TECHNICAL SUPPORT DOCUMENT

Air Discharge Permit ADP 17-3248
ADP Application L-689

Sierra Pacific Industries, Inc.
SWCAA ID - 2272

Final Date: January 16, 2018

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Southwest Clean Air Agency

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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
bf	Board feet
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
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)
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 Chapter 173-460 WAC
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:	Sierra Pacific Industries
Applicant Address:	19794 Riverside Avenue, Redding, CA 96049
Facility Name:	Sierra Pacific Industries, Inc. – Centralia Sawmill
Facility Address:	3115 Kuper Road, Centralia, WA 98531
SWCAA ID:	2272
Contact Person:	Scott North, Facility Manager
Primary Products:	Dimensional dried lumber
SIC/NAICS Code:	2421/321113
Facility Classification:	HAP Major / Criteria Major - CO

2. FACILITY DESCRIPTION

Sierra Pacific Industries (Sierra Pacific) has a sawmill located at 3115 Kuper Road, Centralia, Lewis County, Washington. Sierra Pacific is a manufacturer of dimensional lumber products. The sawmill receives fresh cut Douglas fir and hemlock timber and processes the wood into dimensional lumber. The finished lumber is predominantly used for construction. Dimensional lumber produced at Sierra Pacific is shipped both kiln dried and green. Both the dry and green lumber are treated with anti-stain solution. The lumber facility includes a Nebraska hog fuel boiler, dry kilns, sawing facility, bunkers, a planer, and a baghouse. The sawmill normally operates 3 rotating 10-hour shifts, approximately 120 hours per week. The boiler typically operates twenty-four hours a day, seven days a week.

ADP 08-2799, issued July 17, 2008, established Sierra Pacific as a Title V facility for both hazardous air pollutants (HAPs) and carbon monoxide (CO).

3. CURRENT PERMITTING ACTION

This permitting action is in response to Air Discharge Permit application (ADP application) number L-689 dated April 8, 2017. Sierra Pacific submitted ADP application L-689 requesting to modify their existing permit, including to update dry kiln temperatures, remove source test requirements for the dry kilns and to remove aspects of the dry kiln source test requirements. Sierra Pacific noted there were no known source testing companies with the ability to test wood emissions from drying within reasonable distance to the facility, certainly none in the Pacific Northwest. They stated this was not a test for compliance, but data gathering. They stated that NCASI (National Council for Air and Stream Improvement) indicated concern on the reliability of emission factors and affirmed the impracticality and unavailability for industry to perform onsite tests. SWCAA has not agreed to remove the dry kiln source test requirement entirely, but will remove some constituents to be tested for within the dry kiln source test requirements.

Dry kiln drying temperature has been raised from 180°F to 200°F, therefore increasing emissions from this process. Also, the emission factors for lumber drying have been updated due to new information on VOC and HAP emissions from those activities.

The anti-stain product has been updated.

The Carothers and Son baghouse testing schedule has been modified per request by the facility in 2016.

Air Discharge Permit 08-2799R2 will be superseded by this Permit in its entirety.

4. PROCESS DESCRIPTION

4.a Merchandiser. Green timber is received at the facility via truck and either stored in log storage decks or fed into the merchandiser. Timber is then debarked and cut to length prior to entering the sawmill. The merchandiser equipment is outdoors. The saws and debarking equipment are equipped with sawdust guards which reduce direct air pollutant emissions to a minimal level. Merchandiser operations do generate a small amount of fugitive dust emissions, but there is no reliable way to quantify such emissions.

4.b Sawmill. In the sawmill, timber is processed into stud lumber using various pieces of woodworking equipment such as trim saws and edgers. Wood waste from sawmill operations is mechanically conveyed to storage bins. The wood waste is then transported off site via truck. All sawmill operations except the log deck are located within a building enclosure which reduces direct air pollutant emissions to a minimal level. Sawmill operations do generate a small amount of fugitive dust emissions, but there is no reliable way to quantify such emissions.

The lumber yard is completely paved. The facility utilizes a water truck during the summer months and the facility uses a vacuum sweeper onsite, including the log yard, approximately weekly.

4.c Lumber Drying. A major portion of the green lumber produced in the sawmill is dried using steam heated kilns (300 MMbf/yr dried). The steam is provided by the on-site hog fuel boiler. The exact percentage of total lumber production that is processed in the kilns varies from year to year depending on market demand. The dry kilns have a batch configuration. Green lumber is stacked on carts and manually moved into each dry kiln. The drying profile (length of drying cycle, drying temperature, and final wood moisture) for each 'charge' of lumber is controlled by a preset computer program. Dry kiln temperature is regulated by modulating steam flow and opening/closing vents on each kiln chamber. Although parameters for each drying profile vary, the maximum dry bulb set temperature of the kiln will not exceed 200°F. After drying, lumber carts are moved to a staging area adjacent to the kilns for unloading. Dried lumber is either packaged for shipping or sent to the planer mill for further processing.

4.d Planer Mill. Lumber from the sawmill is sorted and sent to storage trays based on lumber width. Lumber is then sent through the precision end trimmer and then run through the planer. Planer shavings are pneumatically conveyed to a storage bin via a baghouse. An anti-stain treatment is applied to the planed, green lumber as well as a small amount to the dried lumber. The system includes a spray enclosure, mist eliminator, chemical room, and airless sprayer. After treatment, the lumber is sent to the automatic grading station and then transferred to the sorting bins. Finally, it is packaged and shipped off site.

4.e Wood Waste Handling. Wood byproducts (wood chips, bark, shavings and sawdust) generated by sawmill operations are mechanically conveyed to a chip screen and then transferred to multiple bunkers from various points in the facility. Material gathered by the baghouse is pneumatically conveyed within a closed loop system to the sawdust bunker. Stored material is shipped off site via truck.

5. EQUIPMENT/ACTIVITY IDENTIFICATION

5.a Planer Mill. The planer is a USNR 24-knife machine with a maximum speed of 2,400 ft/min. In the planer mill the boards are trimmed prior to the planer and the trim blocks are sent to the chipper. The planer and trim saws are connected to the following baghouse.

Planer Mill Baghouse. One Carothers and Son, Ltd. model CSL 405TR12HEI (serial #CSC3420BH) baghouse rated at 60,000 acfm (source test data recorded airflow at 56,141 acfm) is used to control emissions from the planer mill. It has a 48.24" diameter stack that exhausts 47' above ground level. The baghouse contains 405 bags, 6" by 12' in dimensions providing a surface area of 7,819 ft^2. The bags are constructed out of 12 oz/yd^2 2 polyester felt. This unit serves as primary control equipment for the planer mill.

5.b Anti-Stain Treatment. One water-based anti-stain system with recirculation and a mist eliminator is installed to treat green and dried lumber. It has a 6" diameter stack that exhausts 12' above ground level. The current anti-stain is a combination of Kop-Coat WORKHORSE® III, Sawmill Penetrator A20 concentrate, and Iron FixT® 1002, which are used at a rate of approximately 0.0013 gallons of solution per 10,000 board feet. Emissions from the spray enclosure are collected and vented to a mist eliminator. The mist eliminator consists of internal baffles that collect the anti-stain droplets and send them back into circulation. The mist eliminator is estimated to eliminate 98% of all particles 12 microns or larger. The facility sprays all green wood as well as applies about a third of that amount to dry wood to protect it against the local area's humidity while it is wrapped for shipping.

5.c Chip Bunkers. Two 30-unit bunkers that are connected totaling 60-units are used to collect green chip and one 32-unit bunker is used to collect dry chip. The bunker loadouts are enclosed on two sides with plastic sheeting covering the end.

5.d Sawdust Bunker. One 30-unit bunker is used to collect green sawdust. The bunker loadout is enclosed on two sides with plastic sheeting covering the end. The bunker used to be connected to the shavings bunker. This is the southern-most one of the two.

5.e Shavings Bunkers. One 30-unit bunker is used to collect dry shavings. The bunker loadout is enclosed on two sides with plastic sheeting covering the end. The bunker used to be connected to the sawdust bunker. This is the northern-most one of the two.

5.f Bark Bunker. One 30-unit bunker is used to collect green bark. The bunker loadout is enclosed on two sides with plastic sheeting covering the end.

5.g Hog Fuel Boiler. The Nebraska hog fuel boiler, mounted on three Wellons Inc. fuel cells, was originally installed in 1977 at American Forest Products in California. An ESP was added in the late 1990s. In 1997 it was converted from a natural gas-fired boiler to a wood-fired boiler. The boiler was relocated from California to its current location in 2007. 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 in the future on an as-needed basis. Chips, planer shavings, sawdust, and scrap wood are all fired as hog fuel in the boiler depending on required fuel characteristics. Exhaust from the boiler's furnace passes through a selective noncatalytic reduction (SNCR) system to reduce oxides of nitrogen (NO_x) concentrations and then through a multiclone followed by a Wellons two-field ESP to remove particulate matter (PM).

The Nebraska hog fuel boiler is subject to the NSPS standard 40 CFR 60.40c et seq. (Subpart Dc) "Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units" for units greater than 10 MMBtu/hr but less than 100 MMBtu/hr because it is rated at 88.4 MMBtu/hr and because it was modified by converting it from a natural gas-fired boiler to a wood-fired boiler in October 1997, which is after June 9, 1989.

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:

- Nebraska hog fuel boiler, National Board Number 3681-80, serial #2D1870, rated at 60,000 pounds of saturated steam per hour and 88.4 MMBtu with an airflow of 45,890 acfm at 350 °F (approximately 25,400 dscfm). The unit is equipped with an air heater. The exhaust stack is 71.5' tall and 50.5" in diameter.
- One SNCR system is used to reduce post combustion NO_X concentrations using anhydrous ammonia, which is stored as a liquid and vaporized by a 10 kW heater to be used in the SNCR system. The unit can achieve a control efficiency of approximately 50%. The system includes an ammonia tank, approximately 1,000 gallons in capacity, which the facility only fills 85% full. There are four injection nozzles, two each in the

upper section of the combustion zone of the boiler on both ends of the unit. The ammonia injection is computer controlled and it injects ammonia when the NO_X reaches 85 ppm.

- One multiclone, serial number B9735-0330, and one Wellons two-field ESP, model Wellons "Size #6", ID number 2W-091-1422, in series is used to reduce PM emissions.

The Nebraska boiler can operate at levels of 90 ppm for NO_X, 228 ppm for CO, 0.015 gr/dscf for PM, and 25 ppm for ammonia corrected to 7% O_2.

5.h Dry Kilns. Five dry kilns are 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, is stacked on carts and rolled into the kilns. After drying, lumber is removed from the kilns and sent to the planer mill.

Six kilns were originally permitted, but only five were installed.

The following equipment is associated with the dry kilns:

- Five Sierra Pacific steam heated double track kilns. The kilns are 34' wide by 120' long by 20' tall and hold approximately 230 Mbf each. The kilns have 24 vents each with an area of 28 square inches and a 2.63 feet equivalent diameter. Only about half of the vents exhaust at any given time, per Sierra Pacific. Geomatrix calculated the vent exit velocity to be 5 ft/second. The facility proposed to maintain kiln set point temperatures at or below 200 °F. Drying times last from 24 to 48 hours depending on the size of the lumber and the type of wood.

Other Equipment

5.i Sawmill. The sawmill consists of associated equipment listed below used to produce green lumber. The sawmill is arranged in a linear configuration. Raw logs are debarked and sent through the merchandizer. Associated equipment is outside but equipped with sawdust guards to reduce fugitive emissions. The remaining equipment for the sawmill is enclosed in a building. Processed logs are then cut down to standard stud lumber sizes through multiple stages of trimming, edging, and resawing. Green sawdust and chips from sawing operations are mechanically conveyed to the chip screen.

1 22" debarker
1 Rotary knife hog
1 USNR transverse board edger
1 Comact Inc. canter
1 Horizontal resaw
1 Brunette drum chipper
1 Saw blade filing room (no external exhaust)
6 60" cut-off saws
1 Disk chipper
2 Trim saws
1 USNR vertical gang edger
1 0.7 MW turbine to provide power for the facility

5.j Equipment/Activity Summary.

ID No.	Generating Equipment/Activity	# of Units	Control Equipment	# of Units
1	Planer Mill	1	Total enclosure, baghouse (Carothers and Son)	1
2	Anti-Stain Treatment	1	Mist eliminator	1
3	Chip Bunker	3	Partial enclosure/wind screens	N/A
4	Sawdust Bunker	1	Partial enclosure/wind screens	N/A
5	Shavings Bunker	1	Partial enclosure/wind screens	N/A

6	Bark Bunker	1	Partial enclosure/wind screens	N/A
7	Nebraska Hog Fuel Boiler	1	One multiclone followed by a two-field ESP and SNCR	N/A
8	Dry Kilns	5	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-689 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}.

6.a Planer Mill Baghouse. Emissions from operation of the planer mill baghouse are calculated based on a maximum emission concentration of 0.005 gr/dscf, a rated airflow of 60,000 acfm, and 8,760 hrs/yr of potential operation. All emitted PM is assumed to be PM_{10}. $PM_{2.5}$ emissions are assumed to be 23% of PM emissions (EPA PM Calculator Version 2.0 - SCC 30700899).

Pollutant	Emission Factor	Emissions
PM/PM_{10}	2.57 lb/hr	11.26 tpy
$PM_{2.5}$	0.59 lb/hr	2.58 tpy

6.b Anti-Stain Treatment (*modified*). Emissions from anti-stain treatment come from the usage of Kop-Coat WORKHORSE® III, Sawmill Penetrator A20 concentrate, and Iron FixT® 1002. According to the SDS, the products contain no HAPs or TAPs. The facility treats approximately 300 million board feet, emitting up to 0.18 tpy of VOCs. Emissions shall be based on annual throughput and SDS information.

	Used (gal/yr)	VOC (lb/gal)	VOC (tpy)
Iron FixT	3000	0.05	0.075
Penetrator	18000	0.0071	0.064
Workhorse III	18000	0.0041	0.037
VOC (total)			0.18

The facility wishes to retain their original 1.70 tpy VOC limit (established in 08-2799R1) to allow them flexibility to modify their anti-stain products in the future.

6.c Wood Waste Bunkers. Emissions from wood waste storage and transfer consist primarily of fugitive particulate matter emitted during truck loading. 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, chips and bark transfer due to the use of 3-sided shrouding. $PM_{2.5}$ emissions are estimated to be 23% of PM emissions (EPA PM Calculator Version 2.0 - SCC 30700899).

These emission factors are currently used because no other emissions factors are available to summarize emissions from this type of process. Sierra Pacific has agreed to participate in a test program with SWCAA in the future to develop emissions factors for wood waste storage and transfer processes. Emission factors developed from any such test program will be evaluated for use at this facility in lieu of the current factors.

Hog fuel mix is typically one load of bark, one load of green sawdust and four loads of shavings. A separate hog fuel unloading factor is not established in this permit.

Controlled Emission Factors			
Material	Pollutant	For Dry Wood (lb/bdt)	For Green Wood (lb/bdt)
Sawdust	PM	0.400	0.240
	PM_{10}	0.240	0.144
	$PM_{2.5}$	0.092	0.055
Shavings	PM	0.520	0.320
	PM_{10}	0.312	0.192
	$PM_{2.5}$	0.120	0.074
Chips	PM	0.160	0.080
	PM_{10}	0.096	0.048
	$PM_{2.5}$	0.037	0.018
Bark	PM	0.520	0.120
	PM_{10}	0.312	0.072
	$PM_{2.5}$	0.120	0.028

To determine the potential to emit, bark, sawdust and chips use the green factor and shavings uses the dry factor. Approximately 5% of the chips will be dry.

Material	Throughput (bdt)	Pollutant	Controlled Emission Factors (lb/bdt)	Emissions (tpy)	Emissions (lb/hr)
Sawdust	25,000	PM	0.240	3.00	
		PM_{10}	0.144	1.80	
		$PM_{2.5}$	0.055	0.69	
Shavings	66,686	PM	0.520	17.34	
		PM_{10}	0.312	10.40	
		$PM_{2.5}$	0.120	4.00	
Chips	302,620	PM	0.080	12.10	
(green)		PM_{10}	0.048	7.26	
		$PM_{2.5}$	0.018	2.72	
Chips	15,930	PM	0.160	1.27	
(dry)		PM_{10}	0.096	0.76	
		$PM_{2.5}$	0.037	0.29	
Bark	129,853	PM	0.120	7.79	
		PM_{10}	0.072	4.67	
		$PM_{2.5}$	0.028	1.82	
Total		PM		41.50	9.47
		PM_{10}		24.89	5.68
		$PM_{2.5}$		9.52	2.17

6.d Hog Fuel Boiler. Emissions from the Nebraska hog fuel boiler are established from emission factors provided by Wellons, a heat input of 88.4 MMBtu/hr, an airflow of 25,400 dscf, and annual hours of operation. Concentrations were converted to lbs/MMBtu using a fuel factor of 9,240 dscf/MMBtu.

Emission factors	lbs/MMBtu	PPM	lb/hr	Emissions (tpy) (8,760 hr)
NO_x	0.15	90	13.260	58.08
CO	0.23	228	20.331	89.05
VOC	0.017		1.502	6.58
SO_2	0.025		2.210	9.68
PM/ PM_{10}/$PM_{2.5}$	0.015 gr/dscf		3.265	14.30
Ammonia	0.015	25	1.326	5.81
Acetaldehyde			0.014	0.06
Acrolein			0.00278	0.012
Formaldehyde			0.153	0.67

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

The annual limits include start up and shutdown emissions as requested by Sierra Pacific. During start up the CO and NO_X concentrations spike to averages of 1500 ppm (1.51 lb/MMBtu) and 110 ppm (0.185 lb/MMBtu), respectively. The facility estimates approximately 288 hours of start up situations annually (four start ups per month). These emissions are accounted for in the annual (tpy) limit.

Pollutant	288 hr/yr	8472 hr/yr	Total
CO	19.22 tpy	86.13 tpy	105.35 tpy
NOx	2.35 tpy	56.17 tpy	58.52 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/hr 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 AERMOD Version 04300 for ADP application L-601. The predicted ambient impacts did not exceed each individual TAP's acceptable source impact level (ASIL) as provided in WAC 173-460 effective 2/14/94.

6.e 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 300 MMbf/yr). The average final moisture content is 16% and the facility typically dries at 180 °F, but has requested an upper limit of 200 °F. Actual wood species are approximately 30% hemlock and 70% Douglas fir.

Hemlock Drying

Throughput = 90,000,000 Board Feet
Maximum Kiln Temperature = 200 ° F

		Emission Factors				
Pollutant	Equation	lb/MMBf	lbhr	lb/yr	tpy	Emission Factor Source
PM		51	0.524	4,590.00	2.30	Nov. 1998: Horizon Eng. at OSU
PM_{10}		51	0.524	4,590.00	2.30	Nov. 1998: Horizon Eng. at OSU
$PM_{2.5}$		51	0.524	4,590.00	2.30	Nov. 1998: Horizon Eng. at OSU
VOC	See discussion	281	2.887	25,290.00	12.65	SWCAA Default August 2009
Methanol	2.83*(T) - 457	109.0	1.120	9,810.00	4.91	SWCAA Default August 2009
Formaldehyde	0.064*(T) - 10.8	2.00	0.021	180.00	0.09	SWCAA Default August 2009
Acetaldehyde		113	1.161	10,170.00	5.09	SWCAA Default August 2009
Propionaldehyde		1.2	0.012	108.00	0.05	SWCAA Default August 2009
Acrolein		1.75	0.018	157.50	0.08	SWCAA Default August 2009
Total TAPs				20,425.50	10.21	
Total HAPs				20,425.50	10.21	

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

Douglas Fir Drying

Throughput = 210,000,000 Board Feet
Maximum Kiln Temperature = 200 ° F

		Emission Factors				
Pollutant	Equation	lb/MMBf	lb/hr	lb/yr	tpy	Emission Factor Source
PM		21	0.503	4,410.00	2.21	Nov. 1998: Horizon Eng. at OSU
PM_{10}		21	0.503	4,410.00	2.21	Nov. 1998: Horizon Eng. at OSU
$PM_{2.5}$		21	0.503	4,410.00	2.21	Nov. 1998: Horizon Eng. at OSU
VOC	See discussion	995	23.853	208,950.00	104.48	SWCAA Default August 2009
Methanol	1.45*(T) - 223	67	1.606	14,070.00	7.04	SWCAA Default August 2009
Formaldehyde	0.0495*(T) - 7.6	2.3	0.055	483.00	0.24	SWCAA Default August 2009
Acetaldehyde		49	1.175	10,290.00	5.15	SWCAA Default August 2009
Propionaldehyde		0.53	0.013	111.30	0.06	SWCAA Default August 2009
Acrolein		0.73	0.018	153.30	0.08	SWCAA Default August 2009
Total TAPs				25,107.60	12.55	
Total HAPs				25,107.60	12.55	

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

Discussion

Emissions from lumber drying include particulate matter (presumably condensable PM), volatile organic compounds, methanol, formaldehyde, acetaldehyde, propionaldehyde, acrolein, ethanol, and acetic acid. SWCAA had 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. 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 (reported in "Defaults 090814 (2)" factors):

Wood Species	VOCs as C_3H_8
Western hemlock	2.14*(T) – 147
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.

6.f Facilitywide Potential to Emit.

Pollutant	Emissions
NO_X	58.52 tpy
CO	105.35 tpy
VOC	125.41 tpy
SO_2	9.68 tpy
PM	71.25 tpy
PM_{10}	54.78 tpy
$PM_{2.5}$	30.84 tpy

Facilitywide TAP/HAP Emissions

The Ambient Impact Analysis is only performed for those compounds exceeding the SQER (WAC 173-460 effective 2/14/94).

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	20,607	50	15.8	0.45	A	Yes
Acetophenone	98-86-2	0.0025	--		0	B	Yes
Acrolein	107-02-8	344.4	175	0.602	0.02	B	Yes
Ammonia	7664-41-7	11,616	17,500		100	B	No
Antimony	7440-36-0	17.7	175		1.7	B	Yes
Arsenic	7440-38-2	4.34	--	9.07E-05	0.00023	A	Yes
Benzene	71-43-2	574	20	0.012	0.12	A	Yes
Beryllium	7440-41-7	1.2	--	2.51E-05	0.00042	A	Yes
Bis(2-ethylhexyl) phthalate	117-81-7	0.036	500		2.5	A	Yes
Bromomethane	74-83-9	21.7	175		5.0	B	Yes
Cadmium	7440-43-9	2.25	--	4.68E-05	0.00056	A	Yes
Carbon Tetrachloride	56-23-5	35.2	0.5	0.000733	0.067	A	Yes
Chlorine	7782-50-5	614	175	0.685	5	B	Yes
Chlorobenzene	108-90-7	25.7	22,750		150	B	Yes
Chloroform	67-66-3	21.3	10	0.000444	0.043	A	Yes
Chloromethane	74-87-3	17.88	43,748		340	B	Yes
2-Chlorophenol	108-43-0	0.0261	50		0.18	A	No
Chromium, hexavalent	7440-47-3	0.136	--	2.83E-06	0.000083	A	Yes
Chromium, trivalent	7440-47-3	1.19	175		0.00083	A	Yes
Cobalt	7440-48-4	0.968	175		0.17	B	Yes
Copper	7440-50-8	5.76	175		0.67	B	No
1,2-Dibromoethene	106-93-4	42.4	0.5	0.000885	0.0045	A	Yes
1,2-Dichloroethane	107-06-2	22.6	10	0.000472	0.038	A	Yes
Dichloromethane	75-09-2	222	50	0.00464	0.56	A	Yes
1,2-Dichloropropane	78-87-5	25.8	500		4	A	Yes
Dinitrophenol-24	51-28-5	0.72	--		0	B	Yes
Ethyl benzene	100-41-4	24.2	43,748		1,000	B	Yes
Formaldehyde	50-00-0	1,972.37	20	0.113	0.077	A	Yes
Hydrogen chloride	7647-01-0	2,700	175	0.303	7	B	Yes
Lead	7439-92-1	38.4	50		0.5	A	Yes
Manganese	7439-96-5	76	175		3.3	B	Yes
Mercury	7439-97-6	0.322	175		0.33	B	Yes
Methanol	67-56-1	23,900	43,748		870	B	Yes
Naphthalene	91-20-3	73.2	22,750		170	B	Yes
Nickel	7440-02-2	1.96	0.5	4.08E-05	0.0021	A	Yes
Nitric Oxide	10102-43-9	116,000	17,500	13.0	100	B	No
Nitrophenol-4	100-02-7	0.13	--		0	B	Yes
PAH	PAH	0.14	--	2.91E-07	0	A	Yes

Pentachlorophenol	87-86-5	0.0176	50		0.33	A	Yes
Phenol	108-95-2	9.71	10,500		63	B	Yes
Phosphorus	7723-14-0	27.4	175		0.33	B	Yes
Propionaldehyde	123-38-6	220	--		0	B	Yes
Selenium	7782-49-2	1.35	175		0.67	B	Yes
Styrene	100-42-5	1,440	43,748		1000	B	Yes
Sulfuric Acid Mist	7664-93-9	1,630	175	0.182	3.3	B	No
TCDD, Total	1746-01-6	0.000158	--	3.30E-09	0.00000003	A	Yes
Terpene	8006-64-2	96,000	43,748	121	1900	B	No
Tetrachloroethene	127-18-4	29.6	500		1.1	A	Yes
Tin	7440-31-5	5.13	175		6.7	B	No
Toluene	108-88-3	16.5	43,748		400	B	Yes
1,1,1-Tricholorethane	79-00-5	23.8	22,750		180	B	Yes
Tricholorethane	79-01-6	23.5	50		0.59	A	Yes
Trichlorofluoromethane	75-69-4	31.4	43,748		190000	B	No
2,4,6- Trichlorophenol	88-06-2	0.00849	50		0.32	A	Yes
Vanadium	1314-62-1	1.05	175		0.17	B	No
Vinyl Chloride	75-01-4	14.2	10	0.000297	0.012	A	Yes
Xylene	1330-20-7	19.0	43,748		1500	B	Yes

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. For ADP 08-2799 a second tier analysis was performed for acetaldehyde, acrolein and formaldehyde and is discussed in Section 9.

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 Subpart Dc "Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units" applies to any steam generating unit with a heat input greater than 10 MMBtu/hr but less than 100 MMBtu/hr, modified, or reconstructed after June 9, 1989. The hog fuel boiler at this source has a design heat input between 10 million Btu per hour and 100 million Btu per hour. The unit went through a major modification in 1997, converting the unit from natural gas-fired to wood-fired, therefore this standard applies to this unit.

7.b 40 CFR 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. Sierra Pacific is subject to this regulation because the facility in Centralia 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 March 19, 2008.

7.c 40 CFR 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. Sierra Pacific is subject to this regulation because the facility in Centralia is a major source of HAP emissions.

7.d 40 CFR 64 "Compliance Assurance Monitoring" requires the owner or operator of selected pollutant specific emission units at a major stationary source to develop and implement a monitoring plan that provides a reasonable assurance of compliance with applicable emission limitations or standards. This regulation is applicable to the hog fuel boiler at this facility.

7.e 40 CFR 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 has a 1,000 gallon tank (approximately 694 lbs) of aqueous ammonia, which is below the threshold of 10,000 lbs.

7.f 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.g 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.h WAC 173-401 "Operating Permit Regulation" requires all major sources and other sources as defined in WAC 173-401-300 to obtain a Title V air operating permit. Sierra Pacific's facility (hog fuel boiler and dry kilns) is considered a major source of air pollutants therefore this regulation applies to Sierra Pacific. A Title V permit application was submitted to SWCAA on 7/14/09.

7.i WAC 173-460 "Controls for New Sources of Toxic Air Pollutants" (2/14/94) 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.j 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.k 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.l 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.m 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.n SWCAA 400-040(1) "Visible Emissions" requires that no emission of an air contaminant from any emission 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.o 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.p SWCAA 400-040(3) "Fugitive Emissions" requires that reasonable precautions be taken to prevent the fugitive release of air contaminants to the atmosphere.

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

7.t 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.u 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.v 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.w 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.x 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 – Wood Waste Bunkers. The facility has numerous wood waste bunkers permitted. BACT for these types of processes has not changed since the initial permitting action. The use of two-sided wind shrouds and Best Management Practices has been determined to meet the requirements of BACT for wood waste bunkers at this facility.

8.b BACT Determination - Dry Kilns. 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 (200 °F) and vertical dispersion of exhaust gases had been determined to meet the requirements of BACT for the dry kilns installed at this facility.

Review of dry kiln temperature limits for other SWCAA sources:

Facility	Permit Date	Temperature Limit °F
Hampton Lumber Mills - Morton	8/26/2015	200
Hampton Lumber Mills - Randle	12/16/2014	200
Northwest Hardwoods - Longview	4/30/2014	200
Northwest Hardwoods - Centralia	4/18/2013	200
Exterior Wood	11/10/2009	180
Wilkin's Kaiser Olsen	2/10/2005	250

8.c BACT Determination – Hog Fuel Boiler. The following control measures were determined previously in ADP 07-2753 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 injection for NO_X. SNCR is well suited for furnace temperatures between 1,500-1,950 °F, unlike selective catalytic reduction. The boiler has a furnace temperature of approximately 1,600 °F. 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 emissions equal to or greater than the PSD thresholds. The facility does not fall into the collection of twenty-six sources 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 are not greater than 250 tons of any criteria pollutant. Therefore, PSD review is not applicable to this action.

8.e Compliance Assurance Monitoring (CAM). CAM is generally applicable to any emission unit with the potential to emit (pre-controlled) 100 tons per year or more 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 emission unit affected by this permitting action (dry kilns) do not have any controls to maintain compliance. Therefore, the requirements of the CAM program are not applicable to the proposed unit.

The hog fuel boiler is the only emission unit at Sierra Pacific that meets the criteria for CAM applicability. The hog fuel boiler is equipped with a continuous emission monitor for 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. Particulate matter from the hog fuel boiler could exceed 100 tpy without the additional control of the ESP, therefore, only particulate matter from this boiler is potentially subject to CAM. However, 40 CFR 64.2(b)(1)(i) exempts these emission limitations from the requirements of Part 64 because the facility is subject to a post-1990 NESHAPs (Boiler MACT)... [that establishes PM limits and monitoring.] It is expected that the standards in the Boiler MACT will provide a reasonable assurance of compliance.

9. AMBIENT IMPACT ANALYSIS

9.a TAP Small Quantity Review. Sierra Pacific estimated the following TAP emissions established in ADP 08-2799 and compared the modeled impact to the ASIL in WAC 173-460 [effective 2/14/94]. As detailed in the table below, the project is not expected to cause an incremental exceedance of the ASIL.

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	34,020	50	15.8	0.45	A	Yes
Acrolein	107-02-8	504	175	0.602	0.02	B	Yes
Arsenic	7440-38-2	4.34	--	9.07E-05	0.00023	A	Yes
Benzene	71-43-2	574	20	0.012	0.12	A	Yes
Beryllium	7440-41-7	1.2	--	2.51E-05	0.00042	A	Yes
Cadmium	7440-43-9	2.25	--	4.68E-05	0.00056	A	Yes
Carbon Tetrachloride	56-23-5	35.2	0.5	0.000733	0.067	A	Yes
Chlorine	7782-50-5	614	175	0.685	5	B	Yes
Chloroform	67-66-3	21.3	10	0.000444	0.043	A	Yes
Chromium, hexavalent	7440-47-3	0.136	--	2.83E-06	0.000083	A	Yes
1,2-Dibromoethene	106-93-4	42.4	0.5	0.000885	0.0045	A	Yes
1,2-Dichloroethane	107-06-2	22.6	10	0.000472	0.038	A	Yes
Dichloromethane	75-09-2	222	50	0.00464	0.56	A	Yes
Formaldehyde	50-00-0	1,972.37	20	0.113	0.077	A	Yes
Hydrogen chloride	7647-01-0	2,700	175	0.303	7	B	Yes
Nickel	7440-02-2	1.96	0.5	4.08E-05	0.0021	A	Yes
Nitric Oxide	10102-43-9	116,000	17,500	13.0	100	B	No
PAH	PAH	0.14	--	2.91E-07	0	A	Yes
Sulfuric Acid Mist	7664-93-9	1,630	175	0.182	3.3	B	No
TCDD, Total	1746-01-6	0.000158	--	3.30E-09	0.00000003	A	Yes
Terpene	8006-64-2	96,000	43,748	121	1900	B	No
Vinyl Chloride	75-01-4	14.2	10	0.000297	0.012	A	Yes

Upon the original permitting action, all TAPs/HAPs were modeled using AERMOD Version 04300. All modeled emissions were less than the ASIL except acetaldehyde, acrolein and formaldehyde. Pursuant to WAC 173-460 a second tier analysis was reviewed by WDOE for emissions of acetaldehyde, acrolein and formaldehyde. Acetaldehyde, acrolein and formaldehyde are products from lumber drying and combustion of wood in the hog fuel boiler. WDOE found that the cancer risks from acetaldehyde, acrolein and formaldehyde are less than one in one hundred thousand (as required under WAC 173-460-090 [effective 2/14/94]). The emissions from this source were expected to result in no significant adverse acute or chronic toxic effects on human health at businesses or residences in the vicinity of the lumber mill.

For ADP Application L-689, Sierra Pacific proposed to increase their dry kiln operating temperature from 180 °F to 200 °F, which results in a formaldehyde emissions increase of 0.14 tpy. This amount was modeled by Ramboll Environ on July 6, 2017. Ramboll Environ used AERMOD Version 16216 and meteorological data from the Chehalis-Centralia Airport. If the facility dried all of their lumber at 200 °F, the increase concentration would be

0.113 μg/m^3, which exceeds the ASIL of 0.077 μg/m^3 established in WAC 173-460 [effective February 14, 1994], the version SWCAA uses.

The WDOE uses a more recent version of WAC 173-460 [June 20, 2009] that establishes an ASIL of 0.167 ug/m^3. Typically, if the emissions exceed the established ASIL, a second tier analyses is performed. However, since the increase is still below the version of WAC 173-460 WDOE uses, WDOE did not require a new second tier analysis. A letter dated August 3, 2017 from WDOE explained that the State does not consider the formaldehyde emission increase to exceed the ASIL of the current WAC 173-460. No further review is necessary.

Conclusions

9.b Increase in the dry kiln temperature, as proposed in ADP application L-689, 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.c Increase in the dry kiln temperature, as proposed in ADP application L-689, will not cause the requirements of WAC 173-460 "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.d The dry kilns, as proposed in ADP application L-689, can be operated 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 17-3248 in response to ADP application L-689. ADP 17-3248 contains approval requirements deemed necessary to assure compliance with applicable regulations and emission standards as discussed below.

10.a Supersession of Previous ADP. ADP 17-3248 supersedes ADP 08-2799R2 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-689. 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.

10.c Monitoring and Recordkeeping Requirements. No monitoring or recordkeeping requirements have been modified by this permitting action. ADP 17-3248 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, Sierra Pacific 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. No reporting requirements have been modified by this permitting action. ADP 17-3248 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 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 will exceed the set point temperature and that this is natural for the nature of the equipment. Emission limits for lumber drying are based on emission test data and the maximum lumber capacity of the kilns.

10.f Nebraska Hog Fuel Boiler. Permit requirements for the boiler are based on information provided in ADP application L-618 and additional information provided in ADP application L-635. The boiler is designed for and approved to fire on wood products only. Exhaust gases must be discharged through the multiclone, SNCR and ESP at all times during operation except during start up and shutdown operations. Visible emissions are limited to 10% opacity. Sierra Pacific is required to perform an emission test every two years. Annual air emissions of NO_x and CO are calculated using a continuous emissions monitoring system (CEMS) and the most recent source test and annual production for PM.

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.

Hog fuel boiler.

Boiler startup, as defined by 40 CFR Subpart DDDDD "National Emission standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters", is as follows:
(1) Either the first-ever firing of fuel in a boiler or process heater for the purpose of supplying useful thermal energy for heating and/or producing electricity, or for any other purpose, or the firing of fuel in a boiler after a shutdown event for any purpose. Startup ends when any of the useful thermal energy from the boiler or process heater is supplied for heating, and/or producing electricity, or for any other purpose, or
(2) The period in which operation of a boiler or process heater is initiated for any purpose. Startup begins with either the first-ever firing of fuel in a boiler or process heater for the purpose of supplying useful thermal energy (such as steam or heat) for heating, cooling or process purposes, or producing electricity, or the firing of fuel in a boiler or process heater for any purpose after a shutdown event. Startup ends four hours after when the boiler or process heater supplies useful thermal energy (such as heat or steam) for heating, cooling, or process purposes, or generates electricity, whichever is earlier.

Shutdown, as defined by 40 CFR Subpart DDDDD "National Emission standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters", means the period in which cessation of operation of a boiler or process heater is initiated for any purpose. Shutdown begins when the boiler or process heater no longer supplies useful thermal energy (such as heat or steam) for heating, cooling, or process purposes and/or generates electricity or when no fuel is being fed to the boiler or process heater, whichever is earlier. Shutdown ends when the boiler or process heater no longer supplies useful thermal energy (such as steam or heat) for heating, cooling, or process purposes and/or generates electricity, and no fuel is being combusted in the boiler or process heater.

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 stack temperature reaches 175 °F. The COMS will not report valid data until the ESP exhaust temperature is 175 °F or greater. 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, 228 ppm and 0.015 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 shall not exceed a maximum length of 36 hours.

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 those discussed above in Start-up and Shutdown Provisions. 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. The facility has paved their entire log yard and mill roads to avoid introducing rocks and dirty hog fuel into their fuel mixture. No other 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 – Nebraska Boiler. The Nebraska boiler's initial emission test was performed April 9, 2008. The boiler is required to be tested every two years thereafter for the purpose of formally demonstrating compliance with applicable emission limits. All emission testing shall be conducted in accordance with the provisions of ADP 17-3248, Appendix A.

12.b Emission Testing Requirements – Carothers and Son Baghouse. The baghouse's initial emissions test was performed December 19, 2006. The baghouse is required to be tested every ten years thereafter for the purpose of formally demonstrating compliance with applicable emission limits. This is consistent with similar testing requirements for other large baghouses at lumber production facilities recently permitted. All emission monitoring shall be conducted in accordance with the provisions of ADP 17-3248, Appendix D.

The facility requested to change the Carothers and Son baghouse testing to be performed at the end of June instead of the end of December.

12.c Emission Testing Requirements – Dry Kilns. A lumber drying emission test shall be conducted within one year after achieving maximum intended operation and every five years thereafter. The kilns began operation on September 15, 2008. Emission testing shall be conducted in accordance with the provisions of in ADP 17-3248, Appendix C. Constituents to be measured include wood weight, wood moisture content, kiln temperature, and speciated VOCs including HAPs and TAPs.

Dry kiln testing was last performed May 7, 2013.

SWCAA recognizes there are no active testing companies available to test emissions from lumber drying at the time of permitting. If no testing company with the ability to test emissions from lumber drying is available within the required timeframe of this Permit, the facility should submit to SWCAA a letter proposing an alternate test schedule. This alternate test schedule must be approved by SWCAA.

13. FACILITY HISTORY

13.a Previous Permitting Actions. SWCAA has previously issued the following Permits for Sierra Pacific in Centralia:

Permit Number	Application Number	Date	Purpose
06-2669	L-572	3/21/06	Approval to operate a new green lumber sawmill.
07-2753	L-601	10/10/07	Approval to install a hog fuel boiler and three dry kilns. This Permit superseded ADP 06-2669.
08-2799	L-618	7/17/08	Approval to install three dry kilns, increase kiln throughput, increase HAP emissions, increase NO_X emissions, increase start up emissions, increase anti-stain usage, change NO_X control from urea to anhydrous ammonia and incorporate the addition of bin unloading curtains. This Permit superseded ADP 07-2753. This Permit established Sierra Pacific as a Title V facility.
08-2799R1	L-635	1/21/2010	Modification of the permit to correct an erroneously established emission limit for acrolein. Also, anti-stain product and dry kiln emission factors were updated. This Permit superseded ADP 08-2799 in its entirely.
08-2799R2	L-656	4/25/2012	Approval to install a new chip bin and chipper. This Permit superseded ADP 08-2799R1 in its entirely.

Centralia Sawmill began construction in March 2006 and began production July 2006. Sierra Pacific Industries purchased Centralia Sawmill in March 2007. The boiler and first three dry kilns began operation in January 2008. The three additional kilns began operation on September 15, 2008.

14. PUBLIC INVOLMENT OPPORTUNITY

14.a Public Notice for ADP Application L-689. Public notice for ADP application L-689 was published on the SWCAA internet website for a minimum of (15) days beginning on April 11, 2017.

14.b Public/Applicant Comment for ADP Application L-689. A (30) day public comment period was provided for this permitting action pursuant to SWCAA 400-171(3). No comments were received during the public comment period.

14.c State Environmental Policy Act. This project is exempt from SEPA (SWCAA 17-035) requirements pursuant to WAC 197-11-800(3) since it only involves repair, remodeling, maintenance, or minor alteration of existing structures, equipment or facilities, and will not involve material expansions or changes in use.