TECHNICAL SUPPORT DOCUMENT

Air Discharge Permit ADP 06-2691R1
ADP application L-607

Hampton Lumber Mills – WA, Inc.
Randle Facility
SWCAA ID - 350

Final Date: July 20, 2010

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Abbreviations

acfm	Actual cubic feet per minute
ADP	Air Discharge Permit
AP-42	Compilation of Emission Factors, AP-42, Fifth Edition, Volume 1, Stationary Point and Area Sources – published by the US Environmental Protection Agency
ASIL	Acceptable Source Impact Level
BACT	Best Available Control Technology
BART	Best Available Retrofit Technology
Bdt	Bone dry tons
Btu	British thermal unit
CPM	Condensable particulate matter
CFR	Code of Federal Regulations
CO	Carbon monoxide
EPA	U.S. Environmental Protection Agency
dscfm	Dry standard cubic feet per minute
ESP	Electrostatic precipitator
gr/dscf	Grains per dry standard cubic foot (68 °F, 1 atmosphere)
HAP	Hazardous air pollutant listed pursuant to Section 112 of the Federal Clean Air Act
LAER	Lowest Achievable Emission Rate
lb/hr	Pound per hour
lb/MMBtu	Pound per million British thermal units
mmbf	Thousand board feet
MSDS	Material Safety Data Sheet
NO_x	Nitrogen oxides
NOV	Notice of Violation
NSPS	New Source Performance Standards
PM	Total particulate matter (includes both filterable particulate matter measured by EPA Method 5 and condensable particulate matter measured by EPA Method 202)
PM_{10}	Particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (includes both filterable particulate matter measured by EPA Method 201 or 201A and condensable particulate matter measured by EPA Method 202)
$PM_{2.5}$	Particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers (includes both filterable particulate matter measured by EPA Method 201 or 201A and condensable particulate matter measured by EPA Method 202)
ppm	Parts per million
ppmv	Parts per million by volume
ppmvd	Parts per million by volume, dry
PSD	Prevention of Significant Deterioration
RACT	Reasonably Available Control Technology
RCW	Revised Code of Washington
scf	Standard cubic feet
SQER	Small Quantity Emission Rate listed in WAC 173-460
SNCR	Selective non-catalytic reduction
SO_2	Sulfur dioxide
SWCAA	Southwest Clean Air Agency
TAP	Toxic air pollutant pursuant to WAC 173-460
T-BACT	Best Available Control Technology for toxic air pollutants
tpy	Tons per year
VOC	Volatile organic compound
WAC	Washington Administrative Code

1. FACILITY IDENTIFICATION

Applicant Name:	Hampton Lumber Mills
Applicant Address:	PO Box 189, Randle, Washington 98377
Facility Name:	Hampton Lumber Mills - WA, Inc. Randle Facility
Facility Address:	10166 US Highway 12, Randle, Washington 98377
SWCAA ID:	350
Contact Person:	David Like and George Jacobs
Primary Products:	Dimensional dried lumber
SIC/NAICS Code:	2421/321113
Facility Classification:	Title V (CO, NO_X, VOC, and HAPs)

2. FACILITY DESCRIPTION

Hampton Lumber Mills has a sawmill located at 10166 US Highway 12 in Randle, Lewis County, Washington. Hampton Lumber Mills - WA, Inc. Randle Facility (Hampton Lumber Randle) is a manufacturer of finished dimensional lumber products. The products manufactured by Hampton Lumber Randle are primarily used in the construction industry. Dimensional lumber produced at the Randle facility is shipped both kiln dried and green. The green lumber is treated with anti-stain. The equipment includes a Wellons hog fuel boiler, bunkers, dry kilns, pneumatic conveyors, plant vehicle traffic, and debarking and saw equipment. The facility has the potential to emit more than 100 tons per year of nitrogen oxides, carbon monoxide and volatile organic compounds and more than 10 tons per year of acetaldehyde and methanol; therefore it is a major source and is subject to the Air Operating Permit Program.

3. CURRENT PERMITTING ACTION

This permitting action is in response to Air Discharge Permit application (ADP application) number L-607 dated September 18, 2007. Hampton Lumber Randle submitted ADP application L-607 requesting approval of the following:

- Modify the boiler temperature monitoring requirements. The boiler firebox temperature can not easily be directly monitored due to high temperatures. The harsh environment, such as ash or slag build-up, reduces the temperature indicators' operational life. Also, the conditions within the furnace are constantly in flux due to changing fuel moisture content, boiler load and excess air levels. The main purpose of monitoring the temperature is to assure consistent operation of the SNCR system and alert the operators to any sudden changes in the operating parameters of the boiler, which can also be done if the temperature is monitored at the outlet of the ESP. Also, the oxygen and carbon monoxide levels of the unit are being continuously monitored.
- Modify the averaging periods for the gaseous emission from the hog fuel boiler. ADP 06-2691 established an averaging time of 1-hour and the facility has requested to change this to a 24-hour averaging time. The original application requested an averaging time of 24 hours, and with a hog fuel boiler, CO spikes are unavoidable. Often the facility has to open the boiler and rake the grates. Opening the doors introduces cold air and cools the cell, thus disrupting the operator's control of combustion air. The boiler cannot achieve the current limit with a 1-hr averaging time. Other similar boilers in SWCAA jurisdiction have a 24-hr averaging time for gaseous emissions.
- Update the dry kiln emission factors and testing protocol.
- FNOC #3321 was issued for exceeding bin unloading particulate matter emission limits. This was due to a different accounting method for throughput, not an increase in throughput. Bin unloading throughputs will be updated.
- No new equipment is proposed for this permit action.

Air Discharge Permit 06-2691R1 will supersede Air Discharge Permit 06-2961 in its entirety.

4. PROCESS DESCRIPTION

4.a Green timber is brought into the facility, debarked and cut into specified sizes (dimensional lumber) by wood working equipment.

4.b The Wellons hog fuel boiler provides the steam for the dry kilns. Wood waste from sawmill operations is used to fire the Wellons hog fuel boiler. Emissions from the boiler are controlled via a multiclone, ESP and an SNCR system.

4.c Green lumber is stacked on carts and dried in one of the four American Wood Dryers dry kilns or four Wellons dry kilns. After drying, lumber is removed from the kilns and sent to the planer mill for surfacing and trimming.

4.d Green lumber may also be surfaced in the planer mill without drying. An anti-stain chemical is applied after surfacing to prevent mold growth. Anti-stain may also be applied to dried lumber.

4.e Lumber is sent to the planer mill. Emissions from the planer are controlled by a Clarke's Sheet Metal baghouse, which is exhausted to the atmosphere.

4.f Particulate matter collected from various waste streams throughout the plant is mechanically conveyed to storage bins.

4.g Finished lumber (green and dry) is stored and shipped off site for sale.

5. EQUIPMENT/ACTIVITY IDENTIFICATION

5.a Log Yard. The log yard consists of all outdoor areas on the south side of the facility used for the handling and storage of raw logs. Raw logs are received by trucks, and stacked until needed for the sawmill. Access roads to the log yard from US Highway 12 are completely paved, but the yard area itself is packed earth. Haul road and fugitive dust emissions are controlled by low pressure water spray. Water is applied with a water truck as necessary to minimize emissions.

5.b Sawmill. The sawmill consists of an enclosed building and associated equipment used to produce green lumber. The sawmill is arranged in a linear configuration. Raw logs are debarked and cut to length with bucksaws. Processed logs are then cut down to standard dimensional lumber sizes through multiple stages of trimming, edging, and resawing. Green sawdust from sawing operations is collected by drag chains, and mechanically conveyed to exterior storage bins. Select pieces of equipment, such as planers, are directly connected to the cyclone and baghouse combination. Finished lumber is color coded and/or marked prior to shipment off site.

Particulate matter collected by the planer mill baghouse is conveyed to exterior storage bins. Bark and other streams of byproduct material are mechanically conveyed to a fuel hog and stored in an exterior bin. Other streams of unusable wood are mechanically conveyed to multiple chippers. Wood chips are mechanically conveyed to exterior storage bins prior to shipment off site. Hog fuel produced on-site is sent to the Wellons boiler.

