Permit to Construction Application – Kiln Configuration Update

Woodgrain Millwork, Emmett Lumber

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Sign-off Sheet

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1.0 INTRODUCTION

1.1 DESCRIPTION

Woodgrain Millwork -Emmett (Woodgrain) owns and operates a lumber mill located at 500 West Main Street in Emmett, Gem County, Idaho. UTM coordinates at the approximate center of the facility are 539.0 kilometers (km) Easting and 4,858.3 km Northing (datum WGS84) in UTM Zone 11. The primary NAICS code for the mill is 321113, Dimension lumber, made from logs or bolts.

Gem County is included in Air Quality Control Region (AQCR) 63, and is listed as unclassifiable/ attainment or better than national standards for all criteria pollutants subject to National Ambient Air Quality Standards (NAAQS): particulate matter with an aerodynamic diameter less than or equal to a nominal 10 microns (PM_{10}) and less than or equal to a nominal 2.5 microns ($PM_{2.5}$), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and ozone (O_3).[1]

The mill processes logs into dimensional lumber. Operations include log receiving/scales and pile storage, transferring logs from storage piles to the log deck using front end loaders equipped with a grapple, an enclosed debarker, sorter, a sawmill that includes water sprays to help control emissions and to cool the saw blades, dry kilns supplied with steam from natural gas-fired boilers, and a planer/trimmer mill.

Wood waste management includes an enclosed chipper located within the sawmill building, screens, sawdust and green chip bin storage and truck loadout, and planer shavings bin storage and truck loadout.

Sawdust and fines from the saws in the mill are pneumatically conveyed to a sawdust storage bin. Green chips are conveyed to the chip bin(s) by a mechanical (chain) conveyor. The Chip bin is fully enclosed and does not release to atmosphere. The sawdust bin vent is released via cyclone. The facility modified the vents a couple of years ago to mitigate potential product loss.

Lumber is sent to the planer mill and 1/8" are cut from each of the four edges. Planer shavings are pneumatically conveyed to a cyclone where the shavings drop into a planer shavings storage bin, and fine particulates from the cyclone separator are routed to a baghouse. After the edging of the board are removed, they are sent to the trimmer to remove any excess wood pieces. The excess wood is sent pneumatically to the cyclone associated with the Trimmer Cyclone/baghouse. The trimmer shavings are also sent to the storage bin and fine particulates from the cyclone separator are routed to the trimmer baghouse.

[1] 40 CFR Part 81, Designation of Areas for Air Quality Planning Purposes, Section 313, Idaho.

A diesel-fueled engine is used to run an on-site emergency fire water pump located in a small building northeast of the planer mill building. Small shop and office buildings house support and administrative activities. Electrical power for normal operations is provided by the local utility.

Regulated emissions include:

- Criteria pollutants and hazardous air pollutants (HAPs)/toxic air pollutants (TAPs) from natural gas combustion in the boilers and from diesel combustion in the fire pump engine;
- Particulate matter (PM), volatile organic compounds (VOCs), and HAPs/TAPs from drying green lumber at temperatures of 180 degrees Fahrenheit (°F) in the kilns; and
- PM from materials handling, storage, and loadout.

A process flow diagram illustrating mill operations and emission points is shown in Figure 1-1.

Point source and fugitive emission points and control devices are described in detail in Table 2-1. Scaled plot plans showing the facility layout and emission point locations are included in Appendix A and in Appendix D, the Air Quality Impact Analysis report.

1.2 PERMITTING HISTORY

The most recent permit was issued on August 8, 2017 under P-2010.0016. The project was to install a second natural gas-fired boiler, increase daily and annual production capacity by installing three additional dry kilns and increase annual production of finished lumber from 32 million board feet (MMBF) to 90 MMBF. Facility-wide ambient dispersion modeling of criteria pollutants and TAPs was conducted.

On August 28, 2014, the permit P-2010.0016 for this facility was revised to change the ownership from Emerald Forest Products to Gem Forest Products and to delete references to equipment permitted in the 2010 permit to construct (PTC) but which had never been constructed. i.e., the Zurn boiler and its associated control equipment and a two-cell cooling tower (DEQ Project 61407). The statement of basis was not revised in 2014 to reflect the changes; the 2010 statement of basis continued to be used to document the technical basis for the permit.

The Wellons wood waste-fired boiler emitted a considerable variety and quantity of HAPs, which prompted the facility to request a production limit of 32 MMBF of lumber to ensure that facility-wide emissions of HAPs remained below major source thresholds.

In 2015, Gem Forest Products made the following changes to the mill:

1. Exempt Project No. 1. Replace the existing wood waste-fueled Wellons boiler and the associated wood waste fuel and ash handling with one natural gas-fired boiler located in a new enclosure adjacent to Kiln No.1. The rated heat input capacity of the new boiler

is 20.925 million British thermal units per hour (MMBtu/hr). The Wellons boiler and its associated building and tanks were demolished. In consultation with DEQ Permit Coordinator, Bill Rogers, and a review of the applicable rules, this project was determined to comply with Section 220 of the Rules and the Category II Exemption listed in Section 222.02.c of the Rules:

220.02.c. Fuel burning equipment for indirect heating and for heating and reheating furnaces using natural gas, propane gas, liquefied petroleum gas, or biogas (gas produced by the anaerobic decomposition of organic material through a controlled process) with hydrogen sulfide concentrations less than two hundred (200) ppmv exclusively with a capacity of less than fifty (50) million btu's per hour input.

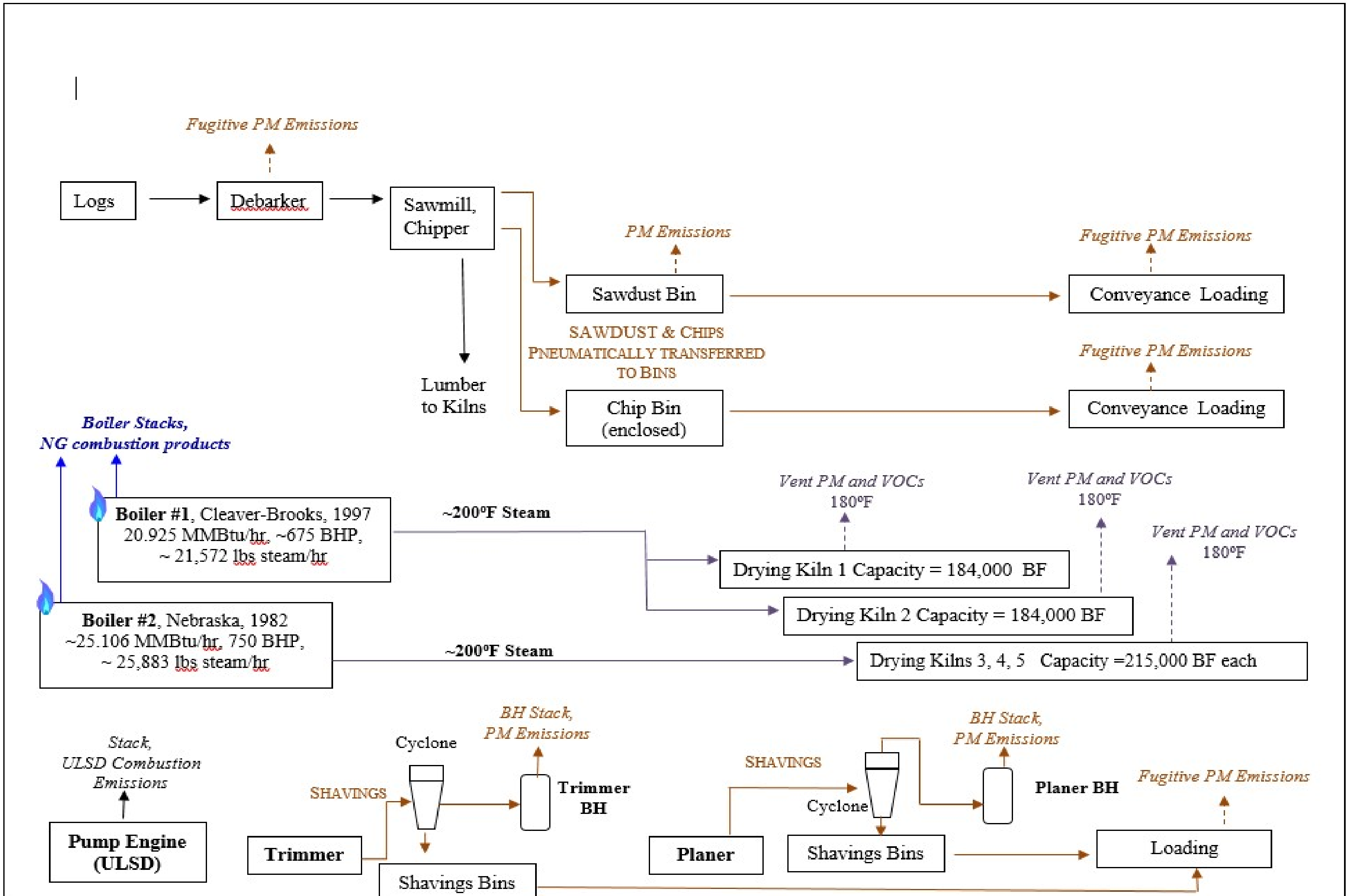

Figure 1-1. WOODGRAIN MILLWORK, EMMETT MILL PROCESS FLOW DIAGRAM

2. Exempt Project No. 2. Replace the planer mill baghouse with a different used baghouse. The existing baghouse exhausted horizontally only a few feet above ground in the space below the existing cyclone. The replacement baghouse exhaust point will be vertical and uncapped with the stack extending to a point just below the shoulder of the existing cyclone. Replacement of a pollution control device with an equivalent device does not result in an increase in emissions, hence is not a "modification" as defined in Section 006 of the Rules. A PTC was not required for this project.
3. Exempt Project No.3. Replace the existing 104 bhp diesel fire pump engine (manufactured in 1994) located in the pump house with a newly rebuilt 2015 diesel-fueled emergency engine with a maximum engine rating of 140 bhp (104.4 kW). The replacement engine was installed in the space left by removing the old 1994 engine, with exhaust routed through the existing stack on the northeast side of the pump house. This project was unrelated to the other two exempt projects implemented during 2015; the engine was replaced in response to local fire service requirements. A review of applicable requirements determined that this project complied with Section 220 of the Rules and the Category II Exemption listed in Section 222.01.d of the Rules:

   222.01.d. Stationary internal combustion engines used exclusively for emergency purposes which are operated less than five hundred (500) hours per year and are fueled by natural gas, propane gas, liquefied petroleum gas, distillate fuel oils, residual fuel oils, and diesel fuel; waste oil, gasoline, or refined gasoline shall not be used.

On March 2, 2016, the air quality permit was transferred to the new owner and operator, Woodgrain Millwork - Emmett.

1.3 APPLICATION SCOPE

The purpose of this PTC application is to request a modified Permit to Construct for the following:

1. Modify kiln configuration associated with wood distribution changes.
   a. 50% White Fir
   b. 25% of Douglas Fir
   c. 25% Pine (95% Ponderosa and 5% Lodgepole)
2. Kiln emission factors modified; both particulate and toxic.
3. Changes to chip and sawmill bin/venting based on wood distribution changes.
4. Planer mill is replaced and moved to another building along with newer baghouses/cyclone in 2018.
   a. Updated flow rates and other stack parameters are included based recent tests.
   b. Hourly throughput increased from 22,000 BF to 40,000 BF

A modeling protocol for this project was submitted to DEQ on February 24, 2020. A pre-application meeting with DEQ was held on February 21, 2020.

1.4 REQUESTED PERMIT CONDITIONS

1. Remove all operating scenarios in permit condition 3.8 of the current permit. Modify with the ability to operate all five kilns simultaneously when drying pine or white fir or combination thereof. Add restricted operations when drying Douglas fir. These include the use of only three kilns when drying Douglas fir. There are three combinations: Kilns 1 ,2 and 3; 1, 2, 4 and 1, 2, 5.

2. Remove permit condition 3.5.

3. All wood species shall be dried at temperatures of 180°F, to limit emissions of HAPs/TAPs. Note that 180°F is the maximum temperature used by Woodgrain and TAP emission factors were updated accordingly per discussion with IDEQ's most recent spreadsheet. Shawnee Chen provided the spreadsheet to Stantec on February 27, 2020.

   Note that short-term TAPs emissions were based on the highest emission rate from any of these wood species: White Fir, Western hemlock, Lodgepole Pine, Ponderosa Pine, Englemann Spruce, Larch, or Douglas Fir. Annual emissions of TAPs were based on the following maximum mix of wood species:

White fir:	50%
Ponderosa pine:	23.5%
Lodgepole Pine:	1.5%
Douglas fir:	25%

   Note that Engelmann Spruce and Larch may be dried as much as 5% but was not included in the modeling analysis because the total emissions are substantially lower than Douglas Fir.

4. Short-term $PM_{2.5}$ and PM_{10} emissions from the kilns are based on two potential operating scenarios.

   a. Option 1 – Worst-case combination of all five kilns operating simultaneously when drying pine or 4 quarter/dimension pine. Based on hourly emission rates, worst-case is White Fir with maximum charge of 215 MBF (Kilns 3-5), a minimum drying cycle of 50 hours and 4 quarter board pine with a maximum charge of 150 MBF (Kilns 1-2) and a minimum drying cycle of 40 hours. This results in an emission rate of 0.075 lb/hr per kiln for 1 and 2 and 0.086 lb/hr per kiln for 3-5. All other potential combinations of white fir and pine will produce fewer PM emissions. Regardless of the board types, it is assumed that the ratio between Ponderosa and Lodgepole pine is 95%/5% for annual averaging periods.

b. Option 2 – Three kilns are operating simultaneously when drying Douglas Fir. The maximum charge is 184 MBF (Kilns 1 and 2) and 215 MBF (Kilns 3-5) with a minimum drying cycle of 25 hours. The other two kilns are not operational when drying Douglas Fir. There are three kiln combinations that are proposed. These include: Kilns 1, 2, 3; Kilns 1, 2, 4 and Kilns 1, 2, 5.

All emission factors (EFs) are derived using the following formula as an example, which is consist with previous permitting analysis

$$\frac{\left(0.02\frac{lb}{MBF}*184{,}000\ BF\right)}{\left(50\ hrs*1000\frac{BF}{MBF}\right)} = 0.0736\ lb/hr \quad \text{(White Fir, Kilns 1 and 2)}$$

Table 1-1 Short-term Species Scenarios by Kiln

Option #	Species Distribution	Maximum BF/Kiln	Species ratio	Minimum hours	PM_{10} EF (lb/MBF)	lb/hr
1a	WF Kiln 1-2	184,000	All White Fir	50	0.02	0.0736
	WF Kiln 3-5	215,000				0.0860
1b	PP/LP Kiln 1-2	150,000	4 quarter boards, 1" thick vs 4"	40		0.0750
	PP/LP Kiln 3-5	161,000				0.0805
1c	PP/LP Kiln 1-2	184,000	Dimension[1] boards	94		0.0391
	PP/LP Kiln 3-5	215,000				0.0457
1d	Combo of WF & Pine	Various	Any combo of White fir and Pine	Various		0.075 & 0.086
2	DF Kiln 1-2	184,000	All Douglas Fir	25		0.1472
	DF Kiln 3 or 4 or 5	215,000				0.1720

1. The National Grading Rule under the Western Wood Products Association as defined by the American Lumber Standard Committee for Dimension Lumber contains three grades of framing: Construction, Standard, and Utility. Additionally, there are common grades of dimension lumber defined as #1C, #2C, #3C, and Economy.

2.0 TECHNICAL ANALYSIS

2.1 EMISSION UNITS AND CONTROL EQUIPMENT

Emission sources that have been decommissioned and removed from the mill site, new sources, and existing sources for which no changes have been made are listed in Table 2-1.

Table 2-1. Emission Units and Controls

Source ID No.	Source Description	Control Equipment	Emission Point ID No. and Description
Equipment Removed in 2015			
WELLBOIL	Wellons woodwaste-fired stoker boiler Manufacturer: Wellons Year manufactured: 1994 Type: Spreader stoker Rated heat input capacity: 28.87 MMBtu/hr Rated steam rate: 25,000 lbs/hr Max woodwaste input rate: 1.68 T/hr, 14,673 T/yr Fuel value: 8,613 Btu per dry lb	Electrostatic precipitator (ESP) Mfr: Wellons Type: Dry No. of T/R sets: 2 Air flow rate: 17,600 acfm at 350°F PM removal efficiency: 80%	WELLBOIL Stack height: 53.0 ft Exit diameter: 3.0 ft Flow rate: 17,600 acfm Exit temp: 350°F
BOILFUG	Fugitive Dust Sources Wood-waste fuel transfer points, ash handling associated with the Wellons woodwaste-fired stoker boiler.		
OLDFPUMP	Old Emergency Fire Pump Engine Mfr: John Deere Year manufactured: 1994 Rated capacity 140 bhp (104 kW) Fuel: #2 diesel Fuel sulfur content: 0.0015% Max fuel consumption: 7.79 gal/hr Displacement < 10 liters per cylinder Maintenance and testing hours: 100 hr/yr, per MACT Subpart ZZZZ (2014 permit)	None. Emissions from the pump engine were uncontrolled.	OLDFPUMP Stack height: 102.3 in (8.52 ft, 2.60 m) Exit diameter: 4 in (0.33 ft, 0.102 m) Exit velocity: 138.2 m/s Set to max 50 m/s (vertical, with rain flap) Exit temperature: 855°F
Equipment installed in 2015 (Exempt projects)			
BOILER1	Boiler No. 1 Manufacturer: Cleaver-Brooks Model: CB 200-500-150, packaged boiler Manufacture date: 1997 Serial No. OLO96563 Rated Heat Input: 20.925 MMBtu/hr Fuel: Natural gas only Max. steam production: 21,572 lb/hr ~675 boiler hp	None. Emissions from natural gas combustion in the boiler are uncontrolled.	BOILER1 Stack height: 25 ft Exit diameter: 2.0 ft Exhaust flow: 6819 cfm Exit temperature: 350°F
Equipment to be installed in 2016-2017 (Previous PTC)			

Table 2-1. Emission Units and Controls			
Source ID No.	**Source Description**	**Control Equipment**	**Emission Point ID No. and Description**
PUMPENGN	Emergency Fire Pump Engine Mfr: Caterpillar Model: C7.1 Displacement < 10 liters per cylinder Year manufactured/reconstructed: 2017 Rated capacity: Max 140 bhp (104 kW) Fuel: ULSD - Tier III certified	None. Combustion emissions from the diesel pump engine are uncontrolled.	PUMPENGN Stack height: 102.3 in (8.52 ft, 2.60 m) Exit diameter: 4 in (0.33 ft, 0.102 m) Exit velocity: max 50 m/s (vertical, with rain flap) Exit temperature: 855°F
BOILER2	Boiler No. 2 Manufacturer: Nebraska Model: TBD, packaged boiler Manufacture date: 1982 Serial No. TBD Rated Heat Input: ~33.5 MMBtu/hr Fuel: Natural gas only Max. steam production: ~34,510 lb/hr 1,000 boiler hp	None. Emissions from natural gas combustion in the boiler are uncontrolled.	BOILER2 Stack height: 32 ft Exit diameter: 2.0 ft Exhaust flow: 10,908 cfm Exit temperature: 350°F
KILN3	Dry Kiln No. 3 Manufacturer: Coe Model: Double-track, Length 120 ft Capacity: 215,000 board feet/charge	None. PM, VOC, and HAPs/TAPs emissions from the kiln are uncontrolled. Vent opening/closing is managed by computerized controls.	KILN3_01 thru KILN3_28 2 rows of 14 vents, each at: Exit height: 29.0 ft Exit: 1.7 ft dia (0.516 m) 1.5' x 1.5' square Exit velocity: 6.32 m/s (flow is impeded by vent flap) Exit temp: 170°F
KILN4	Dry Kiln No. 4 Manufacturer: USNR Model: Double-track, Length 120 ft Capacity: 215,000 board feet/charge	None. PM, VOC, and HAPs/TAPs emissions from the kiln are uncontrolled. Vent opening/closing is managed by computerized controls.	KILN4_01 thru KILN4_28 2 rows of 14 vents, each at: Exit height: 29.0 ft Exit: 1.7 ft dia (0.516 m) 1.5' x 1.5' square Exit velocity: 6.32 m/s (flow is impeded by vent flap) Exit temp: 170°F
KILN5	Dry Kiln No. 5 Manufacturer: USNR Model: Double-track, Length 120 ft Capacity: 215,000 board feet/charge	None. PM, VOC, and HAPs/TAPs emissions from the kiln are uncontrolled. Vent opening/closing is managed by computerized controls.	KILN5_01 thru KILN5_28 2 rows of 14 vents, each at: Exit height: 29.0 ft Exit: 1.7 ft dia (0.516 m) 1.5' x 1.5' square Exit velocity: 6.32 m/s (flow is impeded by vent flap) Exit temp: 170°F

Table 2-1. Emission Units and Controls

Source ID No.	Source Description	Control Equipment	Emission Point ID No. and Description
KILN1	Dry Kiln No. 1 Manufacturer: Wellons Model: Double-track, Length 104 ft Capacity: 184,000 board feet/charge	None. PM, VOC, and HAPs/TAPs emissions from the kiln are uncontrolled. Vent opening/closing is managed by computerized controls.	KILN1_01 thru KILN1_20 2 rows of 10 vents, each at: Exit height: 29.0 ft Exit: 1.7 ft dia (0.516 m) 1.5' x 1.5' square Exit velocity: 6.32 m/s (flow is impeded by vent flap) Exit temp: 170°F
KILN2	Dry Kiln No. 2 Manufacturer: Wellons Model: Double-track, Length 104 ft Capacity: 184,000 board feet/charge	None. PM, VOC, and HAPs/TAPs emissions from the kiln are uncontrolled. Vent opening/closing is managed by computerized controls.	KILN2_01 thru KILN2_18 2 rows of 9 vents, each at: Exit height: 29.0 ft Exit: 1.7 ft dia (0.516 m) 1.5' x 1.5' square Exit velocity: 6.32 m/s (flow is impeded by vent flap) Exit temp: 170°F
BARKBIN	Bark stripped from logs is chain-driven to a bark bin, which is periodically gravity-fed to trucks for offsite shipment.	None. Bark has relatively high moisture content as a result of sprays used to keep the log deck moist.	No Emissions
SAWDUST	Sawdust generated from the sawmill is pneumatically conveyed to the sawdust bin . This collected off the trimmer and Hew saw.	Enclosed conveyor to sawdust bin.	SAWDUST Fully enclosed
SAWLOAD	The sawdust is periodically gravity-fed to trucks for offsite shipment.	None	SAWLOAD Fugitive emissions
CHIPBIN	A chipper is fully enclosed within the sawmill building. The green wood chips generated by the chipper are chain-driven to the chip bin.	Enclosed conveyor	CHIPBIN Fully enclosed
CHIPLOAD	The green wood chips are periodically gravity-fed to trucks for offsite shipment.	None	CHIPLOAD Fugitive emissions
PLANERBH	Planer Baghouse Kiln-dried lumber is planed to final dimensions, producing shavings. Mfr: Pneumafil	Planer Baghouse Note: The emission factor for the cyclone/baghouse is based on board-feet processed per unit time.	PLANERBH1 Exit height: 20 ft Exit diameter: 36 in Exit flow rate: 35,472 acfm Exit temperature: Ambient

Table 2-1. Emission Units and Controls

Source ID No.	Source Description	Control Equipment	Emission Point ID No. and Description
TRIMMERBH	Trimmer Baghouse Kiln-dried lumber is trimmed to final dimensions, producing shavings. Mfr: Pneumafil	Trimmer Baghouse Note: The emission factor for the cyclone/baghouse is based on board-feet processed per unit time.	PLANERBH2 Exit height: 20 ft Exit diameter: 22 in Exit flow rate: 20,965.5 acfm Exit temperature: Ambient
SHAVLOAD	The planer shavings are periodically gravity-fed to trucks for offsite shipment.	None	SHAVLOAD Fugitive emissions

2.2 EMISSION INVENTORIES

2.2.1 Assumptions and Emission Factor Resources

Existing Equipment

Heat input ratings, capacities, and release parameters for equipment existing in 2017 were taken from the Statement of Basis and electronic modeling files for the 2017 permit for this facility. The stack height and diameter for Boiler No. 1 was confirmed in the field. The exhaust temperature for that stack and for Boiler No. 2 were provided by the manufacturer's representative.

