

Lane Regional Air Protection Agency
Standard Air Contaminant Discharge Permit

REVIEW REPORT

American Laminators

12796 Highway 36
Swishhome, Oregon 97480
<http://www.americanlaminators.com/index.html>

Permit No. 200021

1. General Background Information

Wood Diversified Resources, LLC dba American Laminators ("American Laminators" and/or "the facility") manufactures a variety of glulam beams at its facility at 12796 Highway 36 Swishhome, Oregon. The facility operates five (5) lumber kilns and two (2) wood-fired boilers that produces steam for the dry kilns. The boilers are controlled by a multiclone and a wet scrubber (in-series). The facility uses two (2) cyclones to control the emissions of PM, PM₁₀ and PM_{2.5} from millwork activities. American Laminators also has a main office and a manufacturing operation in Drain, Oregon (Douglas County).

2. Reasons for Permit Action

Millwork activities (including structural wood members) are an operation listed in Table 1, Part B of LRAPA Title 37, therefore requiring an air permit. The previous permit was renewed on September 15, 2009 and was set to expire December 31, 2014. The primary reason for the permit action is to renew the expired permit. As part of the renewal, LRAPA is taking the opportunity to add new and/or updated requirements to the permit.

3. Emission Unit Description

The emission units designated in the permit are the following:

Emission Unit	Emission Unit Identification (EU ID)	Control Equipment
Millwork Activities	Millwork	Two (2) cyclones (EQ-1, EQ-3)
Five (5) Dry Kilns	Kilns	None
Two (2) wood-fired boilers	Boilers	Multiclone and wet scrubber

The two (2) wood-fired boilers share a multiclone and wet scrubber installed as pollution controls. Boiler 1 installed in 1978, is rated at 6.7 MMBtu/hr. Boiler 2, installed in 1980, is rated at 5.0 MMBtu/hr. Two (2) cyclones, which exhaust directly to the atmosphere, are used to control particulate emissions from the millwork activities. One cyclone (EQ-3) handles particulate emissions from wood machining equipment including finger jointer, band mill saw, beam planer, cut-off saw, chipper and two (2) trim saws. The other cyclone (EQ-1) collects shavings from the planing mill (1 softwood planer). Material collected by cyclone EQ-1 is conveyed to cyclone EQ-3. Both cyclones were installed in 1979. There are also two (2) wood waste hoppers. Fugitive VOC/HAP emissions are also emitted from the use of wood adhesives for the millwork (glulam beams) and coating products. Fugitive VOC/HAPs are also emitted by the five (5) dry kilns. Currently only four (4) of the five (5) dry kilns on-site are operable; only two (2) are used at any one time in the winter months but all four (4) operational kilns are used in the summer months.

The glulam beams are primarily manufactured from Douglas Fir (DF) and Alaskan Cedar (AC), but the facility also uses Southern Yellow Pine (SP).

4. Enforcement History

Notice of Non-Compliance (NON) No. 3324 was issued to the facility on October 3, 2011 for failure to initiate and maintain monthly and rolling twelve month emission calculations and for failure to submit annual reports for calendar years 2009 and 2010. Notice of Violation (NOV) No. 11-3324 was issued to the facility on November 16, 2011 and included an assessed civil penalty in the amount of \$2,100. On January 4th, 2012 LRAPA and the facility entered into Stipulated and Final Order (SFO) Number 11-3324 to resolve the violations including a reduced penalty in the amount of \$1,050. The facility paid the penalty and the enforcement file was closed.

NON No. 1037: On May 9, 1994 NON No. 1037 was issued for failure to inspect and record inspections on the scrubber used to control emissions from the boilers. Corrective action required to resolve the violation included (at least) monthly inspections of the scrubber to assure scrubber operation. No further action was taken or required to resolve the violation.

5. Performance Testing

No performance testing is known to have been conducted at this facility. The permit requires the facility test one of the two wood-fired boilers to determine compliance with the 0.14 gr/dscf particulate emission standard and to verify the emission factors for PM₁₀, NO_x and CO. The permit requires the smaller of the two boilers (Boiler 2 rated at 5.0 MMBtu/hr) as it is the most commonly-used boiler at the facility. Boiler 1 (rated at 6.7 MMBtu/hr) is used as a backup and its operation is very seldom.