The following relevant equipment is associated with the sawmill:

- Log sawing equipment: Two debarkers, two bucksaws, one fuel hog, three chippers, various conveyors, various chop saws, trim saws, various edgers, one planer.
- One Sutorbilt green sawdust cyclone (Sawdust Cyclone) rated at 1,630 dscfm is used for collection and transfer of green sawdust from log processing operations.

- One cyclone/baghouse combination: Clarke's Sheet Metal, Inc. "Pneu-Aire" baghouse (Baghouse #1), model l00-20-G2 and cyclone with an airflow of 42,200 dscfm to control sawmill emissions.
- Metal shavings from grinding and sharpening saw blades and other cutting equipment are collected by two knock-out boxes which exhaust to the ambient atmosphere with a combined airflow of 4,960 dscfm. Collected metal shavings are stored in barrels prior to disposal.

5.c Anti-Stain Treatment. Spray Technologies sap stain spray system, including a Spray Technologies Linear SS 100 spray booth with an airflow of 500 acfm and a Spray Technologies model CT-12012 mist eliminator. Emissions from the spray enclosure are collected and vented to the mist eliminator. The mist eliminator consists of internal baffles that collect the anti-stain droplets and route them back into circulation. The mist eliminator is estimated to eliminate 98% of all spray particles 12 microns or larger.

5.d Chip Bunkers. Five transfer bunkers with 20-unit capacity. These bunkers are used to store/transfer wood chips.

5.e Sawdust Bunker. One transfer bunker with 30-unit capacity. This bunker is used to store/transfer sawdust and is equipped with wind shrouds.

5.f Hog Fuel/Bark Bunker. One transfer bunker with 30-unit capacity. This bunker is used to store/transfer bark and hog fuel.

5.g Shavings Bunker. One transfer bunker with 30-unit capacity. This bunker is used to store/transfer shavings and is equipped with wind shrouds and a wet suppression system.

5.h Hog Fuel Boiler. The Wellons Inc. hog fuel boiler was manufactured in 2006. The boiler is used to generate steam for the lumber dry kilns on-site and is fired solely on wood byproducts from facility operations with the potential to buy additional hog fuel from other facilities on an as-needed basis. Most of the boiler's fuel is hog fuel from the sawmill. However, chips, planer shavings, sawdust, and scrap wood are all fired in the boiler depending on required fuel characteristics. Exhaust from the boiler's furnace will pass through a selective noncatalytic reduction (SNCR) system to reduce oxides of nitrogen (NO_x) concentrations and then through a multiclone followed by a two-field ESP to remove particulate matter (PM).

The Wellons hog fuel boiler is subject to the NSPS standard 40 CFR 60.40b et seq. (Subpart Db) "Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units" for units greater than 100 MMBtu/hr.

Opacity, NO_x and CO emissions are continuously monitored using continuous emission/opacity monitors.

The following relevant equipment is associated with the hog fuel boiler:

- Wellons hog fuel boiler, model 2D2C9.0A, serial #2606-0501, rated at 120,000 pounds of saturated steam per hour and 164.9 MMBtu with an airflow of 78,090 acfm (approximately 44,000 dscfm). The unit has water cooled grates, where the water from the grates will pre-heat the incoming water to the boiler and a heat exchanger to pre-heat incoming boiler combustion air.
- One SNCR system to reduce post combustion NO_X concentrations using urea. The unit can achieve a control efficiency of approximately 50%. The system includes a urea tank, approximately 6,100 gallons in capacity, with redundant urea and water pumps rated at 18 gpm.
- One multiclone and one two-field ESP model number 2W-092-2922, serial number B2606-2425 in series to reduce PM emissions.
- The stack is 80 feet 5 13/16 inches tall with a diameter of 7 feet 1/8 inches.

Wellons has a guaranteed emission level of 90 ppm for NO_X, 225 ppm for CO, 0.01 gr/dscf for PM, and 25 ppm for ammonia corrected to 7% O_2.

5.i Dry Kilns. Eight dry kilns used to dry green lumber from the sawmill. The kilns are powered exclusively with steam from the facility's hog fuel boiler. Rough sawn lumber, almost exclusively Douglas fir and hemlock, but also minor amounts of pine, spruce and other woods, is stacked on carts and rolled into the kilns. After drying, lumber is removed from the kilns and sent to the planer.

The following equipment is associated with the dry kilns:

- Four American Wood Dryers, Inc. model 1156 steam heated dry kilns with added heat exchangers.
- Four Wellons, Inc. steam heated, 104 foot double track dry kilns. The kilns hold approximately 50 MMBF/yr each, totaling 200 MMBF/yr.

Other Equipment

2 Debarkers	1 Head rig
2 Chop saws	1 Twinsaw
1 Stenner saw	1 Stacker
1 Sorter	1 Water truck

5.j Equipment/Activity Summary.

ID No.	Generating Equipment/Activity	# of Units	Control Equipment	# of Units
1	Log yard	N/A	Water truck – low pressure water spray	1
2	Sawmill/Planer	1	Building enclosures, Sawdust cyclone, Baghouse #1, Knock-out boxes	N/A
3	Spray Technologies Sap anti-stain system	1	Spray Technologies mist eliminator	1
4	Chip bunker	5	None	N/A
5	Sawdust bunker	1	Wind shrouds	N/A
6	Shavings bunker	1	Wet suppression system, Wind shrouds	N/A
7	Hog fuel/bark bunker	1	None	N/A
8	Wellons hog fuel boiler	1	One multiclone followed by a two-field ESP and SNCR	N/A
9	Dry kilns	8	Process temperature limit	N/A

6. EMISSIONS DETERMINATION

Emissions to the ambient atmosphere from the hog fuel boiler and lumber mill operations proposed in ADP application L-607 consist of carbon monoxide (CO), oxides of nitrogen (NO_X), volatile organic compounds (VOC), sulfur dioxide (SO_2), particulate matter (PM), toxic air pollutants (TAPs), and hazardous air pollutants (HAPs). All PM emitted is assumed to be PM_{10} unless otherwise stated.

6.a Haul Roads. Emissions from unpaved haul roads were calculated using AP-42 Section 13.2.2 (11/06) and assuming an average silt content of 4.8%, an average round trip distance of 0.5 miles, and the average truck

weight of 20 tons; the total vehicle miles traveled (VMT) is calculated to be 22,000 mile/yr. The use of wet suppression is expected to provide an overall control efficiency of 80% for haul road emissions.

$$E = k\left(\frac{s}{12}\right)^{a}\left(\frac{w}{3}\right)^{b}(100\% - CE)$$

Where:

E = Emission factor, in lb/VMT, for PM, PM_{10}, or $PM_{2.5}$;
k = Emission constants for PM (k=4.9), PM_{10} (k=1.5), or $PM_{2.5}$ (k=0.23);
a = Emission constants for PM (a=0.7), PM_{10} (a=0.9), or $PM_{2.5}$ (a=0.9);
b = Emission constants for PM (b=0.45), PM_{10} (b=0.45), or $PM_{2.5}$ (b=0.45);
s = Road surface silt content, in percent;
w = Average truck weight, in tons; and
CE = Control efficiency, in percent.

Activity	Mileage (miles/yr)	Pollutant	Emission Factor - Uncontrolled (lb/mile)	Control Efficiency	Emissions (tpy)
Haul Road	22,000	PM	6.06	80%	13.33
		PM_{10}	1.54	80%	3.40
		$PM_{2.5}$	0.24	80%	0.52

6.b Sawmill.

6.b.l. Baghouse: PM emissions from the Clarke's Sheet Metal baghouse (Baghouse #1), based on 42,200 dscfm, 8,760 hours per year, and 0.005 gr/dscf, are 7.92 tpy.

6.b.2. Cyclone: PM emissions from the Sutorbilt cyclone (Sawdust Cyclone), based on 1,630 dscfm, 8,760 hours per year and 0.030 gr/dscf, are 1.84 tpy. The emission limit of 0.030 gr/dscf is referenced from EPA AP-42 10-4.1 (2/80) for other types of sawmill emissions.

6.b.3. Knock-out boxes: PM emissions from the two filing rooms, based on 4,960 dscfm, 8,760 hours per year, and 0.01 gr/dscf, are 1.86 tpy.

$PM_{2.5}$ emissions are assumed to be 23% of PM emissions (EPA PM Calculator Version 2.0 - SCC 30700899). Emission evaluations should be based on maximum allowed emission concentrations and actual hours of operation.

Pollutant	Emissions
PM/PM_{10}	11.62 tpy
$PM_{2.5}$	2.67 tpy

6.c Wood Waste Bunkers *(modified).* Emissions from wood waste storage and transfer consist primarily of fugitive particulate matter emitted during truck loading. Potential emissions from the existing bunkers (shavings, sawdust, chip, hog/bark) are calculated from material throughput reported by the facility for those process units.

Emission factors for PM and PM_{10} are based on information from EPA AP-42 Table 10.4-2 (7/79). The original factors provided in Table 10.4-2 have been modified subsequent to engineering review by SWCAA. The modifications are due to variations in material and emission controls. The resulting emission factors applicable to this facility are provided below. An additional emission reduction of 20% has been applied to the base emission factors for sawdust and shavings transfer due to the proposed use of 2-sided shrouding and additional emission

reduction of 5% on the shavings due to water spray control. $PM_{2.5}$ emissions are estimated to be 23% of PM emissions (EPA PM Calculator Version 2.0 - SCC 30700899).

Material	Throughput	Pollutant	Emission Factor	Emissions
Shavings	38,160 Bdt	PM	0.49 lb/ton	9.35 tpy
		PM_{10}	0.29 lb/ton	5.53 tpy
		$PM_{2.5}$	23% PM	2.15 tpy
Green Sawdust	46,700 Bdt	PM	0.24 lb/ton	5.60 tpy
		PM_{10}	0.14 lb/ton	3.27 tpy
		$PM_{2.5}$	23% PM	1.29 tpy
Chip	111,000 Bdt	PM	0.20 lb/ton	11.10 tpy
		PM_{10}	0.12 lb/ton	6.66 tpy
		$PM_{2.5}$	23% PM	2.55 tpy
Green Hog/Bark	58,330 Bdt	PM	0.15 lb/ton	4.37 tpy
		PM_{10}	0.09 lb/ton	2.62 tpy
		$PM_{2.5}$	23% PM	1.01 tpy
Total		PM		30.42 tpy
		PM_{10}		18.09 tpy
		$PM_{2.5}$		7.00 tpy

6.d Anti-Stain. Emissions from anti-stain treatment come from the usage of "Bazooka", an anti-stain coating. According to supplemental information, "Bazooka" contains 2.71 lbs/gallon of VOCs and 12% dipropylene glycol methyl ether which has an SQER of 43,748 lbs/yr and is a Class B TAP (WAC 173-460 [effective 8/21/98]). The facility intends to use a maximum of 3,500 gallons per year of "Bazooka" to treat 350 million board feet, emitting up to 4.74 tpy of VOCs and 1.73 tpy of dipropylene glycol methyl ether. Emissions of dipropylene glycol methyl ether are considerably less than the SQER. Emissions shall be based on annual throughput and MSDS information.

6.e Hog Fuel Boiler. Emissions from the Wellons hog fuel boiler are determined from emission factors from Wellons, a heat input of 164.9 MMBtu/hr, an airflow of 44,000 dscfm, and 8,760 annual hours per year. $PM_{2.5}$ emission factors are 90% of PM_{10} emissions as determined from EPA's PM Calculator Version 2.0.

Emission factors	lbs/MMBtu	PPM	Emissions (tpy) (8,760 hr)
NO_x	0.15	90	108.34
CO	0.23	225	166.12
VOC	0.03		21.67
SO_2	0.025		18.06
PM/ PM_{10}	0.0228	0.010 gr/dscf	16.52
$PM_{2.5}$	0.0207		14.87
Acetaldehyde	0.000164		0.12
Acrolein	0.0000316		0.02
Ammonia	0.031	25	22.39
Formaldehyde	0.00172		1.24

Compliance with emission limits shall be based on the most recent source test information.

An ammonia slip of 25 ppm can result from the use of the SNCR system.

The annual limits include start up and shutdown emissions. During start up the CO and NO_X concentrations spike to 1500 ppm (1.51 lb/MMBtu) and 110 ppm (0.18 lb/MMBtu), respectively. The facility estimates approximately

144 hours of start up situations annually (twenty-four start ups per year). These emissions are accounted for in the annual (tpy) limit and the boiler is assumed to be at full firing rate, 164.9 MMBtu/hr.

Total Boiler Emissions Including Start Up Emissions

Pollutant	Start Up Hours 144 hr/yr	Normal Operation Hours 8616 hr/yr	Total Emissions
CO	17.93 tpy	163.39 tpy	181.32 tpy
NOx	2.14 tpy	106.56 tpy	108.70 tpy

Emissions of PM during start up and shutdown periods where the ESP is not in operation should be calculated using actual wood consumption during start up/shutdown (or a higher heating value of 8,000 Btu/lb if actual quantity of wood consumption during start up/shutdown is not available), an ash content of 1.5% and actual hours of start up/shutdown where ESP is not online.

All TAPs/HAPs emitted by the boiler were modeled using ISC-PRIME for ADP application L-577, except formaldehyde which was modeled using AERMOD-PRIME. The predicted ambient impacts did not exceed each individual TAP's acceptable source impact level (ASIL) as provided in WAC 173-460 effective 8/21/98.

6.f Lumber Drying (*modified*). Emissions from lumber drying operations are estimated based on applicable emission factors and the maximum rated lumber throughput for each wood type (a total of 325 MMbf/yr). The average final moisture content is 16% and the facility typically dries at 180 ºF, but wants to maintain the ability to operate the kilns at 200 ºF. Actual wood species vary, and are approximately 60% hemlock, 30% Douglas fir and 10% other species.

Emissions from lumber drying include particulate matter (presumably condensable PM), volatile organic compounds, methanol, formaldehyde, acetaldehyde, propionaldehyde, acrolein, ethanol, and acetic acid. SWCAA has developed individual emission factors for PM, VOCs, methanol, formaldehyde, acetaldehyde, propionaldehyde, and acrolein from test data available to SWCAA at the time of permitting. Test data and literature (e.g. articles by Dr. Mike Milota – Oregon State University) indicate that emissions of volatile organic compounds, methanol, and formaldehyde have a strong dependence on the maximum drying temperature; therefore SWCAA has developed a temperature dependent emission factor for each of these pollutants based on a least squares fit of the available data from numerous tests for various facilities. SWCAA is not aware of any full speciation profiles of the VOC emissions from dry kilning lumber from which to develop an accurate scaling factor for the EPA Method 25A results. SWCAA has used the following assumptions to calculate VOC emissions based on the EPA Method 25A test data and the available speciated HAP data:

Assumptions

Component	Response Factor	Molecular Weight	Notes
Methanol	0.69	32.04	CH_4O
Formaldehyde	0	30.04	CH_2O
Acetaldehyde	1.0	44.05	C_2H_4O
Propionaldehyde	2.0	58.08	C_3H_6O
Acrolein	1.95	56.06	C_3H_40
Mono Turpenes	10	136.23	$C_{10}H_{16}$

where response factor = (ppm as CH_4 indicated by M25A)/(ppm compound)

Assume all unknown VOCs are mono turpenes ($C_{10}H_{16}$), Mwt. = 136.23

For example, to correct the Method 25A data for the known methanol emissions, SWCAA assumed that the methanol response factor is 0.69, meaning that for every 1 ppm of methanol measured, the Method 25A analyzer read 0.69 ppm as methane (CH_4). Using this assumption, the portion of the Method 25A reading resulting from methanol in the exhaust stream can be estimated and subtracted from the Method 25A result. After doing this for all known species, we are left with a Method 25A result that is due to compounds other than the known compounds. For this analysis, SWCAA has assumed that the remaining VOCs are represented by mono turpenes ($C_{10}H_{16}$). To scale the remaining VOC emissions expressed as propane (C_3H_8) to mono turpenes ($C_{10}H_{16}$) the following equation would be used:

$$\frac{\text{lb as } C_{10}H_{16}}{\text{MMbf}} = \left(\frac{\text{lb as } C_3H_8}{\text{MMbf}}\right)\left(\frac{\text{Mwt C in } C_3H_8}{\text{Mwt } C_3H_8}\right)\left(\frac{\text{Mwt } C_{10}H_{16}}{\text{Mwt C in } C_{10}H_{16}}\right) = \left(\frac{\text{lb as } C_3H_8}{\text{MMbf}}\right)\left(\frac{36}{44}\right)\left(\frac{136.23}{120}\right)$$

This could result in a significant underestimation of VOC emissions if it turns out that the bulk of the remaining VOC emissions are alcohols or aldehydes since both have low response factors and higher ratios of molecular weight to the number of carbon atoms in the molecule.

For this analysis the following temperature dependent Method 25A relationships were used:

Wood Species	VOCs as C_3H_8
Western hemlock	1.75*(T) – 121
Douglas fir	19.2*(T) – 2,845

where: T is temperature in degrees Fahrenheit

Emissions of acetaldehyde, propionaldehyde, and acrolein did not appear to be strongly temperature dependent, therefore the emission factor for these pollutants is a simple average of the available test data. No test data is yet available to estimate emissions of ethanol and acetic acid.

Source tests conducted by Horizon Engineering using the "H. Dettinger" method were not used to calculate emission factors because this method does not control humidity in the kiln, and therefore does not accurately represent a drying cycle. Generally this resulted in shorter drying times. Some portion of the VOC emissions is believed to be related to thermal decomposition products that would be related to the kiln temperature and the overall time the wood is held at specific temperatures; therefore the H. Dettinger method is likely to underestimate VOC emissions.

The facility wants the flexibility to use Douglas fir and hemlock interchangeably. They expect that the maximum usage of either wood would be 70%, or 227.5 MMbf. Because Douglas fir has higher VOC emissions, the VOC limit will be based on drying 70% Douglas fir and 30% hemlock. However, because hemlock has higher HAP emissions, the HAP limits will be based on drying 70% hemlock and 30% Douglas fir.

Hemlock Drying

Throughput = 227,500,000 Board Feet
Maximum Kiln Temperature = 200 ° F

		Emission Factors			
Pollutant	Equation	lb/MMBf	lb/yr	tpy	Emission Factor Source
PM		50.5	11,488.75	5.74	Nov. 1998 by Horizon Engineering at OSU
PM_{10}		50.5	11,488.75	5.74	Nov. 1998 by Horizon Engineering at OSU
$PM_{2.5}$		50.5	11,488.75	5.74	Nov. 1998 by Horizon Engineering at OSU
VOC	See discussion	371	84,402.50	42.20	SWCAA Default August 2009
Methanol	2.83*(T) - 457	109.0	24,797.50	12.40	SWCAA Default August 2009
Formaldehyde	0.064*(T) - 10.8	2.00	455.00	0.23	SWCAA Default August 2009
Acetaldehyde		113	25,707.50	12.85	SWCAA Default August 2009
Propionaldehyde		1.2	273.00	0.14	SWCAA Default August 2009
Acrolein		1.75	398.13	0.20	SWCAA Default August 2009
Total TAPs			51,631.13	25.82	
Total HAPs			51,631.13	25.82	

(T) is in units of degrees Fahrenheit in the equations presented in the table above.

Douglas Fir Drying

Throughput = 227,500,000 Board Feet
Maximum Kiln Temperature = 200 ° F

		Emission Factors			
Pollutant	Equation	lb/MMBf	lb/yr	tpy	Emission Factor Source
PM		21	4,777.50	2.39	Nov. 1998 by Horizon Engineering at OSU
PM_{10}		21	4,777.50	2.39	Nov. 1998 by Horizon Engineering at OSU
$PM_{2.5}$		21	4,777.50	2.39	Nov. 1998 by Horizon Engineering at OSU
VOC	See discussion	1008	229,320.00	114.66	SWCAA Default August 2009
Methanol	1.45*(T) - 223	67	15,242.50	7.62	SWCAA Default August 2009
Formaldehyde	0.0495*(T) - 7.6	2.3	523.25	0.26	SWCAA Default August 2009
Acetaldehyde		49	11,147.50	5.57	SWCAA Default August 2009
Propionaldehyde		0.53	120.58	0.06	SWCAA Default August 2009
Acrolein		0.73	166.08	0.08	SWCAA Default August 2009
Total TAPs			27,199.90	13.60	
Total HAPs			27,199.90	13.60	

(T) is in units of degrees Fahrenheit in the equations presented in the table above.

The emission factors established for spruce and Engelmann spruce/lodgepole pine (ESLP) are based on a single source test at 180 °F provided by Hampton Lumber Randle. The factors for white fir and ponderosa pine have been scaled to 200 °F. For those species that do not have information on particulate matter emissions, hemlock emission factors should be used. These emission factors are here for future emission inventory determinations not potential to emit establishment since the throughput on these different wood species will be much smaller than the dominate species of Douglas fir and hemlock.

Other Wood Species' Emission Factors					
	VOC (lb/MMBf)	PM (lb/MMBf)	Methanol (Lb/MMBf)	Formaldehyde (lb/MMBf)	Reference
White fir	633	50.5	221	7.1	SWCAA Default
Sitka spruce	290				HLM, OSU, 11/03
Ponderosa pine	2,596		89	3	HLM, OSU, 7/07; HEFLD, Milota, 7/06
ESLP	400		29	0.9	HLM, OSU, 2/07

HLM, OSU, 11/03 - Hampton Lumber Mills test performed by Oregon State University on November, 2003.
HLM, OSU, 7/07 – Hampton Lumber Mills test performed by Oregon State University on July, 2007.
HEFLD, Milota, 7/06 – Hazardous air pollutant emissions from lumber drying, Dr. Michael Milota, July, 2006.
HLM, OSU, 2/07 – Hampton Lumber Mills test performed by Oregon State University on February, 2007.

6.g Facilitywide Potential to Emit.

Pollutant	Emissions
NO_X	108.70 tpy
CO	181.32 tpy
VOC	161.20 tpy
SO_2	18.06 tpy
PM	77.63 tpy
PM_{10}	55.37 tpy
$PM_{2.5}$	30.80 tpy

Facilitywide TAP/HAP Emissions

The Ambient Impact Analysis was only performed for those compounds exceeding the SQER (WAC 173-460 effective 8/21/98) for ADP application L-577.

Toxic Compound	**CAS #**	**Total Annual Emissions (lb/yr)**	**Small Quantity Emission Rate (lb/yr)**	**Ambient Impact ($\mu g/m^3$)**	**Acceptable Source Impact Level ($\mu g/m^3$)**	**TAP Class**	**EPA Classified HAP (Yes/No)**
Acetaldehyde	75-07-0	25,945	50	0.0109**	0.45	A	Yes
Acetophenone	98-86-2	0.0046	--		0	B	Yes
Acrolein	107-02-8	443.73	175	0.602**	0.02	B	Yes
Ammonia	7664-41-7	44,600	17,500	10.2	100	B	No
Antimony	7440-36-0	33.1	175		1.7	B	Yes
Arsenic	7440-38-2	2.05	--	9.43E-05	0.00023	A	Yes
Beryllium	7440-41-7	2.24	--	1.03E-04	0.00042	A	Yes
Benzene	71-43-2	1,070	20	0.0492	0.12	A	Yes
Bis(2-ethylhexyl) phthalate	117-81-7	0.068	500		2.5	A	Yes
Cadmium	7440-43-9	4.19	--	1.92E-04	0.00056	A	Yes
Carbon Tetrachloride	56-23-5	65.6	0.5	0.00301	0.067	A	Yes
Chlorine	7782-50-5	1,140	175	0.262	5	B	Yes
Chlorobenzene	108-90-7	48	22,750		150	B	Yes
Chloroform	67-66-3	39.8	10	0.00182	0.043	A	Yes

2-Chlorophenol	108-43-0	0.049	50		0.18	A	No
Chromium, hexavalent	7440-47-3	1.73	--	7.95E-05	0.000083	A	Yes
Chromium, trivalent	7440-47-3	2.22	175		0.00083	A	Yes
Cobalt	7440-48-4	0.18	175		0.17	B	Yes
Copper	7440-50-8	10.8	175		0.67	B	No
1,2-Dichloroethane	107-06-2	42.2	10	0.00194	0.038	A	Yes
Dichloromethane	75-09-2	415	50	0.019	0.56	A	Yes
1,2-Dichloropropane	78-87-5	48.1	500		4	A	Yes
Dinitrophenol-24	51-28-5	0.14	--		0	B	Yes
Ethyl benzene	100-41-4	45.2	43,748		1,000	B	Yes
Formaldehyde	50-00-0	2,935	20	0.0479**	0.077	A	Yes
Hydrogen chloride	7647-01-0	5,780	175	1.33	7	B	Yes
Lead	7439-92-1	71.5	50	0.0164	0.5	A	Yes
Manganese	7439-96-5	142	175		3.3	B	Yes
Mercury	7439-97-6	0.6	175		0.33	B	Yes
Methanol	67-56-1	25,998	43,748		870	B	Yes
Naphthalene	91-20-3	137	22,750		170	B	Yes
Nickel	7440-02-2	3.65	0.5	1.67E-04	0.0021	A	Yes
Nitric Oxide	10102-43-9	127,000	17,500	29.2	100	B	No
Nitrophenol-4	100-02-7	0.25	--		0	B	Yes
PAH	PAH	0.026	--	1.20E-06	0	A	Yes
Pentachlorophenol	87-86-5	0.033	50		0.33	A	Yes
Phenol	108-95-2	18.1	10,500		63	B	Yes
Phosphorus	7723-14-0	39	175		0.33	B	Yes
Propionaldehyde	123-38-6	361.1	--		0	B	Yes
Selenium	7782-49-2	2.52	175		0.67	B	Yes
Styrene	100-42-5	2,740	43,748		1000	B	Yes
Sulfuric Acid Mist	7664-93-9	2,960	175	0.679	3.3	B	No
TCDD, Total	1746-01-6	0.00002	--	9.98E-10	0.00000003	A	Yes
Tetrachloroethene	127-18-4	55.2	500		1.1	A	Yes
Tin	7440-31-5	9.58	175		6.7	B	No
Toluene	108-88-3	30.7	43,748		400	B	Yes
Trichloroethane	79-01-6	43.8	50		0.59	A	Yes
Trichlorofluoromethane	75-69-4	58.5	43,748		190000	B	No
2,4,6- Trichlorophenol	88-06-2	0.0164	50		0.32	A	Yes
Vanadium	1314-62-1	1.96	175		0.17	B	No
Vinyl Chloride	75-01-4	26.6	10	0.00122	0.012	A	Yes
Xylene	1330-20-7	35.4	43,748		1500	B	Yes

** This modeled result is from hog fuel boiler emissions only, and does not include dry kiln emissions.

Acetophenone, dinitrophenol-2,4, nitrophenol-4 and propionaldehyde are listed as HAPs however have no ASIL information and are listed with low EPA confidence in the studies in which the (reference dose) RfD was based, according to the Technology Transfer Network Air Toxics Web Site. Emissions of acetaldehyde, acrolein, methanol, and propionaldehyde from the hog fuel boiler upgrade were modeled using ISC-PRIME, and formaldehyde was modeled using AERMOD-PRIME. The increase of emissions from the dry kilns due to the new emission factors were not modeled and do not represent an actual increase in emissions.

7. REGULATIONS AND EMISSION STANDARDS

Regulations that have been used to evaluate the acceptability of the proposed facility and establish emission limits and control requirements include, but are not limited to, the regulations, codes, or requirements listed below.

7.a 40 CFR 60.8 "Performance Tests" requires that emission tests be conducted according to test methods approved in advance by the permitting authority and a copy of the results be submitted to the permitting authority.

7.b Title 40 Code of Federal Regulations (40 CFR) Part 60.40 et seq. (Subpart Db) "Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units" applies to any steam generating unit with a heat input greater than 100 million Btu/hr constructed, modified, or reconstructed after June 19, 1984. The hog fuel boiler at this source has a design heat input over 100 million Btu per hour and was constructed after 1984, therefore this standard applies to this unit.

7.c 40 CFR 63.7 "Performance testing requirements" requires that emission tests be conducted according to test methods approved in advance by SWCAA and a copy of the results be submitted to SWCAA.

7.d 40 CFR 63.9 "Notification Requirements" requires that an initial notification, a notification of performance testing, and a notification of compliance status be submitted to SWCAA, the delegated authority.

7.e 40 CFR Part 63.2230 et seq. (Subpart DDDD) "National Emission Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products" applies to each Plywood and Composite Wood Products manufacturing facility that is located at a major source of HAP emissions. Hampton Lumber Randle is subject to this regulation because the facility in Randle is a major source of HAP emissions. The facility is only required to comply with the initial notification requirement and that initial notification was submitted July 15, 2009 based upon evidence that the facility was a major source for HAP emissions.

7.f 40 CFR Part 63.2230 et seq. (Subpart DDDDD) "National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters" applies to each industrial, commercial, or institutional boiler or process heater that is located at, or is part of, a major source of HAP emissions. Hampton Lumber Randle is subject to this regulation because the facility in Randle is a major source of HAP emissions. However, Subpart DDDDD has been vacated and remanded and therefore the initial compliance date is no longer in force.

7.g 40 CFR Part 63.4680et seq. (Subpart QQQQ) "National Emission Standards for Hazardous Air Pollutants: Surface Coating of Wood Building Products" applies to each facility that applies coatings using, for example, roll coaters or curtain coaters in the finishing or laminating of any wood building product that contains more than 50 percent by weight wood or wood fiber excluding the weight of any glass components, and is used in the construction, either interior or exterior, of a residential, commercial, or institutional building. It is indeterminate whether the application of anti-stain/antifungal coatings on finished lumber is covered by this Subpart and an applicability determination has been submitted to the Environmental Protection Agency.

7.h 40 CFR Part 68 "Chemical Accident Prevention Provisions" sets forth the list of regulated substances and thresholds, the petition process for adding or deleting substances to the list of regulated substances, the requirements for owners or operators of stationary sources concerning the prevention of accidental releases, and the State accidental release prevention programs approved under section 112(r). This facility uses urea not aqueous ammonia, therefore this regulation is not triggered.

7.i 40 CFR Part 70 "State Operating Permit Programs" requires affected facilities to have a permit to operate that assures compliance by the source with all applicable requirements. Respondent's facility is an affected facility because potential criteria pollutant emissions are in excess of 100 tons per year and HAPs are in excess of 10 tpy of a single pollutant.

7.j Revised Code of Washington (RCW) 70.94.141 empowers any activated air pollution control authority to prepare and develop a comprehensive plan or plans for the prevention, abatement and control of air pollution within its jurisdiction. An air pollution control authority may issue such orders as may be necessary to effectuate the purposes of the Washington Clean Air Act [RCW 70.94] and enforce the same by all appropriate administrative and judicial proceedings subject to the rights of appeal as provided in Chapter 62, Laws of 1970 ex. sess.

7.k RCW 70.94.152 provides for the inclusion of conditions of operation as are reasonably necessary to assure the maintenance of compliance with the applicable ordinances, resolutions, rules and regulations when issuing an Air Discharge Permit for installation and establishment of an air contaminant source.

7.l Washington Administrative Code (WAC) 173-401 "Operating Permit Regulation" requires that sources with actual or potential emissions greater than the Title V thresholds have a Title V permit. Respondent's actual emissions exceed the Title V thresholds; therefore this regulation applies to the Respondent's facility.

7.m WAC 173-460 "Controls for New Sources of Toxic Air Pollutants" requires Best Available Control Technology for toxic air pollutants (T-BACT), identification and quantification of emissions of toxic air pollutants and demonstration of protection of human health and safety.

7.n WAC 173-470 "Ambient Air Quality Standards for Particulate Matter" establishes ambient air quality standards for total suspended particulate matter and for particulate matter smaller than 10 microns (PM_{10}), which may not be exceeded more than one day per year.

7.o WAC 173-474 "Ambient Air Quality Standards for Sulfur Oxides" establishes ambient air quality standards for sulfur oxides in the ambient air, measured as sulfur dioxide, which shall not exceed:

(1) Four-tenths part per million (0.4 ppm) by volume average for a one-hour period more than once per one-year period;
(2) Twenty-five one-hundredths part per million (0.25 ppm) by volume average for a one-hour period more than twice in a consecutive seven-day period;
(3) One-tenth part per million (0.1 ppm) by volume average for a one-day period more than once per one-year period; and
(4) Two one-hundredths part per million (0.02 ppm) by volume average for a one-year period.

7.p WAC 173-475 "Ambient Air Quality Standards for Carbon Monoxide, Ozone, and Nitrogen Dioxide" establishes ambient air quality standards for carbon monoxide, ozone, and nitrogen dioxide in the ambient air, which shall not be exceeded.

7.q SWCAA 400-040 "General Standards for Maximum Emissions" requires all new and existing sources and emission units to meet certain performance standards with respect to Reasonably Available Control Technology (RACT), visible emissions, fallout, fugitive emissions, odors, emissions detrimental to persons or property, sulfur dioxide, concealment and masking, and fugitive dust.

7.r SWCAA 400-040(1) "Visible Emissions" requires that no emission of an air contaminant from any emissions unit shall exceed twenty percent opacity for more than three minutes in any one hour at the emission point, or within a reasonable distance of the emission point.

7.s SWCAA 400-040(2) "Fallout" requires that no emission of particulate matter from any source shall be deposited beyond the property under direct control of the owner(s) or operator(s) of the source in sufficient quantity to interfere unreasonably with the use and enjoyment of the property upon which the material is deposited.

7.t SWCAA 400-040(3) "Fugitive Emissions" requires that reasonable precautions be taken to prevent the fugitive release of air contaminants to the atmosphere.

7.u SWCAA 400-040(4) "Odors" requires that any person who shall cause or allow the generation of any odor from any source, which may unreasonably interfere with any other property owner's use and enjoyment of their property use recognized good practices and procedures to reduce these odors to a reasonable minimum.

7.v SWCAA 400-040(6) "Sulfur Dioxide" requires that no person shall emit a gas containing in excess of one thousand ppm of sulfur dioxide on a dry basis, corrected to 7% O_2 or 12% CO_2 as required by the applicable emission standard for combustion sources.

7.w SWCAA 400-040(8) "Fugitive Dust Sources" requires that reasonable precautions be taken to prevent fugitive dust from becoming airborne, and minimize emissions.

7.x SWCAA 400-050 "Emission Standards for Combustion and Incineration Units" requires that all provisions of SWCAA 400-040 be met and that no person shall cause or permit the emission of particulate material from any combustion or incineration unit in excess of 0.23 grams per dry cubic meter (0.1 grains per dry standard cubic foot) of exhaust gas at standard conditions.

7.y SWCAA 400-060 "Emission Standards for General Process Units" requires that all new and existing sources not emit particulate matter in excess of 0.1 grains per dry standard cubic foot of exhaust gas.

7.z SWCAA 400-070(2) "Hog fuel boilers" allows hog fuel boilers to emit visible emissions in excess of twenty percent opacity for up to fifteen consecutive minutes once in any eight hour period for the purposes of soot blowing and/or grate cleaning. All hog fuel boilers are also required to utilize RACT and be operated and maintained to minimize emissions.

7.aa SWCAA 400-110 "New Source Review" requires that an Air Discharge Permit application be filed with SWCAA, and an Air Discharge Permit be issued by SWCAA, prior to establishment of the new source, emission unit, or modification.

7.bb SWCAA 400-113 "Requirements for New Sources in Attainment or Nonclassifiable Areas" requires that no approval to construct or alter an air contaminant source shall be granted unless it is evidenced that:

(1) The equipment or technology is designed and will be installed to operate without causing a violation of the applicable emission standards;
(2) Best Available Control Technology will be employed for all air contaminants to be emitted by the proposed equipment;
(3) The proposed equipment will not cause any ambient air quality standard to be exceeded; and
(4) If the proposed equipment or facility will emit any toxic air pollutant regulated under WAC 173-460, the proposed equipment and control measures will meet all the requirements of that Chapter.

8. RACT/BACT/BART/LAER/PSD DETERMINATION

The proposed equipment and control systems incorporate Best Available Control Technology (BACT) and Best Available Control Technology for toxic air pollutants (T-BACT) for the types and amounts of air contaminants emitted by the processes as described below:

8.a BACT Determination. All equipment at the facility has previously been through New Source Review and determined to meet the requirements of BACT at the time of installation, or were installed prior to the establishment of BACT requirements.

8.b BACT Determination - Dry kilns (existing). A review of the RACT/BACT/LAER Clearinghouse (RBLC) showed no add-on controls established for dry kiln emissions. The use of process temperature limits had been determined to meet the requirements of BACT for the dry kilns installed at this facility.

8.c BACT Determination – Hog fuel boiler (existing). The following control measures were determined previously in ADP 06-2691 to meet the requirements of BACT for the hog fuel boiler at this facility:

(1) Proper combustion controls;
(2) A multiclone followed by a two-field ESP for PM; and
(3) An SNCR system with ammonia (urea solution) injection for NO_X. SNCR is well suited for furnace temperatures between 1,500-1,950 ºF, unlike selective catalytic reduction. The boiler has a furnace temperature of approximately 1,600 ºF. NO_X concentration in the exhaust gas is limited to 90.0 ppmvd corrected to 7% O_2 on a 24-hour average. Control measures include operation, monitoring and maintenance provisions for the ammonia injection system.

8.d Prevention of Significant Deterioration (PSD) Applicability. This permitting action will not result in a potential increase in actual emissions equal to or greater than the PSD thresholds. The facility does not fall into the collection of twenty-six source categories that are triggered by the 100 tpy threshold, nor are they subject to any NSPS or NESHAPs promulgated prior to 1980. They are in the 250 tpy category and do not have greater than 250 tons of any criteria pollutant potential to emit. Therefore, PSD review is not applicable to this action.

8.e Compliance Assurance Monitoring (CAM). CAM is generally applicable to any emissions unit with the potential to emit 100 tons per year or more (uncontrolled) of any criteria air pollutant for which an emission standard (limit) applies, and that utilizes a control device to maintain compliance with the emission standard. The hog fuel boiler is the only emission unit at Hampton Lumber Mills, Inc. - Randle that meets the criteria for CAM applicability. However, the hog fuel boiler is equipped with a continuous emission monitor for the applicable pollutant (NO_X). Pursuant to 40 CFR 64.2(b)(1)(vi), CAM requirements are not applicable to emission limitations or standards for which a Part 70 permit specifies a continuous compliance determination method. Therefore CAM is not applicable to the hog fuel boiler.

9. AMBIENT IMPACT ANALYSIS

9.a Ambient impact modeling for NO_X, SO_2 and PM was conducted as part of the Air Discharge Permit application L-577. The modeling indicated that the maximum emissions from this facility would have no significant impact on ambient air quality. In addition, the visibility impact at the most impacted Class I area (Mount Rainier National Park) was evaluated. The maximum concentration at the discrete Class I receptions were less than the Class 1 MSL for each pollutant.

9.b Hampton Lumber Randle estimated the following TAP emissions established in ADP 06-2691 and compared the modeled impact to the ASIL in WAC 173-460 [effective 8/21/98]. As detailed in the table below, the project is not expected to cause an incremental exceedance of the acceptable source impact level.

Toxic Compound	CAS #	Total Annual Emissions (lb/yr)	Small Quantity Emission Rate (lb/yr)	Ambient Impact ($\mu g/m^3$)	Acceptable Source Impact Level ($\mu g/m^3$)	TAP Class	EPA Classified HAP (Yes/No)
Acetaldehyde	75-07-0	25,945	50	0.0109**	0.45	A	Yes
Acrolein	107-02-8	443.73	175	0.602**	0.02	B	Yes
Ammonia	7664-41-7	44,600	17,500	10.2	100	B	No
Arsenic	7440-38-2	2.05	--	9.43E-05	0.00023	A	Yes

Benzene	71-43-2	1,070	20	0.0492	0.12	A	Yes
Beryllium	7440-41-7	2.24	--	1.03E-04	0.00042	A	Yes
Cadmium	7440-43-9	4.19	--	1.92E-04	0.00056	A	Yes
Carbon Tetrachloride	56-23-5	65.6	0.5	0.00301	0.067	A	Yes
Chlorine	7782-50-5	1,140	175	0.262	5	B	Yes
Chloroform	67-66-3	39.8	10	0.00182	0.043	A	Yes
Chromium, hexavalent	7440-47-3	1.73	--	7.95E-05	0.000083	A	Yes
1,2-Dichloroethane	107-06-2	42.2	10	0.00194	0.038	A	Yes
Dichloromethane	75-09-2	415	50	0.019	0.56	A	Yes
Formaldehyde	50-00-0	2,935	20	0.0479**	0.077	A	Yes
Hydrogen chloride	7647-01-0	5,780	175	1.33	7	B	Yes
Lead	7439-92-1	71.5	50	0.0164	0.5	A	Yes
Nickel	7440-02-2	3.65	0.5	1.67E-04	0.0021	A	Yes
Nitric Oxide	10102-43-9	127,000	17,500	29.2	100	B	No
PAH	PAH	0.026	--	1.20E-06	0	A	Yes
Sulfuric Acid Mist	7664-93-9	2,960	175	0.679	3.3	B	No
TCDD, Total	1746-01-6	0.00002	--	9.98E-10	0.00000003	A	Yes
Vinyl Chloride	75-01-4	26.6	10	0.00122	0.012	A	Yes

** This modeled result is from hog fuel boiler emissions only, and does not include dry kiln emissions.

Acetophenone, dinitrophenol-2,4, nitrophenol-4 and propionaldehyde are listed as HAPs however have no ASIL information and are listed with low EPA confidence in the studies in which the (reference dose) RfD was based, according to the Technology Transfer Network Air Toxics Web Site. Emissions of acetaldehyde, acrolein, methanol, and propionaldehyde from the hog fuel boiler upgrade were modeled using ISC-PRIME, and formaldehyde was modeled using AERMOD-PRIME. This current permitting action does not result in an increase in actual emissions of TAP compounds not previously emitted. The emissions from dry kilns have drastically changed due to new data on dry kiln emissions. Actual throughput has not increased from previously permitted levels from ADP 06-2691.

Conclusions

9.c Modification of existing permit terms, as proposed in ADP application L-607, will not cause the ambient air quality requirements of Title 40 Code of Federal Regulations (CFR) Part 50 "National Primary and Secondary Ambient Air Quality Standards" to be violated.

9.d Modification of existing permit terms as proposed in ADP application L-607, will not cause the requirements of WAC 173-460 [effective 8/21/98] "Controls for New Sources of Toxic Air Pollutants," WAC 173-470 "Ambient Air Quality Standards for Particulate Matter," WAC 173-474 "Ambient Air Quality Standards for Sulfur Oxides," and WAC 173-475 "Ambient Air Quality Standards for Carbon Monoxide, Ozone, and Nitrogen Dioxide" to be violated.

9.e The new permit terms, as proposed in ADP application L-607, can be met without causing a violation of emission standards for sources as established under SWCAA General Regulations Sections 400-040 "General Standards for Maximum Emissions," 400-050 "Emission Standards for Combustion and Incineration Units," and 400-060 "Emission Standards for General Process Units."

10. DISCUSSION OF NEW OR MODIFIED APPROVAL CONDITIONS

SWCAA has made a determination to issue ADP 06-2691R1 in response to ADP application L-607. ADP 06-2691R1 contains approval requirements deemed necessary to assure compliance with applicable regulations and emission standards as discussed below.

10.a Supersession of Previous Permits. This permitting action will result in the issuance of a single permit for Hampton Lumber Mills, Inc. - Randle Facility. ADP 06-2691R1 supersedes ADP 06-2691 in its entirety.

10.b General Basis. Permit requirements for equipment affected by this permitting action incorporate the operating schemes proposed by the applicant in ADP application L-607. Unless otherwise requested by the applicant, emission limits for approved equipment are based on the potential emission calculations in Section 6 of this Technical Support Document. BACT is implemented as proposed for each emission unit from pervious permitting actions.

10.c Monitoring and Recordkeeping Requirements. No monitoring or recordkeeping requirements have been modified by this permitting action. ADP 06-2691R1 establishes monitoring and recordkeeping requirements sufficient to document compliance with applicable emission limits, ensure proper operation of approved equipment and provide for compliance with generally applicable requirements. In specific, Hampton Lumber Randle is required to record boiler operation, bin unloading throughput, anti-stain consumption, dry kiln parameters, baghouse operation, upset conditions, and excess emissions.

10.d Reporting Requirements. The boiler grate cleaning schedule report due date has been modified from March 15th to December 31st because SWCAA requires the report submitted prior to the upcoming year. No other reporting requirements have been modified by this permitting action. ADP 06-2691R1 establishes general reporting requirements for annual air emissions, upset conditions and excess emissions. Specific reporting requirements are established for material throughput and hours of operation.

10.e Boiler Temperature. ADP 06-2691 established the condition to measure the boiler firebox temperature as well as the boiler outlet temperature. The facility requested to replace these temperature monitoring requirements with the requirement to monitor the ESP outlet temperature. The ESP outlet temperature is monitored to assure the prevention of condensation and potential corrosion within the ESP unit. The boiler firebox temperature for this unit can not easily be directly monitored due to high temperatures. The harsh environment, such as ash or slag build-up, reduces the temperature indicators' operational life. Also, the conditions within the furnace are constantly in flux due to changing fuel moisture content, boiler load and excess air levels. The main purpose of monitoring the temperature is to assure consistent operation of the SNCR system and alert the operators to any sudden changes in the operating parameters of the boiler, which can also be done if the temperature is monitored at the outlet of the ESP. Also, the oxygen and carbon monoxide levels of the unit are being continuously monitored.

The facility intends to start both the ESP and the SNCR system when the ESP exhaust temperature reaches approximately 300 ºF. At this temperature, condensation should no longer occur within the ESP. An ESP exhaust stack temperature of 300 ºF correlates to approximately 1,400 ºF in the boiler combustion chamber, based on facility studies. When the SNCR system is started it is placed into automatic mode, which uses only the minimal amount of urea possible. It starts feeding urea based upon a NO_X value at or above 85 ppm (@ 7% O_2), thus maintaining the NO_X limit and minimizing any ammonia slip.

10.f Boiler CO Averaging Limit. ADP 06-2691 established an averaging time of 1-hour and the facility has requested to change this to a 24-hour averaging time. The original application requested an averaging time of 24 hours, and with a hog fuel boiler CO spikes are unavoidable. Often the facility has to open the boiler and manually rake the grates. Opening the doors introduces cold air and cools the cell, thus disrupting the operator's control of

combustion air. The boiler cannot achieve the current limit with a 1-hr averaging time. One other boiler with a CEM in SWCAA jurisdiction has a 24-hr averaging time for gaseous emissions.

10.g Bin Unloading Throughput. Hampton Lumber Mills used to generate records of tons sold by an internal record keeping system, and then they discovered the process did not accurately reflect the true volume of wood byproducts. Due to different accounting methods to determine how much a truck holds, the throughputs on bin unloading have changed drastically. The current method measures the tonnage carried by each truck. This change does not represent an increase in actual throughput and is more representative of facility throughputs.

10.h Dry Kilns. Permit requirements for the lumber dry kilns incorporate the operating scheme proposed by the permittee at the time of installation. Visible emissions are limited to 5% opacity consistent with proper operation. Restrictions have been imposed on dry kiln set point temperatures, and monitoring of the average actual dry kiln temperature has been required. Monitoring the actual dry kiln temperature is meant to be reflective of the set point temperature. SWCAA acknowledges that at times the actual temperature may exceed the set point temperature for a short period of time and that this is natural for the normal operation of the equipment. Emission limits for lumber drying are based on emission test data, maximum average temperature, and the maximum lumber capacity of the kilns.

10.i Knock-out Box Emission Testing. Previous Permits required particulate matter emission testing for the two knock-out boxes controlling filing room emissions. The emission testing requirements have been removed because of low emissions from the units and previous source tests showing a wide margin of compliance.

11. START UP AND SHUTDOWN/ALTERNATIVE OPERATING SCENARIOS/POLLUTION PREVENTION

11.a Start up and Shutdown Provisions. Pursuant to SWCAA 400-081 "Start up and Shutdown", technology based emission standards and control technology determinations shall take into consideration the physical and operational ability of a source to comply with the applicable standards during start up or shutdown. Where it is determined that a source is not capable of achieving continuous compliance with an emission standard during start up or shutdown, SWCAA shall include appropriate emission limitations, operating parameters, or other criteria to regulate performance of the source during start up or shutdown.

Start up is when the unit is set in operation for any purpose. Start up commences when an ignition flame is available and the fuel feed within the boiler is started. Start up ends when stable burning is established under good combustion practices and the furnace temperature reaches minimum operating temperature as prescribed by the manufacturer (approximately 1500 ºF) and the ESP is engaged. Shutdown is the cessation of operation of the unit for any purpose and commences upon cessation of fuel feed to the boiler and deactivation of the ESP (operating temperature below 250 ºF). Also, the ESP may not be capable of reliably limiting visible emissions during shutdown once the operating temperature drops below 250 °F. Neither start up nor shutdown periods shall exceed a six-hour continuous period. Refractory curing is covered below.

Hog fuel boiler. In accordance with SWCAA 400-070(2), visible emissions from the hog fuel boiler may exceed the operational opacity limit of 10% and the general standard of 20% during periods of soot blowing and/or grate cleaning. These periods are limited to not more than 15 consecutive minutes once in any eight-hour period.

Emissions are exhausted through the mutliclone and ESP at start up, however the ESP may not be capable of reliably limiting visible emissions during start up until the operating temperature reaches 250 °F. This temperature is not achievable during the early stages of a cold start up. The SNCR may not function properly until the furnace temperature reaches a temperature that can support the reduction reaction (approximately 1600 °F). Therefore, ammonia, NO_X, CO and PM_{10} emissions from the hog fuel boiler may exceed the operational

limit of 25 ppm, 90 ppm, 225 ppm and 0.010 gr/dscf, respectively, corrected to 7% O_2, during periods of start up and shutdown. These periods are limited to a six-hour period.

If refractory work has been performed on the boiler, the boiler start up period is extended to include curing the new refractory. The curing process takes an extended period of time and generates an elevated moisture content in the firebox. Regardless of stack temperature, the ESP can not be operated during the curing process because the high level of stack gas moisture can short out the ESP. Therefore, the length of the start up period must be significantly extended to allow completion of the curing process. Start up periods that occur after refractory work are limited to a 36-hour period.

To SWCAA's knowledge, all other equipment at this facility can comply with all applicable standards during start up and shutdown.

11.b Alternate Operating Scenarios. SWCAA conducted a review of alternate operating scenarios applicable to equipment affected by this permitting action. The permittee did not propose or identify any applicable alternate operating scenarios other than start up and shutdown. Therefore, none were included in the approval conditions.

11.c Pollution Prevention Measures. SWCAA conducted a review of possible pollution prevention measures for the facility. No pollution prevention measures were identified by either the permittee or SWCAA separate or in addition to those measures required under BACT considerations. Therefore, none were included in the approval conditions.

12. EMISSION MONITORING AND TESTING

12.a Emission Testing Requirements – Wellons Boiler. Permit requirements for the Wellons boiler require emission testing on an annual cycle for the purpose of formally demonstrating compliance with applicable emission limits. All emission testing shall be conducted in accordance with the provisions of ADP 06-2691R1, Appendix A.

12.b Emission Testing Requirements – Baghouse and Cyclone. PM emissions from the baghouse and cyclone will be tested by November 2013 and every ten years thereafter, no later than the end of November. This is consistent with similar testing requirements for other large baghouses at lumber production facilities recently permitted. All emission testing shall be conducted in accordance with the provisions of ADP 06-2691R1, Appendix D.

12.c Emission Testing Requirements – Dry Kilns. A lumber drying emission test shall be performed no later than the end of November 2008 and every five years thereafter, no later than the end of November. Emission testing shall be conducted in accordance with the provisions of in ADP 06-2691R1, Appendix C. Constituents to be measured include wood weight, wood moisture content, kiln temperature, and speciated VOCs including HAPs and TAPs.

Hampton Lumber Randle is currently operating under a test schedule extension until November 2010.

13. FACILITY HISTORY

13.a Previous Permitting Actions. SWCAA has previously issued the following Permits for Hampton Lumber Mills, - Randle Facility in Randle:

Permit Number	application Number	Date	Purpose
77-204	L-89	October 26, 1977	Approved the installation of a baghouse filtration system for the sawmill. This Permit was superseded by SWCAA 02-2414.
78-338	L-94	May 4, 1978	Approved the installation of a wet scrubber for the hog fuel boiler. This Permit was superseded by SWCAA 97-2033.
78-380 and 78-381		August 29, 1978	Order of Consent to discontinue the use of the wood waste incinerator. Closed.
88-1033	L-180	January 16, 1989	Approved the installation of a new planer and baghouse for the sawmill. This Permit was superseded by SWCAA 96-1962.
90-1209	L-223	May 21, 1990	Approved the installation of a small log processing system and other lumber production equipment for the sawmill. This Permit was superseded by SWCAA 96-1962.
91-1342	L-254	June 24, 1991	Approved the installation of a new chipper, bucksaw and associated equipment for the sawmill. This Permit was superseded by SWCAA 06-2691.
93-1495	L-291	July 12, 1993	Approved the installation of a new fingerjointer and baghouse for Remanufacturing Plant #1. This Permit was superseded by SWCAA 94-1608.
94-1608	L-251, L-293, L-304	May 16, 1994	Approved the expansion of Remanufacturing Plant #1 and installation of Remanufacturing Plant #2. New control equipment included a Carter-Day baghouse in Remanufacturing Plant #1 and a new H&R Mechanical Systems baghouse in Remanufacturing Plant #2. This Permit was superseded by SWCAA 96-1962 with the exception of the VOC limit. This Permit was entirely superseded by SWCAA 01-2399.
95-1835	L-290	December 13, 1995	Approved the installation of new knock-out boxes for the filing room. This Permit was superseded by SWCAA 96-1962.
96-1953	L-371	December 2, 1996	Approved the installation of one new dry kiln and four new vent changers. This Permit was superseded by SWCAA 02-2414.
96-1962	L-340	January 1, 1992	Approved the modification of existing PM emissions limits for the baghouses, sawdust cyclones, and knock-out boxes. This Permit superseded SWCAA 88-1033, 90-1209, 93-1495, 94-1608, and 95-1835. This Permit was superseded by SWCAA 01-2399.

97-2033	L-385	September 5, 1997	Approved the modifications of existing emissions limits for the hog fuel boiler. This Permit superseded SWCAA 78-338. This Permit was superseded by SWCAA 02-2414.
00-2263	L-456	April 19, 2000	Approved the installation of a new Spray Technologies sap stain spray system. This Permit was superseded by SWCAA 06-2691.
01-2399	L-487	December 17, 2001	Removed the requirements for equipment that was no longer at the facility. This Permit superseded SWCAA 94-1608 and 96-1962. This Permit was superseded by SWCAA 06-2691.
02-2414	L-440	June 17, 2002	Modified existing requirements and scrubber flow. This Permit superseded SWCAA 77-204, 96-1953, and 97-2033. This Permit was superseded by SWCAA 06-2691.
06-2691	L-577	October 8, 2006	Approved the replacement of the hog fuel boiler and wet scrubber with a new hog fuel boiler, ESP and SNCR and the installation of four new dry kilns. This Permit superseded SWCAA 91-1342, 00-2263, 01-2399, and 02-2414. This Permit is superseded by SWCAA 06-2691R1.
08-2801		August 12, 2008	Consent Order for spiking CO emissions. The requirements of the Consent Order will be met with the issuance of this Permit.

Permits in italics have been superseded.

Hampton Lumber Mills purchased Cowlitz Stud Company on June 1, 1999.

13.b Compliance Issues. Hampton Lumber Randle received the following Notice of Correction/Violation:

- Field Notice of Correction/Violation (FNOC/V) #3321 issued November 9, 2009. FNOC #3321 was issued for exceeding bin unloading particulate matter emission limits. The increase in throughput is based on an accounting method to determine tonnage calculated by truck weight instead of volume, and does not constitute an actual increase in throughput.

14. PUBLIC INVOLMENT OPPORTUNITY

14.a Public Notice for ADP Application L-607. Public notice for ADP application L-607 was published on the SWCAA internet website for a minimum of 30 days beginning on October 3, 2007. This permitting action requires a 30 day public notice and comment period pursuant to SWCAA 400-171(2).

14.b Public/Applicant Comment for ADP Application L-607. The thirty (30) day public comment period for this permitting action closed on July 12, 2010. SWCAA did not receive any comment from the applicant or the public during the public comment period for this permitting action.

14.c State Environmental Policy Act. A Determination of Nonsignificance (DNS) was issued for this permitting action by Southwest Clean Air Agency.