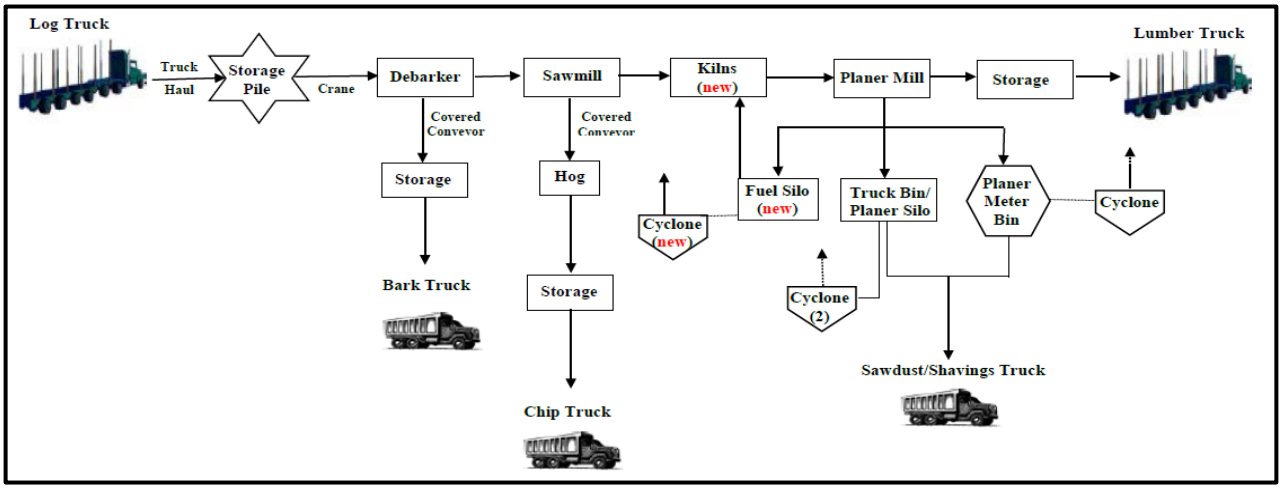


Figure 3. West Fraser, Inc., Whitehouse Lumber Mill Process Flow Diagram.

4.1.1. New Direct-Fired Continuous Kilns (EU 009 and EU 010)

A continuous lumber drying kiln consists of a preheat/conditioning chambers on both ends of the main drying chamber and a pusher system, operated by programmable logic controllers to advance the lumber through the kiln. As shown in

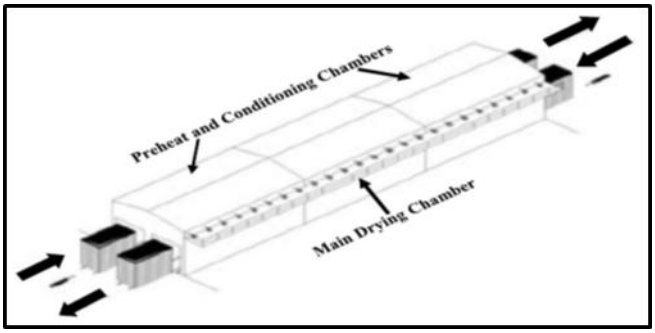
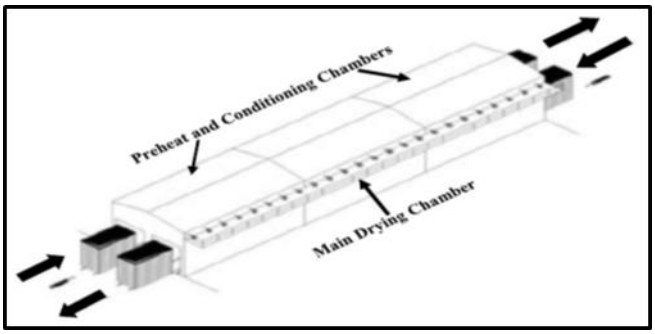


Figure 4. Kiln Configuration & Drying Chambers.

Direct-Fired Continuous Kilns Specifications

- Each kiln has a maximum production capacity of 15 MBF/hour (85 MMBF/year).
- Each kiln is equipped with a direct-fired burner with a maximum heat input of 40 MMBtu/hour.
- Each kiln will consist of three chambers and is 214 feet in length, total.
- Both kilns will fire only wood waste.

, the new kilns will consist of two tracks traveling in opposite directions and three chambers designed to provide and control the environmental conditions of heat, relative humidity, and air circulation necessary for the proper drying of wood. A first chamber, approximately 67 feet in length, will preheat the incoming green lumber using the heat coming off the dry lumber while providing added moisture and saturated cooling for the dried lumber. The moisture conditioning reduces stress and results in a more uniform moisture distribution in the dry lumber. In the middle chamber, about 80 feet in length, heat in the form of steam will be introduced to dry the lumber. A third chamber, approximately 67 feet in length, conditions the dried wood while preheating the incoming green lumber.



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- Each kiln is equipped with a direct-fired burner with a maximum heat input of 40 MMBtu/hour.
- Each kiln will consist of three chambers and is 214 feet in length, total.
- Both kilns will fire only wood waste.