Emission factors and assumptions for other equipment are summarized below and are shown in more detail in the first two worksheets of the emissions inventory spreadsheet.

Boilers, Natural Gas-Fired, Rating < 100 MMBtu/hr

AP-42, Section 1.4, Natural Gas Combustion (July 1998). The two boilers are used but "new" to the Emmett mill. The manufacture date for Boiler No. 1 is 1997. The manufacture date for Boiler No. 2 is 1982. AP-42 factors were determined to be more representative than Webfire factors for newer boilers.

Emergency Engine, 140 bhp, Model Year 2017

40 CFR 60, Subpart IIII, for NOx and CO

AP-42, Section 3.3, Gasoline, and Diesel Industrial Engines (October 1996), for all other criteria pollutants, HAPS, and GHGs.

Kilns, Dry

Recent source test data suggests lower factors as it relates to hemlock/Douglas Fir. The Sierra Pacific Mount Vernon pilot kiln performed a test in 2013, which illustrates a factor of 0.0197 lb/mbf[2]. Additionally, a 2013 permit from the Washington Department of Ecology permitted kilns using 0.02 lb/mbf for Douglas Fir and hemlock[3]. Note that hemlock source tested by other state agencies from North Carolina, Oklahoma and Arkansas have also employed 0.022 lb/mbf[4]. There was an addition test at the Sierra Pacific Ferndale facility which suggested a very low rate (0.00614 lb/mbf)[5]. While that appears to be somewhat of an outlier, it also explicitly states $PM_{2.5}$ when some of the other sources only reflect PM or assume PM_{10} equivalency. Based on the consensus of other states and more recent source test information, a value of 0.02 lb/mbf for all wood types is considered appropriate.

All VOC and TAP emission factors were derived from a 2019 compilation of factors developed by Idaho DEQ and EPA Region 10.[6]

Planer and Trimmer Baghouses

DEQ provided some information related to another wood mill permitted facility (Idaho Forest Group, IFG) and asked if 20% of the planer baghouse emissions would be an appropriate representative of Woodgrain's trimmer baghouse emissions. Stantec and Woodgrain reviewed some of the most recent IFG permits. It was also determined that the process used by IFG is very similar to that employed by Woodgrain. Therefore, it was concluded that 20% would be representative. However, to maintain a higher level of conservatism, the updated emissions inventory applied 50%. This change was accepted by DEQ on July 2nd.

It was also determined that DEQ has accepted a 67% ratio of PM2.5 to PM10 for planer and trimmer processes. In previous analysis, Woodgrain was assuming that the two were equivalent. This update was accepted by DEQ on June 9th. The source for this change is the EPA PM

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[2] 2013 Sierra Pacific Source Mt Vernon Test Pilot kiln Oregon SW Clean Air Agency http://www.swcleanair.org/docs/Dry%20Kilns/SourceTests/2013-05-29%20Sierra%20Pacific%20-%20Mt%20Vernon%20-%20Pilot%20Dry%20Kiln%20Filterable%20and%20Condensable%20PM%20Test%20Report.pdf
[3] Washington State of Ecology Sierra Pacific Permit https://fortress.wa.gov/ecy/ezshare/AQ/PSD/PSD_PDFS/Final_SPI_PSD_05-04_Amendment_2_Permit_10232013.pdf
[4] NC https://deq.nc.gov/about/divisions/air-quality/air-quality-permits/application-forms-instructions/application-forms-air-quality-permit-construct-operate-non-title-v-title-v-facilities/spreadsheets
OK https://applications.deq.ok.gov/permitspublic/storedpermits/4324.pdf
[5] 2013 Sierra Pacific Source Ferndale Test Pilot kiln Oregon SW Clean Air Agency http://www.swcleanair.org/docs/Dry%20Kilns/SourceTests/2013-02-21%20Sierra%20Pacific%20-%20Chemco%20-%20Ferndale%20-%20Dry%20Kiln%20PM%20Test%20Report.pdf
[6] EPA Region 10 HAP and VOC Emission Factors for Lumber Drying

Calculator. This approach is also consistent with the Grangeville IFG permit[7] . Therefore, the emission rates for the planer and trimmer baghouse have been updated. The changes are: 1) 50% emission reduction from the planer to the trimmer; 3) $PM_{2.5}$ emissions are reduced by 33% from the PM_{10} values. See refer to Appendix I for more details.

2.2.2 Pre-Project Emissions, Criteria Pollutants and GHGs

The change in emissions of criteria pollutants and greenhouse gases (GHGs, as represented by the equivalent emissions of carbon dioxide (CO_2e)) in pounds per hour (lb/hr) are shown in Table 2-2. The value shown for kiln VOCs is the worst-case emission rate for any of the wood species processed at the Emmett Mill. Detailed tables showing pre- and post-project emissions are also included in the electronic emissions inventory. VOC emissions have been modified to reflect the 2019 factors. While the potentially hourly rate is increasing, the overall annual VOC emissions are decreasing because the percentage of pine (higher VOC emission factors) to be dried is much less than the previous permitting action. Pre-project emissions in tons per year (T/yr) are shown in Table 2-3. Note that the fire pump engine PM, CO and NOx emissions were slightly updated because the previous application incorporated the new CAT C7.1 engine at the last minute and the emission calculations were not updated. Other changes include increasing the throughput of the planer from 22,000 BF to 40,000 BF per hour, but the annual total is unchanged. Finally, the chip bin no longer releases to atmosphere. It is fully enclosed.

[7] PTC application - https://www.deq.idaho.gov/media/60183070/idaho-forest-group-grangeville-ptc-application-0719.pdf

Table 2-2 Pre-Project Emissions

(lb/hr)							
Process	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**CO_2e**
Boiler No. 1	0.16	0.16	2.06	0.012	1.73	0.11	
Boiler No. 2	0.25	0.25	3.29	0.020	2.76	0.18	
Dry Kilns (5) (90 MMBF/yr)	0.20	0.20				37.05	
Planer mill baghouse	0.30	0.30					
Sawdust bin vent	0.15	0.21					
Chip bin vent	0.26	0.26					
Fire pump engine	0.046	0.046	0.92	0.0015	0.23	0.35	
Total	**1.36**	**1.43**	**6.27**	**0.03**	**4.72**	**37.70**	

Table 2-3 Pre-Project Emissions

(T/yr)							
Process	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**CO_2e**
Boiler No. 1 @ 8760 hr/yr	0.68	0.68	9.0	0.05	7.56	0.50	10,864
Boiler No. 2 @ 8760 hr/yr	1.09	1.09	14.4	0.09	12.10	0.79	17,379
Dry Kilns (5) (90 MMBF/yr)	0.86	0.86				67.87	
Planer mill baghouse @90 MMBF/yr	0.34	0.34					
Sawdust bin vent @90 MMBF/yr	0.29	0.43					
Chip bin vent @90 MMBF/yr	1.48	1.48					
Fire Pump Engine @ 500 hr/yr	0.012	0.012	0.23	0.0004	0.06	0.09	40.18
Total	**4.75**	**4.89**	**23.64**	**0.14**	**19.72**	**69.25**	**28,283**

2.2.3 Post-Project Emissions, Criteria Pollutants and GHGs

Tables 2-4 and 2-5 summarize the post-project emissions, based on the assumptions noted in the tables.

Table 2-4 Post-Project Emissions

(lb/hr)							
Process	**PM_{10}**	**$PM_{2.5}$**	**NOx**	**SO_2**	**CO**	**VOC**	**CO_2e**
Boiler No. 1	0.16	0.16	2.06	0.012	1.73	0.11	
Boiler No. 2	0.25	0.25	3.29	0.020	2.76	0.18	
All Dry Kilns (5) 90 MMBF	0.47	0.47				47.94	
Planer mill baghouse	0.30	0.30					
Trimmer baghouse	0.22	0.22					
Sawdust bin vent	0.15	0.21					
Chip bin vent	0.00	0.00					
Fire pump engine	0.05	0.05	0.92	0.0015	0.23	0.35	
Total	**1.59**	**1.66**	**6.27**	**0.03**	**4.72**	**48.59**	

Table 2-5 Post-Project Emissions

(T/yr)							
Process	**PM_{10}**	**$PM_{2.5}$**	**NOx**	**SO2**	**CO**	**VOC**	**CO_2e**
Boiler No. 1 @ 8760 hr/yr	0.68	0.68	9.00	0.05	7.56	0.50	10,864
Boiler No. 2 @ 8760 hr/yr	1.09	1.09	14.4	0.09	12.1	0.79	17,379
All Dry Kilns (5) 90 MMBF	0.90	0.90				45.92	
Planer mill baghouse @ 90 MMBF/yr	0.34	0.34					
Trimmer baghouse @ 90 MMBF/yr	0.11	0.11					
Sawdust bin vent @ 90 MMBF/yr	0.29	0.43					
Chip bin vent @ 90 MMBF/yr	0.00	0.00					
Fire Pump Engine @ 500 hr/yr	0.01	0.01	0.23	0.0015	0.06	0.09	40.18
Total	**3.43**	**3.57**	**23.64**	**0.14**	**19.72**	**47.30**	**28,283**

2.2.4 Change in Emissions, Criteria Pollutants and GHGs

The increase in emissions associated with this project is shown in Tables 2-6 and 2-7.

Table 2-6 Change in Emissions

(lb/hr)							
Process	**PM_{10}**	**$PM_{2.5}$**	**NOx**	**SO_2**	**CO**	**VOC**	**CO_2e**
Pre-Project Emissions	1.36	1.43	6.27	0.03	4.72	37.70	
Post-Project Emissions	1.59	1.66	6.27	0.03	4.72	48.59	
Total Change	**0.22**	**0.22**	**0.00**	**0.00**	**0.00**	**10.89**	

Table 2-7 Change in Emissions

(T/yr)							
Process	**PM_{10}**	**$PM_{2.5}$**	**NOx**	**SO2**	**CO**	**VOC**	**CO_2e**
Pre-Project Emissions	4.75	4.89	23.64	0.14	19.72	69.25	28,283
Post-Project Emissions	3.43	3.57	23.64	0.14	19.72	47.30	28,283
Total Change	**-1.32**	**-1.32**	**0.00**	**0.00**	**0.00**	**-21.95**	**0.00**

2.2.5 HAPs/TAPs Emissions

The change in emissions of toxic air pollutants (TAPs) from this project is described in detail in the emission inventory (Appendix C) and modeling report (see Appendix D). Maximum emissions of any HAP (methanol) are 3.43 tons per year. Maximum emissions of all HAPs are 8.19 tons per year.

2.3 AMBIENT AIR QUALITY IMPACT ANALYSES

A detailed description of the ambient air quality impact analyses is included as Appendix D to this report. The analyses demonstrated that the project will not cause a violation of any applicable air quality standard.

3.0 REGULATORY APPLICABILITY

A review of applicable State and Federal Rules for this project is provided in Sections 3.1 and 3.2 below.

3.1 STATE REGULATORY APPLICABILITY

A review of applicable requirements of the Rules for the Control of Air Pollution in Idaho is provided in Table 3-1 for this project. Each regulation is described in the sections following the table.

Table 3-1 State Regulatory Applicability Summary

Section	Description	Regulatory Citation	Applicable?
3.1.1	Certification of Documents	IDAPA 58.01.01.123	Yes
3.1.2	Excess Emissions	IDAPA 58.01.01.130-136	Yes
3.1.3	Ambient Air Quality Standards for Specific Air Pollutants	IDAPA 58.01.01.577	Yes
3.1.4	Toxic Air Pollutants	IDAPA 58.01.01.585 and 586	Yes
3.1.5	New Source Performance Standards	IDAPA 58.01.01.590	Yes
3.1.6	National Emissions Standards for Hazardous Air Pollutants	IDAPA 58.01.01.591	Yes
3.1.7	Open Burning	IDAPA 58.01.01.600-616	Yes
3.1.8	Visible Emissions	IDAPA 58.01.01.625	Yes
3.1.9	Rules for Control of Fugitive Dust	IDAPA 58.01.01.650	Yes
3.1.10	Fuel Burning Equipment – Particulate Matter	IDAPA 58.01.01.675-681	Yes
3.1.11	Particulate Matter – Process Weight Limitations	IDAPA 58.01.01.701	Yes
3.1.12	Odors	IDAPA 58.01.01.775-776	Yes

3.1.1 Certification of Documents

IDAPA 58.01.01.123 requires that all documents, including application forms for permits to construct, records, and monitoring reports submitted to DEQ, contain a certification by a responsible official. Woodgrain will comply with this requirement, and the appropriate certifications by a responsible official are being submitted with this application.

3.1.2 Excess Emissions

IDAPA 58.01.01.130-136 requires that any episode of excess emissions be reported to DEQ, where appropriate. Woodgrain will abide by all excess emission requirements.

3.1.3 Ambient Air Quality Standards for Specific Air Pollutants

IDAPA 58.01.01.577 establishes ambient air quality standards for specific air pollutants including $PM_{2.5/10}$, Sulfur Dioxide, Ozone, Nitrogen Dioxide, Carbon Monoxide, and Lead. Dispersion modeling was conducted for $PM_{2.5}$, PM_{10}, and NOx. Please see the dispersion modeling report in Appendix D for details.

3.1.4 Toxic Air Pollutants

IDAPA 58.01.01.585 and 586 establishes requirements for compliance with toxic air pollutants. Toxic pollutants associated with this project have been evaluated and demonstrated compliance with the standards. Please refer to Section 2.2.5 of this document for details.

3.1.5 New Source Performance Standards

New Source Performance Standards (NSPS) in 40 CFR Part 60 apply to new, modified, or reconstructed stationary sources that meet or exceed specified applicability thresholds.

Emergency Fire Pump Engine, 40 CFR 60, Subpart IIII

The new fire pump engine was installed in 2017. The pump engine was reconstructed in early 2017, was not reconstructed as a fire pump engine, and is subject to 40 CFR 60, Subpart IIII.

Per Section 60.4200(a), the construction date for this engine is the date the engine was ordered, in July 2017.

Emission Standards:

Per Section 60.4205(b), the emergency "fire pump" engine must comply with the emission standards for new nonroad CI engines in §60.4202, for all pollutants, for the same model year and maximum engine power.

60.4202(a) Stationary CI internal combustion engine manufacturers must certify their 2007 model year and later emergency stationary CI ICE with a maximum engine power less than or equal to 2,237 KW (3,000 HP) and a displacement of less than 10 liters per cylinder that are not fire pump engines to the emission standards specified in paragraphs (a)(1) through (2) of this section.

60.4202(a)(2) For engines with a maximum engine power greater than or equal to 37 KW (50 HP), the certification emission standards for new nonroad CI engines for the same model year and maximum engine power in 40 CFR 89.112 and 40 CFR 89.113 for all pollutants beginning in model year 2007.

89.112, Oxides of nitrogen, carbon monoxide, hydrocarbon, and particulate matter exhaust emission standards. Table 1, *for rated power equal to 140 bhp (104.398 kW).*

(a) Exhaust emission from nonroad engines to which this subpart is applicable shall not exceed the applicable emission standards contained in Table 1, as follows:

Table 1.—Emission Standards (g/kW-hr)

Rated Power (kW)	Tier	Model Year	NOx	HC	NMHC + NOx	CO	PM
75 ≤ kW < 130	Tier 3	2017	---	---	4.0	5.0	0.30

Note that the CAT C7.1 has a CO and PM emission rate of 1.0 g/kW-hr and 0.20 g/kW-hr.

89.113, Smoke Emission Standard

(a) Exhaust opacity from compression-ignition nonroad engines for which this subpart is applicable must not exceed:

(1) 20 percent during the acceleration mode;
(2) 15 percent during the lugging mode; and
(3) 50 percent during the peaks in either the acceleration or lugging modes.

Fuel Requirements:

60.4207 (b) Beginning October 1, 2010, owners and operators of stationary Compression Ignition Internal Combustion Engine subject to this subpart with a displacement of less than 30 liters per cylinder that use diesel fuel must purchase diesel fuel that meets the requirements of 40 CFR 80.510(b) for nonroad diesel fuel.

80.510(b) Beginning June 1, 2010. Except as otherwise specifically provided in this subpart, all NR and LM diesel fuel is subject to the following per-gallon standards:

(1) Sulfur content.

(i) 15 ppm maximum for Nonroad diesel fuel.

(ii) 500 ppm maximum for Locomotive or marine diesel fuel.

(2) Cetane index or aromatic content, as follows:

(i) A minimum cetane index of 40; or

(ii) A maximum aromatic content of 35 volume percent.

Monitoring Requirements:

60.4209(a) If you are an owner or operator of an emergency stationary CI internal combustion engine that does not meet the standards applicable to non-emergency engines, you must install a non-resettable hour meter prior to startup of the engine.

Compliance Requirements:

60.4206 Owners and operators of stationary CI ICE must operate and maintain stationary CI ICE that achieve the emission standards as required in §§60.4204 and 60.4205 over the entire life of the engine.

60.4211(a) If you are an owner or operator and must comply with the emission standards specified in this subpart, you must do all of the following, except as permitted under paragraph (g) of this section:

(1) Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's emission-related written instructions.

(2) Change only those emission-related settings that are permitted by the manufacturer; and

(3) Meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply to you.

(f) If you own or operate an emergency stationary ICE, you must operate the emergency stationary ICE according to the requirements in paragraphs (f)(1) through (3) of this section. In order for the engine to be considered an emergency stationary ICE under this subpart, any operation other than emergency operation, maintenance and testing, emergency demand response, and operation in non-emergency situations for 50 hours per year, as described in paragraphs (f)(1) through (3) of this section, is prohibited. If you do not operate the engine according to the requirements in paragraphs (f)(1) through (3) of this section, the engine will not be considered an emergency engine under this subpart and must meet all requirements for non-emergency engines.

(1) There is no time limit on the use of emergency stationary ICE in emergency situations.

(2) You may operate your emergency stationary ICE for any combination of the purposes specified in paragraphs (f)(2)(i) through (iii) of this section for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by paragraph (f)(3) of this section counts as part of the 100 hours per calendar year allowed by this paragraph (f)(2).

(i) Emergency stationary ICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE beyond 100 hours per calendar year.

(g) If you do not install, configure, operate, and maintain your engine and control device according to the manufacturer's emission-related written instructions, or you change emission-related settings in a way that is not permitted by the manufacturer, you must demonstrate compliance as follows:

(1) If you are an owner or operator of a stationary CI internal combustion engine with maximum engine power less than 100 HP, you must keep a maintenance plan and records of conducted maintenance to demonstrate compliance and must, to the extent practicable, maintain and

operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, if you do not install and configure the engine and control device according to the manufacturer's emission-related written instructions, or you change the emission-related settings in a way that is not permitted by the manufacturer, you must conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of such action.

(2) If you are an owner or operator of a stationary CI internal combustion engine greater than or equal to 100 HP and less than or equal to 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of startup, or within 1 year after an engine and control device is no longer installed, configured, operated, and maintained in accordance with the manufacturer's emission-related written instructions, or within 1 year after you change emission-related settings in a way that is not permitted by the manufacturer.

Testing Requirements:

60.4212 Owners and operators of stationary CI ICE with a displacement of less than 30 liters per cylinder who conduct performance tests pursuant to this subpart must do so per paragraphs (a) through (e) of this section.

General Provisions (40 CFR 60): Table 8 of the subpart.

Natural Gas-Fired Boilers No. 1 and No. 2, 40 CFR 60, Subpart Dc

Boiler No. 1 is a 20.925 MMBtu/hr Cleaver Brooks package boiler constructed in 1997. Boiler No. 2 has a maximum heat input rating of 33.5 MMBtu/hr (1,000 boiler horsepower) manufactured by Nebraska in 1982. Both boilers combust natural gas exclusively.

Per 60.40c(a), this rule applies to any boiler for which construction, modification, or reconstruction commenced after June 9, 1989 and that has a maximum design heat capacity between 10 and 100 MMBtu/hr. Both boilers fall into the heat capacity range, but only Boiler No. 1 was constructed after 1989. The provisions of Subpart Dc do not apply to Boiler No. 2.

The SO_2 emission limits in Section 60.42c do not apply because Boiler No. 1 combusts natural gas exclusively. The PM emission limits in Section 60.43c do not apply because Boiler No. 1 combusts natural gas exclusively.

3.1.6 National Emission Standards for Hazardous Air Pollutants

Emergency Fire Pump Engine, 40 CFR 63, Subpart ZZZZ

The emergency fire pump engine is a 140 bhp diesel engine ordered by Woodgrain in July 2017. The engine was built after June 6, 2006. The engine is subject to the requirements specified in 40 CFR 63, Subpart ZZZZ, that apply to new and reconstructed stationary engines rated at less than 500 bhp located at an area source of HAPs.

In accordance with 40 CFR 63.6590(c)(1), a new or reconstructed stationary RICE located at an area source must meet the requirements of Subpart ZZZZ by meeting the requirements of 40 CFR 60, Subpart IIII for compression ignition (diesel) engines. No further requirements of Subpart ZZZZ apply.

Natural Gas Fired Boilers No. 1 and No. 2, 40 CFR 63, Subpart JJJJJJ (6J)

Boiler No. 1, which replaced the old Wellons wood-waste fired boiler in 2015 (an exempt project), and Boiler No. 2, which is being added as part of this permitting project, are both fueled exclusively by natural gas; no testing on liquid fuel is anticipated. As defined in 40 CFR 63.11237:

> *Gaseous fuels* includes, but is not limited to, natural gas, process gas, landfill gas, coal derived gas, refinery gas, hydrogen, and biogas.
>
> *Gas-fired boiler* includes any boiler that burns gaseous fuels not combined with any solid fuels, burns liquid fuel only during periods of gas curtailment, gas supply emergencies, or periodic testing on liquid fuel. Periodic testing of liquid fuel shall not exceed a combined total of 48 hours during any calendar year.

Gas-fired boilers as defined above are explicitly excluded from the requirements of Subpart 6J by 40 CFR 63.11195 and 63.11195(e).

40 CFR 63, Subpart DDDD (4D)

This subpart applies to Plywood and Composite Wood Products.

§63.2230 What is the purpose of this subpart?

This subpart establishes national compliance options, operating requirements, and work practice requirements for hazardous air pollutants (HAP) emitted from plywood and composite wood products (PCWP) manufacturing facilities. This subpart also establishes requirements to demonstrate initial and continuous compliance with the compliance options, operating requirements, and work practice requirements.

Section 63.2231 states that both subparts (a) and (b) must apply to Woodgrain. Part (a) applies because there are lumber kilns and produce kiln-dried lumber, however part (b) states that the facility must be a major source for HAPs. A major source is defined as 25 tons/yr of HAPs in total or 10 tons/yr of the maximum HAP. Woodgrain emits annually a total of 8.15 tons and a maximum of 3.46 tons of methanol.

40 CFR 63, Subpart QQQQ (4Q)

This subpart applies to surface coatings of wood products. Woodgrain does not apply any coatings whatsoever. Also, laminating does not take place at Woodgrain. Therefore, this subpart does not apply.

3.1.7 Open Burning

IDAPA 58.01.01.600 and 616 establishes requirements for open burning. Woodgrain does not expect to conduct open burning at the facility; however, Woodgrain will comply with the requirements under Section 600-616 if any allowable burning is to be conducted at the facility.

3.1.8 Visible Emissions

IDAPA 58.01.01.625 restricts discharge of air pollutants into the atmosphere which is greater than 20% opacity for a period or periods aggregating more than three (3) minutes in any sixty (60) minute period. Woodgrain will comply with this rule by conducting monthly facility-wide inspections of potential sources of visible emissions, during daylight hours and under normal operating conditions. The inspection will consist of a see/no see evaluation for each potential source. If any visible emissions are observed Woodgrain will take corrective action or perform a Method 9 or Method 22 opacity test in accordance with the procedures outlined in IDAPA 58.01.01.625. Woodgrain will keep records onsite documenting the monthly visible emission inspection or Method 9/22 test conducted.

