Preliminary Determination Summary

WEST FRASER WOOD PRODUCTS
Permit Numbers 6729, PSDTX1526, and GHGPSDTX173

I. Applicant

West Fraser Wood Products
PO Box 460
Henderson, TX 75653-0460

II. Project Location

Lumber Mill
609 Industrial Dr
Rusk County
Henderson, Texas 75652

III. Project Description

West Fraser Wood Products (West Fraser) operates an existing Lumber Mill in Henderson, Rusk County, Texas. This is a major source with respect to the Prevention of Significant Deterioration (PSD) program with air emissions authorized under New Source Review (NSR) Permit No. 6729. With this amendment application, West Fraser has requested an authorization for new equipment, buildings and roads as part of a major "Greenfield" expansion at the Henderson Mill. This expansion project consists of full replacement of the green end sawmill and lumber drying equipment.

All existing equipment other than the planer building will be shutdown and new sawmill and lumber drying equipment will be installed. The lumber drying and energy system will include two continuous kilns (Emission Point Numbers [EPN] CK01 and CK02) heated with thermal hot oil, produced with a wood-fired Thermal Oil Heating System (EPN HTR1). The two kilns will have the ability to operate either in dual-path or parallel path mode. The approximate maximum design rate of the two kilns combined will be 300,000,000 board feet per year (300,000 MBF/yr) total of dried lumber.

The planer building is being removed from the permit as a source of emissions because the new kilns will be not be direct-fired so no combustion ash will be present on the dried lumber when it enters the planer building. Any dust on the lumber is expected to be minimal and will be collected by the planer shavings collection system.

Planned maintenance, startup, and shutdown emissions and activities for the new sources were reviewed. Maintenance activities, other than the manufacturer's recommended maintenance of the TOHS, will be authorized either under Permit by Rule or claimed under 30 Texas Administrative Code § 116.119, De Minimis Facilities or Sources. Emissions from planned startup and shutdown activities and the manufacturer's recommended maintenance of the TOHS will be authorized by this permit. The TOHS startup emissions (EPN HTR1-MSS) will be minimized by limiting the maximum startup duration to fifteen hours/startup and the number of startups per year to six. In addition, all control devices will operate during shutdown of the TOHS and all continuous monitoring systems will operate during both startup and shutdown of the TOHS.

IV. Emissions

Table 1: Proposed Allowable Emission Rates

Air Contaminant	Proposed Allowable Emission Rates (tpy)
VOC	525.44
NO_x	69.60
SO_2	2.48
CO	327.94
$PM/PM_{10}/PM_{2.5}$	69.84
NH_3	16.97
CO_2	134,262
CH_4	258
N_2O	1,537
CO_2 Equivalents (CO_2e)	136,057

CO2e - carbon dioxide equivalents based on global warming potentials of CH_4 = 25 and N_2O = 298.

All applicable federally regulated pollutants were reviewed. The proposed project affected $PM_{10}/PM_{2.5}$. The applicant included condensable $PM_{10}/PM_{2.5}$ emissions (back half catch) in the review along with the filterable $PM_{10}/PM_{2.5}$ emissions (front half catch).

Maintenance activities, other than the manufacturer's recommended maintenance of the TOHS, will be authorized either under Permit by Rule or claimed under 30 Texas Administrative Code § 116.119, De Minimis Facilities or Sources.

Emissions from planned startup and shutdown activities will be authorized by this permit. Startup of the TOHS will be an incremental process and will take approximately 15 hours. The number of startups per year will be limited to 6. The same controls will be used for TOHS startup for control of VOC, CO and SO2. During startup, the SNCR will not operate until stable combustion is achieved (above 50% load) and the ESP will not operate until the end of the 15th hour of startup. The control devices will continue to operate until the TOHS is shutdown and no fuel will be fired during maintenance activities. Therefore, no additional emissions will result from shutdown of the TOHS or maintenance activities. Planned shutdown emissions are included in the normal production emissions under EPN HTR1.

Startup and shutdown emissions for all other sources are included in the production emissions. Although there may be minor emissions associated with startup and shutdown, emission factors used to quantify production emissions are considered to have enough conservatism to include any incidental increases that may be attributed to startup and shutdown.