The applicant states that the proposed continuous lumber drying kilns will significantly improve productivity, lumber grade, and energy efficiency compared to the operation of conventional batch-fed kilns. A traditional batch drying kiln loses much of the heat between batches when the doors are opened whereas in a continuous kiln the heat is retained. Additionally, a continuous kiln does not require downtime between batches and the kiln remains at operating temperatures, which results in significant energy savings.

4.1.1.1. *Kiln Emissions*

VOC Emissions

As shown in **Table 2** above, the applicants PSD analysis identifies the only pollutant that triggered PSD review with 319.2 TPY was VOC emissions. 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 VOC 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.

The applicant used EPA's "Wood Product Protocol 1 VOC" for measuring and reporting VOCs in the forest product industries. VOCs are reported based on the total mass of the individual organic compounds comprising the VOC. This protocol was established for adjusting traditional VOC as carbon (C) emission factors to a total mass VOC basis and requiring individual measurements of methanol and formaldehyde at sources for which these compounds are significant. The VOC emission factor for continuous kilns was calculated using the following equation:

Total VOC = VOC as C x 1.133 + (1 - 0.65) x Methanol + Formaldehyde

Where:

VOC as C = EPA Method 25/25A

1.133 = The ratio of the molecular weight of pinene ($C_{10}H_{16}$, 136 amu) to the molecular weight of carbon in pinene (120 amu).

Methanol and formaldehyde = The emission factors are multiplied by the response factors, defined as the flame ionization analyzer response divided by the actual compound concentration.

The potential emissions of VOC of 319.2 TPY from the kilns were calculated by multiplying the maximum production capacity of dried lumber from the kilns (MBF/year) by the emission factor (lb/MBF) calculated above. The annual capacity of the kilns were based on the 1.3 MMBF/year/foot of primary drying chamber length and the design length for the primary drying chamber of each new continuous kiln.

Exhaust produced from kilns is released from the doors, seams in the structure, multiple vents and openings in the roof of the kiln. Emissions from lumber kilns are difficult to capture and accurately test for pollutants. Efforts in directing the air flow from the vents would disrupt the necessary ventilation and circulation patterns required to maintain the proper moisture content and temperature during the various drying cycle stages. To provide reasonable assurance that emissions of VOC will not exceed BACT standard of 3.76 lb/MBF and 319.2 TPY, the Department has determined that the applicant, West Fraser, Inc., shall meet the following provisions in addition to the VOC BACT determination discussed in **Section 5** of this document:

- Minimize over-drying the lumber.
- Maintain consistent moisture content for the processing lumber charge.
- Dry the lumber at the minimum temperature.
- Develop a written Operation and Maintenance (O&M) plan identifying the above practices and the operation and maintenance requirements from the kiln manufacturer.
- Record and monitor the total monthly amount and 12-month annual total of wood dried in each kiln (board-feet).
- Record the calculated monthly and 12-month annual total emissions of VOC to demonstrate compliance with the process and emissions limits.

PM/PM_{10}/$PM_{2.5}$ Emissions

As shown in **Table 2**, the applicants PSD analysis included emissions of PM/PM_{10}/$PM_{2.5}$ for the proposed new kilns to be 11.7 TPY of total PM, 8.8 TPY of PM_{10} and 8.4 TPY of $PM_{2.5}$. The applicant used test data from Bibler Brothers Lumber Company in Russellville, Arkansas, and information provided by NCASI in determining emissions of condensable and filterable PM/PM_{10}/$PM_{2.5}$. The applicant requested limits on operation and PM emission limits for the new fuel storage silo and the existing planer meter bin and truck bin/planer silo to avoid PSD review for PM/PM_{10}/$PM_{2.5}$. To provide reasonable assurance that the estimated emissions of PM/PM_{10}/$PM_{2.5}$ will remain below the PSD significant emissions rate of 25/15/10 TPY, the Department has determined that the applicant, West Fraser, Inc., shall meet the opacity limit, which will be used as a surrogate for emissions of PM. Each kiln must not exceed 30% opacity, except that visible emissions (VE) of 40% opacity are permissible for not more than 2-minutes in any one hour.

GHG Emissions

GHG in the form of CO_2e are produced as a result of combustions of wood waste used as fuel by the kilns. The emission factors for CO_2e from wood combustion were based on factors established in the Greenhouse Gas Mandatory Reporting rule in 40 CFR 98, Table C-1 and C-2. Due to the proposed triggering for non-GHG PSD pollutant (VOC) emissions, the projects potential CO_2e emissions of 74,045 TPY increase was compared to 75,000 TPY major source threshold. The CO_2e emissions increase is less than the major source threshold, the project will not be subject to PSD permitting for GHG emissions.

4.1.1.2. *NESHAP Provisions for the Kilns*

The Wood Drying Kiln Nos. 4 and No. 5 are subject to the applicable NESHAP provisions of 40 CFR 63 for Subpart A, General Provisions (Link to Subpart A) and Subpart DDDD, National Emission Standards for Plywood and Composite Wood Products (Link to Subpart DDDD). The new lumber kilns are process units within the existing "affected source" and are subject to the applicable requirement of Subpart DDDD. However, according to Subpart DDDD there are no applicable control requirements or work practice standards for lumber kilns. The new kilns will need to meet the initial notification requirements pursuant to Subpart A.