3.1.9 Rules for Control of Fugitive Dust

IDAPA 58.01.01.650 requires that all reasonable precautions be taken to prevent the generation of fugitive dust. Woodgrain will comply with fugitive particulate matter regulations.

3.1.10 Fuel Burning Equipment - Particulate Matter

IDAPA 58.01.01.676 restricts emissions from fuel burning sources, which are defined as any furnace, boiler, apparatus, stack and all appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer. Boiler Nos. 1 and 2 are subject to an allowable emission standard equal to 0.015 grains per dry standard cubic foot (gr/dscf) at 3% oxygen.

Table 3-2. Compliance with PM Emission Standard			
	Unit:	**Boiler No. 1**	**Boiler No.2**
Applicable PM Standard		676	676
Fuel		Natural Gas	Natural Gas
Rated Heat Input (Q, MMBtu/hr)		20.93	33.48
PM Emission Rate (lb/hr)		0.156	0.250
Flue Gas Flowrate Calculation			
F_d (Table 19-2, EPA Method 19) (dscf/MMBtu)		8,710	8,710
Exit flowrate @ 0% O_2 = Fd x Q x (hr/60 min)= (dscfm)		3,038	4,860
Convert flow rate to %O_2 =		3	3
Exit flowrate: (dscfm) [1]		3,548	5,675
Calculated Grain Loading (gr/dscf @O_2) [2]		0.005	0.005
PM Loading Standard		0.015	0.015
Compliance w/ PM Loading Standard?		**Yes**	**Yes**

[1] Example: Flow @3%O_2 = Flow @0%O2 x (20.9/(20.9 - 3)), where 20.9 = Oxygen concentration (%) in ambient air and "3" = %O_2 is the stack oxygen concentration in percent on a dry basis.

[2] (PM lb/hr) x (7,000 gr/lb) x (hr /60 min) x (min/dscf) = gr/dscf

3.1.11 Particulate Matter - Process Weight Limitations

IDAPA 58.01.01.701 promulgates restrictions on PM for the entire facility based on process weight. Fuel burning equipment at the facility is not subject to this requirement.

For "new" equipment that commenced operation on or after October 1, 1979, the PM allowable emission rate (E) is based on one of the following two equations:

If PW is < 9,250 lb/hr, E = 0.045(PW)0.60 (Eqn. 701.01.a)

If PW is > 9,250 lb/hr, E = 1.10(PW)0.25 (Eqn. 701.01.b)

"New Equipment" at the Emmett Mill includes just the three new kilns; there is no change in the maximum short-term emissions from the rest of the mill processes.

Kiln Process Weight. The two older kilns have a maximum capacity ranging of 150,000 BF for pine and 184,000 BF for White Fir, Douglas Fir and larch of lumber per charge. The three newer kilns charge range from 150,000 BF (Ponderosa and Lodgepole Pine) and 215,000 BF for White and Douglas Fir. Process weight for the kilns depends on the maximum kiln charge and the minimum drying time for any wood species processed, as shown in Table 3-3.

Table 3-3. Kiln Process Weight Emission Limit (emissions vary by wood species).

Log Species	Density (lb/ft3)	Convert to lb/BF	lb/ charge	Kiln Cycle (hrs)	Process Weight (lb/hr)	Rule 701 PM Limit per kiln (lb/hr)	Max PM Emissions (lb/hr)	Complies with Process Weight Limit?
White Fir	46	3.83	824,167	50	16,483	12.46	0.086	Yes
Lodgepole Pine	39	3.25	523,250	40	13,081	11.76	0.126	Yes
Douglas Fir	35	2.92	627,083	25	25,083	13.84	0.172	Yes
Ponderosa Pine	45	3.75	603,750	94	6,423	8.67	0.126	Yes
Engelman Spruce	39	3.25	698,750	25	27,950	14.22	0.172	Yes
Larch	48	4.00	860,000	25	34,400	14.98	0.172	Yes

3.1.12 Odors

IDAPA 58.01.01.775-776 requires no emissions of odorous gases, liquids, or solids to the atmosphere in such quantities as to cause air pollution. Woodgrain will comply with this requirement by keeping records of any odor complaints received and will take appropriate action for each complaint which has merit.

3.2 FEDERAL REGULATORY APPLICABILITY

A review of applicable Federal Rules is provided in Table 3-4. The completed federal regulatory applicability FRA form is included in Appendix B.

Table 3-4 Federal Regulatory Applicability Summary

Section	Description	Regulatory Citation	Applicable?
3.2.1	National Ambient Air Quality Standards (NAAQS)- (dispersion modeling)	40 CFR Part 50	Yes
3.2.2	Title V Operating Permit	40 CFR Part 70	No
3.2.3	Air Pollutants (NESHAPs)	40 CFR Parts 61, 63	Yes
3.2.4	New Source Review (NSR/PSD)	40 CFR Part 52	No
3.2.5	New Source Performance Standards (NSPS)	40 CFR Part 60	Yes
3.2.6	Acid Rain Requirements	40 CFR Parts 72–78	No
3.2.7	Risk Management Programs for Chemical Accidental Release Prevention	40 CFR Part 68	No

3.2.1 National Ambient Air Quality Standards (NAAQS)

Primary NAAQS are identified in 40 CFR Part 50 and define levels of air quality, which the United States Environmental Protection Agency (USEPA) deems necessary to protect the public health. Secondary NAAQS define levels of air quality, which the USEPA judges necessary to protect public welfare from any known or anticipated adverse effects of a pollutant. Examples of public welfare include protecting wildlife, buildings, national monuments, vegetation, visibility, and property values from degradation due to excessive emissions of criteria pollutants.

Specific standards for the following pollutants have been promulgated by USEPA: $PM_{2.5}$, PM_{10}, SO_2, NO_x, CO, ozone, and lead. The emission sources at the Emmett mill will emit $PM_{2.5}$, PM_{10}, SO_2, NO_x, CO, and VOCs, a precursor to ozone. A demonstration of compliance with the applicable NAAQS is described in the dispersion modeling report included as Appendix D.

3.2.2 Title V (Part 70) Operating Permit

Title V of the Clean Air Act created the federal operating permit program. These permitting requirements are codified in 40 CFR Part 70. These permits are required for major sources with a PTE (considering federally enforceable limitations) greater than 100 tpy for any criteria pollutant, 25 tpy for all HAPs in aggregate, or 10 tpy of any single HAP. The Emmett mill is a minor source because the potential to emit any criteria pollutant is less than 100 tons per year, the potential to emit of all HAPs in aggregate is less than 25 tpy, and the potential to emit of any single HAP is less than 10 tpy.

3.2.3 National Emission Standards for Hazardous Air Pollutants (NESHAPs)

NESHAPs are discussed in Section 3.1.6 above.

3.2.4 Prevention of Significant Deterioration (PSD) Requirements

Gem County is designated as in attainment or unclassifiable for all criteria pollutants. Therefore, the PSD regulations codified in 40 CFR Part 52 could potentially apply to the proposed facility. The PSD rule applies to: (1) a new major source that has the potential to emit 100 tons per year or more for any criteria pollutant for a facility that is one of the 28 industrial source categories listed in 40 CFR § 52.21(b)(1)(i)(a); or (2) a new major source that has the potential to emit 250 tons per year or more of a regulated pollutant if the facility is not on the list of industrial source categories; or (3) a modification to an existing major source that results in a net emission increase greater than a PSD significant emission rate as specified in 40 CFR § 52.21 (b)(23)(i); or (4) a modification to an existing minor source that is major in itself. The Emmett mil does not fall under one of the 28 industrial source categories, nor will the PTE exceed 250 tpy for any regulated pollutant. Therefore, the mill is not subject to PSD regulations.

3.2.5 New Source Performance Standards (NSPS)

New Source Performance Standards are discussed in Section 3.1.5 above.

3.2.6 Acid Rain Requirements

The acid rain requirements codified in 40 CFR Parts 72-78 apply only to utilities and other facilities that combust fossil fuel and generate electricity for wholesale or retail sale. The proposed facility will not produce electrical power for sale. Therefore, the facility is not subject to the acid rain provisions and will not require an acid rain permit.

3.2.7 Risk Management Programs for Chemical Accidental Release Prevention

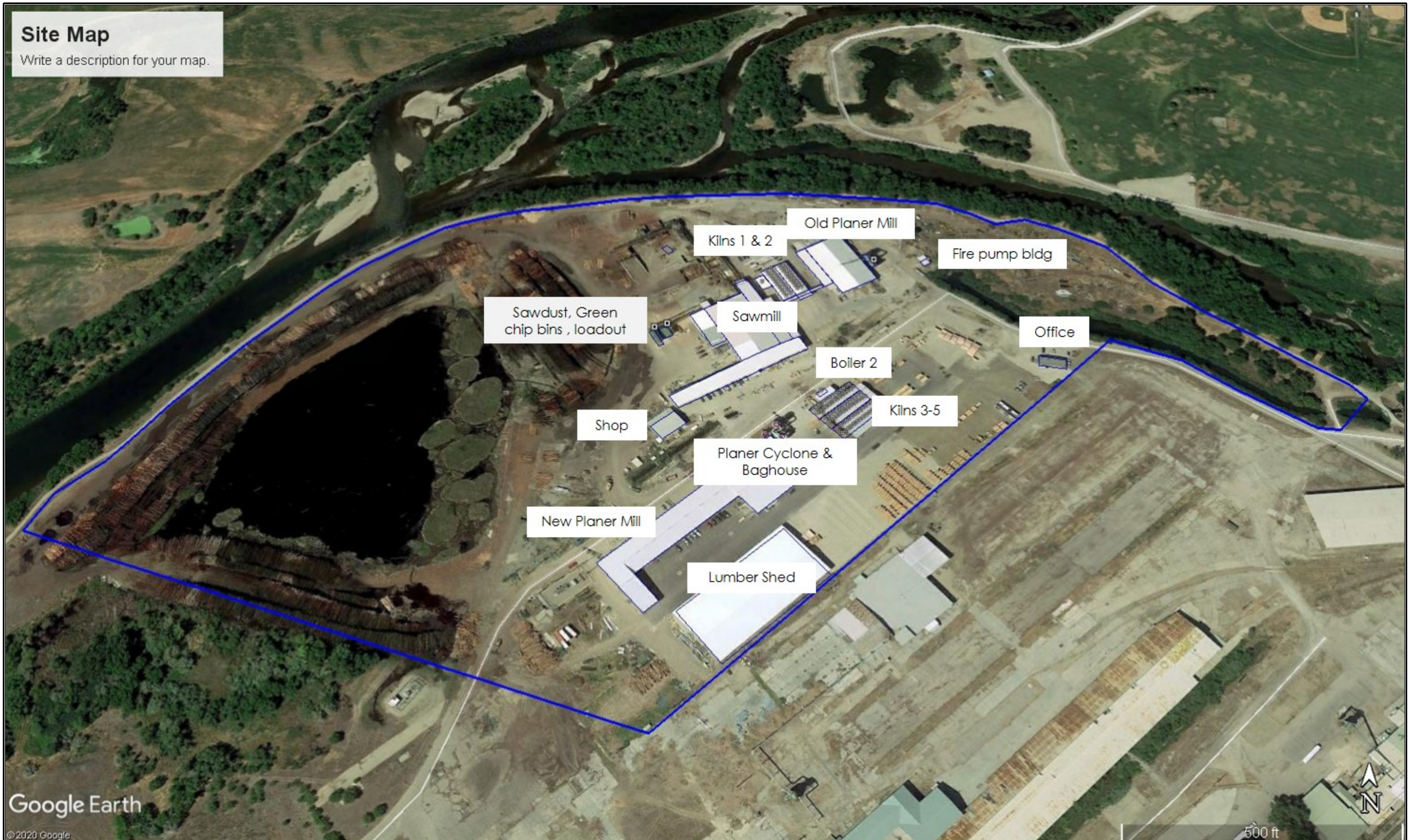
The facility is not subject to the Chemical Accidental Release Prevention Program and will not be required to develop a Risk Management Plan (RMP). Facilities that produce, process, store, or use any regulated toxic or flammable substance in excess of the thresholds listed in 40 CFR Part 68 must develop a RMP. The facility does not store any regulated toxic or flammable substances in excess of the applicable thresholds. An RMP is not necessary for this facility.

APPENDICES

Appendix A SITE MAP

PERMIT TO CONSTRUCTION APPLICATION – KILN CONFIGURATION UPDATE

Appendix A Site Map
September 29, 2020



Appendix B DEQ PTC FORMS AND CHECKLISTS

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Baghouse Control Equipment **Form BCE**
Revision 6
2/18/10

Complete this form for each baghouse. Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name	2. Facility Name:
Woodgrain Millwork	Woodgrain Millwork - Emmett Lumber

3. Brief Project Description: New planer baghouse to new planer building

BAGHOUSE INFORMATION

4. Baghouse Manufacturer: Pneumafil	5. Baghouse Model: 13.5	6. Baghouse Equipment ID: PBH1

7 (a). Baghouse particulate matter emission concentration. **Note: Provide information in 7(a)-(c) or answer question #8 below.**	_____ gr/dscf	*Manufacturers typically provide guarantees in grains per dry standard cubic foot (gr/dscf). Provide a copy of the guarantee, or other documentation, with the application along with a description of the types of bags that must be used to achieve the emission concentration.* ***Emission concentrations less than 0.01 gr/dscf will receive additional scrutiny by DEQ and a source test of the baghouse may be required.*** *If a guarantee is not provided then you must document how you obtained the emission concentration. Without documentation the application is not complete.*
7 (b). Percentage PM_{10} Or Provide PM_{10} Emission Concentration	_____ % _____ gr/dscf	*What percentage of the PM concentration listed in question #7(a) is PM_{10}. You must provide documentation as to how the percentage was determined (i.e per the baghouse manufacturer). Without documentation the application is not complete.*
7 (c). Baghouse flow rate	35,472.5 dscfm	*Provide the baghouse flow rate in dry standard cubic feet per minute. Actual cubic feet per minute may be given in lieu of dscfm* ***if it is documented*** *that moisture content is insignificant. You must provide documentation as to how this flow rate was determined (i.e. per the exhaust fan manufacturer, combustion evaluation, etc.). Without documentation the application is not complete.*
8. Baghouse particulate matter control efficiency. **Note: Not needed if section #7 is completed.**	_____ % PM control _____ % PM_{10} control	*Applicant's providing the control efficiency of the baghouse must provide control efficiency for both PM and PM_{10}. Provide a copy of the control efficiency documentation with the application. Documentation must include a description of the types of bags that must be used to achieve the control efficiency. Without documentation the application is not complete.*
9. Is the baghouse equipped with a bag leak detector?	☐ Yes ☒ No	*If a bag leak detector is installed provide documentation on the leak detector, including; how the leak detector functions and what level of the output signal indicates that a bag is leaking. Without documentation the application is not complete.*

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Baghouse Control Equipment **Form BCE**
Revision 6
2/18/10

Complete this form for each baghouse. Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name	2. Facility Name:
Woodgrain Millwork	Woodgrain Millwork - Emmett Lumber
3. Brief Project Description: New trimmer baghouse to new planer building	

BAGHOUSE INFORMATION

4. Baghouse Manufacturer: Pneumafil	5. Baghouse Model: 11.5	6. Baghouse Equipment ID: PBH2

7 (a). Baghouse particulate matter emission concentration. **Note: Provide information in 7(a)-(c) or answer question #8 below.**	_____ gr/dscf	*Manufacturers typically provide guarantees in grains per dry standard cubic foot (gr/dscf). Provide a copy of the guarantee, or other documentation, with the application along with a description of the types of bags that must be used to achieve the emission concentration.* ***Emission concentrations less than 0.01 gr/dscf will receive additional scrutiny by DEQ and a source test of the baghouse may be required.*** *If a guarantee is not provided then you must document how you obtained the emission concentration. Without documentation the application is not complete.*
7 (b). Percentage PM_{10} Or Provide PM_{10} Emission Concentration	_____ % _____ gr/dscf	*What percentage of the PM concentration listed in question #7(a) is PM_{10}. You must provide documentation as to how the percentage was determined (i.e per the baghouse manufacturer). Without documentation the application is not complete.*
7 (c). Baghouse flow rate	20,965.5 dscfm	*Provide the baghouse flow rate in dry standard cubic feet per minute. Actual cubic feet per minute may be given in lieu of dscfm* ***if it is documented*** *that moisture content is insignificant. You must provide documentation as to how this flow rate was determined (i.e. per the exhaust fan manufacturer, combustion evaluation, etc.). Without documentation the application is not complete.*
8. Baghouse particulate matter control efficiency. **Note: Not needed if section #7 is completed.**	_____ % PM control _____ % PM_{10} control	*Applicant's providing the control efficiency of the baghouse must provide control efficiency for both PM and PM_{10}. Provide a copy of the control efficiency documentation with the application. Documentation must include a description of the types of bags that must be used to achieve the control efficiency. Without documentation the application is not complete.*
9. Is the baghouse equipped with a bag leak detector?	☐ Yes ☒ No	*If a bag leak detector is installed provide documentation on the leak detector, including; how the leak detector functions and what level of the output signal indicates that a bag is leaking. Without documentation the application is not complete.*

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Preapplication Meeting Information Form FRA (Federal Requirements Applicability) - Regulatory Review

In each box in the table below, CTRL+click on the blue underlined text for instructions and information.

IDENTIFICATION	
1. Company Name: Woodgrain Millwork	2. Facility Name: Woodgrain Millwork - Emmett Lumber
3. Brief Project Description:	Adjust kiln operating scenarios, move planer BH and remove bin vent emissions
APPLICABILITY DETERMINATION	
4. List all applicable subparts of the New Source Performance Standards (NSPS) (40 CFR part 60). List all non-applicable subparts of the NSPS which may appear to apply to the facility but do not. Examples of NSPS-affected emissions units include internal combustion engines, boilers, turbines, etc. Applicant must thoroughly review the list of affected emissions units.	List of all applicable subpart(s): Subpart IIII (fire pump engine) List of all non-applicable subpart(s) which may appear to apply but do not: Subpart DC (boilers); QQQQ & DDDDD (kilns) ☐ Not Applicable
5. List applicable subpart(s) of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) (40 CFR part 61 and 40 CFR part 63). List all non-applicable subparts of the NESHAP which may appear to apply to the facility but do not. Examples of affected emission units include solvent cleaning operations, industrial cooling towers, paint stripping and miscellaneous surface coating. Reference EPA's webpage on NESHAPs for more information.	List of all applicable subpart(s): Subpart ZZZZ (fire pump engine) List of all non-applicable subpart(s) which may appear to apply but do not: Subpart 6J (boilers) ☐ Not Applicable
6. For each subpart identified above, conduct a complete regulatory analysis using the instructions and referencing the example on the following pages. **Note** - Regulatory reviews must be submitted with sufficient detail so that DEQ can verify applicability and document in legal terms why the regulation does or does not apply. Regulatory reviews submitted with insufficient detail will be determined incomplete.	☑ A detailed regulatory review is provided (Follow instructions and example). ☐ DEQ has already been provided a detailed regulatory review. Give a reference to the document including the date. See sections 3.1.5 & 3.1.6 in the application

Appendix C EMISSION INVENTORY

The detailed emission inventory is contained in a spreadsheet submitted with this application. A summary of pre- and post-project criteria pollutant emissions is provided in Section 2 of this application.

Appendix D AIR QUALITY IMPACT ANALYSIS

Idaho DEQ Impact Modeling Analyses Report Form

1.0 Summary

This air quality modeling report documents the methodology used to prepare an air quality analysis in support of an Idaho Department of Environmental Quality (IDEQ) Permit to Construct (PTC) application for Woodgrain Millwork's Emmett, Idaho lumber mill. This analysis demonstrates that the increase in emissions associated with this project 1) was below Level I modeling thresholds or 2) will not cause or significantly contribute to a violation of any air quality standard. For pollutants and averaging times for which the ambient impacts from the project exceeded significance thresholds, modeling was conducted to demonstrate that facility-wide ambient impacts for those pollutants will not cause a violation of any National Ambient Air Quality Standard (NAAQS). In addition, this analysis demonstrates that the change in emissions of state-regulated toxic air pollutants (TAPs) from this project were either below the applicable screening emission level (EL) or the ambient impacts did not exceed the applicable acceptable ambient concentration (AAC) for noncarcinogens or the AAC for carcinogens (AACC).

2.0 Project Description and Background as it Relates to Modeling Analyses

2.1 General Facility/Project Descriptions

Woodgrain's Emmett Mill produces dimensional lumber from raw logs, as described in Section 1 of the associated application. This project includes updating of particulate emission factors from each of the five kilns. The distribution of wood types was modified as well. The prior analysis assumed White Fir at 25%, Douglas Fir 20% and Pine 50%. The remaining 5% was assumed from other wood types such as Engelmann Spruce or Larch. The new configuration is 50% White Fir, 25% of Douglas Fir and 25% Pine. The Pine is distributed with 95% Ponderosa and 5% Lodgepole. Additionally, maximum charging rates and minimum drying times have been updated to reflect more accurate operations. No fuel-burning is being modified.

Lastly, because of these changes, the current operating scenarios are proposed to be eliminated and replaced with all five kilns operating simultaneously when drying pine or white fir. When drying Douglas fir, three specific scenarios are proposed. The Planer throughput and location is moving as well. The previous modeling analysis assumed an hourly rate of 22,000 BF, which is proposed to be updated to 40,000 BF/hr.

Also, the planer and associated baghouse/cyclone were in the northeastern portion of the property. However, a new planer building has been built with two new baghouses and a cyclone. The chip bin vent has been modified such that they that no longer emit to atmosphere. The PTC application includes information and pictures illustrating the full enclosure. The sawdust bin vent emissions have been updated to accurately reflect the control from the associated cyclone. The loading rates are still applicable to modeling via conveyor which is partially enclosed.

2.2 Location of Project

__X__A map showing the geographical location of the facility is provided in this section.

Figure 2-1. LOCATION MAP FOR WOODGRAIN'S EMMETT MILL

Project Location:

Woodgrain's mill occupies a 53-acre parcel carved out of the property formerly occupied by the now defunct Boise Cascade mill at 500 W. Main Street in Emmett, Gem County, Idaho as shown in Figure 2-2. Since the previous permitting effort, Woodgrain fully owns the former Boise Solutions' property, approximately 19 acres of adjacent property for log storage. The total 53-acre property remains unchanged from the previous permitting action.

Figure 2-2. WOODGRAIN'S EMMETT MILL PROPERTY BOUNDARY WITH LEASED AREA

Area Classification: Gem County is designated as an attainment or unclassifiable area for all criteria pollutants.

UTM Coordinates: UTM coordinates at the approximate center of the facility are 539.0 kilometers (km) Easting and 4,858.3 km Northing (datum WGS84) in UTM Zone 11.

Rural vs. Urban: AERMOD includes rural and urban algorithm options. These options affect the wind speed profile, dispersion rates, and mixing-height formula used in calculating ground-level pollutant concentrations. A protocol was developed by USEPA to classify an area as either rural or urban for dispersion modeling purposes. The classification is based on average heat flux, land use, or population density within a three-km radius from the plant site. Of these techniques, the USEPA has specified that land use is the most definitive criterion (USEPA, 1987). The urban/rural classification scheme based on land use is as follows:

> *The land use within the total area, A_0, circumscribed by a 3-km circle about the source, is classified using the meteorological land use typing scheme proposed by Auer (1978). The classification scheme requires that more than 50% of the area, A_0, be from the following land use types in order to be considered urban for dispersion modeling purposes: heavy industrial (I1); light-moderate industrial (I2); commercial (C1); single-family compact residential (R2); and multi-family compact residential (R3). Otherwise, the use of rural dispersion coefficients is appropriate.*

Woodgrain's Emmett Mill is in a light industrial area just west of downtown Emmett. Although the immediate vicinity of the site is industrial and commercial, site and map reconnaissance showed that the area A_0 within a 3-km circle of the source is below the 50% urban land use criteria necessary for use of urban dispersion coefficients. Rural dispersion coefficients were therefore used in the air quality dispersion modeling.

2.3 Existing Permits and Modeling Analyses Performed

_X_ Any existing air quality permits are listed and described in this section, and any associated air quality modeling analyses have been described and referenced and submitted if appropriate.

Recent permitting history is described in Section 1.2 of this application. The existing permit is P-2010.0016, Project 61859, issued August 10, 2017. This project included adding a second natural gas-fired boiler (Boiler No. 2), three new lumber drying kilns (Kilns 3, 4, and 5), and increasing the allowable production of dimensional lumber from 32 million board feet per year (MMBF/yr) to 90 MMBF/yr.

3.0 Modeling Analyses Applicability and Protocol

3.1 Applicable Standards

Criteria pollutant NAAQS are listed in Table 3-1, along with significant impact levels (SILs).

Table 3-1 APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Significant Impact Levels[a] (μg/m³)[b]**	**Regulatory Limit[c] (μg/m³)**	**Modeled Design Value Used[d]**
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	24-hour	1.2	35[i]	Mean of maximum 8th highest[j]
	Annual	0.3	12[k]	Mean of maximum 1st highest[l]
Carbon monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2nd highest[n]
	8-hour	500	10,000[m]	Maximum 2nd highest[n]
Sulfur Dioxide (SO_2)	1-hour	3 ppb[o] (7.8 μg/m³)	75 ppb[p] (196 μg/m³)	Mean of maximum 4th highest[q]
	3-hour	25	1,300[m]	Maximum 2nd highest[n]
	24-hour	5	365[m]	Maximum 2nd highest[n]
	Annual	1.0	80[r]	Maximum 1st highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 μg/m³)	100 ppb[s] (188 μg/m³)	Mean of maximum 8th highest[t]
	Annual	1.0	100[r]	Maximum 1st highest[n]
Lead (Pb)	3-month[u]	NA	0.15[r]	Maximum 1st highest[n]
	Quarterly	NA	1.5[r]	Maximum 1st highest[n]
Ozone (O_3)	8-hour	40 TPY VOC[v]	70 ppb[w]	Not typically modeled

a. Idaho Air Rules Section 006 (definition for significant contribution) or as incorporated by reference as per Idaho Air Rules Section 107.03.b.
b. Micrograms/cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
d. The maximum 1st highest modeled value is always used for the significant impact analysis unless indicated otherwise. Modeled design values are calculated for each ambient air receptor.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
f. Not to be exceeded more than once per year on average over 3 years.
g. Concentration at any modeled receptor when using five years of meteorological data.
h. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
i. 3-year mean of the upper 98th percentile of the annual distribution of 24-hour concentrations.
j. 5-year mean of the 8th highest modeled 24-hour concentrations at the modeled receptor for each year of meteorological data modeled. For the SIL analysis, the 5-year mean of the 1st highest modeled 24-hour impacts at the modeled receptor for each year.
k. 3-year mean of annual concentration.
l. 5-year mean of annual averages at the modeled receptor.
m. Not to be exceeded more than once per year.
n. Concentration at any modeled receptor.
o. Interim SIL established by EPA policy memorandum.
p. 3-year mean of the upper 99th percentile of the annual distribution of maximum daily 1-hour concentrations.
q. 5-year mean of the 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of 1st highest modeled 1-hour impacts for each year is used.
r. Not to be exceeded in any calendar year.
s. 3-year mean of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
t. 5-year mean of the 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of maximum modeled 1-hour impacts for each year is used.
u. 3-month rolling average.
v. An annual emissions rate of 40 ton/year of VOCs is considered significant for O_3.
w. Annual 4th highest daily maximum 8-hour concentration averaged over three years.

TAPs of concern for this project are identified in Table 3-2, along with the applicable screening emissions level (EL) and acceptable ambient concentration (AAC) or acceptable ambient concentration for carcinogens (AACC). A complete list of TAPs from natural gas combustion, along with the applicable

EL, is included in the emissions inventory in Appendix C and in the electronic Excel spreadsheet submitted with the application. All other TAPs do not exceed the applicable EL.

Table 3-2. TAP ELs AND AAC/AACCs			
TAP	**Non-carcinogen or Carcinogen**	**Screening Emissions Level (EL)[a] (lb/hr)**	**AAC or AACC[b] (µg/m³)**
Acrolein	Non-carcinogen (24-hr)	0.017	0.0125 mg/m³
Methanol	Non-carcinogen (24-hr)	17.3	13 mg/m³
Propionaldehyde	Non-carcinogen (24-hr)	0.0287	0.0215 mg/m³
Acetaldehyde	Carcinogen (Annual)	3.0E-03	4.5E-01
Formaldehyde	Carcinogen (Annual)	5.1E-04	7.7E-02

a. ELs from Idaho Air Rules Section 585 and 586 in pounds/hour.

b. Acceptable Ambient Concentration (AAC) or Acceptable Ambient Concentration for a Carcinogen (AACC) from Idaho Air Rules Section 585 and 586, in micrograms/cubic meter or milligrams/cubic meter. Note that AACs listed in Idaho Air Rules Section 585 are expressed in units of milligrams/cubic meter rather than micrograms/cubic meter.

3.2 Criteria Pollutant Modeling Applicability

__X__ Explanations/documentation why modeling was or was not performed for each criteria pollutant are provided in this section.

__X__ Emissions calculations that clearly show how the modeling applicability determination was performed are provided in Appendix C and in the electronic emissions inventory.

There is no net increase in criteria pollutant emissions associated with this project. However, there is a reconfiguration of kiln operating scenarios and emission factor modification that warrant facility-wide ambient assessments of short and long-term particulate impacts. No other gaseous pollutant related sources are changing. Note that NO_2 emissions are greater than modeling thresholds (no net increase), but for this modification no NO_2 emissions changes are made. Therefore, modeling was not conducted. Particulate emissions were modeled because of the emissions change and distribution of the kiln wood types.

Table 3-3 lists criteria pollutants for which site-specific modeling analyses were performed to demonstrate compliance with NAAQS. It should be noted that emissions from Boiler No. 2 alone exceed Level 1 modeling thresholds for short- and long-term PM_{10}, $PM_{2.5}$, and NO_x NAAQS. However, the boiler is not being modified, nor are any other NOx emission sources. Therefore, gaseous modeling was not performed.

Table 3-3 MODELING APPLICABILITY		
Criteria Pollutant	**Modeled (yes/no)**	**Basis for Exclusion from Modeling**
$PM_{2.5}$ 24-hour	Yes	___BRC Exempt[a] ___Emissions Below Level l Thresholds[b] ___Emissions Below Level II Thresholds[c]
$PM_{2.5}$ annual	Yes	___BRC Exempt ___Emissions Below Level l Thresholds ___Emissions Below Level II Thresholds
PM_{10} 24-hour	Yes	___BRC Exempt ___Emissions Below Level l Thresholds ___Emissions Below Level II Thresholds
NO_2 1-hour	No	___BRC Exempt ___Emissions Below Level l Thresholds ___Emissions Below Level II Thresholds
NO_2 annual	No	___BRC Exempt ___Emissions Below Level l Thresholds ___Emissions Below Level II Thresholds
SO_2 1-hour, 3-hour	No	___BRC Exempt _X_Emissions Below Level l Thresholds ___Emissions Below Level II Thresholds
SO_2 annual	No	___BRC Exempt _X_Emissions Below Level l Thresholds ___Emissions Below Level II Thresholds
CO 1-hour, 8-hour	No	___BRC Exempt _X_Emissions Below Level l Thresholds ___Emissions Below Level II Thresholds

a. If the project would have qualified for a Category I BRC permitting exemption for the criteria pollutant in question, as per Idaho Air Rules Section 221.01, except for the emissions quantities of another criteria pollutant, then a NAAQS compliance analysis is not required under Section 203.02 or 403.02 for that criteria pollutant.

b. Level I Modeling Thresholds from Table 2 in Section 3 of the DEQ Modeling Guideline. NAAQS compliance is assured through DEQ's non-site-specific modeling analyses.

c. Level II Modeling Thresholds from Table 2 in Section 3 of the DEQ Modeling Guideline. NAAQS compliance is assured through DEQ's non-site-specific modeling analyses. Level II Modeling Thresholds can only be used with prior DEQ approval.

3.3 TAP Modeling Applicability

__X__Explanation/documentation on why modeling was or was not performed for emissions of each TAP identified in the emissions inventory of the exemption determination are provided in this section.

Kilns: TAP emissions have been modified for both the pre and post project emissions per discussion with Shawnee Chen of IDEQ. This was done to compare apples to apples and reflect the most accurate change because of the project. Of all the pollutants outlined in Table 3-2, four TAPs illustrate a net increase over the appropriate averaging period. Also, only the acetaldehyde is increased above the EL.

The 24-hr emission rates are based on the worst-case for any of following three drying scenarios. Note that modeling files **do not** include a pine only run or a White Fir only scenario because the worst-case possible combination was evaluated. This is Kilns 1-2 drying four quarter board and Kilns 3-5 drying white fir. The scenarios are as follows:

- **White Fir/Pine** – Worst-case combination of all five kilns operating simultaneously when drying pine or 4 quarter/dimension pine. Based on hourly emission rates, worst-case is White Fir with maximum charge of 215 MBF (Kilns 3-5), a minimum drying cycle of 50 hours and 4 quarter board Pine with a maximum charge of 150 MBF (Kilns 1-2) and a minimum drying cycle of 40 hours. This results in an emission rate of 0.075 lb/hr per kiln for 1 and 2 and 0.086 lb/hr per kiln for 3-5. All other potential combinations of white fir and pine will produce fewer PM emissions. Regardless of the board types, it is assumed that the ratio between Ponderosa and Lodgepole Pine is 95%/5% for annual averaging periods.
- **Douglas Fir** – Three kilns are operating simultaneously when drying Douglas Fir. The maximum charge is 184 MBF (Kilns 1 and 2) and 215 MBF (Kilns 3-5) with a minimum drying cycle of 25 hours. The other two kilns are not operational when drying Douglas Fir. There are three kiln combinations that are proposed. These include: Kilns 1, 2, 3; Kilns 1, 2, 4 and Kilns 1, 2, 5.

Annual emission rates in TPY reflect the percentage mix of wood species (50% White Fir, 25% Douglas Fir, and 25% Pine (95% Ponderosa and 5% Lodgepole). Note that Engelmann Spruce and Larch may be dried as much as 5% but was not included in the modeling analysis because the total emissions are substantially lower than Douglas Fir.

Table 3-5. KILN TAPS EXCEEDING THE EL

Pollutant	Max Net Emission Rate Change (24-hr: Maximum amongst 3 scenarios) (Annual: TPY @ 58 MMBF*2000/8760) (lb/hr)	Screening EL (lb/hr)	Modeling Required?
Methanol (24-hr)	0.90	17.3	No
Propionaldehyde (24-hr)	0.01	0.0287	No
Acrolein (24-hr)	0.01	0.017	No
Acetaldehyde (Annual)	0.28 x 2000/8760 = 0.0525	3.0E-03	Yes

Although acetaldehyde emissions associated with kilns exceed the EL, they are not required to be modeled because DEQ has provided concurrence with a Stantec/Woodgrain memo on March 6, 2017 stating that a minor source should be treated similarly to a major source under 40 CFR Part 63, Subpart DDDD (PCWP MACT – Plywood and Composite Wood Products MACT) under IDAPA 58.01.01.210. Morrie Lewis stated in the email correspondence that "even though this subpart does not include substantive requirements to control or limit emissions from kilns. It follows that minor sources of HAP emissions are also excluded from Section 210 review, because in developing Subpart DDDD, EPA stated "…we know of no other lumber kilns that are controlled for HAP, and we know of no cost effective HAP controls for lumber kilns…" (Fed Reg /Vol 68, No. 6/Thursday, Jan 9, 2003/Proposed Rules, page 1285).". Therefore, because all TAPs are considered HAPs, no kiln hazardous pollutants were modeled. Stantec and Woodgrain believe that the March 6, 2017 memo is still accurate.

3.4 Modeling Protocol

A modeling protocol was submitted to DEQ prior to the application, on February 24, 2020. Conditional DEQ protocol approval was provided to Stantec on March 9, 2020. The submitted modeling differs from the proposed approach in the protocol in the following ways: 1) the scope of the project has been modified a bit to include changes to the planer and associated control equipment, 2) Response to Comment 1 of the approval letter with evaluated changes in VOC and NOx annual emissions (tpy) for 32 MMBF to 90 MMBF, 3) Slight modification to the receptor grid surrounding the highest impact locations per Comment 7, 4) Shifting of saw and chip bin building and loading sources, relocation of lumber shed, addition of new planer building per comment 9.

The annual VOC and NO_x emissions when drying only 32 MMBF (pre 2017 PTC modification) were 16.08 tons/yr and 9.38 tons/yr, respectively. The newly proposed annual totals are 47.30 and 23.64 tons/yr. Therefore, the increase in VOC and NO_x emissions from 2010 is 31.28 tons/yr and 14.26 tons/yr, respectively. Because the increases are less than 40 tons/yr. It is Stantec's and Woodgrain's understanding that an 8-hour Significant Impact Level (SIL) ozone analysis and a MERPs assessment is not necessary.

Project-specific modeling and other required impact analyses were generally conducted using data and methods described in the protocol, DEQ's recommendations, and in the *Idaho Air Quality Modeling Guideline*.

__X___If a protocol was submitted to DEQ prior to performing the modeling analyses, the protocol and DEQ's conditional protocol approval notice are included in Attachments 1 and 2 of this Modeling Report.

___X__Concerns identified by DEQ in the protocol approval notice have been addressed in the analyses performed and in this Modeling Report.

4.0 Modeled Emissions Sources

__X___The modeling emissions inventory and the emissions inventory presented in other parts of the permit application are consistent, and if they are not identical numbers, it is clearly shown, with calculations submitted, how the modeled value was derived from the value provided in the emissions inventory.

4.1 Criteria Pollutants

4.1.1 Modeled Emissions Rates for Significant Impact Level Analyses

All emission rates used in the modeling analysis were consistent with those rates identified in Appendix C of the application. All pollutants with emissions in excess of the Level I modeling thresholds also had maximum impacts greater than significant.

4.1.2 Modeled Emission Rates for Cumulative Impact Analyses

All emission rates used in the modeling analysis were consistent with those rates identified in Appendix C of the application. Modeled emission rates are provided in Table 4-1. These emission rates were based on the following assumptions:

- Short-term $PM_{2.5}$ and PM_{10} emissions from the kilns are based on three potential scenarios. The older kilns (1 and 2) have a maximum charging rate of 184,000 BF when drying white fir and Douglas Fir. The rate is 215,000 BF for Kilns 3-5. The minimum drying times are 50 and 25 hours for White Fir and Douglas Fir, respectively. Pine drying parameters are dependent on the type of boards dried. If the boards are dimensional (the vast majority) and have the same charge rates of the firs, then they are dimensional as well. If the pine is 4x4, the charging rates are 150,000 BF (Kilns 1 and 2) and 161,000 BF (Kilns 3-5). The drying times are 40 and 94 hours for dimensional and 4x4, respectively.

- The emission rates of the kilns have been updated since the previous permitting action. The previous permit utilized 0.051 lb/mbf for White Fir/hemlock, while 0.024 lb/mbf was used for Douglas Fir (Ponderosa Pine was considered equivalent). All data was derived from Oregon DEQ and the Willamette Industries source test from 2000/2003. Oregon DEQ also stated that the pine should be less than Douglas Fir[1]. However, there have been more recent source test data suggesting lower factors as it relates to hemlock/Douglas Fir. The Sierra Pacific Mount Vernon pilot kiln performed a test in 2013, which illustrates a factor of 0.0197 lb/mbf[2]. Additionally, a 2013 permit from the Washington Department of Ecology permitted kilns using 0.02 lb/mbf for Douglas Fir and hemlock[3]. Note that hemlock source tested by other state agencies from North Carolina, Oklahoma and Arkansas have also employed 0.022 lb/mbf[4]. There was an additional test at the Sierra Pacific Ferndale facility which suggested a very low rate (0.00614 lb/mbf)[5]. While that appears to be somewhat of an outlier, it also explicitly states $PM_{2.5}$ when some of the other sources only reflect PM or assume PM_{10} equivalency. Based on the consensus of other states and more recent source test information, a value of 0.02 lb/mbf for all wood types is considered appropriate.

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[1] Oregon DEQ Wood Industry Emission Factors https://www.oregon.gov/deq/FilterPermitsDocs/AQ-EF02.pdf

[2] 2013 Sierra Pacific Source Mt Vernon Test Pilot kiln Oregon SW Clean Air Agency http://www.swcleanair.org/docs/Dry%20Kilns/SourceTests/2013-05-29%20Sierra%20Pacific%20-%20Mt%20Vernon%20-%20Pilot%20Dry%20Kiln%20Filterable%20and%20Condensable%20PM%20Test%20Report.pdf

[3] Washington State of Ecology Sierra Pacific Permit https://fortress.wa.gov/ecy/ezshare/AQ/PSD/PSD_PDFS/Final_SPI_PSD_05-04_Amendment_2_Permit_10232013.pdf

[4] NC https://deq.nc.gov/about/divisions/air-quality/air-quality-permits/application-forms-instructions/application-forms-air-quality-permit-construct-operate-non-title-v-title-v-facilities/spreadsheets OK https://applications.deq.ok.gov/permitspublic/storedpermits/4324.pdf

[5] 2013 Sierra Pacific Source Ferndale Test Pilot kiln Oregon SW Clean Air Agency http://www.swcleanair.org/docs/Dry%20Kilns/SourceTests/2013-02-21%20Sierra%20Pacific%20-%20Chemco%20-%20Ferndale%20-%20Dry%20Kiln%20PM%20Test%20Report.pdf

- All emission factors are derived using the following formula as an example, which is consist with previous permitting analysis

$$\frac{\left(0.02\frac{lb}{MBF}*184{,}000\ BF\right)}{\left(50\ hrs*1000\frac{BF}{MBF}\right)} = 0.0736\ lb/hr \quad \text{(White Fir, Kilns 1 and 2)}$$

Table 4-1 Short-term Species Scenarios by Kiln

Option #	Species Distribution	Maximum BF/Kiln	Species ratio	Minimum hours	EF	lb/hr
1	WF Kiln 1-2	184,000	All White Fir	50		0.0736
	WF Kiln 3-5	215,000				0.0860
2a	PP/LP Kiln 1-2	150,000	4 quarter boards, 1" thick vs 4"	40		0.0750
	PP/LP Kiln 3-5	161,000				0.0805
2b	PP/LP Kiln 1-2	184,000	Dimension[1] boards	94	0.02	0.0391
	PP/LP Kiln 3-5	215,000				0.0457
2c	Combo of WF & Pine	Various	Any combo of White fir and Pine	Various		0.075 & 0.086
3	DF Kiln 1-2	184,000	All Douglas Fir	25		0.1472
	DF Kiln 3 or 4 or 5	215,000				0.1720

1. The National Grading Rule under the Western Wood Products Association as defined by the American Lumber Standard Committee for Dimension Lumber contains three grades of framing: Construction, Standard, and Utility. Additionally, there are common grades of dimension lumber defined as #1C, #2C, #3C, and Economy.

- Annual $PM_{2.5}$ emissions are based on dividing the 90 MMBF annual production evenly over the five (5) kilns, and reflects the approximate percentages of each wood species processed each year (50% White Fir, maximum between 25% Douglas Fir, 5% Englemann Spruce, and/or Larch, and Maximum 25% Pine (5% Lodgepole pine 95% Ponderosa Pine).
- Chip bin venting emissions were removed because the bin is fully enclosed and does not release to atmosphere. Truck loading was adjusted slightly based on a new weighted average bulk density calculated from the new percentage distribution of white fir (50%), Douglas fir (25%) and Ponderosa Pine (25%).
- Sawdust bin vent have been adjusted to reflect correspondence with Shawnee Chen on September 25-26th 2020. The South Carolina EFs were applied in lb/ton handled
- Only 3 of the 5 kilns will be operated at any one time when drying Douglas Fir. Kiln 1 and Kiln 2 will operate with **one** of Kilns 3-5 also operating simultaneously.

Table 4-2 lists criteria pollutant emissions rates used in the significant impact analyses.

Table 4-2 MODELED EMISSIONS RATES FOR CUMULATIVE ANALYSES (LB/HR)				
Source ID	**Source Description**	**$PM_{2.5}$ (24-hr)**	**$PM_{2.5}$ (Annual)**	**PM_{10} (24-hr)**
BOILER1	Boiler No. 1	0.156	0.156	0.156
BOILER2	Boiler No. 2	0.25	0.25	0.25
PUMPENGN	Fire Pump Engine[a]	1.92E-03	2.63E-03	1.92E-03
KILN1	Total divided equally, Vents 1-20	0.0750 or 0.1412 (3.75E-03, or 7.36E-03)	0.041 or 0.068 (2.05E-03 or 3.42E-03)	0.0750 or 0.1412 (3.75E-03, or 7.36E-03)
KILN2	Total divided equally, Vents 1-18	0.0750 or 0.1412 (4.17E-03, or 8.18E-03)	0.041 or 0.068 (2.28E-03 or 3.81E-03)	0.0750 or 0.1412 (4.17E-03, or 8.18E-03)
KILN3	Total divided equally, Vents 1-28	0.086 or 0.172 (3.07E-03, or 6.14E-03)	0.041 or 0.068 (1.47E-03 or 2.45E-03)	0.086 or 0.172 (3.07E-03, or 6.14E-03)
KILN4	Total divided equally, Vents 1-28	0.086 or 0.172 (3.07E-03, or 6.14E-03)	0.041 or 0.068 (1.47E-03 or 2.45E-03)	0.086 or 0.172 (3.07E-03, or 6.14E-03)
KILN5	Total divided equally, Vents 1-28	0.086 or 0.172 (3.07E-03, or 6.14E-03)	0.041 or 0.068 (1.47E-03 or 2.45E-03)	0.086 or 0.172 (3.07E-03, or 6.14E-03)
PLANERBH	Planer Baghouse	0.299	0.077	0.446
TRIMMERBH	Trimmer Baghouse	0.149	0.038	0.223
SAWDUST	Sawdust Bin Vent	0.215	0.098	0.145
SAWLOAD	Sawdust Truck Loadout	1.83E-03	5.43E-04	6.09E-03
CHIPLOAD	Chips Truck Loadout	1.49E-04	4.43E-04	1.49E-02
SHAVLOAD	Shavings Loadout	2.16E-03	6.40E-04	2.16E-03

a. The engine is emergency and only operates 1 hr/day. The hourly emission rate is averaged over 24 hr.

__X___Emissions rates in Table 4-2 are identical to those in the model input files for the analyses.

__X___Calculation of modeled emissions are thoroughly documented in this section, and any unique handling of emissions in the model have been described.

4.1.3 NO_2/NOx Ratio for NOx Chemistry Modeling

NO_x chemistry is not applicable because only particulate modeling was performed

4.1.4 Special Methods for Modeling Criteria Pollutant Emissions

Not applicable.

4.2 Toxic Air Pollutants

No TAPs modeling was conducted.

__X___TAP emissions rates have been listed for each TAP that has project cumulative emissions exceeding the applicable EL.

__N/A___Emissions rates in Table 4-3 are identical to those in the model input file for TAP analyses.

4.3 Emissions Release Parameters

Emission release parameters for point sources are provided in Table 4-3. Stack height and diameter for Boiler No. 1, the pump engine, and the planer baghouse stack were confirmed in the during the previous analysis. The exhaust temperature for Boiler No. 1 was provided by the manufacturer's representative; the exit temperature for Boiler No. 2 was set to the same value because of the similarity of the boilers. The exhaust flow in dscfm from each boiler was calculated using F_d from the table in EPA Method 19; this is conservative, as the flow rate in acfm would be greater, resulting in a higher exit velocity. The exit temperature for the fire pump engine was based on similar engines, and the exhaust velocity was set to a maximum of 50 m/second.

Exhaust temperatures from the kiln vents will range from 160 to 180°F, based on maintaining drying temperatures of 180°F for all wood species. The exit temperature for all kiln vents was set to 170°F. Exit velocities for all kiln vents were set to 6.32 m/sec based on documentation provided by M. Sprague and Sons Thermal Products & Consulting and calculations from Bob Shaw of Woodgrain. In addition, DEQ email from Thomas Swain dated May 4th, 2017 confirmed the use of worst-case emissions with a realistic average flow rate. It was questioned whether the release orientation of the kiln vents was vertical or horizontal. After consultation with Woodgrain personnel, it was determined that vertical orientation was most representative.