V. Federal Applicability

The following chart illustrates the annual project emissions for each pollutant and whether this pollutant triggers PSD or Nonattainment (NA) review.

Table 2: Annual Project Emissions

Pollutant	Project Emissions (tpy)	Major Mod Trigger (tpy)	NA Triggered Y/N	PSD Triggered Y/N
VOC	+197.50	25 for NA 40 for PSD	N/A	Y
NO_x	+19.97	25 for NA 40 for PSD	N/A	N
SO_2	-2.48	40	N/A	N
CO	+275.20	100	N/A	Y
PM	-96.04	25	N/A	N
PM_{10}	-74.84	15	N/A	N
$PM_{2.5}$	-64.65*	10	N/A	N

* Although $PM_{2.5}$ emissions are not currently speciated on the Maximum Allowable Emission Rates Table (MAERT), these emissions were previously quantified as 106.54 tpy.

The proposed project triggers PSD review for non-GHG NSR regulated pollutants. As shown in the table below, because the project increase is more than 75,000 tpy of CO_2e, PSD review is triggered for GHG emissions.

Table 3: PSD Review for GHG Emissions

Pollutant	Project Emissions (tpy)	Major Source or Major Mod Trigger Level (tpy)	PSD Triggered Y/N
CO_2e	136,057	75,000	Y

The mill is located in Rusk County which is in attainment or unclassified for all pollutants. Therefore, nonattainment review is not applicable. The mill is an unnamed source with major source definition of 250 tpy.

To determine the project emission increases, the baseline actual emission rates were compared to the potential to emit (PTE). Netting was triggered for VOC, NO_x, CO, PM, PM_{10}, and $PM_{2.5}$. After considering creditable contemporaneous increases and decreases, the net emission increases for VOC, CO, and GHG triggered PSD review as shown in the following table. Note the project increase for VOC below is the VOC amount as measured and calculated by the protocol referred to as “WPP1 VOC” (Wood Products Protocol 1 VOC) which is VOC calculated as Total Hydrocarbons (THC) expressed as propane plus methanol and formaldehyde expressed as compound, minus adjustments. This protocol is used for PSD applicability in the wood industry.

Table 4: Net Emissions Change

Pollutant	Project Increase (tpy) [1]	NA Netting Trigger (tpy)	PSD Netting Trigger (tpy)	Netting Required Y/N	Net Emission Change (tpy) [2]	Major Mod Trigger (tpy)	PSD Triggered Y/N	NA Triggered Y/N
VOC [3]	661.4	N/A	40	Y	+366.6	250	Y	N/A
NOx [3, 4]	69.60	N/A	40	Y	+33.6	250	N	N/A
SO_2 [4]	2.48	N/A	40	N	N/A	N/A	N/A	N/A
CO	327.94	N/A	100	Y	+289.70	250	Y	N/A
PM	69.84	N/A	25	Y	-12.50	250	N	N/A
PM_{10}	50.48	N/A	15	Y	-10.40	250	N	N/A
$PM_{2.5}$ [5]	41.87	N/A	10	Y	-3.70	250	N	N/A
Pb	1.07E-04	N/A	0.6	N	N/A	N/A	N/A	N/A

Note: Nonattainment (NA) significance levels (trigger levels) should follow current Federal New Source Review (FNSR) guidance, and be based on the classification of the NA area in which the project is proposed.

[1] Project Increases: Comparison of Baseline Actual to PTE (or Projected Actual) Increases only

[2] Net Emissions: Baseline Actual to PTE (or Projected Actual) for the project currently under review, Baseline Actual to PTE for all other increases and decreases within netting window.

[3] Ozone precursor. Either pollutant precursor can trigger BACT/LAER and impacts analysis, as applicable.

[4] $PM_{2.5}$ precursor. Not used to trigger $PM_{2.5}$ BACT/LAER or impacts analysis at this time.

[5] Use PM_{10} emissions only if $PM_{2.5}$ emissions cannot be quantified or estimated. ($PM_{2.5}$ Implementation Plan).