4.1.1.3. *State Regulations for the kilns*

The new dry shavings burners for the kilns have a maximum heat input of 40 MMBtu/hour and are subject to Rule 62-296.410, F.A.C. (Carbonaceous Fuel Burning Equipment). This rule establishes emission standards for PM of 0.2 lb/MMBtu for carbonaceous fuel (dry shavings) for each burner and a VE limitation of 30% opacity, except that VE of 40% opacity are permissible for not more than two minutes in any one hour.

4.1.2. New Fuel Storage Silo (EU 011)

The applicant is proposing to replace the existing fuel storage silo with a new fuel storage silo to store dried wood shavings. The existing silo (EU 008) will be dismantled and removed from the site. The new fuel storage silo will be used to store fuel for the kiln burners of the proposed kilns. The new silo will have a greater storage capacity than the existing fuel silo, and will be controlled by a cyclone identical in size and control efficiency as the existing cyclone. The proposed silo will have a maximum hourly process rate of 35 MBF/hour. The silo will be equipped with a new cyclone with an exhaust design flow rate of 3,390 standard cubic feet per minute (scfm) to control emissions of $PM/PM_{10}/PM_{2.5}$. The applicant has requested an emission limit of 0.015 gr/scf for PM emissions to avoid PSD review.

4.1.2.1. *Silo Emissions*

The applicant included the potential emission for the fuel storage silo under the "Associated Units" in **Table 2**. The potential emissions for the silo were estimated to be 1.91 TPY of total PM, 0.76 TPY of PM_{10} and 0.38 TPY of $PM_{2.5}$. The potential emissions for the new silo were based on the applicants requested PM emission limit of 0.015 gr/scf. PM_{10} was estimated to be 40% of total PM (0.006 gr/scf) and $PM_{2.5}$ was estimated to be 25% of total PM (0.003 gr/scf) pursuant to EPA's PM Calculator used to estimate filterable and condensable fraction of $PM_{10}/PM_{2.5}$ emissions.

To provide reasonable assurance that the emission factors used for the fuel silo is a good representation of $PM/PM_{10}/PM_{2.5}$ emissions, the Department has determined that the applicant, West Fraser, Inc., shall meet the following provisions:

- Emissions of $PM/PM_{10}/PM_{2.5}$ (filterable) shall be tested on the new fuel silo to demonstrate compliance with applicable emission standards identified in this permit. If the permittee provides a manufacturers guarantee that the new cyclone will meet the exit grain loading rate of 0.015 gr/scf, the permittee may use the vendor guarantee in lieu of the initial test for $PM/PM_{10}/PM_{2.5}$ emissions.
- If the tests show that that emissions of $PM/PM_{10}/PM_{2.5}$ are less than or equal to the emission factor used in this application, the applicant shall compute and report annual emissions based on the emission factor obtained from the test data, the actual hours of operation and volumetric flow rate of the cyclone.
- If the tests show that $PM/PM_{10}/PM_{2.5}$ emissions factors are higher than the ones used in calculating the potential emissions for the fuel silo, a construction permit shall be submitted prior to exceeding the PSD threshold for $PM/PM_{10}/PM_{2.5}$.
- The permittee shall monitor and report the actual annual emissions of $PM/PM_{10}/PM_{2.5}$ for the fuel silo for a period of 5 years following resumption of regular operations after the fuel silo has been installed.

4.1.2.2. *State Regulations for the New Fuel Storage Silo*

The existing Whitehouse Lumber Mill is located within the PM maintenance area in Jacksonville, Florida. Therefore, the new silo is subject to Rules 62-296.700, F.A.C. (Reasonable Achievable Control Technology (RACT) PM) and 62-296.711, F.A.C. (Materials Handling, Sizing, Screening, Crushing and Grinding Operations). These rules establish design specifications, operating limitations, an emissions standards for PM of 0.03 gr/dscf and visible emissions of 5% opacity, and requires an O&M Plan.

4.1.3. Existing Planer Meter Bin and Truck Bin/Planer Silo (EU 006 and EU 007)

The existing planer meter bin and truck bin/planer silo stores shavings and fugitive dust collected from the planer dried lumber transport. Each bin/silo has a maximum process rate of 35 MBF/hour and are equipped with a cyclone to control emission of $PM/PM_{10}/PM_{2.5}$. The existing planer meter bin cyclone has a nominal volumetric flow rate of 46,611 cfm and each of the truck bin/planer silo cyclones have a 2,580 cfm nominal volumetric flow rate. After the planer meter bin a diverter valve exists to direct the flow to either the truck bin or the planer silo; therefore, the two units cannot operate simultaneously. The applicant has requested a limit of 6,200 hours/year for the planer meter bin and truck bin/planer silo and an emission limit of 0.015 gr/scf for PM emissions to avoid PSD review.

4.1.3.1. *Existing Planer Meter Bin and Truck Bin/Planer Silo Emissions*

The applicant included the potential annual emission increases for the existing planer meter bin and truck bin/planer silo under the "Associated Units" in **Table 2**. The estimated $PM/PM_{10}/PM_{2.5}$ emission increases were 4.6/1.82/0.91 TPY for the planer meter bin and 0.25/0.10/0.05 TPY for the truck bin/planer silo. The potential emissions were based on the applicants requested PM emission limit of 0.015 gr/scf. PM_{10} was estimated to be 40% of total PM (0.006 gr/scf) and $PM_{2.5}$ was estimated to be 25% of total PM (0.003 gr/scf) pursuant to EPA's PM Calculator used to estimate filterable and condensable fraction of $PM_{10}/PM_{2.5}$ emissions.