The planer and trimmer baghouse flow rates were evaluated by Woodgrain Engineering personnel. Two separate flow tests and calculations were conducted. The values applied in the modeling evaluation are an average of the maximum readings/calculations from each of the two measurements. For further detail, please refer to the Flow Calculations memorandum provided as part of the second incompleteness letter response (Appendices E and H of this application).

Table 4-3 POINT SOURCE STACK PARAMETERS

Release Point	Description	UTM[a] Coordinates Easting-X (m)[b]	UTM[a] Coordinates Northing-Y (m)	Stack Height (ft)	Stack Gas Exit Temp. (F)[c]	Stack Gas Exit Velocity (m/sec)[d]	Modeled Stack Diameter (ft)	Orient. Of Release[e]
BOILER1	Boiler No. 1 Stack	539037.21	4858311.95	25	350	11.03	2.0	Default
BOILER2	Boiler No. 2 Stack	539075.98	4858212.29	32	350	17.64	2.0	Default
PUMPENGN	CAT pump engine exhaust	539163.69	4858337.84	8.53	855	50	0.33	Default
PLANERBH	Planer Baghouse Stk	539044.34	4858184.16	20	Ambient	25.49	3.0	Default
TRIMMERBH	Trimmer Baghouse Stk	539036.68	4858175.59	20	Ambient	40.49	1.83	Default
SAWDUST	Sawdust Bin Vent	538966.87	4858269.87	48	Ambient	0.001	4.92	Default
Kiln1_01 to 20	Kiln 1 vents	---	---	29	170	6.32	1.7	Default
Kiln2_01 to 18	Kiln 2 vents	---	---	29	170	6.32	1.7	Default
Kiln3_01 to 28	Kiln 3 vents	---	---	29	170	6.32	1.7	Default
Kiln4_01 to 28	Kiln 4 vents	---	---	29	170	6.32	1.7	Default
Kiln5_01 to 28	Kiln 5 vents	---	---	29	170	6.32	1.7	Default

a. Universal Transverse Mercator.
b. Meters.
c. Fahrenheit.
d. Meters per second.
e. Vertical uninterrupted (default), rain-capped, or horizontal release.

Release parameters for the three truck loadout sources are provided in Table 4-4.

Table 4-4 VOLUME SOURCE RELEASE PARAMETERS						
Source	Description	UTM[a] Coordinates		Release Height (ft)[b]	Initial Horizontal Dimension (m)	Initial Vertical Dimension (m)
		Easting - X (m)[a]	Northing - Y (m)			
SAWLOAD	Sawdust bin loadout	538967.82	4858270.16	12	0.71	1.97
CHIPLOAD	Chip bin loadout	538958.78	4858266.71	12	0.71	1.97
SHAVLOAD	Shaving bin loadout	539122.20	4858334.66	12	0.71	1.97

a. Universal Transverse Mercator
b. feet

The release parameters for these volume sources were taken from the 2010 modeling conducted by CH2M but confirmed by Woodgrain personnel. These loadout emission sources are reflected on bin to truck loading. The release height is the height of the trucks (12 ft/4.27 m). Each point is considered a single volume source. Therefore, the initial lateral dimension is the length of the truck divided by 4.3. The length of each truck is approximately 10 ft (3.053 m). The dimension value is 3.053/4.3 = 0.71 m. Lastly, the initial vertical dimension calculated by dividing the vertical dimension of the source by 2.15. The height of the vertical dimension approximately 13.9 ft as the loading point is slightly higher than the truck. When 13.9 ft is divided by 2.15 the result is 6.465 ft or 1.97 meters.

__X___The specific methods used to determine/calculate given release parameters is described in this section.

__X__The release orientation of all point source stacks (horizontal, rain-capped, or uninterrupted vertical release) has been verified and is documented in this section.

5.0 Modeling Methodology

The key modeling parameters used in the impact analyses are summarized in Table 5-1.

Table 5-1 MODELING PARAMETERS		
Parameter	**Description/Values**	**Documentation/Addition Description**
General Facility Location	Emmett, Gem County, Idaho	The area is an attainment or unclassifiable area for all criteria pollutants
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 19191
Meteorological Data	Boise surface data Boise upper air data 2014-2018	The meteorological model input files for this project were developed by IDEQ. See Section 5.2 of this memorandum for additional details of the meteorological data.
Terrain	Considered	3-dimensional receptor coordinates were obtained from USGS National Elevation Dataset (NED) files and were used to establish elevation of ground level receptors and base elevations for buildings and sources. AERMAP v. 18081 was used to determine each receptor elevation and hill height scale.
Building Downwash	Considered	Plume downwash was considered for the structures associated with the facility. BPIP-PRIME v. 04274 was used to evaluate building dimensions for consideration of downwash effects in AERMOD.
NOx Chemistry	N/A	N/A
Receptor Grid	**Significant Impact Analyses**	
	Grid 1	25-meter spacing along the ambient air boundary
	Grid 2	25-meter spacing out to 100 meters
	Grid 3	50-meter spacing out to 25 meters
	Grid 4	100-meter spacing out to 500 meters

Table 5-1 MODELING PARAMETERS		
Parameter	**Description/Values**	**Documentation/Addition Description**
	Grid 5	250-meter spacing out to 1,000 meters (1.0 km)
	Grid 6	500-meter spacing to 2,000 meters (2 km)
	Grid 7	1000-meter spacing out to 5 km
	NAAQS Analyses	
	List if different from grid used for Significant Impact Analyses	
	TAPs Analyses	
	List if different from grid used for Significant Impact Analyses	

The model setup included factors applied to kiln operations to represent the following assumptions:

- When Douglas Fir is being dried, two current kilns of 3-5 will be inactive any time. Modeling presumed that Kiln 1 and Kiln 2 are in use when Douglas Fir is dried. All other wood assumes all five kilns operating. Four runs were conducted for all particulate averaging periods (PM_{10} 24-hr, $PM_{2.5}$-24hr and $PM_{2.5}$-annual), three of which have kilns 3, 4 or 5 turned off.

5.1 Model Selection

AERMOD version 19191 was used for the modeling analyses to evaluate ambient impacts from this project at Woodgrain's Emmett Mill. This is the current version of the regulatory guideline model.

__X__The current versions of all models and associated programs were used in analyses, or alternate versions were specifically approved by DEQ.

__X__Any non-default model options used were approved by DEQ in advance.

5.2 Meteorological Data

Preprocessed AERMOD ready meteorological files were provided by Kevin Schilling of IDEQ. The surface data files cover the years 2014 through 2018 utilizing U* from the Boise Airport with upper air soundings collected during the same period at the nearby National Weather Service station. The surface data is hourly from the National Weather Service Automated Surface Observing System (ASOS). The data presented by IDEQ is model-ready and was used without alteration or processing. These data originated from IDEQ but have been included as part of this submittal.

__X__Meteorological data files are provided with the application.

5.3 Effects of Terrain

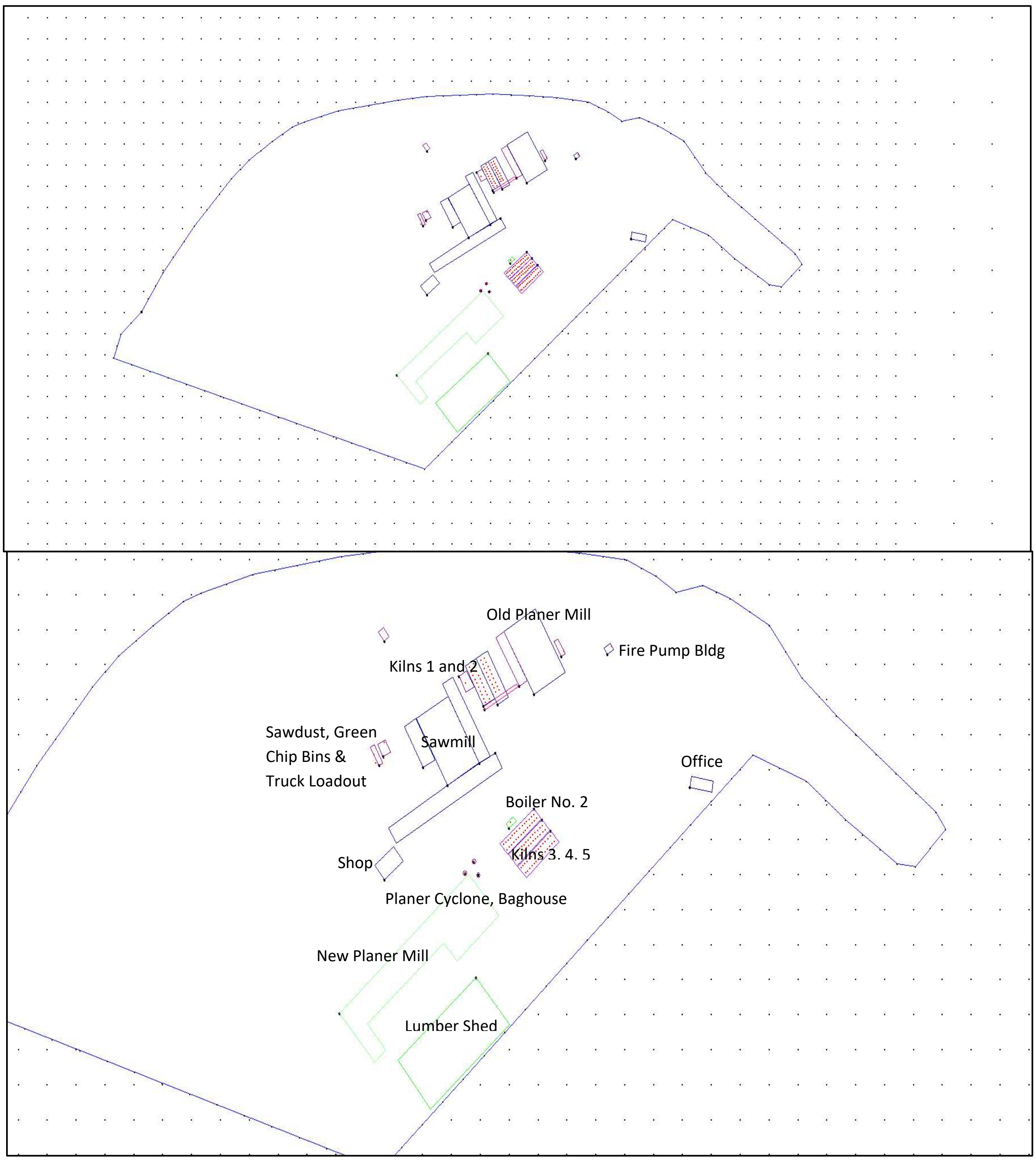
All source base and receptor elevations were calculated from USGS NED data obtained via the National Map Viewer website using the Bee-Line BEEST preprocessing system. A 1/3-arc second NED file was used in the analysis, covering the area between 43.750 and 44.000 degrees latitude and -116.375 to -116.750 degrees longitude. Input and output files from AERMAP have been included with the electronic files submitted with this application.

__X__The datum of terrain data, building corner locations, emissions sources, and the ambient air boundary are specified (NAD83/WGS84) and are consistent such that the modeled plot plan accurately represents the facility and surroundings.

5.4 Facility Layout

The facility layout is shown in Figure 5-1

__X__The facility layout plot plan is provided in this section that clearly and accurately depicts buildings, emissions points, and the ambient air boundary.



5.5 Effects of Building Downwash

Building downwash effects were determined using the BPIP – Prime algorithm and included all buildings on Woodgrain's Emmett Mill site.

5.6 Ambient Air Boundary

The facility is located in a light industrial area in Emmett, Idaho. Consistent with IDEQ guidance, the ambient air boundary used in this analysis is the boundary of the owned property. The boundary is entirely fenced and posted with No Trespassing signs to preclude public access.

__X__ This section thoroughly describes how the facility can legally preclude public access (and practically preclude access) to areas excluded from ambient air in the modeling analyses.

5.7 Receptor Network

__X__ This section of the Modeling Report provides justification that receptor spacing used in the air impact analyses was adequate to reasonably resolve the maximum modeled concentrations to the point that NAAQS or TAP compliance is assured.

The receptor density is described in Table 5-1. The receptor network ensures that the analysis meets or exceeds EPA receptor network requirements and captures the maximum impact from the facility.

5.8 Background Concentrations

Background concentrations were obtained from the Northwest Airquest Consortium's website, based on lat/long coordinates for the approximate center of Woodgrain's lumber mill in Emmett. These values were approved by DEQ as part of the modeling protocol review.

Table 5-2. BACKGROUND CONCENTRATIONS

Parameter and Unit	NW AirQuest Results
Lat_or_UTMN	43.88
Lon_or_UTME	-116.50
PM2.5_24hr_ugm3	25.4
PM2.5_annual_ugm3	7.0
PM10_24hr_ugm3	70.4

__X__Background concentrations have been thoroughly documented and justified for all criteria pollutants where a cumulative NAAQS impact analysis was performed.

5.9 NOx Chemistry

Not applicable

6.0 Results and Discussion

6.1 Criteria Pollutant Impact Results

6.1.1 Significant Impact Level Analyses

The SIL analyses for pollutants with project emissions greater than Level I modeling thresholds showed that impacts for all modeled pollutants and averaging times exceeded significance.

__N/A___Model input and output files for SIL analyses have been provided with the application, with descriptions of the analyses associated with those files.

6.1.2 Cumulative NAAQS Impact Analyses

Table 6-1 provides results of cumulative NAAQS Impact analyses for pollutants with project impacts greater than significant. Note that the particulate results are the impact range between all twelve modeling scenarios.

Table 6-1. RESULTS FOR CUMULATIVE NAAQS IMPACT ANALYSES

Pollutant	Averaging Period	Modeled Design Concentration ($\mu g/m^3$)[a]	Background Concentration ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
$PM_{2.5}$[b]	24-hour	8.4-9.3[g]	25.4	33.8-34.7	35
	Annual	1.8-2.0[h]	7.0	8.8-9.0	12
PM_{10}[c]	24-hour	12.6-13.5[i]	70.4	83.0-83.9	150
NO_2[d]	1-hour	---[g]	---	---	188
	Annual	---	---	---	100
SO_2[e]	1-hour	---[j]	---	---	196
CO[f]	1-hour	---[k]	---	---	40,000
	8-hour	---[k]	---	---	10,000

a. Micrograms/cubic meter
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
d. Nitrogen dioxide.
e. Sulfur dioxide.
f. Carbon Monoxide.
g. Maximum of 5-year means (or a lesser averaging period if less than 5 years of meteorological data were used in the analyses) of 8th highest modeled concentrations for each year modeled.
h. Maximum of 5-year means (or a lesser averaging period if less than 5 years of meteorological data were used in the analyses) of maximum modeled concentrations for each year modeled.
i. Maximum of 6th highest modeled concentrations for a 5-year period (or the maximum of the 2nd highest modeled concentrations if only 1 year of meteorological data are modeled).
j. Maximum of 5-year means (or a lesser averaging period if less than 5 years of meteorological data were used in the analyses) of 4th highest modeled concentrations for each year modeled.
k. Maximum of 2nd highest modeled concentrations for each year modeled.

__X__Model input and output files for the cumulative NAAQS impact analyses are provided with the application.

___N/A__If there were modeled NAAQS violations, all violations were analyzed and clearly show that the project did not significantly contribute to those modeled violations. If there were multiple violations at a given receptor, all cumulative impacts (including background) for the averaging period analyzed were ranked along with the project contribution, and the project contributions were below the applicable SIL. A table was included to show all ranked impacts above the NAAQS along with the project contribution.

6.2 TAP Impact Analyses

6.2.1 Results of TAP Impact Analyses

TAP analysis is not required because the net change is either below the EL or compliant with IDAPA 58.01.01.220.

7.0 Quality Assurance/Control

All modeling has been independently, and quality reviewed and expected to be accurate and complete. The results of all ambient modeling demonstrate that facility-wide emissions are compliant with NAAQS.

Appendix E MANUFACTURER INFORMATION

Stantec

Memo

To:	Darrin Mehr 1410 N. Hilton Street Boise, Idaho 83706	From:	Eric Clark, P.E. 727 East Riverpark Lane, Suite 150 Boise, Idaho 73706
File:	203721639	Date:	June 24, 2020

Reference: Woodgrain Millwork Emmett Lumber – Flow Measurement Discussion

Mr. Mehr:

During the reviewing process of Woodgrain Millwork Emmett Lumber (Woodgrain) Permit to Construct (PTC) application, the Idaho Department of Environmental Quality (DEQ) has asked questions regarding the methods and techniques utilized for the exhaust flow rate applied in the dispersion model. Stantec Consulting Services (Stantec) has discussed the process in more thorough detail with Woodgrain Engineering personnel. The following outlines the process that should satisfy DEQ's concerns.

Two separate independent exhaust measurements were made on 9/16/2019, conduct by Brian Odegaard of Clarke's Sheet Metal in Eugene, Oregon and 3/16/2020 of Thomas Moore of Woodgrain Engineering. The two parties did not converse with each other prior to their readings.

Both the planer and the trimmer measured the pipe diameter and the velocity pressure. The diameter is measured in two separate ways. One method is to physically wrap a measuring tape around the circumference of the exhaust point. The resulting value is then divided by π to obtain the diameter. The second approach is to drill a small hole into the exhaust pipe. A pitot tube with inch markings is inserted and manually read. The point at which the measurements are taken is at a straight portion of the pipe and nearest the exit point. The measurements of each method produced identical values of 22" for the trimmer and 36" for the planer. This is consistent with what was previously modeled.

The maximum velocity pressure is measured by a 3/8" hole at 5' from the top of the exhaust point, 15' from ground level. Two different pitot tube approaches are implemented. First, a smaller pitot tube of 26" is used to obtain readings across multiple locations along the cross section area of the pipe. These locations expand the center of the pipe to the edges. Each reading takes approximately 5 minutes to confirm. The maximum value of all locations is recorded. An identical approach is conducted with a second 50" pitot tube. This is done to confirm the previous readings from the 26" tube. According to the 3/16/2020 measurements, the differential between the minimum and the maximum velocity pressure readings were as follows:

- Planer VP (Maximum) – 1.75" of water
- Planer VP (Minimum) – 1.25" of water
- Trimmer VP (Maximum) – 4.2" of water
- Trimmer VP (Minimum) – 3.7" of water

As illustrated, the differential is minimal amongst all readings which suggests the measurement process is consistent. Ultimately, if there are any discrepancies or differentials, only the maximum values are utilized for calculation purposes. The maximums tend to be closer to the center of the pipe per Woodgrain as the measurements tend to decrease by 0.5" as the pitot tube is closer to the pipe walls.

Reference: Woodgrain Millwork Emmett Lumber – Flow Measurement Discussion

The measured pipe diameters and velocity pressure maximums are then applied to standard area and velocity/flow rate equations. To calculate the cross sectional area of the pipe the following equation was implemented to convert the inch measurement to square feet:

$$A = \left(\frac{\pi}{4}\right) \times D^2 \div 144$$

Air velocity in feet per minute is calculated by taking the square root of velocity pressure and multiplied by a coefficient of 4,005[1]. This calculation is applicable when the airflow is not compressed (less than 10” water column) and a density at 70° Fahrenheit. Both the trimmer and planer baghouse are at ambient temperature. Therefore, an approximation of 70° and use of the coefficient is appropriate. Lastly, the exhaust flow rate is determined by multiplying the velocity by pipe area. For example, the following flows calculations from 3/16/2020 are:

Trimmer: $$Flow\ CFM = \sqrt{4.20"\ W.C} \times 4.005 \times 2.64\ ft^2 = 21{,}667\ CFM$$

Planer: $$Flow\ CFM = \sqrt{1.75"\ W.C} \times 4.005 \times 7.07\ ft^2 = 37{,}450\ CFM$$

The Clarke’s flow calculations were determined in an identical manner on 9/16/2019. The respective rates are 20,264 CFM for the trimmer and 33,495 CFM for the planer. As suggested in the June 24th email to DEQ, updated modeling was conducted applied the average of the two measurement maximums. This approach was generally accepted by DEQ on July 2nd. Per, DEQ’s request, the manufacturer maximum flow capacity information has also been provided.

- Trimmer: 20,965.5 CFM
- Planer: 35,472.5 CFM

Stantec and Woodgrain believes these values to be representative of the emissions units at the Emmett facility. Thank you.

Stantec Consulting Services Inc.

Eric E. Clark

Eric Clark P.E.
Project Engineer

Phone: 208 388 4324
eric.clark@stantec.com

c. Shawnee.chen@deq.idaho.gov; lwarness@woodgrain.com; rskinner@woodgrain.com; dschneider@woodgrain.com; dan.heiser.com

[1] https://www.hamlincos.com/wp-content/uploads/2016/03/EP-0024-1.pdf

From:	Thomas.Swain@deq.idaho.gov
To:	Clark, Eric
Cc:	Kevin.Schilling@deq.idaho.gov; Tom.Burnham@deq.idaho.gov
Subject:	Woodgrain Kiln exhaust flows
Date:	Thursday, May 4, 2017 2:47:00 PM

Eric,

The DEQ modeling staff has reviewed your response to the assessment of exhaust flows from the kilns at Woodgrain. Our initial comment on this issue, as sent in the letter of incompleteness, is listed below:

1.) *The applicant needs to provide more justification to confirm kiln vent exhausts as being 20.8 ft/sec, as referenced in document from M Sprague (consultant), as these sources are critical to contributing to modeled impacts of PM2.5 24 hour concentrations (which consume 99+ % of NAAQS). Documentation is unclear with regards to usage of a lower number of 15 ft/sec, as stated in reference document. It appears that the thermal consultant, Mr. Sprague, is recommending usage of the lower value rather than using the 20.8 ft/sec value due to the cooling mechanism within the inherent process of the kiln vents.*

The response, dated May 1, 2017, discusses the overall mechanisms of kiln operations and the complexities involved. DEQ appreciates the description of the processes and the issues involved. When modeling impacts of a short term nature, (ie, 24 hours or less), the modeling emissions and parameters should reflect an estimation of worst case impacts, and not characterize average conditions. DEQ is still not totally convinced that this is the case. Woodgrain originally referenced the memorandum from Mr. Sprague that was used in the original flow calculations. DEQ's questions regarding that derivation were not specifically addressed in this response. Is Mr. Sprague the consultant referred to Mr. Shaw's document, and are these his original or revised depictions? DEQ is willing to accept modeling analyses using estimated worst case emissions and an average exhaust flow. We are unsure if this is the situation proposed. (This of course, is dependent on the ensuing emission calculations for the kiln vents.) Also, DEQ has further questions regarding the flow from the kilns. If the exit flows are impeded vertically and have a horizontal exit direction, as the latest depiction infers, then they should be treated as having a horizontal release. It is unclear from the depiction if flows are vertical or horizontal. We would appreciate clarifications on these matters.

Thanks

Thomas Swain
Analyst 3/Modeler
Idaho DEQ - Air Quality Division
1410 N. Hilton, Boise ID 83706-1255
ph: (208) 373-0220 fax: (208) 373-0340
Thomas.swain@deq.idaho.gov

MIKROPUL
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Charlotte, NC 28216
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Fax: 704-998-2603

May 8, 2020

Woodgrain Lumber
500 W. Main Street
Emmett ID 83617

Attn.: Mr. Ryan Skinner

Re: Filter Efficiency Statement

Specification:	Pneumafil Reverse Air Filter	job #6-19917
	Model Number:	13.5-460-12
	Max AirFlow:	69,000 CFM (Max)
	Air to Cloth Ratio:	10:1 (Max)
	Media Area:	6900 sq. ft.
	Blower Horsepower:	15 hp
	Rotating Horsepower:	1/4 hp
	*Pressure Drop:	2-4" wg
	Bag Type:	16 oz. polyester

Dear Mr. Skinner:

This filter manufactured in 1993, in **like new condition,** is 99.96% efficient when applied to wood dust at an air-to-cloth ratio less than 10 to 1 and running at a pressure drop between 2-4” W.G. If the inlet dust loading concentration does not exceed 5 grains per cubic foot, and it is typically no more than 3 grains per foot, then the outlet dust concentration is 0.0012 grains per cubic foot of air, which is lower than the EPA standard.

At 3 grains per cubic foot = (6879 mg/cu.m.) times 99.96% efficient equals an outlet dust concentration of 2.75 mg/cu.m., which is lower than the OSHA standard, 15mg/cu.m.