6. Plant Site Emission Limits (PSELs)

Below are the facility's PSELs as they appear in the permit. In accordance with LRAPA Title 42, these limits are set at the Generic PSEL level except for VOC which is set at the source-specific level accounting for baseline emissions and a potential to emit that is greater than the Significant Emission Rate (SER) for VOC.

Annual (12-month rolling) PSELs
 (tons/year)

Source	PM	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	VOC	GHG
Totals	24	14	9	39	39	99	40	74,000

- a. The PM_{2.5} PSEL is established as part of this permit action and is based upon the fraction of PM₁₀ that is PM_{2.5}.
- b. The GHG PSEL is established at the Generic PSEL level in accordance with LRAPA Title 12 and Title 42.

Comparison of Baseline Emission Rates (BERs) and Significant Emission Rates (SERs)

The baseline emissions for the facility were established during the previous permitting action and, except for VOC, were not revised with this permit action. The BER for VOC was revised on the

basis of better information: new emission factors for VOC (and HAPs) were finalized in early 2015. Estimated emissions are based on emission factors from LRAPA's General Permit for Sawmills, boiler manufacturer data, and pilot-scale kiln testing (for VOC and/or HAPs). The following table includes each pollutants' baseline emission rate, netting basis and PSEL to show that PSEL increase above the proposed netting basis are all less than the SER.

Pollutant	Baseline Emission Rate (tons/yr)	Netting Basis		Plant Site Emission Limit (PSEL)		
		Previous (tons/yr)	Proposed (tons/yr)	Previous PSEL (tons/yr)	Proposed PSEL (tons/yr)	PSEL Increase over Netting Basis (tons/yr)
PM	7.2	7.2	7.2	31	24	16.8
PM ₁₀	7.2	7.2	7.2	21	14	6.9
PM _{2.5}	NA	NA	5.5	NA	9	3.5
CO	1.8	1.8	1.8	99	99	97.2
NO _x	20	20	20	59	39	19
SO ₂	58	58	58	39	39	-19
VOC	1.5	2.0	1.5	42	40	38.5
GHG	NA	NA	NA	NA	74,000	74,000

- a. The baseline emission rates for PM, PM₁₀, CO, NO_x, and SO₂ were determined in previous permitting actions and there has been no changes.
- b. The VOC baseline emission rate was revised (reduced) on the basis of revised (better) emission factors for kiln drying.
- c. A baseline emission rate is not required for PM_{2.5} in accordance with the definition of "baseline emission rate" in LRAPA Title 12. The PM_{2.5} netting basis is established with this permitting action as the ratio of the fraction of PM₁₀ that is PM_{2.5} (0.77) multiplied by the PM₁₀ netting basis (7.2 tons/year). No "true-up" was necessary since the PM_{2.5} required PSEL minus the PM_{2.5} calculated netting basis (5.5 tons/year) was less than the 10 ton/year Significant Emission Rate (SER) for PM_{2.5}.
- d. The facility did not request a GHG baseline be established with this permitting action.

7. PSEL Compliance Demonstration

In order to ensure that the 12-month rolling PSELs are not exceeded, the facility is required to perform emission calculations by the 15th day of each month and submit annual reports by March 1st of each year to LRAPA. For GHGs, compliance with the PSEL is determined by complying with the Oregon GHG reporting program requirements specified in division 215 (as applicable).

8. Continuous Compliance

To further ensure compliance with the PSELs, the facility is required to keep a record of the following information for a period of two (2) years after entry.

Item	Parameter (units)	Minimum Recording Frequency
A	Boiler steam production (1000's of pounds)	Daily
B	Amount of material processed through the cyclones (tons)	Monthly
C	Dry Kiln Throughput by species (MBF)	Monthly
D	Amount and type of glue used in the laminating plant (pounds)	Monthly
E	Operating hours of laminating plant	Daily
F	Dry Kiln Temperature (degrees F)	Twice per charge
G	Dates of inspection and maintenance of scrubber system and cyclones	As Performed

9. Reporting Requirements

The facility is required to submit an annual report as described in the permit.

10. Additional Regulatory Considerations

The permit includes grain loading limitations as well as general visible emissions limitations in accordance with the rules adopted by DEQ on April 15, 2015.