Each cyclone will have an initial test done to demonstrate compliance with $PM/PM_{10}/PM_{2.5}$ (filterable) emissions following the kiln conversion project. If it is determined that emissions of $PM/PM_{10}/PM_{2.5}$ are less than or equal to the emission standard (0.015/0.006/0.003 gr/scf) in this application, the permittee may calculate the actual annual emissions of $PM/PM_{10}/PM_{2.5}$ using each cyclones actual hours of operation, the volumetric flow rate and test data (gr/scf) to provide reasonable assurance that PSD will not be triggered.

To provide reasonable assurance that the emission factors used for the existing planer meter bin and truck bin/planer silo are a good representation of $PM/PM_{10}/PM_{2.5}$ emissions, the Department has determined that the applicant, West Fraser, Inc., shall meet the following provisions:

- Record and monitor the total monthly hours of operation and 12-month annual total hours of operation to demonstrate compliance with the operational restrictions.
- Emissions of $PM/PM_{10}/PM_{2.5}$ (filterable) shall be tested on the existing planer meter bin and truck bin/planer silo to demonstrate compliance with applicable emission standards identified in this permit. Only one cyclone for truck bin/planer silo will be tested since both processes cannot operate simultaneously.
- If the tests show that that emissions of $PM/PM_{10}/PM_{2.5}$ are less than or equal to the emission factor used in this application, the applicant shall compute and report annual emissions based on the emission factor obtained from the test data, the actual hours of operation and volumetric flow rate of the cyclones.
- If the tests show that $PM/PM_{10}/PM_{2.5}$ emissions factors are higher than the ones used in calculating the potential emissions for the existing planer meter bin and truck bin/planer silo, a construction permit shall be submitted prior to exceeding the PSD threshold for $PM/PM_{10}/PM_{2.5}$.
- The permittee shall monitor and report the actual annual emissions of $PM/PM_{10}/PM_{2.5}$ for the existing planer meter bin and truck bin/planer silo for a period of 5 years following resumption of regular operations after the kiln conversion project is completed.

5. BACT REVIEW FOR CONTINUOUS LUMBER DRYING KILNS (EU 009 AND EU 010)

As previously described, the kiln conversion project is subject to PSD preconstruction review for VOC emissions. Therefore, the proposed Wood Drying Kiln Nos. 4 and 5 are subject to a BACT determination for VOC emissions.

5.1. General Discussion of VOC Emissions

The uncontrolled exhaust steam from the kilns, discharged through the kiln vents, consists of wood dust, mineral dust, aerosols of organic substances and aerosols of mineral salts. Emissions from the drying of green lumber are primarily VOC. Hot water is used to heat the air in the kiln. The air is circulated through the lumber with several

axial fans located along the center of the kiln. Vents in the roof of the kiln are designed to vent moisture-laden air and to maintain the desired wet bulb temperature within the kiln.

Naturally occurring VOCs are released from the wood throughout the drying cycle. VOC emissions vary considerably over the drying cycle, with no emissions during loading and unloading and varying rates during the drying phase. Emissions are minimal at the start of the drying cycle when the kilns are being heated because the exhaust vents are closed. Once the exhaust vents open, VOC emission concentrations and flow rates vary with exhaust flow.

As stated previously, emissions from lumber kilns are difficult to capture. Efforts by the wood products industry to accurately test and quantify potential VOC emissions from lumber drying kilns have proven difficult. The kiln exhaust exits from multiple vents and openings in the roof of the kiln and also through other seams in the structure (e.g., doors). Attempts to direct the kiln vent air flows to a control device would disrupt the necessary ventilation and circulation patterns required to maintain the proper moisture content and temperature during the various drying cycle stages. Potential back pressure from a control device or a vacuum generated by a blower would disrupt the controlled drying environment and adversely affect the lumber product quality.

The wood drying kilns are the source of VOC emissions from this project. The applicant estimated the potential annual emissions of VOC produced from the kilns to be 319.2 TPY. The applicant reviewed data in EPA's RACT/BACT/LAER Clearinghouse (RBLC) to identify control technology determinations for the operation of wood lumber kilns and other wood products industry sources. The information provided by the applicant is summarized in **Table 3** below.

TABLE 3. VOC BACT DETERMINATIONS FOR WOOD LUMBER KILNS.