VI. Control Technology Review

PSD BACT

Sources undergoing a PSD review must apply Best Available Control Technology (BACT) to any new or modified emission unit that emits a PSD triggered pollutant in an amount above significant impact levels. The applicant has opted for the "top-down" methodology for determining BACT. The top-down BACT analysis involves the following five steps: (1) identify all control technologies; (2) eliminate all technically infeasible control technologies; (3) rank remaining control technologies by control effectiveness; (4) evaluate the most effective controls and document results; and (5) select BACT.

While the top-down BACT analysis is a procedural approach suggested by EPA policy, this approach is not specifically mandated as a statutory requirement of the BACT determination. The BACT limit is an emissions limitation or work practice standard and does not require the installation of any specific control device.

The proposed project is subject to PSD permitting for VOC, CO, and GHG, and thus is subject to BACT for VOC, CO, and GHG. Table 5 below summarizes the emission units which are considered in this BACT analysis.

Table 5: BACT Applicability

Unit ID	Emission Unit Description	VOC	CO	GHG
EPN CK01	Continuous Indirect Fired Kiln No. 1	X		
EPN CK02	Continuous Indirect Fired Kiln No. 2	X		

EPN HTR1	Thermal Oil Heating System	X	X	X

The control options were identified by three methods: (1) researching the Reasonably Available Control Technology (RACT)/Best Available Control Technology (BACT)/Lowest Achievable Emission Rate (LAER) Clearinghouse (RBLC); (2) drawing upon previous engineering experience; and (3) surveying available literature. The applicant performed a general review of the RBLC database and only the most recent determinations for the previous ten years were considered.

Lumber Kilns VOC BACT (EPNs CK01 and CK02)

The applicant identified the control technologies for the pollutants listed on Table 6.

Table 6: Potential VOC Controls for the Proposed Lumber Kilns

Pollutants	Potential Technologies
VOC	Proper Design and Operation; Regenerative Thermal Oxidizer (RTO); Regenerative Catalytic Oxidizer (RCO); Condensation; Carbon Adsorption; Polymer Adsorption; Wet Scrubbing; and Biofiltration.

After identification of control options, the second step in the BACT assessment is to eliminate technically infeasible options. A control option is eliminated from consideration if there are process-specific conditions that would prohibit the implementation of the control or if highest control efficiency of the option would result in an emission level that is higher than any applicable regulatory limits. Table 7 shows this elimination process.

Table 7: Elimination of Technically Infeasible Control Options

Control Option	Reason for Elimination
Condensation	Only effective if temperature of the emissions can be cooled to a temperature necessary to cause condensation, i.e., 32˚F. At this temperature, the unit will plug up with ice from the water vapor.
Thermal or Catalytic Oxidation	The high moisture and low exit temperature of the exhaust stream will likely make an RTO technically infeasible. While RCOs 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.
Carbon Adsorption	Carbon adsorption is not recommended for exhaust

	streams with greater than 50% relative humidity and temperatures greater than 150°F. Water vapor preferentially condenses on the activated carbon above a relative humidity of about 50%, drastically reducing the efficiency and overall effectiveness of the adsorbent.
Polymer Adsorption	Requires that the surface of the polymer remain clean. Lumber kiln emissions contain condensable organic compounds that coat the surface of polymer beads, blocking access of the VOC to the pores where adsorption takes place, and rendering them ineffective.
Wet Scrubbing	The VOC emissions from the lumber kilns are primarily terpenes, which have relatively high Henry's Law constants and low water solubility, and therefore are not effectively removed from the exhaust gas stream with wet scrubbing.
Biofiltration	The microorganisms used in the biofiltration cannot survive at temperatures exceeding 105˚F. The temperature of the exhaust stream from the kilns will be a minimum of 120˚F. Also, the highly viscous terpenes will also cause the biofilter to easily foul.

The only remaining technology is proper maintenance and operating practices of the kilns which can effectively minimize VOC formation.

Based on the RBLC search, the technical infeasibility of control devices, and survey of other state agency BACT determinations, proper design and operation of the lumber kilns is being proposed as BACT for VOC in the lumber kilns. West Fraser is proposing an annual emission limit for VOC (as carbon) of 3.38 pounds of VOC per thousand board feet of lumber dried (lb/MBF). This limit is consistent with other lumber kilns around the country and will be achieved through proper design and operation of the lumber kilns.