11. Hazardous Air Pollutants (HAPs)

The HAP emission estimates for the dry kilns assume that all lumber is dried at temperatures less than 200 degrees Fahrenheit. A condition in the permit requires monitoring and recordkeeping of the dry kiln temperatures to further ensure the estimation assumption remains valid.

The following are the estimated maximum emissions (potential to emit) of HAPs:

Pollutant	Total (tons/year)
HCl	0.97
Acrolien	0.21
Propionaldehyde	0.01
Formaldehyde	1.23
Acetaldehyde	0.66
Benzene	0.01
Phenol	11.1
Styrene	0.1
Toluene	0.05
Xylenes	0.001
Methanoi	0.52
Total	18.61

Phenol is the highest single HAP emitted by the facility and is the pollutant required to be tracked monthly.

12. National Emission Standards for Hazardous Air Pollutants (NESHAPs)

The facility is an "area source" of HAPs and therefore is not subject to the Plywood and Composite Wood Products NESHAP that is applicable only to major sources. The two wood-fired boilers at

the facility are subject to the Area Source Boiler NESHAP (Subpart JJJJJJ, Subpart 6J) applicable requirements including biennial tune-ups. Boiler 1 is defined as a "limited-use" boiler and its operation is restricted to an annual capacity factor of no more than 10 percent (876 hours/year); the biennial tune-up requirement doesn't apply to limited-use boilers. Because each boiler is rated at less than 10 MMBtu/hr, the one-time energy assessment is not required.

13. Typically Achievable Control Technology (TACT)

LRAPA Title 32-008 requires an existing emission unit at a facility to meet TACT if: the emissions unit results in emissions of criteria pollutants greater than ten (10) tons per year of any gaseous pollutant or five (5) tons per year of PM; the emissions unit is not subject to the emissions standards under LRAPA Title 32, Title 33, Title 39, or Title 46 for the pollutants emitted; and if the facility is required to have a permit. The boilers emits more than 10 tons of NO_x and CO and is required to meet TACT; LRAPA has determined that there are no controls other than 'good combustion practices' required for these boiler types/sizes. The dry kilns emit more than 10 tons of gaseous pollutants and are therefore required to meet TACT. LRAPA has determined that there are no control technologies typically achieved for dry kilns.

14. New Source Review (NSR) and Prevention of Significant Deterioration (PSD)

The facility is located in an area that is designated attainment for all pollutants. There are no increases in the PSEs above the netting basis by more than the SER, so the facility isn't subject to PSD.

15. New Source Performance Standards (NSPSs)

Because each of the two (2) wood-fired boiler's rated capacity is less than 10 MM BTU/hr, neither of the boilers are subject to the New Source Performance Standards for Small Industrial-Commercial-Institutional Steam Generating Units (40 CFR Part 60 Subparts A and Dc).

16. Public Notice

The draft permit was on public notice from June 5, 2015 to July 9, 2015. No written comments were submitted during the 35-day comment period.

Max/cmw
07/10/15

Criteria Pollutants

Pollutant	Kilns tpy	Boilers tpy	Millwork tpy	Total tpy	Netting Basis tpy	Total - NB tons	Existing PSEL tpy	Requested PSEL tpy
PM	0.2	5.6	5.3	11.1	7.2	3.9	31	24
PM10	0.2	2.8	2.6	5.7	7.2	-1.5	21	14
PM2.5	0.2	2.8	1.4	4.4	5.5	-1.1	--	9
SO2		0.7		0.7	58	-57.3	39	39
NOx		14.4		14.4	20	-5.6	59	39
CO		139.8		139.8	1.8	138.0	99	99
VOC	7.0	6.1	33.5	46.6	1.4	45.2	41	40
GHGs		NA		0	NA	NA	NA	74,000

HAPs

	Boilers tpy	Kilns tpy	Millwork tpy	Total tpy
HCl	0.97			0.97
Acrolein	0.20	0.01		0.21
Formaldehyde	0.23	0.01	1.0	1.23
Acetaldehyde	0.04	0.61		0.66
Benzene	0.01			0.01
Phenol	0.00		11.1	11.1
Propylene	--			--
Propionaldehyde	0.00	0.01		0.01
Toluene	0.05			0.05
Ethyl benzene	0.00			--
Hexane	--			--
Xylenes	0.00			0.00
Methanol	0.00	0.52	0.7	0.52
Total	1.71	1.16	15.7	18.61