Facility	Kiln Type & Throughput [a]	Fuel	Date	Control Method [a]	Type	VOC (lb/MBF)
West Fraser, Inc. Opelika Mill (AL)	DF-Continuous 87.5 MMBF/year	Wood Shavings	09/11/2013	---	BACT	3.76
West Fraser Timberland Co. LTD, Newberry Mill (SC)	DF-Continuous 15 MBF/hour	Sawdust	04/30/2013	GOP	BACT	3.76
The Westervelt Company (AL)	IF-Continuous 93 MMBF/year	Steam (indirect heat)	04/15/2013	---	BACT	4.57[b]
West Fraser, Inc. Mapleswile Mill (AL)	DF-Continuous 100 MMBF/year	Wood Residuals	01/14/2013	---	BACT	3.76
New South Companies, Inc. Conway Plant (SC)	IF-Continuous 85 MMBF/year	Steam Heated	09/24/2012	PMO	BACT	4.2
Simpson Lumber Company Meldrim Operations (GA)	DF-Continuous 65 MMBF/year	Waste Wood	04/25/2012	PMO	BACT	3.83
Simpson Lumber Company Meldrim Operations (GA)	DF-Batch 73 MMBF/year	Waste Wood	04/25/2012	PMO	BACT	3.93
Temple-Inland Rome Lumber Mill (GA)	Batch 2,200 MMBF/year	---	03/28/2012	---	BACT	4.2
West Fraser, Inc. Lumber Mill (TX)	DF-Continuous 137.5 MMBF/year[c]	Wood	12/15/2011	GOP	BACT	3.5
Tin, Inc., Temple Inland Pineland MFG Complex (TX)	DF-Batch 156 MBF/Charge	Wood	08/12/2011	GOP	BACT	2.49
Bibler Brothers Lumber Company (AR)	DF-Continuous 25 MMBtu/hour	Wood Residue	08/25/2008	---	BACT	3.8
Bowater (Alabama) Inc., Forest Product Division (AL)	IF-Batch 182 MBF	Steam-Headed	04/09/2008	WBSP 185°F	BACT	7.0
Weyerhaeuser Company Millport Wood Products (AL)	IF-Batch 53.33 MMBF/year[d]	Steam Heated	07/10/2007	---	BACT	4.52
International Paper Company (AL)	IF-Batch 53 MMBF/hour	Steam Heated	12/05/2006	---	BACT	4.95
Weyerhaeuser, Wright City	Batch	---	07/21/2006	---	BACT	4.8

Facility	Kiln Type & Throughput [a]	Fuel	Date	Control Method [a]	Type	VOC (lb/MBF)
Complex (OK)						
Interfor Pacific, Inc., Gilchrist Facility (OR)	Batch	---	05/22/2006	GOP	BACT	1.69
Weyerhaeuser Company Pine Hill Wood Products (AL)	IF-Batch 125 MMBF/year	Steam Heated	11/30/2005	---	BACT	4.52
Potlatch Corporation Ozan Unit (AR)	IF-Batch 265 MMBF/year	Steam Heated	07/26/2005	GOP	---	3.5
Deltic Timber Corporation Waldo (AR)	IF-Batch 44.2-48.3 MMBF/year	Steam Heated	01/12/2005	---	BACT	3.5
Elliott Sawmilling Company (SC)	DF-Batch 53 MMBF/hour	Wood Waste	05/23/2004	WP	LAER	4.5

a. DF=Direct-Fired; IF=Indirect-Fired; MBF=Thousand Board Feet; MMBF=Million Board Feet; GOP=Good Operation Practices; PMO=Proper Maintenance and Operation; WBSP=Wet Bulb Set Point; and WP=Work Practices.
b. RACT/BACT/LEAR Clearinghouse states 4.57 lb/MMBF, which appears to be an error in entry.
c. 275 MMBF/year for two kilns.
d. 160 MMBF/year for 3-kilns, total.

Table 4 illustrates the Department research on the EPA RBLC database and came up with the following additional facilities. Included in this table is a recently permitted mill located in the state of Florida.

TABLE 4. DEPARTMENT RESEARCH ON VOC BACT DETERMINATIONS FOR LUMBER KILNS.

Facility	Kiln Type & Throughput	Fuel	Date	Control Method	Type	VOC (lb/MBF)
Klausner Holding USA, Inc (SC)	DF-Continuous 700 MMBF/year	---	01/03/2013	---	CBC [a]	3.5
Simpson Lumber Company, LLC (SC)	DF-Batch 34 MBF/hour	Dry Wood Waste	08/29/2012	WP	BACT	3.8
Anthony Timberlands, Inc. (AR)	IF-Batch 200 MMBF/year	Steam Heated	09/16/2009	---	BACT	3.5
North Florida Lumber Bristol Saw Mill (FL)	IF-Continuous 92 MMBF/year	Steam Heated	08/04/2009	GOP	BACT	5.36
Elliott Sawmilling Company (SC)	DF-Batch 53 MMBF/year	Sawdust	04/14/2009	WP	BACT	4.5
Elliott Sawmilling Company (SC)	DF-Batch 53 MMBF/year	Sawdust	03/06/2006	WP	BACT	4.5
Gilman Building Products Perry Mill (FL) [b]	DF-Batch 90 MMBF/year	Wood	04/01/2014	GOP	BACT	3.5

a. CBC=Case-by-Case
b. Recently permitted in the state of Florida and not yet in the EPA RBLC database.

The specified VOC BACT/LAER determinations are applicable to the operation of batch and/or continuous kilns that fire wood or are steam heated. The proposed lumber kilns are direct-fired continuous kilns that fire wood. As shown in **Table 3** and **Table 4** above, for direct-fired continuous kilns that fire wood, the VOC BACT ranges from 3.5 to 3.83 lb/MBF. The database indicates that no add-on emission controls have been established as BACT or LAER. The applicant is proposing a VOC BACT emission limit of 3.76 lb/MBF.