Thermal Oil Heating System (TOHS) VOC and CO BACT (EPN HTR1)

The applicant identified the control technologies for the pollutants listed on Table 8.

Table 8: Potential VOC Controls for the Proposed TOHS

Pollutants	Potential Technologies
VOC and CO	Proper Design and Operation; Thermal or Catalytic Oxidation

Just as with the lumber kilns above, after identification of control options, the second step in the BACT assessment is to eliminate technically infeasible options. All the above control technologies are considered technically feasible.

The third step in the BACT assessment is to rank the technically feasible control technologies by control effectiveness. The rankings are listed in the following table.

Table 9: Rankings of VOC and CO Control Technologies

Rank	Control Technology
1	Thermal or Catalytic Oxidation
2	Proper Design and Operation

A stand-alone catalytic oxidizer system would be expected to reduce CO emissions by as much as 98% but since the VOC emissions are low from biomass combustion, the reduction in VOC emissions is difficult to estimate. Although addition of thermal or catalytic oxidation provides some incremental removal of VOC and CO, the emission limits for units with thermal oxidation versus those employing proper design/operation are similar.

The fourth step in the BACT assessment is to evaluate the most effective control and document the results. West Fraser evaluated the controls based on economic, energy, and environmental considerations. For either thermal or catalytic oxidation, significant auxiliary fuel input will be required to raise the temperature of the flue gas. Preliminary estimates by West Fraser indicate that an additional 5,500 scf/hr of natural gas combustion would be required to provide reheating to a minimum catalytic oxidation requirement of 500°F. In addition, the use of a non-renewable fuel source (natural gas-fired oxidizer) to achieve an emissions reduction for a predominantly renewable energy generation source represents a negative energy impact.

West Fraser demonstrated that the emission rates achieved at a properly designed and operated combustion unit are similar to those at oxidizer-equipped units without negative environmental and energy impacts based on results from the RBLC database. Therefore, West Fraser proposed BACT for VOC and CO for the proposed TOHS to be proper design and operating practices. This is done by ensuring that the boiler/heater temperature and oxygen availability are adequate for complete combustion. The proposed CO limit (0.505 lb/MMBtu) and proposed VOC limit (0.028 lb/MMBtu) are both within the range of RBLC listed emission limits for similar biomass combustion units.

Pollution Prevention, Sources, Controls and BACT for GHG

West Fraser conducted a BACT analysis that was reviewed and verified by the TCEQ. It included the identification and evaluation of add-on controls, energy efficient processes/practices, equipment design, and available control options for the TOHS (EPN HTR1). The evaluation included information from the

Environmental Protection Agency's (EPA's) RACT/BACT/LAER Clearinghouse (RBLC), and on-going permitting in Texas and other states. BACT for the GHG is based on the information from the RBLC analysis. For the proposed project, the only emission unit that emits GHG emissions and for which GHG BACT analysis is required is the TOHS (EPN HTR1).

West Fraser looked at the potential CO_2 control strategies which are carbon capture and storage (CCS), selection of the most efficient biomass boiler technology, selection of the lowest carbon fuel, installation of energy efficiency options, and fuel switching. Table 10 shows the control strategies that were eliminated.