Highest Single HAP

Diversified Wood Resources, LLC dba American Laminators
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Kiln Emissions

Kiln Production	Maximum		Projected Production Scenario	
	82%	90%	10%	10%
Doug Fir (DF)	18%	15,867 M bf/yr	3,483 M bf/yr	17,415 M bf/yr
Cedar	18%	3,483 M bf/yr	1,935 M bf/yr	1,935 M bf/yr

Criteria Pollutants	90% Douglas Fir			
	Max throughput (M bd feet/yr)	Emission Factor (lb/1000 bd feet)	Conversion Factor (ton/lb)	Annual Emissions (tons)
Pollutant	19,350	0.7222	0.0005	7.0
VOC	19,350	0.023	0.0005	0.2
PM/PM10/PM2.5	19,350	0.025	0.0005	0.2

Operate a maximum of 8,760 hours per year.
 Emission factors are from General Permit Emission Factors (PM) and "2015 Compilation of VOC and HAP Emission Factors for Lumber Drying Kilns - ODEQ and EPA R10"
 Assume Alaskan Yellow Cedar actually dried at the facility is represented by the Western Red Cedar emission factors.

Criteria Pollutants	82% Douglas Fir			
	Max throughput (M bd feet/yr)	Emission Factor (lb/1000 bd feet)	Conversion Factor (ton/lb)	Annual Emissions (tons)
Pollutant	19,350	0.68478	0.0005	6.6
VOC	19,350	0.025	0.0005	0.2
PM/PM10/PM2.5	19,350	0.025	0.0005	0.2

Operate a maximum of 8,760 hours per year.
 Emission factors are from General Permit Emission Factors (PM) and "2015 Compilation of VOC and HAP Emission Factors for Lumber Drying Kilns - ODEQ and EPA R10"
 Assume Alaskan Yellow Cedar actually dried at the facility is represented by the Western Red Cedar emission factors.

HAPs	82% Douglas Fir			
	Emission Factors	Cedar	DF	Emissions
formaldehyde	0.0013 lb/M bf	0.0013 lb/M bf	20.63 lb/yr	4.53 lb/yr
acetaldehyde	0.051	0.12	809.22	417.96
methanol	0.0389	0.122	617.23	424.93
propionaldehyde	0.0005	0.0012	7.93	4.18
acrolein	0.0007	0.0015	11.11	5.22
Total	0.0924	0.246	1466.11	856.82

HAPs	90% Douglas Fir			
	Emission Factors	Cedar*	DF	Emissions
formaldehyde	0.0013 lb/M bf	0.0013 lb/M bf	22.64 lb/yr	2.52 lb/yr
acetaldehyde	0.051	0.12	888.17	232.20
methanol	0.0389	0.122	677.44	236.07
propionaldehyde	0.0005	0.0012	8.71	2.32
acrolein	0.0007	0.0015	12.19	2.90
Total	0.0924	0.246	1609.15	476.01

Emission factors are from "2015 Compilation of VOC and HAP Emission Factors for Lumber Drying Kilns - ODEQ and EPA R10"
 Assume Alaskan Yellow Cedar actually dried at the facility is represented by the Western Red Cedar emission factors.

Baseline/Netting Basis Revision	1977 Baseline Year		VOC EF		VOC Emissions	
	Dry Kiln Throughput	Board Feet	lb/M bf	tons/yr	lb/yr	T/yr
Alder	4,280,000	Board Feet	0.31	0.66	1120.37	0.56
Cedar	1,070,000	Board Feet	0.769	0.41	913.51	0.46
TOTAL				1.07	2033.88	1.02

Previous baseline emission rate (1.7 ton/yr) from kilns was based upon VOC EF of 3.1 lb/M bf (N.CASI TB #405)
 Previous baseline emission rate assumed no VOCs from cedar

*Formaldehyde, acetaldehyde, propionaldehyde and acrolein: for western cedar, western hemlock is used
 *Methanol: for western cedar, white fir is used
 **For PM, assume cedar is represented by hemlock and white fir PM factors

Boilers		Hours of Operation	8760	hours/yr	Criteria Pollutants		Heat Input	11.7	MMBtu/hr
Pollutant	Emission Factor (existing)	EF Units	Total Boilers (tons)	Emission Factor (New DEQ)	EF units	Emission Factor (new)	EF Units	Total Boilers (tons)	
PM	0.066	lb/MMBtu	3.4	0.12	lb/M lb steam	0.11	lb/MMBtu	5.6	
PM10	0.065	lb/MMBtu	3.3	0.06	lb/M lb steam	0.05	lb/MMBtu	2.8	
PM2.5	NA	lb/MMBtu	NA	0.06	lb/M lb steam	0.05	lb/MMBtu	2.8	
SO2	0.025	lb/MMBtu	1.3	0.014	lb/M lb steam	0.01	lb/MMBtu	0.7	
NOx	0.49	lb/MMBtu	25	0.31	lb/M lb steam	0.28	lb/MMBtu	14.4	
CO	0.017	lb/MMBtu	0.9	3	lb/M lb steam	2.73	lb/MMBtu	139.8	
VOC	0.13	lb/MMBtu	6.7	0.13	lb/M lb steam	0.12	lb/MMBtu	6.1	
GHG (CO2)	NA	lb/MMBtu	NA	NA		206.96	lb/MMBtu	10575.125	

All Emission Factors are from ODEQ "Sawmill" General ACDP, except for GHG which is from 40 CFR Part 98, Table C-1
 PM factor assumes 70% efficiency for multistage and wet scrubber combined.
 Assume 1000 lbs steam = 1.1 MMBtu

Millwork

Cyclones

Cyclone	Emission Desc.	Pollutant	Max Annual Throughput (BDT/year)	Emission Factor (lbs/BDT)	PM	PM10	PM2.5
					Annual Emissions (tons/year)	Annual Emissions (tons/year)	Annual Emissions (tons/year)
EQ-1	wood machining equipment	PM	10,575	0.5	2.6		
EQ-1	wood machining equipment	PM10	10,575	0.25		1.3	
EQ-1	wood machining equipment	PM2.5	10,575	0.13			0.7
EQ-3	planing mill	PM	10,575	0.5	2.6		
EQ-3	planing mill	PM10	10,575	0.25		1.3	
EQ-3	planing mill	PM2.5	10,575	0.13			0.7
Total					5.3	2.6	1.4

Emission factors are from DEQ Sawmill General Permit (assume medium efficiency cyclones) and AQEF-08 (PM2.5 fractions of PM10).

Laminating Plant

Adhesive Usage Type	Adhesive Usage Amount (pounds/yr)	VOC (%)	Phenol (%)	Formaldehyde (%)	Resorcinol (%)	Methanol (%)	Ditethanolamine (%)
					Formaldehyde (%)	Resorcinol (%)	Methanol (%)
Beam Laminating	369,000	16.6	5.5	0.49	1	0.35	0.45
Fingerjointing	35,100	16.6	5.5	0.49	1	0.35	0.45

All percentages are maximum pollutant content in terms of percent by weight (% wt)

Pollutant	Emissions (tons/year)
VOC	33.5
Phenol	11.1
Formaldehyde	1.0
Resorcinol	2.0
Methanol	0.7
Diethanolamine	0.9
Total HAP	15.7

Boiler HAP Emission Summary

Pollutant	Max Firing Rate		Ref	Emissions
	Emission Fac	Units		
11.70 MMBtu/hr				
Metals				
Antimony	7.90E-06	lb/MMBtu	EPA AP-42	4.05E-04
Arsenic	1.80E-07	lb/MMBtu	WA Ecology	9.22E-06
Beryllium	1.70E-07	lb/MMBtu	WA Ecology	8.71E-06
Cadmium	4.40E-07	lb/MMBtu	WA Ecology	2.25E-05
Chromium -total	2.70E-05	lb/MMBtu	WA Ecology	1.38E-03
Cobalt	6.50E-06	lb/MMBtu	EPA AP-42	3.33E-04
Lead	3.20E-06	lb/MMBtu	WA Ecology	1.64E-04
Managanese	4.20E-05	lb/MMBtu	WA Ecology	2.15E-03
Mercury	2.70E-07	lb/MMBtu	WA Ecology	1.38E-05
Nickel	3.00E-06	lb/MMBtu	WA Ecology	1.54E-04
Selenium	2.00E-06	lb/MMBtu	WA Ecology	1.02E-04
			Total Metals	0.0047
Hydrogen Chloride	1.90E-02	lb/MMBtu	EPA AP-42	0.97
Chlorine	7.90E-04	lb/MMBtu	EPA AP-42	0.04
			Total HCL and C	1.01

Organics

POM or PAH	3.00E-05	lb/MMBtu	EPA AP-42	0.00E+00
Dioxins	1.70E-06	lb/MMBtu	EPA AP-42	8.71E-05
Furans	1.90E-09	lb/MMBtu	EPA AP-42	9.74E-08
Acetaldehyde	8.30E-04	lb/MMBtu	EPA AP-42	4.25E-02
Acetophenone	3.20E-09	lb/MMBtu	EPA AP-42	1.64E-07
Acrolein	4.00E-03	lb/MMBtu	EPA AP-42	2.05E-01
Benzene	1.20E-04	lb/MMBtu	WA Ecology	6.15E-03
Bromomethane	1.50E-05	lb/MMBtu	EPA AP-42	7.69E-04
Carbon tetrachlori	4.50E-05	lb/MMBtu	EPA AP-42	2.31E-03
Chlorobenzene	3.30E-05	lb/MMBtu	EPA AP-42	1.69E-03
Chloroform	2.80E-05	lb/MMBtu	EPA AP-42	1.43E-03
Chlormethane	2.30E-05	lb/MMBtu	EPA AP-42	1.18E-03
Ethylbenzene	3.10E-05	lb/MMBtu	EPA AP-42	1.59E-03
Formaldehyde	4.40E-03	lb/MMBtu	EPA AP-42	2.25E-01
Napthalene	9.70E-05	lb/MMBtu	EPA AP-42	4.97E-03
Pentachloropheno	5.10E-08	lb/MMBtu	EPA AP-42	2.61E-06
Phenol	5.10E-05	lb/MMBtu	EPA AP-42	2.61E-03
Propionaldehyde	6.10E-05	lb/MMBtu	EPA AP-42	3.13E-03
Styrene	1.90E-03	lb/MMBtu	EPA AP-42	9.74E-02
Tetrachloroethene	3.80E-05	lb/MMBtu	EPA AP-42	1.95E-03
Toluene	9.20E-04	lb/MMBtu	EPA AP-42	4.71E-02
1,1,1- trichloroeth	2.60E-09	lb/MMBtu	EPA AP-42	1.33E-07
Trichloroethene	3.00E-05	lb/MMBtu	EPA AP-42	1.54E-03
2,4,6- trichlorophe	2.20E-08	lb/MMBtu	EPA AP-42	1.13E-06
Vinyl chloride	1.80E-05	lb/MMBtu	EPA AP-42	9.22E-04
Xylene	2.50E-05	lb/MMBtu	EPA AP-42	1.28E-03
			Total Organics	0.65
			Total HAP	1.71

Total HAP Factor	3.26E-02	lb/MMBtu	
Highest HAP Facto	5.10E-05	lb/MMBtu	phenol is the highest single HAP emitted at the facility

PM2.5 Netting Basis Establishment

	PM10 PSEL (tpy)	PM2.5 Fraction of PM10 (%)	PM2.5 (tpy)
Material Handling Cyclones	2.6	0.5	1.3
Dry Kilns	0.2	1	0.2
Boilers	2.8	1	2.8
	<u>5.7</u>		<u>4</u>
PM2.5/PM10 PSEL Ratio =	0.77 Fraction of PM10 that is PM2.5		
PM10 netting basis =	7.2 tons/year	1978 Baseline Emission Rate	
PM2.5 netting basis =	5.5 tons/year	calculated as PM10 PSEL x fraction	
PM2.5 required PSEL	4 tons/year		
PM2.5 req. PSEL-PM2.5 NB	-1 tons/year	<10 ton/year SER for PM2.5	
PM2.5 netting basis (true up): NA	tons/year	True up not required	

PM2.5 netting basis established in accordance with the DEQ "PM2.5 Netting Basis and PSEL Corrections..." IMD (February 1, 2012)