5.2. BACT for VOC Emissions

Lumber kilns are generally controlled by proper maintenance and operating practices, but thermal oxidation, bio-filtration, adsorption, and condensation technologies are available for reducing these emissions.

5.2.1. Identification of Control Technology

The applicant provided the following control technologies:

- *Thermal Oxidizer:* VOCs are oxidized to carbon dioxide (CO_2) and water vapor (H_2O) at a high temperature. 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 parts per million by volume (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.
- *Thermal Oxidation - Recuperative:* Recuperative oxidizers (RO) uses plate-to-plate or shell and tube gas heat exchangers to recover up to 70% of the heat present in the hot exhaust to transfer it to the incoming process gas. ROs can achieve a destruction/removal efficiency of greater than 98% depending on the system requirements of the air contaminant stream.
- *Thermal Oxidation – Regenerative:* A regenerative thermal oxidizer (RTO) uses a high-density packed heat transfer media, typically ceramic random saddle packing or honeycomb monolith structures, to preheat incoming waste gas streams and to achieve 85 to 95% heat recovery. The RTO consists of large ceramic beds to serve as heat sinks for the process. The exhaust stream passes through one ceramic bed that preheats the gas stream before oxidation in the combustion chamber. Hot gases exit the combustion chamber and heat up a second ceramic bed, which serves as the inlet bed for the next cycle once the first bed cools below the required temperature. The RTO can achieve a destruction/removal efficiency of greater than 95% depending on the system's requirements and the characteristics of the contaminated stream.
- *Biofiltration:* In biofiltration, off-gases containing biodegradable organic compounds are vented, under controlled temperature and humidity, through a biologically active material. The process uses a biofilm containing a population of microorganisms immobilized on a porous substrate such as peat, soil, sand, wood, compost, or numerous synthetic media. As an air stream passes through the biofilter, the contaminants in the air stream partition from the gaseous phase to the liquid phase of the biofilm. Once contaminants pass into the liquid phase, they become available for the complex oxidative process by the microorganisms inhabiting the biofilm.
- *Adsorption - Regenerative:* Regenerative adsorption systems involves two or more fixed adsorption beds. The bed operates in adsorption mode while the others operate in regeneration mode. Adsorbent materials used consist of activated carbon, organic resin polymers, and inorganic materials (zeolite). An induced draft fan forces the VOC-laden gas through the adsorption bed where VOC molecules are bound to the pore space in the adsorbent. After breakthrough has occurred in an adsorbent bed, it must be regenerated using a thermal swing or vacuum process. Thermal swing uses steam to raise the temperature of the loaded adsorbent bed to the boiling point of the VOC where VOC is desorbed and discharged from the bed with steam. The VOC-laden steam is 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 for disposal. Vacuum regeneration lowers the pressure of the adsorbent bed below the vapor pressure of the adsorbed VOC. VOC boils off of the adsorbent and is collected in a condenser or routed to an oxidizer. 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%.
- *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 (saturation point). Before the VOC can condense, any heat present in the exhaust gas above the saturation point must be removed by reducing the temperature below the saturation point for collection or recycling. Available cooling fluids include chilled water, brine, or refrigerants. The control efficiency of a condenser is based on the outlet temperature and inlet concentration of VOC in the exhaust stream, condensers exhibit a wide range of VOC control efficiency from 50% to 99%.

- *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.

5.2.2. Discussion of Technically Infeasible Control Options and Ranking of Remaining Options

On July 28, 2003, EPA stated in memorandum regarding lumber kilns in the Plywood and Composite Wood Products (PCWP) MACT, "… there are no currently applicable controls for lumber kilns …" The very nature of lumber kilns presents a variety of technical challenges to add destructive control devices. Kilns typically operate with several vents to supply fresh air and exhaust high-moisture air. It is typical that these vents will alternate inlet/outlet operation. Any add on control device would have to function in coordination with the complex inlet/outlet kiln ventilation system and still maintain consistent kiln conditions for drying wood. However, it is possible to destroy VOC emissions from kiln operations with devices such as thermal or catalytic oxidation systems. Nevertheless, such large volumes of air and water vapor will result in a dilute emissions stream, which is difficult and expensive to control.

Thermal oxidizers can be used with dilute gas streams to destroy 95% or more of the VOC emissions. However, thermal oxidizers (without heat recovery) would require constantly firing a supplemental fuel to sustain the minimum temperature necessary for destruction, which would result in high operating costs. For an RTO, the high moisture content and low exit temperature of the exhaust stream as well as high capital costs, estimated at $29,000/ton of VOC removed, would make an RTO technically infeasible. While RO 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. In addition, the PM and other contaminants in the exhaust stream would cause a loss of catalytic activity. Furthermore, there would also be associated energy and environmental impacts resultant from use of the natural gas, including additional pollutant emissions such as NO_X emissions from natural gas from combustion.

Biofiltration uses microorganisms to naturally biodegrade organic compounds into CO_2 and H_2O. The VOC stream is considered the feedstock for the microorganisms, which must be carefully managed or the colony can be destroyed. Air flows, temperatures and contaminants can all negatively affect the colony. This control system would require much research and development for application to a lumber kiln. The cost of controlling VOC with biofiltration is estimated at approximately $38,000/ton of VOC removed. Therefore, biofiltration is not considered technically feasible for this application.

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 degrees Fahrenheit (°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.

The kiln exhaust contains the H_2O 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 an active adsorption site, reducing the efficiency of the adsorption system. This control device is, therefore, deemed technically infeasible.

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. As previously shown by the applicant, data in the RBLC database (2004 – 2014) supports the proper maintenance and operating practices as BACT for lumber kilns.

5.2.3. Selection of BACT and Rationale

The applicant proposes to use proper maintenance and operating practices of the kilns to establish BACT for VOC as 3.76 lb/MBF. As show in **Table 3** and **Table 4**, previous VOC BACT determinations for direct-fired continuous lumber kilns range from 3.5 to 3.83 lb/MBF. The applicant's proposed limits are based on the applicants experience with operating numerous identical lumber kilns throughout the United States.

Considering all available information, the Department establishes the following BACT standard for the proposed lumber kilns:

- VOC (Emission Factor): 3.76 lb/MBF; and
- Proper Maintenance and Operating Practices

The draft permit includes a plan to implement the best O&M practices. The O&M plan can be changed without revising the air construction or operation permits.

6. AIR QUALITY IMPACT ANALYSIS

6.1. Introduction

The proposed project will increase emissions of the PSD-pollutant VOC at a level in excess of the PSD SER. For this pollutant the applicant must provide a demonstration using approved air quality models that project emissions will not cause or contribute to a violation of an ambient air quality standard (AAQS) or PSD increment for the pollutants when they apply. There are no applicable PSD increments, AAQS, significant impact or de minimis monitoring levels for VOC. Consequently the primary concern with respect to VOC emissions is the influence of such emissions on the formation of ozone (O_3).

6.2. Class I Impact Analysis

A Q/D screening analysis is required for Class I areas greater than 50 km from the facility. The applicant performed a Q/D analysis to demonstrate that no visibility impacts will occur at any of these Class I areas. The results are shown in the following table:

Table 5. Class I Areas within 300 km of the Whitehouse Lumber Mill.

Class I Area	Distance from Site (km)	VAP Emissions – Q (TPY)	FLAG 2010 Q/D
Okefenokee Fish & Wildlife	41	---	1.32
Wolf Island Fish & Wildlife	123	---	0.44
Chassahowitzka Wilderness	187	---	0.29
Saint Marks Fish & Wildlife	204	54	0.27
Bradwell Bay Wilderness	254	---	0.21

a. Q = Combined annual emissions increase of SO_2, NO_x, PM_{10}, and SAM (H_2SO_4), combined in TPY.
b. D = Nearest distance to a Class I Area.

As shown in **Table 5** above, the Q/D is less than 10 for all Class I areas; therefore, there is no adverse impacts and no Air Quality Related Values (AQRV) analysis is required.

6.3. Ambient Ozone Air Monitoring Surrounding Proposed Facility

The State ambient air monitoring network operated by the Department and its partners (local air pollution control programs) includes monitors in counties containing over 90% of the population. The ambient air monitoring sites are concentrated in areas of high population density, along the coasts and near major highways in the interior portion of the state.

O_3 is a key indicator of the overall state of regional air quality. It is not emitted directly from combustion processes. Rather it is formed from VOC and NO_X emitted primarily from regional industrial and transportation sources. VOC is also emitted from authorized agricultural fires, natural drought-related fires and natural emissions from vegetation. These two precursors participate in photochemical reactions that occur on an area-wide basis and are highly dependent on meteorological factors.

The O_3 monitor selected as the representative background O_3 monitoring station for the Whitehouse Lumber Mill is located 8.01 km from the mill. From **Figure 5**, it is clear that the highest ozone monitor in Duval County is on the east coast, which show an 8-hour O_3 NAAQS of 65 parts per billion (ppb).

