WOOD PRODUCTS MANUFACTURING (SAWMILLS & MILLWORK) ASSIGNMENT TO GENERAL AIR CONTAMINANT DISCHARGE PERMITS

FORM AQGP-110 ANSWER SHEET

Source Category Description:

Sawmill and millwork facilities producing 25,000 or more board feet per shift of finished product and veneer peeling and plywood manufacturing. Activities include sawing, debarking, chipping, planing, sanding, veneer production, kiln drying, cabinet and structural wood manufacturing, surface coating,, and supporting activities such as material conveyors (mechanical and pneumatic), veneer dryers, plywood presses and boilers.

1. Qualifications:

For each qualification statement listed below, answer "yes" or "no" in the far right column.

a.	Do your facility operations meet the description provided above?	
b.	Is a completed Form AQ 220 attached?	
c.	Does the facility use a steam-generating boiler? (If yes, a completed Form AQ 224 (if hogged fuel fired) or Form AQ 208 (for gas, diesel, or oil fired) must be attached.)	
d.	Are wood-drying kilns used? (If yes, a completed Form AQ 225 must be attached.)	
e.	Are cyclones used? (If yes, a completed Form AQ 226 must be attached.)	
f.	Does the facility have a veneer dryer? (If yes, a completed Form AQ 221 must be attached.)	
g.	Does the facility apply paint or other type of coating onto products? (If yes, a completed Form AQ 211 must be attached.)	
h.	Are there any additional operations onsite, other than wood products manufacturing? (If yes, provide a brief description below.)	
i.	Is the facility currently in compliance with LRAPA regulations?	
j.	Have there been any violations in the last 5 years?	
k.	If there have been violations, have they been resolved?	
l.	Does the facility have the proper land use approvals? Stationary Sources must attach a completed Land Use Compatibility Statement.	

2. Additional Comments:

3. Permit Requirements:

All conditions of the General ACDP apply to the source, unless they are listed below. Applicability of these permit conditions is based on date of construction or installation of air contaminant sources. For each permit condition listed below, indicate whether the condition applies to your plant by writing "yes" or "no" in the appropriate column.

Permit condition	**Applicability question:**	**Applicable (yes/no)**
2.1.a	Were any of the equipment or processes installed on or before June 1, 1970 and is the plant operated outside of special control areas? (yes/no)	
2.1.b	Were any of the equipment or processes installed after June 1, 1970 or is the plant operated inside of a special control area? (yes/no)	
2.2a. & 2.2.f	Does the facility have fuel burning equipment (boilers) installed on or before June 1, 1970? (yes/no)	
2.2.b.	Does the facility have fuel burning equipment (boilers) installed, constructed or modified after June 1, 1970? (yes/no)	
2.2.c.	Does the facility have non-fuel burning equipment that was installed on or before June 1, 1970? (yes/no)	
2.2.d.	Does the facility have non-fuel burning equipment that was or will be installed after June 1, 1970? (yes/no)	
2.6.a	Is distillate or residual fuel oil burned in any equipment at the facility? (yes/no)	
2.6.b.	Is on-specification used oil burned in any equipment at the facility? (yes/no)	
3.0	Are there any gas or oil fired boilers with a heat input of 10 to 100 million Btu/hr that constructed, modified, or reconstructed after June 9, 1989? (yes/no)	
4.4	Does the facility have veneer dryers? (yes/no)	
6.5	Does the facility have wood-fired boilers? (yes/no)	
8.4	Is this a new facility? (yes/no)	

4. Maximum Projected Pollutant Emissions: Determine the maximum projected annual pollutant emissions for all of the equipment used at the plant.

a. Gas, Oil and Wood Fired Boilers:

Device	Maximum Projected Annual Fuel Usage	Pollutant	Emission Factor Units	Emission factor	Emissions (tons/yr.)
Boiler (natural gas)	10^6 ft^3	PM	lb/10^6 ft^3	2.5	
		PM_{10}		2.5	
		SO_2		1.7	
		NO_X		100	
				50 (1)	
				32 (2)	
		CO		84	
		VOC		5.5	
Boiler (propane)	10^6 ft^3	PM	lb/1000 gallons	0.6	
		PM_{10}		0.6	
		SO_2		0.10 x S (5)	
		NO_X		19	
		CO		3.2	
		VOC		0.5	
Boiler (Butane)	10^6 ft^3	PM	lb/1000 gallons	0.6	
		PM_{10}		0.6	
		SO_2		0.09 x S (5)	
		NO_X		21	
		CO		3.6	
		VOC		0.6	
Boiler (#1 distillate oil)	gallons	PM	gallons	3.3	
		PM_{10} (3)		1.7	
		SO_2		142 x S (5)	
		NO_X		18	
		CO		5	
		VOC		0.2 (6)	
Boiler (#2 distillate oil)	gallons	PM	gallons	3.3	
		PM_{10} (3)		1.7	
		SO_2		142 x S (5)	
		NO_X		20	
		CO		5	
		VOC		0.2 (6)	

Boiler (#4 distillate oil)	gallons	PM	gallons	8.5	
		PM_{10} (4)		7.3	
		SO_2		150 x S (5)	
		NO_X		20	
		CO		5	
		VOC		0.2 (6)	
Boiler (#5 & #6 residual oil)	gallons	PM	gallons	11.5	
		PM_{10} (4)		9.9	
		SO_2		157 x S (5)	
		NO_X		55	
		CO		5	
		VOC		0.28 (6)	
Boiler (wood)	lb. Steam	PM (7)	lb/1000 lb Steam	0.4	
		PM_{10} (7)		0.2	
		SO_2		0.014	
		NO_X		0.31	
		CO		3.0 (8)	
				2.0 (9)	
				1.0 (10)	
		VOC		0.13	

(1) Emissions factor for "Low NO_X burners"
(2) Emission factor for "Flue gas recirculation"
(3) PM_{10} is 50% of total PM. Total PM is the sum of filterable PM and condensable PM. [AP-42 tables 1.3-1, 1.3-2, and 1.3-6]
(4) PM_{10} is 86% of total PM. Total PM is the sum of filterable PM and condensable PM. [AP-42 tables 1.3-1, 1.3-2 and 1.3-5]
(5) S indicates that the weight % of sulfur in the oil should be multiplied by the value given. For example, if the fuel is 1% sulfur, then S=1.
(6) VOC reported as non-methane total organic carbon (NMTOC).
(7) Emission factor for boilers with PM control devices can be determined using the procedures in section b: Wood-fired boiler PM control efficiencies and PM_{10} fractions.
(8) Emission factor for Dutch Ovens.
(9) Emission factor for Spreader-Stokers.
(10) Emission factor for Fuel Cells.

b. Wood-fired boiler PM control efficiencies and PM_{10} fractions:

Use the following information to make adjustments to the PM emission factors given in table a above. For example, the PM and PM_{10} emissions factors for a Dutch Oven boiler with a high pressure multiclone would be:

EFPM	=	0.40 x (1- 70%/100)	=	0.12 lb/1000 lb of steam
$EFPM_{10}$	=	0.12 x 95%/100)	=	0.11 lb/1000 lb of steam

Control Device	Estimated Efficiency (%)	PM10 Fraction (%)
Uncontrolled	NA	50
Multiclone (low pressure)	50	50
Multiclone (high pressure)	70	95
Wet scrubber (low pressure)	70	80
Wet scrubber (medium to high pressure)	80	95
Electrostatic Precipitator (wet or dry)	95	100

b. Cyclones and Target Boxes:

Device	Materials	Type	Projected Annual Production (BDT) (1)	Emission Factors (lb/BDT)		Emissions (tons/yr)
Cyclone	Dry & Green Chips, Shavings, Hogged Fuel/Bark, Green Sawdust	Medium Efficiency		PM	0.5	
				PM_{10}	0.25	
		High Efficiency		PM	0.2	
				PM_{10}	0.16	
		Baghouse Control		PM	0.001	
				PM_{10}	0.001	
	Sanderdust	Medium Efficiency		PM	NA	
				PM_{10}	NA	
		High Efficiency		PM	2.0	
				PM_{10}	1.6	
		Baghouse Control		PM	0.04	
				PM_{10}	0.04	
Target Box	Sanderdust	Medium Efficiency		PM	0.1	
				PM_{10}	0.05	

(1) Bone Dry Tons

c. Kilns:

Device	Lumber Species	Projected Annual Production (MBF) (1)	Pollutant	Emission Factor (2)	Emissions (tons/yr)
Steam and Electric Kiln	Douglas Fir		PM/PM_{10}	0.02 lb/MBF (3)	
			VOC (7)	0.6 lb/MBF (6)	
			Methanol	0.02 lb/MBF (4)	
			Formaldehyde	0.001 lb/MBF (4)	
	Ponderosa Pine		PM/PM_{10}	0.02 lb/MBF (10)	
			VOC (7)	1.7 lb/MBF (4)	
			Methanol	0.07 lb/MBF (4)	
			Formaldehyde	0.003 lb/MBF (4)	
	Hemlock		PM/PM_{10}	0.05 lb/MBF (3)	
			VOC (7)	0.39 lb/MBF (5)	
			Methanol	0.128 lb/MBF (5)	
			Formaldehyde	0.003 lb/MBF (9)	
	Lodgepole Pine		PM/PM_{10}	0.02 lb/MBF (10)	
			VOC (7)	1.3 lb/MBF (4)	
			Methanol	0.06 lb/MBF (4)	
			Formaldehyde	0.004 lb/MBF (4)	
	White Fir		PM/PM_{10}	0.05 lb/MBF (11)	
			VOC (7)	0.33 lb/MBF (4)	
			Methanol	0.12 lb/MBF (4)	
			Formaldehyde	0.003 lb/MBF (4)	

(1) MBF = 1,000 board feet
(2) Use source specific data, if available.
(3) OSU kiln study, 1998 (WI).
(4) OSU kiln study, 2000 (NCASI)
(5) Emissions from Western Hemlock lumber during drying, Milota & Mosher (2006)
(6) University of Idaho kiln study, 1996 (NCASI), average of heart and sap wood results
(7) VOC emissions factors are based on propane, using the carbon based results and multiplying by 44/36.
(8) Assumed to equal emissions for Douglas Fir
(9) No data, use White Fir
(10) No data, use Douglas Fir
(11) No data, use Hemlock

d. Veneer Dryers PM/PM_{10}, NO_X and CO Emission Factors (lb/1000 ft^2, 3/8" basis):

Dryer Type	Wood species	Annual Production (MSF) (1)	Controls	Pollutant	Emission Factors (lb/MSF)	Emissions (tons/yr.)
Veneer Dryer (Gas Heat)	Douglas Fir		uncontrolled	PM/PM_{10}	0.52	
				NO_X	0.12	
				CO	0.02	
			Burley or 45% control	PM/PM_{10}	0.29	
				NO_X	0.12	
				CO	0.02	
	Hemlock, White Fir		uncontrolled	PM/PM_{10}	0.15	
				NO_X	0.12	
				CO	0.02	
			Burley or 45% control	PM/PM_{10}	0.10	
				NO_X	0.12	
				CO	0.02	
Veneer Dryer (Steam Heat)	Douglas Fir		uncontrolled	PM/PM_{10}	1.01	
				NO_X	NA	
				CO	NA	
			Burley or 45% control	PM/PM_{10}	0.56	
				NO_X	NA	
				CO	NA	
	Hemlock, White Fir		uncontrolled	PM/PM_{10}	0.25	
				NO_X	NA	
				CO	NA	
			Burley or 45% control	PM/PM_{10}	0.15	
				NO_X	NA	
				CO	NA	

(1) MSF = 1000 ft^2

e. Veneer Dryer VOC and Hazardous Air Pollutant Emission Factors: These factors are based on recent studies performed on softwoods by NCASI. EPA incorporated NCASI's data into AP-42, but did not distinguish between southern and northwest softwood species. Therefore, the highest average test result is included in this permit as a conservative estimate of emissions. The VOC emission factors have been adjusted to a propane basis by multiplying the carbon basis by a factor of 44/36. All emission factors are in units of pounds per 1000 square feet on a 3/8" basis (lb/MSF 3/8" basis).