Table 10: Elimination of Technically Infeasible GHG Control Options for CO_2

Control Option	Reason for Elimination
Carbon Capture and Storage	While potentially available for certain high purity CO_2 streams, CCS is technically infeasible for the TOHS. The power demand to adequately capture and compress CO_2 would require tremendous financial cost and generate additional air pollutants. Also, there is a lack of available sequestration options such as a pipeline or geologic formation to permanently sequester the captured gas. The existing pipelines are several hundred miles away.
Most Efficient Biomass Boiler Technology	Options included here are Fluidized Bed Combustion, Suspension Combustion, Stoker Combustion, and Pile Combustion. Though these are technically feasible, nonetheless, based on special characteristics of the biomass fuel and unique nature of the TOHS, West Fraser determined that only a fuel cell or hybrid suspension grate unit would serve the intended purpose.
Lowest Carbon Fuel	Firing of a fuel (i.e. natural gas) containing less carbon per MMBtu of heat released than biomass or other fossil fuels is a technically feasible option for CO_2 control in the TOHS. However, the Mill's intention is to use the abundant biomass generated on-site as the only fuel for the TOHS. West Fraser believes that the proposed biomass fuel is a byproduct of manufacturing lumber from sustainably-grown trees. GHG emissions associated with harvest, transport, and processing of the biomass fuel would largely occur whether or not the biomass byproducts were used for fuel. If the byproducts were not used as fuel, they would typically decay and the carbon in them would be emitted as CO_2 or CH_4 (which has a higher global warming potential than CO_2). Thus combustion of the biomass does not increase the total

	amount of carbon in circulation and it is a reasonable assertion that biomass produced as a byproduct of lumber manufacturing at the Mill is the lowest carbon fuel.
Fuel Switching	Fuel switching is only applicable to coal-fired and oil-fired boilers according to the GHG BACT guidance for boilers.

Based on the top-down process described above for control of GHG from TOHS, West Fraser proposed using a fuel cell or hybrid suspension grate unit design, firing biomass as the only fuel source, and the operation of several energy efficiency options described in Table 11 constitutes BACT for the TOHS.

Table 11: Summary of Energy Efficiency Options for the TOHS

Energy Efficiency Option	Features of the TOHS
Heating system maintenance	The heater and auxiliary thermal oil equipment will be maintained per the manufacturer's recommendations.
Heater process control	The heater will have an induced draft fan with a variable energy frequency drive (VFD) and instrumentation/controls for measuring fuel firing rate, induced draft, thermal oil flow and temperature, and excess O_2 in the flue gas.
Reduction of flue gas quantities	Heater passages and ducts will be seal welded to reduce and/or avoid any flue gas leakage. Flanged joints will be used to connect the ductwork to the stack, fans, expansion joints, and other connections. In addition, installed combustion controls will minimize the gas flow.
Reduction of excess air	The furnace will consist of two cells which can fire independently or in unison. Each consists of a heavy rolled steel outside casing with high temperature insulation and an air space between the steel shell and refractory for secondary combustion air. The refractory is field installed, consisting of minimum 9-inch thick low cement castable mullite-based shotcrete. Multiple tuyere holes are formed tangentially in the cell refractory, creating a cyclonic action. Excess air in modern sealed furnaces is typically less than 20-25% where older tile and tube type boilers typically run 30% excess air.
Improved heater insulation	As described above, the furnace ductwork will be insulated in keeping with good engineering practices to conserve heat, protect personnel, and to prevent condensation and corrosion.
Flue gas heat recovery	A heat exchanger will be installed on the heater exhaust for cooling stack temperatures and raising combustion air temperatures. The heat exchanger allows the system to

	gain overall efficiency and permits the firing of green or wet hogged fuel, as received. It consists of vertical tubes and baffles for directing forced draft air around the outside of the tube surface. Heater gases pass through the inside of these tubes and discharge at low temperatures. Outside surfaces are fully insulated with three inches of 700^{O}F mineral wool and weather protected with an aluminum cover.

BACT Analysis for CH_4: The RBLC search did not return any CH_4 BACT limits for wood-fired boilers/heaters similar to the TOHS. The only RBLC searches for CH_4 BACT for gas-fired boilers with CH_4 emission limit, for which the control method described was proper operation and good combustion practices. Because no other control techniques for limiting CH_4 emissions from TOHS were identified, West Fraser proposed proper operation and good combustion practices as BACT.

BACT Analysis for N_2O: The RBLC search did not return any N_2O BACT limits for wood-fired boilers/heaters similar to the TOHS. The only RBLC searches for N_2O BACT for gas-fired boilers with N_2O emission limit, for which the control method described was proper operation and good combustion practices. Because no other control techniques for limiting N_2O emissions from TOHS were identified, West Fraser proposed proper operation and good combustion practices as BACT.

State BACT

TCEQ's NSR policy requires state BACT for new and physically modified facilities. West Fraser proposes the following as BACT:

Kilns: The two kilns will emit both VOC and $PM/PM_{10}/PM_{2.5}$. As mentioned earlier, the BACT for the VOC emissions from the kilns is proper design and operation of the kilns. The kilns are sources of $PM/PM_{10}/PM_{2.5}$ emissions, primarily from condensables in the exhaust from the humidity vents. The PM emission rates from the two kilns only amount to 4.11 tpy per kiln; therefore, it would not be cost effective to control these sources. Also due to problems having so many vents on the roof of the lumber kilns and kiln entry and exit doors, it is impractical (technically infeasible) to duct these vents to a control without interfering with air circulation and ventilation, which is critical to the lumber drying process. Furthermore, the RBLC search identified no control as BACT for lumber kilns. Therefore, no control is considered BACT for $PM/PM_{10}/PM_{2.5}$ emissions from the two kilns.

TOHS: The TOHS will emit VOC, CO, NO_x, SO_2, and $PM/PM_{10}/PM_{2.5}$. As mentioned earlier, BACT for VOC and CO for the proposed TOHS is proper design and operating practices. This is done by ensuring that the boiler/heater temperature and oxygen availability are adequate for complete combustion. The particulate matter emissions will be controlled by a primary multiclone separator and a secondary Electrostatic Precipitator (EPS). The TOHS also meets the source Boiler MACT standard of 0.020 lb/MMBtu for filterable particulate matter from biomass fuel cell or sloped grate units (40 CFR 63, Subpart DDDDD). For SO_2, West Fraser considered the use of wet or dry scrubber using an alkaline agent. Uncontrolled SO_2 emission from the TOHS is 2.47 tpy. Based on the most conservative figures available in EPA's fact sheet for Flue Gas Desulfurization (FGD), the operating cost for a scrubber would be over $29,000, resulting in a cost per ton of SO_2 removed of $11,600 per ton. This is in addition to an estimated cost of nearly $1.5 million as the capital cost to build the control unit. Due to inherently low sulfur content of the biomass fuel and high construction, operation, and maintenance costs associated with add-on controls, West Fraser proposed low sulfur (biomass only) fuel as the BACT work practice for TOHS for SO_2. For NO_x, West Fraser considered both the Catalytic Reduction and Selective Non-Catalytic Reduction (SNCR) but only the SNCR is technically feasible. Based on RBLC search result, West Fraser proposed to control NO_x emissions with an SNCR urea injection. This will achieve a NO_x emission rate of 0.11 lb/MMBtu (3-hour average). Ammonia (NH_3) is used as a reagent in an SNCR system. The level of NO_x that can be controlled is directly related to the amount of NH_3 injected. Excess NH_3 (unreacted) is emitted as NH_3 slip. Due to the higher NO_x concentrations and more exhaust gas volume to be treated for wet biomass firing, more NH_3 is required to be injected, compared to that of natural gas firing. Therefore, NH_3 slip BACT for gas-fired boilers is not applicable and no BACT has been determined for NH_3 slip for biomass fired units. As a result, West Fraser proposed BACT for NH_3 slip to be 25 ppmvd at 7% O_2 for the TOHS.

TOHS MSS: Startup of the TOHS will be an incremental process and will take approximately 15 hours. The number of startups per year will be limited to 6. The same controls will be used for TOHS startup for control of VOC, CO and SO_2. During startup, the SNCR will not operate until stable combustion is achieved (above 50% load) and the ESP will not operate until the end of the 15th hour of startup. MSS BACT for other combustion sources is to limit the amount of startups per year and/or limit control device bypass to 144 hours per year. The startup of the TOHS will be limited to a total of 6 startups or 90 hours per year. The bypass of the control devices will also be limited to less than 144 hours per year. This meets MSS BACT.

The control devices will continue to operate until the TOHS is shutdown and no fuel will be fired during maintenance activities. Therefore, no additional emissions will result from shutdown of the TOHS or maintenance activities. Planned shutdown emissions are included in the normal production emissions under EPN HTR1.

Startup and shutdown emissions for all other sources are included in the production emissions. Although there may be minor emissions associated with startup and shutdown, emission factors used to quantify production emissions are considered to have enough conservatism to include any incidental increases that may be attributed to startup and shutdown.

Storage Bins, Material Handling, and Truck Loading: Material handling at the lumber mill involves bark, sawdust, and chip storage bins and loading, shavings storage bins and loading, a green chip pad, and fuel storage systems (silos). TCEQ Bulk Material Handling guideline states that a 70% reduction meets Tier I BACT and that wet material up to 1.5% moisture content qualifies as 50% reduction for transfer points and stockpiles. The moisture content of bark and green sawdust and chips stored and handled at EPNs 21, 22, 23, 24, and 31-34 is approximately 50%. In addition, the storage bins and fuel silos are fully enclosed structures with only a small vent opening(s) for displaced air to escape. Engineering judgment estimates that the enclosure provides greater than 90% reduction in PM emissions.

Planer Shavings Collection: The existing planer mill building and equipment will remain in place but a new planer mill shavings dust collection system (and planer shavings storage system) will be part of the initial phase of the project. TCEQ Oriented Strandboard (OSB) Mills BACT guideline states that OSB Trim Process with an outlet grain loading of 0.01 gr/dscf are considered BACT for PM. The trim process at an OSB mill is very similar to a lumber planer mill operation. Emissions from the planer mill shavings system and planer shavings storage bin will be controlled by high efficiency cyclones (EPNs 28 and 29) and this control meets 0.01gr/dscf. This meets Tier II BACT requirement.

In summary, this facility meets or exceeds current BACT as demonstrated by the controls above.

VII. Air Quality Analysis

The air quality analysis (AQA) is acceptable for all review types and pollutants. The results are summarized below.

A. De Minimis Analysis

A De Minimis analysis was initially conducted to determine if a full impacts analysis would be required. The De Minimis analysis modeling results for 1-

hr and 8-hr CO indicate that the project is below the respective de minimis concentrations and no further analysis is required.

Table 12: Modeling Results for PSD De Minimis Analysis

Pollutant	Averaging Time	GLCmax ($\mu g/m^3$)	De Minimis ($\mu g/m^3$)
CO	1-hr	120	2000
CO	8-hr	109	500

The GLCmax are the maximum predicted concentrations associated with five years of meteorological data.

B. Air Quality Monitoring

The De Minimis analysis modeling results indicate that CO is below its respective monitoring significance level.

Table 13: Modeling Results for PSD Monitoring Significance Levels

Pollutant	Averaging Time	GLCmax ($\mu g/m^3$)	Significance ($\mu g/m^3$)
CO	8-hr	109	575

The GLCmax is the maximum predicted concentration associated with five years of meteorological data.

C. National Ambient Air Quality Standards (NAAQS) Analysis

Table 14: PSD Ambient Air Quality Analysis for Ozone

Pollutant	Monitor	Averaging Time	Background (ppb)	Standard (ppb)
O_3	481830001	8-hr	65	70

A background concentration for O_3 was obtained from the EPA AIRS monitor 481830001 located at the Gregg County Airport near Longview, Gregg County. A three-year average (2015-2017) of the annual fourth highest daily maximum 8-hr concentrations was used in the analysis. The use of this monitor for a background concentration of ozone is reasonable based on the applicant's comparison of land use, and the monitor is located in the same air shed as the project site (approximately 24 kilometers [km] away).

The applicant reviewed ozone photochemical modeling conducted in support of the Texas State Implementation Plan. The modeling was conducted by the TCEQ and focused on an ozone episode from May to September 2012. The applicant reviewed a plot of the predicted VOC to NO_x ratios for Rusk County for the period of May 1 – September 30, 2012. The ratios ranged from 28 to 61 depending on the time of day. Based on this information, the applicant concluded that Rusk County is NO_x-limited. In NO_x-limited areas, ozone formation is responsive to changes in NO_x emissions. Given that the project proposes PSD-significant emission increases of VOCs, the applicant concluded that the proposed VOC emissions from the project will not cause a significant change in ozone concentrations in the area.

D. Increment Analysis

The proposed project triggered PSD review for CO and ozone. PSD increments have not been established for CO and ozone; therefore, an increment analysis was not conducted.

E. Additional Impacts Analysis

The applicant performed an Additional Impacts Analysis as part of the PSD AQA. The applicant conducted a growth analysis and determined that population will not significantly increase as a result of the proposed project. The applicant conducted a soils and vegetation analysis and determined that all evaluated criteria pollutant concentrations are below their respective secondary NAAQS. The applicant meets the Class II visibility analysis requirement by complying with the opacity requirements of 30 TAC Chapter 111. The Additional Impacts Analyses are reasonable and possible adverse impacts from this project are not expected.

The ADMT evaluated predicted concentrations from the proposed site to determine if emissions could adversely affect a Class I area. The nearest Class I area, Caney Creek Wilderness, is located approximately 252 km from the proposed site.

The predicted concentrations of NO_2 for the annual averaging time are less than the de minimis level along the fence line. Caney Creek Wilderness is an additional 252 km from the location where the predicted concentrations of NO_2 for the annual averaging time are less than de minimis. Therefore, emissions from the proposed project are not expected to adversely affect the Caney Creek Wilderness Class I area.

F. Minor Source NSR and Air Toxics Review

Table 15: Modeling Results for Minor NSR De Minimis

Pollutant	Averaging Time	GLCmax ($\mu g/m^3$)	De Minimis ($\mu g/m^3$)
NO_2	Annual	0.3	1

The GLCmax is the maximum predicted concentration associated with one year of meteorological data.

Table 16: Minor NSR Site-wide Modeling Results for Health Effects

Pollutant & CAS#	Averaging Time	GLCmax ($\mu g/m^3$)	GLCni ($\mu g/m^3$)	ESL ($\mu g/m^3$)
acetaldehyde 75-07-0	1-hr	436	239	120
acetaldehyde 75-07-0	Annual	7	< 7	45

Table 17: Minor NSR Hours of Exceedance for Health Effects

Pollutant	Averaging Time	1 X ESL GLCni	2 X ESL GLCmax
acetaldehyde	1-hr	14	20

The GLCmax are located along the property line. The GLCni, according the applicant, is located approximately 50 meters from the property line towards the north.

A request for comments was sent to the Toxicology Division for the predicted exceedances of acetaldehyde. The TD concluded that considering the magnitude of ESL exceedance, the permit limitations on the kilns, and that a variety of conservative emission rate calculation methods were used to estimate emissions, these proposed short-term emissions for acetaldehyde are allowable. The predicted long-term impacts at the GLCmax will not exceed the ESL for acetaldehyde. Thus, based on Tier I evaluation, the proposed long-term emissions for acetaldehyde are acceptable. In conclusion, the TD does not anticipate any short- or long-term adverse health effects to occur among the general public as a result of exposure to the proposed emissions from this facility.

G. Greenhouse Gases

EPA has stated that unlike the criteria pollutants for which EPA has historically issued PSD permits, there is no National Ambient Air Quality Standard (NAAQS) for GHGs, including no PSD increment. The global climate-change inducing effects of GHG emissions, according to the "Endangerment and Cause or Contribute Finding", are far-reaching and multi-dimensional (75 FR 66497). Climate change modeling and evaluations of risks and impacts are typically conducted for changes in emissions that are orders of magnitude larger than the emissions from individual projects that might be analyzed in PSD permit reviews. Quantifying the exact impacts attributable to a specific GHG source obtaining a permit in specific places and points would not be possible [EPA's PSD and Title V Permitting Guidance for GHGs at 48]. Thus, EPA has concluded in other GHG PSD permitting actions it would not be meaningful to evaluate impacts of GHG emissions on a local community in the context of a single permit.

The TCEQ has determined that an air quality analysis would provide no meaningful data and has not required the applicant to perform one. As stated in the preamble to TCEQ's adoption of the GHG PSD program, the impacts review for individual air contaminants will continue to be addressed, as applicable, in the state's traditional minor and major NSR permits program per 30 TAC Chapter 116.

VIII. Conclusion

In conclusion, the applicant demonstrated the project meets all applicable rules, regulations and requirements of the Texas and Federal Clean Air Acts. As a result, the permits should be issued.