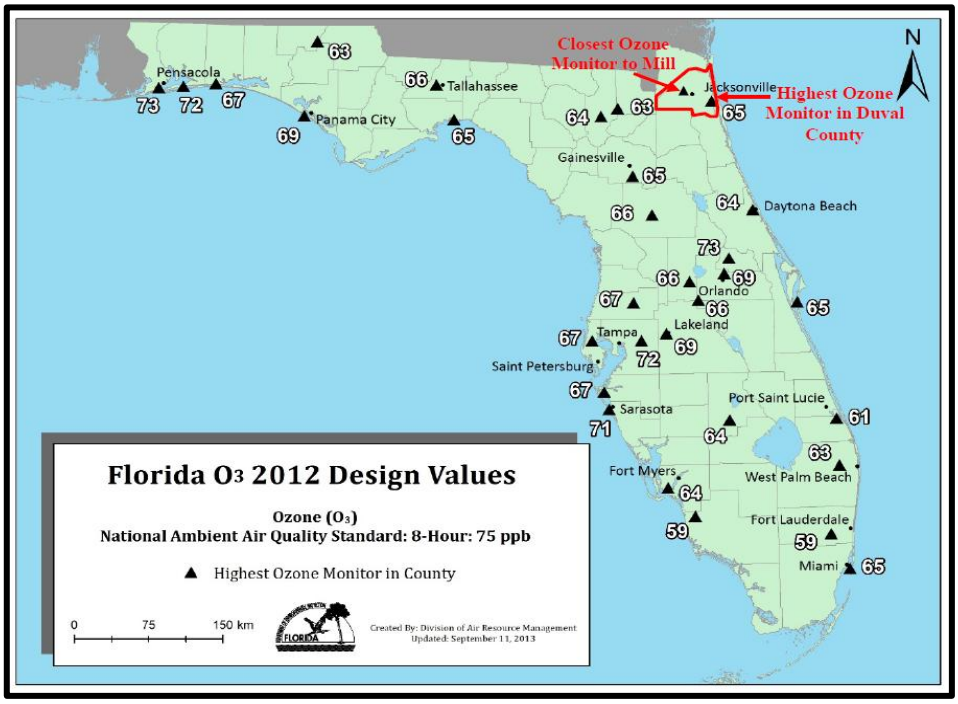

Figure 5. Ozone Monitors and Design Values in Florida.

Figure 5 shows the 8-hour O_3 NAAQS of 64.3 ppb, 3-year average, for the O_3 monitor closest to the mill, which is below the 8-hour standard of 75 ppb for ozone.

Table 6. Ozone Air Quality Measurement Nearest to the Whitehouse Lumber Mill (2010-2012).

Pollutant	Location (Site Number)	Averaging Period	Ambient Concentration		
			Compliance Period	Value (ppb)	Standard (ppb)
Ozone	Duval County (12-031-0106)	8-hour	2010-2012	64.3	75

6.4. Ozone Modeling

Generally speaking, within the Southeastern states, ozone formation in the non-coastal areas is significantly influenced by natural VOC emissions emitted by forested areas. Pine forest emissions such as isoprene readily participate in O_3 formation. Because of the large pools of available VOC to participate in O_3 formation, the southeastern U.S. is considered a NO_X-limited atmosphere with respect to O_3 formation.

According to the 2011 National Emission Inventory (NEI), the total NO_X and VOC emissions for counties within 50 km of the representative background O_3 monitoring site were 86,515 TPY for NO_X emissions and 107,315 TPY for VOC emissions. The proposed project shows the potential annual NO_X and VOC emissions increases to be 23.8 TPY and 319.2 TPY, respectively. This West Fraser O_3 precursor emission data equates a 0.03% increase in NO_X emissions and a 0.29% increase in VOC emissions over the current baseline emissions from counties within 50 km of the representative background monitor. Based on this small increase in regional NO_X and VOC emissions, the proposed project will have a negligible impact on O_3 formation. Even if all of the additional NO_X and VOC emissions resulting from the proposed project were converted to O_3 (i.e., a 0.32% increase above the current representative background monitor design value of 64.3 ppb), the post-project design concentration would be 64.5 ppb which is still well below the 8-hour O_3 NAAQS of 75 ppb.

The applicant used studies conducted by Georgia in support of their 8-hour O_3 SIP development predict that reductions in O_3 concentrations for every ton per day (tpd) of NO_X emissions reductions are in the range of 0.092

ppb/tpd. This same study predicted that an O_3 concentration reduction of 0.016 ppb would occur for every tpd of VOC emissions reductions. Assuming that NO_X and VOC emissions increases and decreases affect O_3 concentrations similarly in Georgia and Florida, and considering the average tpd of NO_X and VOC emissions from the proposed Whitehouse Mill project (i.e., 0.065 tpd for NO_X and 0.87 tpd for VOC), the O_3 sensitivity data suggests that NO_X and VOC emissions from the Whitehouse Mill could potentially increase 8-hour ambient O_3 concentrations by approximately 0.02 ppb, which is well below the 10 ppb margin between the NAAQS and the representative background concentration. Therefore, O_3 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 monitor that are nearby.

6.5. Additional Impacts Analysis

6.5.1. Growth-Related Impacts Due to the Proposed Project

A growth analysis is intended to quantify the amount of new growth that is likely to occur as a result of the project and to estimate emissions resulting from the associated growth. Associated growth includes residential and commercial/industrial growth resulting from the new kiln project at the Whitehouse Lumber Mill. 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 mill.

According to the applicant, the project will result in only a minimal, if any, increase in the work force at the mill nor is residential or commercial growth expected to increase. Consequently, there is expected to be negligible growth related impacts as a result of the kiln conversion project.

6.5.2. Impact on Soils, Vegetation, and Wildlife

The Whitehouse Lumber Mill is located in Duval County, which is designated as attainment, or unclassifiable for NO_2 and O_3. The mill emits higher quantities of VOC than NO_X, and therefore, O_3 formation is primarily dependent upon NO_X emissions and proper atmospheric conditions. Since NO_X emissions increases from the project are less than the SER, O_3 impacts attributable to the project is expected to be minimal as well. Therefore, negative impact on soil or vegetation as a result of this project should be minimal.

6.5.3. Visibility

The project is not expected to produce any visibility impacts in the vicinity of the mill. VOC is not a visibility impairing pollutant; therefore, no immediate visibility impairment is anticipated

7. PRELIMINARY DETERMINATION

The Department makes a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations as conditioned by the draft permit. This determination is based on a technical review of the complete application, reasonable assurances provided by the applicant, and the conditions specified in the Draft Permit. Further details of the analyses may be obtained by contacting the project engineer, Tammy McWade by email at tammy.mcwade@dep.state.fl.us or by phone at 850-717-9086.