These conclusions listed above are based on testing done at various furniture plants in the United States with an average rating of 99.96% efficiency.

*For pressure drops of 1.5”-1.90” W.G. & 4.1”- 6.0” W.G. with grain loading and air to cloth ratio per above, then the efficiency is expected to be 99.90%.

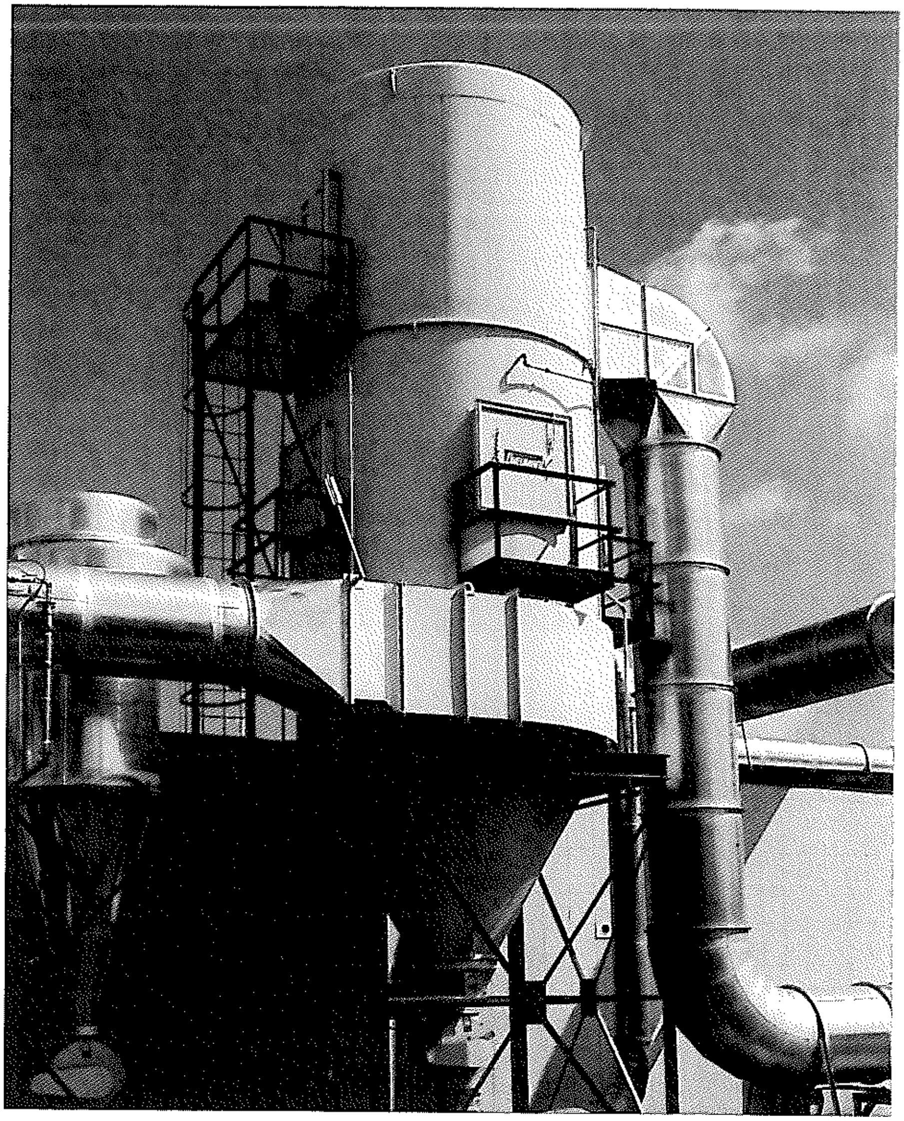
Please call me if you need additional information.

Sincerely,

Sherree Moore
Aftermarket Parts & Service Sales
Nederman Mikropul LLC (Pneumafil)
704-398-7699 phone
Sherree.Moore@pneumafil.com

PNEUMAFIL

BETTER IDEAS IN AIR FILTRATION



REVERSE AIR FILTER II

Walk-in plenum

Maintenance-free design

Energy efficient filtration system

PNEUMAFIL

Performance Data

Model Size*	Media Area ft²	Fan Motor hp	Drive Motor hp	ACFM @ 5:1 A/C	ACFM @ 10:1 A/C
4.5-40-8	400	5	¼	2,000	4,000
4.5-40-10	500	5	¼	2,500	5,000
5.5-60-8	600	5	¼	3,000	6,000
5.5-60-10	750	5	¼	3,750	7,500
6.5-90-8	900	10	¼	4,500	9,000
6.5-90-10	1,125	10	¼	5,625	11,250
8.5-159-8	1,590	10	¼	7,950	15,900
8.5-159-10	1,987	10	¼	9,935	19,870
8.5-159-12	2,385	10	¼	11,925	23,850
11.5-320-8	3,200	15	¼	16,000	32,000
11.5-320-10	4,000	15	¼	20,000	40,000
11.5-320-12	4,800	15	¼	24,000	48,000
13.5-460-8	4,600	15	¼	23,000	46,000
13.5-460-10	5,750	15	¼	28,750	57,500
13.5-460-12	6,900	15	¼	34,500	69,000
16-600-10	7,500	20	¼	37,500	75,000
16-600-12	9,000	25	¼	45,000	90,000

* Model size nomenclature: A 4.5-40-8 filter is 4.5 ft. in diameter, has 40 filter bags 8 ft. in length.

Notes

- Customer may specify less than the maximum number of bags for a given model; however, filter dimensions remain unchanged. Additional bags may be added as filtering demands increase.
- Hopper to grade height (D) may be changed per customer request.
- Entry section may be rotated 360° except where it would interfere with ladder.
- Discharge section and ladder may be rotated together 360° in approximately 6" increments except where they would interfere with the entry elbow.
- Counterclockwise shown, clockwise opposite.
- Structural supports are designed for 25 P.S.F. wind loading and 50 P.C.F. dust loading unless otherwise specified.
- Filters are available as bin vents and retrofits
- All units have a 360° mounting ring.
- 4.5' and 5.5' units are not walk-in filters.

Dimensions*

Model Size	A	B	C	D	E	F	G	H	J	K	L	M	N
4.5-40-8	4'6"	20'5"	16'4"	4'6"	2'1"	17'4"	3'8"	2'3"	1'6"	1'6"	1'4"	1'4"	2'(
4.5-40-10	4'6"	22'5"	18'4"	4'6"	2'1"	19'4"	3'8"	2'3"	1'6"	1'6"	1'4"	1'4"	2'(
5.5-60-8	5'6"	21'4"	17'2"	4'6"	2'11"	18'2"	4'2"	2'9"	1'6"	1'6"	1'4"	1'4"	2'(
5.5-60-10	5'6"	23'4"	19'2"	4'6"	2'11"	20'2"	4'2"	2'9"	1'6"	1'6"	1'4"	1'4"	2'(
6.5-90-8	6'6"	30'6"	19'7"	4'6"	3'10"	20'5"	5'8"	3'3"	3'6"	3'6"	2'6"	2'6"	2'(
6.5-90-10	6'6"	32'6"	21'7"	4'6"	3'10"	22'5"	5'8"	3'3"	3'6"	3'6"	2'6"	2'6"	2'(
8.5-159-8	8'6"	32'3"	21'4"	4'6"	5'7"	22'2"	6'8"	4'3"	3'6"	3'6"	3'0"	2'6"	2'(
8.5-159-10	8'6"	34'3"	23'4"	4'6"	5'7"	24'2"	6'8"	4'3"	3'6"	3'6"	3'0"	2'6"	2'(
8.5-159-12	8'6"	37'9"	25'4"	4'6"	5'7"	26'2"	6'8"	4'3"	3'6"	3'6"	3'0"	2'6"	2'(
11.5-320-8	11'6"	39'0"	28'1"	6'0"	7'4"	28'6"	8'2"	5'9"	4'0"	41'0"	3'6"	4'0"	3'(
11.5-320-10	11'6"	39'0"	28'1"	6'0"	7'4"	28'6"	8'2"	5'9"	4'0"	4'10"	3'6"	4'0"	3'(
11.5-320-12	11'6"	42'6"	30'1"	6'0"	7'4"	30'6"	8'2"	5'9"	4'0"	4'10"	3'6"	4'0"	3'(
13.5-460-8	13'6"	41'5"	30'6"	4'6"	10'3"	30'11"	10'2"	6'9"	5'2"	4'10"	5'0"	5'0"	2'(
13.5-460-10	13'6"	41'5"	30'6"	4'6"	10'3"	30'11"	10'2"	6'9"	5'2"	4'10"	5'0"	5'0"	2'(
13.5-460-12	13'6"	44'11"	32'6"	4'6"	10'3"	32'11"	10'2"	6'9"	5'2"	4'10"	5'0"	5'0"	2'(
16-600-10	16'0"	46'5"	35'6"	6'0"	12'0"	35'10"	12'3"	8'0"	7'0"	7'0"	6'0"	7'0"	3'(
16-600-12	16'0"	49'11"	32'6"	6'0"	12'0"	37'10"	12'3"	8'0"	7'0"	7'0"	6'0"	7'0"	3'(

*Dimensions and weights are nominal. Please consult factory prior to layout for exact dimensions.

Woodgrain Lumber
500 W. Main Street
Emmett, Idaho 83617

Attention: Ryan Skinner

16 Sept 2019

Subject: Plant Pneumatic Systems and Bins.

Plant Storage Bins (Truck Bins)

Bin A) Planer Shavings: One (1) Peerless 62 Unit Double Door.
Bin B) Planer Trim Ends Hog / Trimmer: One (1) Peerless 62 Unit Double Door.
Bin C) Sawmill Sawdust Hew-Saw: One (1) Peerless 62 Unit Double Door.
Bin D) Sawmill Chips: One (1) 40 Unit Single Door and One (1) 30 Unit Single Door (installed end to end)

Air Systems:

#1) Planer Baghouse:

Pneumafil Model 13.5" Ø X 460 Bags X 12' Long X 5" Ø.
33,495 CFM.
7,226 Bag Cloth Area.
4.7:1 Air-to-Cloth Ratio.
16'-6" Ø Semi-Long-Cone Cyclone (cyclone is oversized).
Size 450 Fan 250 HP 1785 RPM.
50" Ø Fan Wheel.
4739 FPM.

#2) Trimmer Baghouse:

Pneumafil Model 11.5" Ø X 312 Bags X 12' Long X 5" Ø.
20,264 CFM.
4,901 Bag Cloth Area.

TRIMMER

(D) - PIPE DIAMETER	22.00	in	
(VP) - VELOCITY PRESSURE	4.20	in water	Recorded 03/16
(A) - PIPE AREA	2.64	ft^2	
(VFM) - VELOCITY FEET OF AIR / MIN	8,207.81	ft/min	
(CFM) - CUBIC FEET / MIN	21,667.06	ft^3/min	

RELEASE POINT 20FT ABOVE GROUND

PLANER

(D) - PIPE DIAMETER	36.00	in	
(VP) - VELOCITY PRESSURE	1.75	in water	Recorded 03/16
(A) - PIPE AREA	7.07	ft^2	
(VFM) - VELOCITY FEET OF AIR / MIN	5,298.12	ft/min	
(CFM) - CUBIC FEET / MIN	37,450.18	ft^3/min	

RELEASE POINT 20FT ABOVE GROUND

From: Moore, Thomas
To: Clark, Eric
Subject: RE: Baghouse Measurements
Date: Wednesday, June 17, 2020 1:17:00 PM

Eric,

- We were about 5ft from the outlet, so we were measuring from about 15ft off the ground.
- Generally checking with two pitot tubes will get the exact same maximum value, if I were ever to get a discrepancy yes I would take the maximum of the two.
- The velocity pressure that is measure with the pitot tube will usually yield our maximum results in the middle of the pipe, and at times we can find a about -0.5 differentiation in VP when we get closer to the pipe walls. For this specific test see my maximum and minimum VP below.

  PLANER VP (MAX) - 1.75" of Water
  PLANER VP (MIN) – 1.25" of Water

  TRIMMER VP (MAX) - 4.2" of Water
  TRIMMER VP (MIN) – 3.7" of Water

Regards,

TOM MOORE | *PROJECT ENGINEER*
WOODGRAIN – MILLWORK DIVISION

From: Clark, Eric [mailto:eric.clark@stantec.com]
Sent: Wednesday, June 17, 2020 12:09 PM
To: Moore, Thomas
Subject: RE: Baghouse Measurements

Tom –

A few questions regarding the velocity measurements. Approximately, how far from the fan and the exhaust point in the pipe are the measurements taken? Do you take the maximum between the two pitot tubes or an average and how much of differential do you see amongst the various cross sectional readings? Thank you

Eric Clark, P.E.
Project Engineer
Eric.Clark@stantec.com

From: Moore, Thomas <THMoore@woodgrain.com>
Sent: Wednesday, June 17, 2020 11:35 AM
To: Clark, Eric <eric.clark@stantec.com>; Skinner, Ryan <RSkinner@woodgrain.com>
Cc: Warness, Lindsay <LWARNESS@woodgrain.com>; Heiser, Dan <dan.heiser@stantec.com>
Subject: RE: Baghouse Measurements

Eric,

Our contact for DEQ Documentation at Woodgrain is actually no longer with DEQ; he has worked for DEQ in both Idaho and Montana for many years, and now he is just a private contractor that we bring in to do our documentation for us. I have re-attached the documents with the measurements from Brian Odegaard on 9/16/2019 and myself on 3/16/20, as you can see our measurements were taken off the same system 6 months apart. Please see my comparison below between our results on these two separate days.

Brian's Planer Measurement: **33,495 CFM (9/16/2019)**
Tom's Planer Measurement: **37,450 CFM (3/16/2020)**

Brian's Trimmer Measurement: **20,264 CFM (9/16/2019)**
Tom's Trimmer Measurement: **21,667 CFM (3/16/2020)**

Although there was a slight variation between our two measurements this is expected; our results are so close to one another that I am confident in our measurements. When testing the system I had no idea what numbers we were looking for, and I had not conversed with Brian or saw his results until over a month after I submitted my readings to Ryan Skinner. These results were not tampered with in any way, and I am confident that they are the correct readings from these systems.

When testing the air flow for a given system there are two different measurements that I need to compute the CFM equations. These two measurements are the Pipe Diameter (D) and The Maximum Velocity Pressure (VP) within the system. With this information I use the following equations to solve for the CFM.

- A (Pipe Area) = ((π/4)*D^2)/144 - This will take the pipe diameter in inches and provide me with the cross sectional area if the pipe in squared feet
- VFM (Velocity Feet of Air/Min) = √(VP)*4005 - This equation takes our velocity pressure reading and converts it into air velocity in the pipe in FPM
- CFM (Cubic Feet of Air/Min) = VFM*A - You multiply the velocity by the cross sectional area to find the CFM (ft^3/min)

As I have mentioned there are two inputs into the that I need to test in order to calculate the CFM, and these are the pipe diameter (D) and the velocity pressure (VP) in the pipe I will describe below how I test for these two values.

Pipe Diameter (D): I check the pipe diameter 2 ways, first I will wrap a tape completely around the pipe to check the circumference of the pipe. Then I take this number and divide it by π, because Diameter = Circumference/π. To confirm this number I will drill a small hole into the pipe to, and stick a pitot tube clear through, the pitot tubes owned by Woodgrain have inch markings on them so as long as the pipe is in straight I am able to confirm the pipe diameter that I previously determined.

Velocity Pressure (VP): I use two different size pitot tubes to check for the velocity pressure inside the pipe. We have a smaller 26" Pitot tube that I use, and a longer 50" pitot tube that is also used.

The reason that I use two different tubes when testing is so that I can confirm my measurements, and make sure my VP measurements are accurate. To test what I do is drill a 3/8" hole in the side of the pipe, and then stick my pitot tube into the hole. When I do this I have to make sure that the tip of the tube opposes the flow of the pipe. From here I will move my pitot tube to all different locations across the cross sectional area if the pipe. I would say that this process takes 5 mins to confirm that I test all locations across the area and confirm that my VP reading is the maximum VP in the pipe. From here I will repeat all of these steps with another pitot tube.

Please let me know if you have any questions, or if I need to describe anything better.

Regards,

TOM MOORE | *PROJECT ENGINEER*
WOODGRAIN – MILLWORK DIVISION

From: Skinner, Ryan
To: Warness, Lindsay; Clark, Eric
Cc: Schneider, Donald
Subject: FW: Dust collection
Date: Wednesday, March 18, 2020 3:27:59 PM
Attachments: image001.png

Please see the information from our engineering team regarding planer baghouses and stack heights. Please let me know if we need more information.

Thank you

From: Moore, Thomas
Sent: Monday, March 16, 2020 1:27 PM
To: Schneider, Donald; Skinner, Ryan
Cc: Laird, Brad
Subject: RE: Dust collection

Don & Ryan,

I am running through some calculations on the Trimmer/Hog system to help determine how much we can choke it off, and how much we can expect it to help. We also got other information from the Trimmer blower, and I am going to run the numbers on that and let you know if we can crank it up at all.

Before I get you that information I just wanted to answer those questions from Eric Clark.

1. The exhaust flow rate and other information for each baghouse:

   - TRIMMER BAGHOUSE: DIAMETER=22in, VFM=8,200 ft/min, CFM=21,700 ft^3/min
   - PLANER BAGHOUSE: DIAMETER=36in, VFM=5,300 ft/min, CFM=37,500 ft^3/min

2. The release points for the exhausts are at the same height, and they are both 20ft from ground level.

Please let me know if you or Eric have any other questions, and I will try to answer them the best I can!

Regards,

TOM MOORE | *PROJECT ENGINEER*
WOODGRAIN – MILLWORK DIVISION

From: Laird, Brad
Sent: Friday, March 13, 2020 3:48 PM
To: Schneider, Donald
Cc: Moore, Thomas; Skinner, Ryan
Subject: RE: Dust collection

Sounds good, we'll try for around 10:00
Thanks,
Brad

WOODGRAIN MILLWORK
BRAD LAIRD | *SR. ENGINEER*

From: Schneider, Donald
Sent: Friday, March 13, 2020 3:23 PM
To: Laird, Brad
Cc: Moore, Thomas; Skinner, Ryan
Subject: RE: Dust collection

Sure, I am open after 9:00 am.

From: Laird, Brad
Sent: Friday, March 13, 2020 1:12 PM
To: Schneider, Donald
Cc: Moore, Thomas
Subject: Dust collection

Don,

Kelly had asked about looking at your reman dust collection, and Ryan asked about air flow in the Planer systems. Would Monday be a good day to come over and look at things?

Thanks,
Brad

WOODGRAIN MILLWORK
BRAD LAIRD | *SR. ENGINEER*
V. 208-452-8265 | C. 208-602-6126
blaird@woodgrain.com www.woodgrain.com

Image shown may not reflect actual configuration

Caterpillar is leading the power generation marketplace with Power Solutions engineered to deliver unmatched flexibility, expandability, reliability, and cost-effectiveness.

Specifications

Generator Set Specifications	
Rating	158 ekW (197 kVA)
Voltage	480 Volts
Frequency	60 Hz
Speed	1800 rpm

Generator Set Configurations	
Emissions/Fuel Strategy	U.S. EPA Certified for Stationary Emergency Application (Tier 3 Nonroad Equivalent Emission Standards)

Engine Specifications		
Engine Model	C7.1 In-line 6, 4-cycle diesel	
Bore	105 mm	4.13 in
Displacement	7.01 L	427.8 in^3
Stroke	135 mm	5.31 in
Compression Ratio	16.7:1	
Aspiration	Turbocharged Air-to-Air-Aftercooled	
Governor Type	Electronic	
Fuel System	Common Rail	

Package Dimensions*		
Length	3037 mm	120 in
Width	1110 mm	44 in
Height	483 mm	58 in
Weight†	1698 kg	3743 lb

*Note: For reference only – do not use for installation design. Please contact your local dealer for exact weight and dimensions.

†Weight includes: Oversize generator, skid base, circuit breaker, oil, and coolant.

Benefits & Features

Cat® Diesel Engine

- Reliable, rugged, durable design
- Four-stroke cycle diesel engine combines consistent performance and excellent fuel economy with minimum weight
- Electronic engine control

Generator

- Matched to the performance and output characteristics of Cat engines
- Industry-leading mechanical and electrical design
- Industry-leading motor starting capabilities
- High efficiency

Cat EMCP Control Panel

The EMCP controller features the reliability and durability you have come to expect from your Cat equipment. EMCP 4 is a scalable control platform designed to ensure reliable generator set operation, providing extensive information about power output and engine operation. EMCP 4 systems can be further customized to meet your needs through programming and expansion modules.

Seismic Certification

- Seismic certification available
- Anchoring details are site specific, and are dependent on many factors such as generator set size, weight, and concrete strength
- IBC certification requires that the anchoring system used is reviewed and approved by a professional engineer
- Seismic certification per applicable building codes: IBC 2006, IBC 2009, IBC 2012, IBC 2015

Design Criteria

- The generator set accepts 100% rated load in one step per NFPA 110 and meets ISO 8528-5 transient response
- Cooling system designed to operate in 50˚C/122˚F ambient temperatures with an air flow restriction of 0.5 in. water

UL 2200/CSA – Optional

- UL 2200 Listed
- CSA Certified

Certain restrictions may apply. Consult with your Cat dealer.

Single-Source Supplier

Fully prototype tested with certified torsional vibration analysis.

Worldwide Product Support

Cat dealers provide extensive post-sale support including maintenance and repair agreements. Cat dealers have over 1,800 dealer branch stores operating in 200 countries. The Caterpillar S•O•S℠ program cost-effectively detects internal engine component condition, even the presence of unwanted fluids and combustion by-products.

Standard Equipment

Air Inlet

- Dry replaceable paper element type with restriction indicator

Cooling

- Radiator and cooling fan complete with protective guards
- Standard ambient temperatures up to 50°C (122°F)

Exhaust

- Exhaust flange outlet

Fuel

- Primary and secondary fuel filters
- Fuel priming pump
- Flexible fuel lines

Generator

- Matched to the performance and output characteristics of Cat engines
- Load adjustment module provides engine relief upon load impact and improves load acceptance and recovery time
- IP23 protection
- Integrated Voltage Regulation

Governor

- Electronic governor – ADEM™ A4

Control Panels

- EMCP 4.2 Series generator set controller

Mounting

- Rubber vibration isolators

Starting/Charging

- 12 volt starting motor
- Batteries with rack and cables

General

- Paint **–** Caterpillar Yellow except rails and radiators gloss black

Optional Equipment

Exhaust

- Industrial, residential, critical mufflers

Generator

- Excitation: [ ] Permanent Magnet Excited (PM) [ ] Internally Excited (IE)
- Anti-condensation heater
- Oversize and premium generators

Starting/Charging

- Battery charger – UL 10 amp
- Battery disconnect switch
- Jacket water heater

General

- UL 2200
- CSA Certification
- Enclosures: sound attenuated, weather protective
- Sub-base dual wall UL Listed fuel tanks
- Automatic transfer switches (ATS)

C7.1
158 ekW/ 196.9 kVA/ 60 Hz/ 1800 rpm/ 480V/ 0.8 Power Factor

Rating Type: PRIME

Emissions: U.S. EPA Certified for Stationary Emergency Application (Tier 3 Nonroad Equivalent Emission Standards)

Image shown may not reflect actual configuration

D175-4

158 ekW/ 197 kVA
60 Hz/ 1800 rpm/ 480V

Package Performance	
Generator Set Power Rating with Fan @ 0.8 Power Factor	157.5 ekW
Generator Set Power Rating	196.9 kVA

Fuel Consumption		
100% Load With Fan	48.0 L/hr	12.7 g/hr
75% Load With Fan	38.3 L/hr	10.1 g/hr
50% Load With Fan	25.5 L/hr	6.7 g/hr

Cooling System[1]		
Engine Coolant Capacity	9.5 L	2.5 gal
Radiator Coolant Capacity	11.5 L	3.0 gal
Engine Coolant Capacity with Radiator/Exp Tank	21.0 L	5.5 gal
Air Flow Restriction (System)	0.12 kPa	0.48 in Water

Inlet Air		
Combustion Air Inlet Flow Rate	15.2 m³/min	536.8 cm

Exhaust System		
Exhaust Stack Gas Temperature	487.2°C	909°F
Exhaust Gas Flow Rate	33.7 m³/min	1190 cfm
Exhaust System Backpressure (maximum allowable)	15.0 kPa	60.2 in water
Exhaust Flange Size (internal diameter)	89.0 mm	3.5 in

Rating Type: PRIME

U.S. EPA Certified for Stationary Emergency Application (Tier 3 Nonroad Equivalent Emission Standards)

Heat Rejection		
Heat Rejection to Coolant (total)	78.0 kW	4436 Btu/min
Heat Rejection to Exhaust (total)	149.0 kW	8473 Btu/min
Heat Rejection to Aftercooler	36.0 kW	2047 Btu/min
Heat Rejection to Atmosphere from Engine	30.2 kW	1717 Btu/min
Heat Rejection to Atmosphere from Generator	12.8 kW	727.9 Btu/min

Alternator[2]		
Motor Starting Capability @ 30% Voltage Dip	387 skVA	
Frame	LC5014D	
Temperature Rise	105°C	189°F
Excitation	Self Excited	

Lube System		
Sump Refill with Filter	17.5 L	4.4 gal

Emissions (Nominal)[3]	
NOx + HC	4.0 g/kW-hr
CO	1.0 g/kW-hr
PM	0.2 g/kW-hr

[1] For ambient and altitude capabilities consult your Cat dealer. Air flow restriction (system) is added to the existing restriction from the factory.

[2] Generator temperature rise is based on a 40°C (104°F) ambient per NEMA MG1-32.

[3] The nominal emissions data shown is subject to instrumentation, measurement, facility and engine to engine variations. Emissions data is based on 100% Prime load. This information should not be used for permitting purposes and is subject to change without notice. Contact your Cat dealer for further details.

C7.1
158 ekW/ 196.9 kVA/ 60 Hz/ 1800 rpm/ 480V/ 0.8 Power Factor

Rating Type: PRIME **Emissions: U.S. EPA Certified for Stationary Emergency Application (Tier 3 Nonroad Equivalent Emission Standards)**

DEFINITIONS AND CONDITIONS

Applicable Codes and Standards:
AS1359, CSA C22.2 No 100-04, UL142, UL489, UL601, UL869, UL2200, NFPA 37, NFPA 70, NFPA 99, NFPA 110, IBC,IEC60034-1, ISO3046, ISO8528, NEMA MG 1-22, NEMA MG 1-33, 72/23/EEC, 98/37/EC, 2004/108/EC.

PRIME: Output available with varying load for an unlimited time. Average power output is 70% of the prime power rating.Typical peak demand is 100% of prime rated ekW with 10% overload capability for emergency use for a maximum of 1 hour in 12. Overload operation cannot exceed 25 hours per year.

Ratings are based on SAE J1349 standard conditions. These ratings also apply at ISO3046 standard conditions.

Fuel Rates are based on fuel oil to specification EPA 2D 89.330-96 with a density of 0.845 – 0.850 kg/L (7.052 – 7.094 lbs/U.S. gal.) @ 15°C (59°F) and fuel inlet temperature 40°C (104°F).

Additional ratings may be available for specific customer requirements, contact your Cat representative for details.

M. Sprague & Son
Thermal Products & Consulting

P. O. Box 231012 • Portland, OR 97281 • Phone: (503) 709-6338
• *E-mail: msprague1012@gmail.com, mspragueson@Gmail.com*

February 6, 2017

Mr. Robert Shaw
Woodgrain Sawmill
500 W Main St.
Emmett, ID 83617

Subject: Vent Velocity

Dear Bob:
I received your information by email today and went through it. The amount of CFM required for venting is achieved by using the amount of exhaust air required to maintain the wet bulb setting in the schedule. In first step of the schedule, 52,684 CFM is needed to be exhausted from the fourteen vents on the pressure side of the fan which will satisfy the first part of the drying schedule. This means on paper that your exhaust velocity out of the vent opening should be about 1,250 ft. /min. I do not know the distance the hot air will have to travel from the vents before dissipating because of the low exhaust pressure. The only pressure created is by the main circulating fans within the dry kiln to push the air through the load. These fans are operating at about a quarter inch of water column or less across the fan wall. As the air is exhausted, it expands into the large area outside of the vent which allows the velocity to quickly be diminished. I think the velocity should be dissipated within 2 to 3 feet from the vent opening. This velocity changes throughout the schedule because the venting load in each step is different. The above calculation was done on step one because it had the largest venting load in the schedule.

The intake air (ambient air temperature) is brought in through the other fourteen vents on the negative side of the fan, which then chills the inside air being circulated by condensing water out of the airstream in the form of rain. By doing this the venting efficiency may be as low as 50% or as high as 70%. This phenomenon not only puts water back in the dry kiln to be evaporated again for a second time but also could change the venting pressure within the kiln. This is done by cooling the hot air from a specific volume of 19 $ft.^3$ per pound which is reduced in volume to about 15 $ft.^3$ per pound. This would reduce the hot CFM to be vented to 1,980 CFM.

Any other questions, please give me a call or email.

Mike Sprague

4/27/2017

Robert Shaw
Woodgrain Millwork – Emmett Sawmill
500 W Main St
PO Box 757
Emmett, Idaho 83617

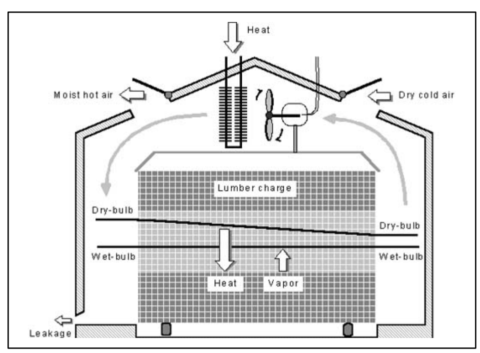
Tom Burnham
Permit Writer
Department of Environmental Quality

Re: Kiln Venting

In an effort to help explain the complexities and factors that impact the exiting air velocity, I thought an explanation of the purpose and process of kiln venting is appropriate.

The purpose of venting is to control the humidity inside the kiln. This is accomplished by monitoring a wet bulb temperature and using controls to open and close the vents. If there is too much humidity in the kiln as determined by the wet bulb setting then the vents will open. If the there is too little humidity, the vents will close. The opening and closing is proportional, meaning the vents are not just open or closed but open or closed a certain percentage. Of course, the velocity is impacted by the area of the vent opening; the smaller the opening the higher the velocity, given the other factors remain constant.

Mechanically, each conventional kiln has two rows of vents, one on each side of the roof with a row of fans running in between. The vents on the negative pressure side of the fans draw in make-up air and the vents on the positive pressure side allow the moisture laden air to escape. Again, the heated air exiting the kiln is a different volume than the ambient air being drawn into the kiln, which impacts velocity. Since the kilns are constructed side by side, the make-up air may contain a large portion of the hot moist air being vented from the neighboring kiln.



The process factors that impact venting include the ambient temperature, the ambient humidity, the moisture content of the incoming lumber, the temperature of the incoming lumber, the dimensions of the lumber being dried, how fast the lumber is being dried, how carefully the kiln is loaded and the charge is baffled.

I asked a kiln consultant to help determine the velocity of the air exiting through the vents. The consultant has over 40 years in the kiln drying field, beginning as an engineer, working on developing heat exchangers for dry kilns, and consulting on design and operations. Given all the factors, he developed a scenario based on drying a common product – 6/4 Ponderosa Pine and used a common drying schedule. The table below shows the result of his calculations:

Step	Dry Bulb Setpoint ◦f	Wet Bulb Setpoint ◦f	Dry Bulb Discharge Air ◦f	Wet Bulb Discharge Air ◦f	Exit Air Velocity Ft/Min
1	160	140	140	138	2,210
2	165	140	140	138	1,051
3	170	140	141	138	1,076
4	180	168	160	159	641

This calculates to an average exiting air velocity of 1,244 feet per minute. Given the factors that impact velocity and the fact that multiple kilns will be operating at various points in the drying schedule, using the average exiting air velocity is the number that makes the most sense.

I am enclosing the letter that the consultant provided that explains his rationale.

Sincerely,

Robert Shaw
General Manager
Woodgrain Millwork – Emmett Sawmill

Appendix F MACT DEQ CONCURRENCE

Stantec

Memo

To:	Morrie Lewis 1410 N Hilton St Boise, Idaho 83706	From:	Eric Clark, P.E. 727 E Riverpark Lane Suite 150 Boise, Idaho 83706
File:	203701114	Date:	March 1, 2017

Reference: DDDD MACT Policy

Mr. Lewis:

Woodgrain has reviewed the NESHAP toxic air pollutant (TAPs) requirements as it pertains to IDAPA 58.01.01.210.20 and applicable 40 CFR Part 63 subparts. Portion b of Section 20 states that following:

If the owner or operator demonstrates that the toxic air pollutant from the source or modification is regulated by the EPA at the time of permit issuance under 40 CFR Part 60, 40 CFR Part 61 or 40 CFR Part 63 and the permit to construct issued by the Department contains adequate provisions implementing the federal standard, no further procedures for demonstrating preconstruction compliance will be required under Section 210 for that toxic air pollutant as part of the application process.

40 CFR 63, Subpart DDDD states that a facility is subject to the subpart if two criteria are met.

(a) You own or operate a PCWP manufacturing facility. A PCWP manufacturing facility is a facility that manufactures plywood and/or composite wood products by bonding wood material (fibers, particles, strands, veneers, etc.) or agricultural fiber, generally with resin under heat and pressure, to form a structural panel or engineered wood product. Plywood and composite wood products manufacturing facilities also include facilities that manufacture dry veneer and lumber kilns located at any facility. Plywood and composite wood products include, but are not limited to, plywood, veneer, particleboard, oriented strandboard, hardboard, fiberboard, medium density fiberboard, laminated strand lumber, laminated veneer lumber, wood I-joists, kiln-dried lumber, and glue-laminated beams.

(b) The PCWP manufacturing facility is located at a major source of HAP emissions. A major source of HAP emissions is any stationary source or group of stationary sources within a contiguous area and under common control that emits or has the potential to emit any single HAP at a rate of 9.07 megagrams (10 tons) or more per year or any combination of HAP at a rate of 22.68 megagrams (25 tons) or more per year.

Woodgrain does not manufacture plywood or composite products. However, there are lumber kilns onsite; therefore, portion (a) is met. For all major sources, they also met the criteria set in portion (b). Thus, it is Woodgrain and Stantec's understanding that any major source that operates lumber drying kilns would be subject to subpart DDDD and would fall under the 210.20 window eliminating the requirement to further evaluate any TAPs associated with lumber kilns.

Reference: DDDD MACT Policy

Most lumber facilities such as Woodgrain generate the majority of their HAP emissions via the kiln drying process. Additionally, most facilities become a major source due to their HAP emissions (Idaho Forest Group, Chilco facility as an example). Generally speaking, major facilities generate more HAPs and subsequently more individual HAPs (i.e. acetaldehyde or formaldehyde) than their minor source counterparts. It would seem that if a major source is not required to assess HAP impacts, then a minor source shouldn't either and that this approach can be allowed by the agency without increased risk to public health or the environment

Woodgrain and Stantec acknowledge that the lumber mill does not meet the requirements to be subject to 40 CFR part 63, Subpart DDDD and thus in the strictest sense would not fall under 210.20. However, lumber kilns are a source category outlined in the subpart and are the only regulated source within the subpart for similar Major facilities throughout the state. Therefore, it is reasonable to assume that a lumber kiln would be regulated in the same capacity whether it be part of minor or major source.

In review of the stipulations set forth in the subpart pertaining to those facilities that are not required to have controls or work practice requirements (section 63.2252) lumber kilns are explicitly identified. For those units not subject to compliance options, work practices, testing, monitoring etc. only an initial notification is required. If necessary, Woodgrain would be willing supply an initial notification to DEQ in accordance with section 63.2252 of the subpart to comply with all requirements a major source lumber facility would need to do.

Lastly, it appears the latest practice implemented by DEQ regarding the inclusion of Subpart DDDD in Title V permits for lumber mills is to exclude it in its entirety because only the initial notification is required and no further steps are necessary. Stantec and Woodgrain requests DEQ to consider allowing that path regarding our upcoming PTC submittal. The only HAPs/TAPs that exceed the emission screening level are acrolein, acetaldehyde and formaldehyde. All HAPs wouldn't require further evaluation per 210.20. Therefore, we are requesting DEQ's concurrence regarding this matter within the next 10 business days otherwise we plan to submit this correspondence as part of the PTC application. Thank you for consideration.

Eric E. Clark

Eric Clark, P.E.
Project Engineer
Phone: 208-853-0883
Eric.Clark@stantec.com

c. Stephen.west@stantec.com; RShaw@woodgrain.com; RSkinner@woodgrain.com

From: Morrie.Lewis@deq.idaho.gov
To: Clark, Eric
Cc: West, Stephen; RShaw@woodgrain.com; RSkinner@woodgrain.com
Subject: RE: Woodgrain Concurrence Request
Date: Monday, March 06, 2017 4:30:04 PM

Hi Eric,

Per DEQ policy, it has been determined that for lumber drying kilns located at any source (i.e., major or minor), that the 187 HAP do not need to be included in the IDAPA 58.01.01.210 (Section 210) review. This is because HAP emissions from lumber drying kilns were evaluated in promulgating 40 CFR 63, Subpart DDDD (PCWP MACT – Plywood and Composite Wood Products MACT). This subpart for major HAP sources includes lumber kilns at PCWP manufacturing facilities and "at any other kind of facility" as affected sources, even though this subpart does not include substantive requirements to control or limit emissions from kilns. It follows that minor sources of HAP emissions are also excluded from Section 210 review, because in developing Subpart DDDD, EPA stated "…we know of no other lumber kilns that are controlled for HAP, and we know of no cost effective HAP controls for lumber kilns…" (Fed Reg /Vol 68, No. 6/Thursday, Jan 9, 2003/Proposed Rules, page 1285). It should be noted that TAP which are not also HAP would still need to be evaluated for the kilns for compliance with Section 210, and that HAP TAP from other sources not covered by a MACT would also need to be evaluated for compliance with Section 210.

With regard to the applicable initial notification requirement of 40 CFR 63.2252, it seems that the application itself could be used to satisfy this requirement in accordance with 40 CFR 63.9(b)(iii). Once satisfied, this requirement would not need to be incorporated as a permit requirement. Using this option, you might include in the application the information identifying any existing and new affected sources (lumber kilns), and explicitly state that the information in the application is being used to satisfy the initial reporting requirements of 40 CFR 63.2252.

Hopefully this helps to answer most of your questions.

Thanks,

Morrie Lewis
Air Quality Permit Analyst
Idaho Department of Environmental Quality
1410 North Hilton Street
Boise, Idaho 83706-1255
Phone: (208) 373-0495 Fax: (208) 373-0340
Morrie.Lewis@deq.idaho.gov

From: Clark, Eric [mailto:eric.clark@stantec.com]
Sent: Wednesday, March 01, 2017 3:27 PM
To: Morrie Lewis
Cc: West, Stephen; Shaw, Robert; Skinner, Ryan
Subject: Woodgrain Concurrence Request

Morrie –

Per our conversation this week regarding the DEQ HAPs/MACT policy, I am submitting the attached memorandum for your review and hopefully subsequent concurrence. Please let me know if you have any questions. Thank you for your consideration in this matter.

Eric Clark, P.E.
Project Engineer
727 East Riverpark Lane, Suite 150
Boise, Idaho 83706
Ph: (208) 853-0883 x 102
Cell: (208) 861-7182
Eric.clark@stantec.com

Appendix G BIN VENT CONVEYANCE PICTURES




Conveyance to bin vents

The sawmill green chips and sawdust chips are pneumatically conveyed to the appropriate bin vents.

Appendix H INCOMPLETENESS LETTER RESPONSES

Stantec

Memo

To:	Shawnee Chen, P.E. 1410 N Hilton Street Boise, Idaho 83706	From:	Eric Clark, P.E. 727 East Riverpark Lane, Suite 150 Boise, Idaho 83706
File:	203721639	Date:	May 13, 2020

Reference: Incompleteness Letter Response – Woodgrain Millwork, Emmett Lumber

Dear Ms. Chen:

Woodgrain Millwork – Emmett Lumber (Woodgrain) and Stantec Consulting Services (Stantec) received an incompleteness letter on May 6, 2020 in reference to a Permit to Construct application for permit P-2010.0016, Project 62425. The follow memorandum is Woodgrain and Stantec's response to all of your permitting and modeling questions.

Emissions Inventory and Miscellaneous

1. ***The drying kiln emissions rate in lb/hr in Cell B20 of "Pre- and Post-Project Criteria" worksheet is lower than what is modeled. Please address the discrepancy.***

The previously submitted excel spreadsheet did not accurately account for all kilns that could be operating at any one time. As stated in the application, there are essentially two operating scenarios. One in which all five kilns are operating simultaneously when drying any combination of white fir or pine. The other is the operation of three kilns when drying Douglas fir. Kilns 1 and 2 will always be in operation with one of the other three kilns (3,4 or 5). Therefore, the spreadsheet has been updated to account for the maximum total between the two. This increased from 0.32 lb/hr to 0.47 lb/hr which correlates to the modeled rates.

2. Please update the "References of Emissions" worksheet to include the new particulate emissions factor (EF) for drying kilns, including the explanation on how this EF is developed.

The "References of Emissions" tab has been updated per Idaho DEQ's request.

3. For "2020 Kiln PM, VOCs & HAPs" worksheet, consider adding a footnote to refer the PM EF to "References of Emissions" worksheet for Cell O8, adding "(lb/hr of each kiln)" to Cell S8 and Cell T8, and adding PM to Cell O7.

The requested changes to the referenced cells have been made.

4. Update the process flow diagram to include both planner baghouses.

The process flow diagram has been updated to include both baghouses and better represents the planer and trimmer baghouse.

Also, note that there have been some minor emission changes due to the modeling questions provided in the incompleteness letter as well as further discussion with Woodgrain to better accurately account for some processes. These modifications are provided in detail below when responding to the modeling questions and the inventory has been updated to reflect this as well.

Reference: Incompleteness Letter Response – Woodgrain Millwork, Emmett Lumber

Modeling Questions

1. By-Product Bin Loading Emissions.

Sawdust bin and chip bin loading vent emissions were eliminated for this project. This application included photos of caps on the bin vents and a description that these points are now enclosed, thus, no modeled emissions were modeled from these former point sources.

Was the elimination of the sawdust bin vent accomplished with by capping a cyclone? If this is still a pneumatic delivery system, please explain where the airflow for sawdust byproduct transfer to the sawdust bin if there is no open exhaust vent for the sawdust bin pneumatic delivery system? Does this create a potential fugitive source from any cracks or openings in the sawdust bin? As a comparison, the planer mill shavings bin cyclone appears to have a capped exhaust outlet and the airflow and PM emissions are routed to one of the two planer mill baghouses.

The sawdust bin vent cyclone has not been capped. After further discussion with Woodgrain, it was determined that the saw dust bin vent is **not** fully enclosed as previously thought. The delivery system for the sawdust bin remains pneumatically driven. While the potential emissions are routed through the cyclone and into the bin vent, a small percentage will escape to atmosphere. In review of the sawdust bin vent calculations, it was determined that the control efficiency of the cyclone was not properly included. Additionally, the emission factors and control percentages were adjusted based on South Carolina Department of Health and Environmental Control Wood Working estimates for storage bins. The sawdust bin vent emissions have been incorporated back into the model and are more accurate ensuring the cyclone controls are addressed properly. Please refer to the attached excel spreadsheet for further details regarding the calculations.

2. New Planer Building Baghouses Exhaust Parameters.

These are two new baghouses that were installed after issuance of the August 10, 2020, Project 61859 PTC, with release parameters that do not match the specifications for the single baghouse permitted in Project 61859, and a complete exhaust parameter justification is warranted for this project. Is additional manufacturer's design documentation available to support the exhaust parameters for the two planer mill baghouses to enhance justification of exhaust parameters listed by the Woodgrain Millwork's staff email documentation? Stack design drawings and manufacturer/vendor specifications, pneumatic system fan and blower motor combination performance curves that support exhaust flow rate and stack dimensions are generally available information for a facility purchasing pneumatic conveyance systems. DEQ generally requests that modeling demonstrations reflect release parameters which are representative of actual operating conditions.

Stantec and Woodgrain obtained information from the manufacturer. The information was reviewed, but it was determined that the discharge point as provided in the manufacturer specifications differ from the process at the mill. Rather than releasing directly to atmosphere from the air discharge point on the baghouse (see schematics for details), the effluent air is ducted downward from the baghouse and pushed back vertically via a fan at the base of the elbow ducting to the actual release point adjacent to the baghouse. The discharge air essentially travels in a U-shape through ducting after existing the baghouse. This is consistent for both the planer and trimmer baghouse.

Because of the path taken described above, it was determined that the Woodgrain Engineering release parameters are more accurate for the facility. To ensure the originally submitted values are further substantiated, we have included more documentation from the Woodgrain Engineering group with associated measurement methods and calculations.

3. Planer Mill Emissions

PTC P-2010.0016 Project 61859, issued August 10, 2017, contains one permitted planer mill baghouse located at the historical planer mill building. The current project contains two baghouses with different release parameters than represented in the Project 61859 PTC located at a new planer building that was not included in the Project 61859 PTC. This project's application lists two planer process sources (model IDs PLANER1 and PLANER2 and DEQ Application Form IDs PBH1 and PBH2). Confirm whether neither, one, or both PLANER1 and/or PLANER2 are new process units to accommodate the increased throughput from 22,000 BF/hr to 40,000 BF/hr.

The modeling demonstration used 0.44 lb/hr PM10 and PM2.5 total for the planer building for baghouses 1 and 2 combined (model IDs PLANERBH1 and PLANERBH2 and DEQ form IDs PBH1 and PBH2). The EI listed emissions of 0.45 lb/hr for the entire planer building process.

The planer building baghouses were described as the "Trimmer" baghouse and the "Planer" baghouse. The emission calculations assume a material throughput of 20,000 BF/hr is processed by each planer independently. Is this assumption accurate or does the full 40,000 BF/hr go through the Planer No. 1 process, which controlled by cyclone/baghouse PBH1, and then some portion of that 40,000 BF/hr goes through Planer No. 2, which is controlled by cyclone/baghouse PBH2, considering PBH2 is described as a trimmer process? If so, the emission rate would be higher due to emission factors based on a lb/ton basis. The application's emission inventory takes into account 40,000 BF/hr and splits the emissions evenly between the two baghouses. Please clarify how the planer mill process operates and evaluate whether there is any effect on the modeled emission rates.

Both PLANER1 and PLANER2 are new process units since the previous permitting action. There were not added to necessarily accommodate the proposed throughput increase, but rather because of new planer building. Also, the previously permitted planer baghouse has been removed and is no longer onsite. Note that these sources have been updated to PLANERBH and TRIMMERBH in the updated modeling files.

It is very likely that the difference in emission rate was merely a rounding issue. The actual calculation is 0.446 (rounded to 0.45) and when divided by 2 it becomes 0.223. When rounded down, the two values input into the model become 0.22 with only two digits. For all intents and purposes, these are the same number. However, after further discussion with Woodgrain, the assumption that half of the emissions were allocated to each baghouse was incorrect. The Planer BH and the Trimmer BH are two separate processes. Therefore, all 0.446 lb/hr of calculation emissions should have been routed to the Planer BH.

All 40,000 BF/hr are cut on all edges via the planer (initial calculations assumed 1/8th of the board on all sides). After further evaluation of Woodgrain's planing process 1/8" is too high. A more representative, but still conservative amount is 1/16" on all four sides (see updated excel spreadsheet for calculation details). The remaining shavings are routed through the Planer Cyclone/baghouse. The updated calculation results in a 0.223 lb/hr emission rate from the Planer BH. After the edging of the board are removed, they are all trimmed (1/16" on all sides again), and a percentage of the excess wood is sent to the cyclone associated with the Trimmer Cyclone/baghouse. Some of that material is filtered through the cyclone and sent to an enclosed bin and ultimately trucked offsite. The loading emissions are accounted for as a fugitive release at the original bin loading site near the old planer building. All of the finer dust remaining is sent through the Trimmer BH. These emissions are somewhat difficult to quantify, thus, to ensure maximum conservatism, the Trimmer BH emissions are assumed to be similar to the Planer BH, but slightly less because the boards entering the trimmer have already gone through the planer. The starting size of the boards are smaller. The end emission rate associated with the Trimmer BH is 0.209 lb/hr. These have been updated within the model.

4. Methods used to establish physical dimension exhaust parameters

Describe the methods used by Woodgrain to establish modeled stack release heights, exit diameter at the point of release, and release orientation. The modeling protocol requests information on how these values were determined.

All measurements were taken by Woodgrain personnel by direct measurement or visual inspection with respect to orientation. Woodgrain also utilized a company drone to take pictures and obtain measurements for harder to reach areas as necessary. Also, in the case of the new baghouses, the Woodgrain engineering group conducted tests and performed calculations as necessary.

5. Volume Source Parameter Substantiation

Please submit the volume source release parameter assumptions and calculations. Supporting information for the assumptions used in the dispersion coefficient calculations and the modeled release heights was not found in the permit application. This documentation should have been submitted to support the Project 61859 modeling demonstration and should be readily available for submittal to DEQ.

All parameters are consistent with previous analysis dating back to at least 2010. These loadout emission sources are reflected on bin to truck loading. The release height is the height of the trucks (12 ft/4.27 m). Each point is considered a single volume source. Therefore, the initial lateral dimension is the length of the truck divided by 4.3. The length of each truck is approximately 10 ft (3.053 m). The dimension value is 3.053/4.3 = 0.71 m. Lastly, the initial vertical dimension calculated by dividing the vertical dimension of the source by 2.15. The height of the vertical dimension approximately 13.9 ft as the loading point is slightly higher than the truck. When 13.9 ft is divided by 2.15 the result is 6.465 ft or 1.97 meters.

6. Drying Kiln Release Parameters

The modeling report states that Woodgrain release orientations are uninterrupted vertical point source releases for all drying kiln vents. Confirm the kiln vents remain open in a full vertical orientation throughout the entire drying cycle, when opened for venting, in a similar fashion to rain flaps on many emergency generator engines that open to a full vertical orientation during operation of the engines.

The email from the DEQ modeler for Project 61859 regarding the assumptions and justification of the drying kiln exhaust parameters was not included in the current PTC application. The referenced email was not found in DEQ's electronic file database and the modeler is not available to provide input. Please provide the referenced DEQ email for consideration as supporting documentation for the current project.

All vents are either fully closed with no emissions escaping to atmosphere or fully open in a vertical orientation when releasing emissions. There are similar to rain flaps such that they open when flow is pushed through the system or closed otherwise.

The email stating average flow with worst case emissions is acceptable from Thomas Swain has been attached a part of this resubmittal.

Please also note that the kilns annual emission rates have been updated. Previous modeling assumed 0.90 tpy (0.205 lb/hr) released from each of the five kilns for all wood types, but that is an overestimate. Each scenario should have been 0.90 tpy in total. Therefore, the annual lb/hr emission rate was adjusted to distribute the total tpy across the number of kilns being operated. Thus, the White Fir/Pine uses all five kilns, while the Douglas Fir is only three. The change is reflected in the updated modeling. Even with the added emissions all scenarios remained compliant with the PM2.5 annual standard, but one was extremely close. Thus, to avoid further concern from Idaho DEQ and to ensure more accuracy, the change was made.

Attachments to Response

- Updated emission inventory spreadsheet
- Updated modeling files and report
- Baghouse schematics and Engineering measurement process
- Email from Thomas Swain
- Updated Process Flow Diagram

Thank you for your consideration.

Stantec Consulting Services Inc.

Eric E. Clark

Eric Clark P.E.
Project Engineer

Phone: 208 388 4324
eric.clark@stantec.com

c. lwarness@woodgrain.com; DSchneider@woodgrain.com; rskinner@woodgrain.com; Darrin.mehr@deq.idaho.gov; dan.heiser@stantec.com

Stantec

Memo

To:	Shawnee Chen, P.E. 1410 N Hilton Street Boise, Idaho 83706	From:	Eric Clark, P.E. 727 East Riverpark Lane, Suite 150 Boise, Idaho 83706
File:	203721639	Date:	July 8, 2020

Reference: Incompleteness Letter Response – Woodgrain Millwork, Emmett Lumber

Dear Ms. Chen:

Woodgrain Millwork – Emmett Lumber (Woodgrain) and Stantec Consulting Services (Stantec) received a second incompleteness letter on June 12, 2020 in reference to a Permit to Construct application for permit P-2010.0016, Project 62425. The follow memorandum is Woodgrain and Stantec's response to all of your permitting and modeling questions.

It is Stantec's understanding that Idaho Department of Environmental Quality (DEQ) has two primary questions. First, the prior assumption of the 1/16" of wood removed from the planer process was not deemed conservative by DEQ. DEQ recommended reverting back to 1/8" cuts. Based on the May 2020 dispersion modeling would not have demonstrated compliance with the short term 24-hr $PM_{2.5}$ National Ambient Air Quality Standard (NAAQS) based on DEQ sensitivity analyses. Secondly, some changes configuration changes to the modeling is necessary, specifically a better understanding of the exhaust flow rates associated with the planer and trimmer baghouses.

Stantec developed a proposed path forward to complete all of DEQ's questions. This approach was submitted to DEQ via email on June 24th. The email consisted of three items. These include a thorough discussion of flow measurement techniques and calculations, adjustment of $PM_{2.5}$ emission rates from DEQ accepted sources and conduct updated dispersion modeling. This approach was generally accepted via email on July 2nd (see attached email for reference).

Woodgrain Engineering personnel provided information to Stantec pertaining to two separate flow measurements of the trimmer and planer taken six months apart. Based on an average of the two tests, flow calculations were incorporated into updated dispersion modeling. New exhaust flows applied were 20,965.5 acfm for the trimmer baghouse and 35,472.5 acfm for the planer baghouse. For further comprehensive detail of how these values were derived please see the accompanying flow measurement memorandum. Additionally, the two cyclone/baghouse units are both manufactured by Pneumafil with a model number of 13.5-460-12. The maximum capacity flow rate is 69,000 cfm. While the units have a much greater flow capacity, the configuration used by Woodgrain reduces the flows. The lower flows are very conservative relative to the manufacturer maximums.

Stantec and DEQ conducted some email correspondence on June 8th and 9th that discussed potential modifications to emission rates associated with the planer and trimmer baghouses (see attached emails). DEQ provided some information related to another wood mill permitted facility (Idaho Forest Group, IFG) and asked if 20% of the planer baghouse emissions would be an appropriate representative of Woodgrain's trimmer baghouse emissions. Stantec and Woodgrain reviewed some of the most recent IFG permits. It was also determined that the process used by IFG is very similar to that employed by Woodgrain. Therefore, it was concluded that 20% would be representative. However, to maintain a higher level of conservatism, the updated emissions inventory applied 50%. This change was accepted by DEQ on July 2nd.

Reference: Incompleteness Letter Response – Woodgrain Millwork, Emmett Lumber

It was also determined that DEQ has accepted a 67% ratio of $PM_{2.5}$ to PM_{10} for planer and trimmer processes. In previous analysis, Woodgrain was assuming that the two were equivalent. This update was accepted by DEQ on June 9th. The source for this change is the EPA PM Calculator. This approach is also consistent with the Grangeville IFG permit[1]. Therefore, the emission rates for the planer and trimmer baghouse have been updated from the previously submitted analysis. The changes are: 1) 1/8" cut off each side of the boards from the planer; 2) 50% emission reduction from the planer to the trimmer; 3) $PM_{2.5}$ emissions are reduced by 33% from the PM_{10} values.

All three particulate-based NAAQS were remodeled to demonstrate compliance. This was conducted for the White fir/pine and Douglas Fir scenarios. The new files are available via Microsoft OneDrive at the following link as is the updated modeling memo, EI and other supporting documents.

One Drive Link

Attachments to Response

- Updated emission inventory spreadsheet
- Updated modeling files and report
- Flow Measurement Techniques Memo, manufacturer info and Woodgrain measurement documentation
- Email correspondence with DEQ
- Updated $PM_{2.5/10}$ ratio for planer/trimmer.

Thank you for your consideration.

Stantec Consulting Services Inc.

Eric E. Clark

Eric Clark P.E.
Project Engineer

Phone: 208 388 4324
eric.clark@stantec.com

c. lwarness@woodgrain.com; DSchneider@woodgrain.com; rskinner@woodgrain.com; Darrin.mehr@deq.idaho.gov; dan.heiser@stantec.com

[1] PTC application - https://www.deq.idaho.gov/media/60183070/idaho-forest-group-grangeville-ptc-application-0719.pdf

Appendix I TRIMMER/PLANER REFERENCES & EMAILS

From:	Shawnee.Chen@deq.idaho.gov
To:	Clark, Eric; Darrin.Mehr@deq.idaho.gov
Cc:	Heiser, Dan; LWARNESS@woodgrain.com; DSchneider@woodgrain.com; RSkinner@woodgrain.com; Shawnee.Chen@deq.idaho.gov
Subject:	RE: Proposed Path Forward for Woodgrain Emmett
Date:	Thursday, July 2, 2020 11:41:54 AM

Hi Eric,

Here is from Darrin:

> **Flow Measurements** – DEQ will review the referenced description of the methods used to establish modeled volumetric flow rates when submitted with the application. If operational capacity rates for the primary planer and trimmer planer process units at the time the field survey measurements were taken this information should also be submitted with the substantiation documentation. The submittal of manufacturer or equipment vendor rated design volumetric flow rate capacities for the planer baghouse and trimmer baghouse pneumatic systems in the incompleteness response could assist DEQ in confirming that the measured flow rates, which are intended to establish the modeling demonstration's modeled flow rates, are accurate or conservative values that are representative of actual operational practice for these points of emissions.

Your proposal makes sense to me. 50% assumption is good.

Sorry for not being able to look into this earlier.

Thanks and have a great weekend!
Shawnee

From: Clark, Eric [mailto:eric.clark@stantec.com]
Sent: Wednesday, June 24, 2020 11:04 AM
To: Shawnee Chen; Darrin Mehr
Cc: Heiser, Dan; Warness, Lindsay; Schneider, Donald; Skinner, Ryan
Subject: Proposed Path Forward for Woodgrain Emmett

Shawnee and Darrin –

Stantec and Woodgrain have devised a path to complete the air quality permit application to DEQ's satisfaction. This includes questions regarding flow measurement techniques, cut amounts from the planer/trimmer process and updated PM2.5 emission rates. The following is a list of steps we propose to conduct to answer all of DEQ's concerns. Please let us know if this approach is appropriate.

- **Flow Measurements** – Woodgrain Engineering has provided Stantec with two separate measurements taken 6 months apart that demonstrate similar results. One of these measurements was conducted by an outside third party. Stantec has a better understanding of the process conducted by Woodgrain and will provide a detailed discussion of the techniques and calculation methods used. The intent is then to use an average flow of these two measured values within the model.

Cut Amount from Planer/Trimmer – In DEQ's most recent incompleteness letter, dated June 12, 2020, it was stated the use of 1/16" cuts on all four sides may not represent a worst case scenario. While 1/16" is a typical cut for Woodgrain, we are proposing to move back to the 1/8" for the planer, but with a modification to the original PM2.5 percentage. As discussed with Shawnee, Idaho Forest Group (IFG) has implemented an assumption of 67% of PM10 for PM2.5 from the EPA PM Calculator. This has been accepted by DEQ in the recent past. In a June 9th email correspondence between Shawnee and myself, DEQ appears accepting of this assumption for this project. Additionally, previous IFG permits suggest 20% of the planer emissions to be released via the trimmer baghouse as suggested by DEQ. Stantec and Woodgrain have discussed their process and the operations are very similar to IFG. However, if necessary, we are willing to add another layer of conservatism and assume up to 50% rather than 20%.

- **Updated Modeling** – Because of the above proposed changes, an updated modeling effort is required. All operating scenarios will be rerun using 1/8" @ 67% PM2.5 of PM10, an average flow rate from the two previous measurements and 20-50% allocated to the trimmer. All other sources are expected to remain unchanged from the previous modeling submittal. Any necessary modifications to the modeling report will be incorporated as well.

- **Response to Incompleteness Letter** – Lastly, Stantec and Woodgrain will provide a formal memorandum in response to the most recent letter. Data provided along with the letter will be new modeling files, updated model report, updated EI and a memo about the flow measurement approach.

It is our hope that DEQ is accepting of this approach and provided compliance is met with these assumptions can finalize the completeness phase of the project. Please let us know if this is amenable to DEQ so we can finalize everything by the July 12th deadline. Thank you for your consideration.

Eric Clark, P.E.
Project Engineer
727 East Riverpark Lane, Suite 150
Boise, Idaho 83706
Ph: 208-388-4324
Cell: 208-861-7182
Eric.Clark@stantec.com

From:	Shawnee.Chen@deq.idaho.gov
To:	Clark, Eric
Cc:	LWARNESS@woodgrain.com; DSchneider@woodgrain.com; RSkinner@woodgrain.com; Darrin.Mehr@deq.idaho.gov; Shawnee.Chen@deq.idaho.gov
Subject:	RE: Planer/Trimmer EF follow-up
Date:	Tuesday, June 9, 2020 2:25:49 PM
Attachments:	image001.png

Hi Eric,

Thank you for locating the source of the 67% assumption!

Unfortunately I won't be able to agree that that use of 67% of PM-10 for PM-2.5 is appropriate without test requirements because whether a source test will be required in the permit will be decided by following DEQ's internal guidance on source testing and will be decided when developing the draft permit.

Here are a few factors taken from the guidance that I think is somewhat related to our project:

- *Quantity of emissions (emissions unit's impact on the environment).*
- *Margin of compliance with ambient air quality standards (facilities with an ambient impact >90% of the short term averaging period may require additional testing).*
- *Availability of data specific to emission unit and/or facility. Data may include manufacturer tested and/or guaranteed emissions factors for emission unit and/or control devices, previous source tests, process mass balances, or other source-specific information.*

As you can see, I won't be able to give you a firm answer at this point.

Thanks,
Shawnee

Shawnee Chen, PE | Senior Air Quality Engineer
Idaho Department of Environmental Quality
1410 N. Hilton Street, Boise, Idaho 83706
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Our mission is to protect human health and the quality of Idaho's air, land, and water.

From: Clark, Eric [mailto:eric.clark@stantec.com]
Sent: Tuesday, June 9, 2020 12:20 PM
To: Shawnee Chen
Cc: Warness, Lindsay; Schneider, Donald; Skinner, Ryan
Subject: Planer/Trimmer EF follow-up

Shawnee –

I found a reference to the 67% used throughout IFG permits we discussed yesterday and appears to be without a source testing. It is from the EPA PM Calculator (referenced in Section 4.1 and 4.4). Please see attachment C-7 of the link below. Please advise as to whether DEQ agrees that use of 67% of PM10 for PM2.5 is appropriate without test requirements. Thank you for your assistance.

https://www.deq.idaho.gov/media/60183070/idaho-forest-group-grangeville-ptc-application-0719.pdf

Eric Clark, P.E.
Project Engineer
Eric.Clark@stantec.com

From: Shawnee.Chen@deq.idaho.gov <Shawnee.Chen@deq.idaho.gov>
Sent: Monday, June 8, 2020 4:17 PM
To: Clark, Eric <eric.clark@stantec.com>
Subject: 1/8" and 20% vs. 1/8" for both planner and trimmer - another thought

Hi Eric,

You may want to give enough safety margin to trimmer to avoid that monitoring data exceed throughput limits or test data exceed emissions limits.

Thanks,
Shawnee

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From:	Shawnee.Chen@deq.idaho.gov
To:	Clark, Eric
Cc:	Darrin.Mehr@deq.idaho.gov; Shawnee.Chen@deq.idaho.gov; LWARNESS@woodgrain.com
Subject:	to Eric - Project 62425 - Woodgrain Millwork Emmett - PTC Modificatiion 25 day modeling completeness/incompleteness evaluation
Date:	Monday, June 8, 2020 10:20:44 AM
Attachments:	image002.jpg image003.jpg image004.jpg image005.jpg image006.png

Hi Eric,

I wonder whether it makes sense to you to model the planner baghouse emissions based on 1/8" wood removing and trimmer baghouse emissions based on an assumption that trimmer emissions is 20% of planner baghouse emissions. See the discussions following this email.

I am still looking at the response to the incompleteness letter.

Thanks,
Shawnee

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The following are some thoughts and discussions between me and Darrin and also please see Darrin's email about modeling:

The assumption for removing wood for planner and trimmer has been changed from 1/8th to 1/16th. What is the basis for this change? Should short term emissions be based on worst case scenario, such as 1/8"? If using 1/8", the 24-hr PM-2.5 NAAQS could be exceeded per the following sensitivity analysis so how to ensure the emissions from both baghouses in the planner process equal or below what have been modeled?

1. Monitor total shavings and trimmers from planner process? How to monitor them? or
2. Using filter grain loading guarantee and flowrate to estimate the short term emissions limits in lb/hr to show they are below the modeled rates? or
3. Source testing? (this is not my preference.)

I looked into EFs from IFG Laclede. I believe they were based on the production data. Woodgrain's total EF from planner and trimmer is about the same as IFG's total though I understand each facility could operate different. Maybe Woodgrain could apply IFG's emissions distribution for planner baghouse and trimmer baghouse?
For Woodgrain EI, tThe assumption that the trimmer works the same as planner does not make sense to me. I am not sure that is correct.

Here are the IFG Laclede (proj 61833) EFs:

Planer Chips	0.049	BDT/mbdft planer	20%
Shavings	0.195	BDT/mbdft planer	80%
total	0.244	BDT/mbdft planer	100%

Here are the Woodgrain EFs based on assumptions and calculations

Planer Chips/Trimmer	0.26	lb shavings/bdft	0.117	BDT/mbdft planer
Shavings	0.28	lb shavings/bdft	0.126	BDT/mbdft planer
total			0.243	BDT/mbdft planer

From: Darrin Mehr
Sent: Friday, June 5, 2020 5:54 PM
To: Shawnee Chen
Cc: Kevin Schilling; Darrin Mehr
Subject: Project 62425 - Woodgrain Millwork Emmett - PTC Modificatiion 25 day modeling completeness/incompleteness evaluation

Hi Shawnee,

The 25 day modeling completeness falls on Sunday so it is due today.

I have not found any glaring incompleteness issues at this time.

I am looking into just how critical the two new baghouses servicing the new Planer Building are to 24 hour PM2.5 compliance.
You may recall these two baghouses exhaust emissions from two new planer processes that were constructed at the facility. Stantec and Woodgrain's incompleteness response confirmed that these are two new planer units. It doesn't appear they were part of the 2017 PTC project. The emission points are labeled PLANERBH and TRIMMERBH.

I conducted a sensitivity run that doubled the incompleteness response 24 hr avg emission rates in an attempt to identify the effects of having emissions based on Project 62425's original 1/8 inch material removal assumption as a worst case approach. The incompleteness response changed the planer board thickness removal to 1/16 inch for each side for both planer units. By doubling the emission rates, PLANERBH – 0.466 lb/hr PM2.5 and TRIMMERBH at 0.418 lb/hr PM2.5 I got very high impacts at the receptors near the new Planer Building location.

cid:image002.jpg@01D63C11.40A36910

The background for the project is 25.4 ug/m^3, so the design impact of this sensitivity run is 38.6 ug/m^3, which would exceed the NAAQS of 35 ug/m^3, 24 hour avg.
Notice that the planer and trimmer baghouses become the controlling sources for the design concentration. Group ID "2_BHS" contains PLANERBH and TRIMMERBH.
And the design impact is now attributed almost entirely to the planer building baghouses.

EPA pm_calculator_point_sccs_start_with_3_but_greater_than_30399999

Values of 50% for cyclone and 67% for baghouse were recommended by IDEQ in 2013. Cyclone is process unit, not control unit.

Source Classification Code	Option Group	SCC Level One	SCC Level Two	SCC Level Three	SCC Level Four	Map To					
SCC	Description primary control	Description secondary control	PMCALC_PMFIL_UNCONTROLLED	PMCALC_PM10FIL_UNCONTROLLED	PMCALC_PM25FIL_UNCONTROLLED	PMCALC_PM10FIL_CONTROLLED	PMCALC_PM25FIL_CONTROLLED	PMCALC_PM10FIL_CONTROL_EFF	PMCALC_PM25FIL_CONTROL_EFF	PM2.5/PM10
30700801	Uncontrolled	Uncontrolled	100	58	19	58	19	0	0	0.33
30700801		Industrial Processes	Pulp and Paper and Wood Products	Sawmill Operations	Log Debarking					
30700802	Uncontrolled	Uncontrolled	100	58	19	58	19	0	0	0.33
30700802		Industrial Processes	Pulp and Paper and Wood Products	Sawmill Operations	Log Sawing					
30700803	Uncontrolled	Uncontrolled	100	35	11	35	11	0	0	0.31
30700803		Industrial Processes	Pulp and Paper and Wood Products	Sawmill Operations	Sawdust Pile Handling					
30700804	Uncontrolled	Uncontrolled	100	40	20	40	20	0	0	0.50
30700804	Centrifugal Collector (Cyclone) -	Uncontrolled	100	40	20	5	4	87.5	80	0.80
30700804	Centrifugal Collector (Cyclone) -	Centrifugal Collector (Cyclone) - High Efficiency	100	40	20	0.85	0.8	97.88	96	0.94
30700804	Centrifugal Collector (Cyclone) -	Centrifugal Collector (Cyclone) - Medium Efficienc	100	40	20	2.19	2	94.51	90	0.91
30700804	Centrifugal Collector (Cyclone) -	Centrifugal Collector (Cyclone) - Low Efficiency	100	40	20	4.16	3.6	89.58	82	0.87
30700804		Industrial Processes	Pulp and Paper and Wood Products	Sawmill Operations	Sawing: Cyclone Exhaust					
30700805	Uncontrolled	Uncontrolled	100	40	20	40	20	0	0	0.50
30700805	Uncontrolled	Fabric Filter - High Temperature, I.E. T>250F	100	40	20	0.3	0.2	99.25	99	0.67
30700805	Centrifugal Collector (Cyclone) -	Uncontrolled	100	40	20	5	4	87.5	80	0.80
30700805	Centrifugal Collector (Cyclone) -	Centrifugal Collector (Cyclone) - High Efficiency	100	40	20	0.85	0.8	97.88	96	0.94
30700805	Centrifugal Collector (Cyclone) -	Centrifugal Collector (Cyclone) - Medium Efficienc	100	40	20	2.19	2	94.51	90	0.91
30700805	Centrifugal Collector (Cyclone) -	Centrifugal Collector (Cyclone) - Low Efficiency	100	40	20	4.16	3.6	89.58	82	0.87
30700805	Centrifugal Collector (Cyclone) -	Fabric Filter - High Temperature, I.E. T>250F	100	40	20	0.04	0.04	99.89	99.8	1.00
30700808		Industrial Processes	Pulp and Paper and Wood Products	Sawmill Operations	Other Cyclones: Exhaust					
30700820	Uncontrolled	Uncontrolled	100	51	15	51	15	0	0	0.29
30700820	Centrifugal Collector (Cyclone) -	Uncontrolled	100	51	15	4.8	3	90.59	80	0.63
30700820	Centrifugal Collector (Cyclone) -	Centrifugal Collector (Cyclone) - High Efficiency	100	51	15	0.69	0.6	98.65	96	0.87
30700820	Centrifugal Collector (Cyclone) -	Centrifugal Collector (Cyclone) - Medium Efficienc	100	51	15	1.86	1.5	96.34	90	0.81
30700820	Centrifugal Collector (Cyclone) -	Centrifugal Collector (Cyclone) - Low Efficiency	100	51	15	3.74	2.7	92.66	82	0.72
30700820		Industrial Processes	Pulp and Paper and Wood Products	Sawmill Operations	Chipping and Screening					
30700821		Industrial Processes	Pulp and Paper and Wood Products	Sawmill Operations	Chip Storage Piles					
30700822	Uncontrolled	Uncontrolled	100	51	15	51	15	0	0	0.29