Device	Annual Production	Pollutant	Steam Heated (1)	Direct Wood Fired	Direct Natural Gas-Fired	Emissions (tons/yr.)
Veneer Dryers	MSF (2)	VOC	1.8	1.0	3.1	
		Acetaldehyde	0.022	ND (3)	0.062	
		Acrolein	0.001	ND	0.012	
		Formaldehyde	0.03	0.045	0.064	
		Methanol	0.04	ND	0.036	
		Phenol	0.003	ND	0.006	
		Propionaldehyde	0.0044	ND	0.0016	
		Benzene	0.0012	ND	ND	
		Toluene	0.0032	ND	ND	
		M, p-xylene	0.0012	ND	ND	

(1) From NCASI Tech Bulletin 768
(2) MSF = 1000 ft^2
(3) ND = No Data

Device	Annual Production	Pollutant	Steam Heated	Direct Wood Fired	Direct Natural Gas-Fired	Emissions (tons/yr.)
Veneer Dryers-Cooling Section	MSF	VOC	0.08	ND (1)	0.05	
		Acetaldehyde	0.0004	ND	0.003	
		Acrolein	0.0008	ND	BDL (2)	
		Formaldehyde	0.002	ND	0.002	
		Methanol	0.005	ND	0.006	
		Phenol	0.0003	ND	0.01	
		Propionaldehyde	0.008	ND	BDL	
Fugitives		VOC	0.06	ND	0.046	
		Acetaldehyde	0.005	ND	0.003	
		Formaldehyde	0.001	ND	0.002	
		Methanol	0.01	ND	0.006	
		Phenol	0.006	ND	0.01	

(1) ND = No Data
(2) BDL = Below Detection Limits

e. Plywood Presses (lb/MSF[(1)])

Pollutant	Softwood Emission Factor
VOC	0.07
Acetaldehyde	0.002
Formaldehyde	0.002
Methanol	0.04
Phenol	0.006
Propionaldehyde	0.003

(1) MSF = 1000 ft^2

f. Miscellaneous Plywood Activities

Pollutant	I-J CC [(1)] (lb/MLF)	I-J Saw [(2)] (lb/MLF)	Log Vats (lb/MSF 3/8")	Trim Chip (lb/MSF 3/8")	Sander (lb/MSF)	Skin Saw (lb/MSF)
VOC	0.003	0.11	ND [(3)]	0.068	0.18	0.088
Acetaldehyde	BDL [(4)]	BDL	0.005	BDL	0.003	0.0009
Formaldehyde	0.0002	BDL	BDL	BDL	0.002	0.0003
Methanol	0.0006	0.016	0.007	0.008	0.012	0.012

(1) I-Joist Conditioning Chamber
(2) I-Joist Saw
(3) ND = No Data
(4) BDL = Below Detection Limits

e. Surface Coating Operations:

Note: Consult manufacturer or material safety data sheet for required information to calculate emissions.

Paint Type	Projected Annual Quantity (gallons)	VOC Content (lb/gal.)	HAP Content (lb/gal)	Annual Emissions (tons/yr.)

Certifying Signature

I hereby apply for permission to discharge air contaminants in the State of Oregon, as stated or described in this application, and certify that the information contained in this application and the schedules and exhibits appended hereto, are true and correct to the best of my knowledge and belief.	
Name of official (Printed or Typed):	Title of official and phone number:
Signature of official: SIGN	Date: