Table 1
Input Process Rates and Parameters
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter	EU ID	TEU ID	Short-Term Value	Current PTE Values		Proposed PTE Values		
				Daily	Annual	Hourly	Daily	Annual
PROPOSED NEW SAWMILL								
Hours of Operation	--	--	--	--	--	--	24 (hrs/day) [1]	4,200 (hrs/yr) [2]
Total Lumber Throughput (Volume-basis)		--	--	--	--	120 (Mbdft/hr) [3]	2,880 (Mbdft/day) [aj]	250,000 (Mbdft/yr) [2]
Total Lumber Throughput (Mass-basis)		--	--	--	--	115 (BDT/hr) [b]	2,760 (BDT/day) [aj]	239,500 (BDT/yr) [b]
Green Chip Throughput (Green-basis)	--	--	--	--	--	160 (tons/hr) [5]	3,840 (tons/day) [aj]	672,000 (tons/yr) [c]
Green Chip Throughput (Bone dry-basis)		--	--	--	--	93.0 (BDT/hr) [5]	2,232 (BDT/day) [aj]	390,600 (BDT/yr) [c]
Green Sawdust Throughput (Green-basis)	--	--	--	--	--	54.0 (tons/hr) [6]	1,296 (tons/day) [aj]	226,800 (tons/yr) [c]
Green Sawdust Throughput (Bone dry-basis)		--	--	--	--	27.0 (BDT/hr) [6]	648 (BDT/day) [aj]	113,400 (BDT/yr) [c]
EXISTING SOURCES WITH MODIFICATIONS								
Hogged Fuel Fired Boilers								
Normal Operations								
Hours of Operation	H-BLR		--	24 (hrs/day) [1]	--	--	24 (hrs/day) [1]	--
Combined Steam Production	H-BLR	--	86.1 (Mlb-steam/hr) [7]	2,066 (Mlb-steam/day) [8]	475,000 (Mlb-steam/yr) [9]	--	2,066 (Mlb-steam/day) [10]	660,000 (Mlb-steam/yr) [11]
Wood Fuel Usage	H-BLR	--	--	4,257 (MMBtu/day) [8]	978,500 (MMBtu/yr) [d]	--	4,257 (MMBtu/day) [d]	1,359,600 (MMBtu/yr) [d]
Total Boiler Throughput Controlled by Dry ESP	H-BLR_ESP	H-BLR_ESP	--	3,205 (MMBtu/day) [8]	922,236 (MMBtu/yr) [8]	--	3,205 (MMBtu/day) [e]	1,281,430 (MMBtu/yr) [f]
Total Boiler Throughput Controlled by Scrubber	H-BLR_SCR	H-BLR_SCR	--	1,051 (MMBtu/day) [8]	56,264 (MMBtu/yr) [8]	--	1,051 (MMBtu/day) [g]	78,180 (MMBtu/yr) [h]
Startup/Shutdown (SU/SD) Operations - CAO Only								
Boiler with Multi-clone Control Only								
Hours of Operation	H-BLR_MC	H-BLR_MC	--	--	--	--	8.00 (hrs/day) [17]	640 (hrs/yr) [i]
Wood Fuel Usage			--	--	--	109 (MMBtu/hr) [j]	873 (MMBtu/day) [k]	69,875 (MMBtu/yr) [l]
Boiler with ESP Control								
Hours of Operation	H-BLR_ESP	H-BLR_ESP	--	--	--	--	16.0 (hrs/day) [20]	6,585 (hrs/yr) [m]
Wood Fuel Usage			--	--	--	177 (MMBtu/hr) [j]	2,838 (MMBtu/day) [k]	1,089,775 (MMBtu/yr) [n]
Fuel Dryer								
Normal Operations								
Hours of Operation	S-400	H-DRY	--	24.0 (hrs/day) [1]	2,160 (hrs/yr) [8]	--	24.0 (hrs/day) [1]	3,000 (hrs/yr) [11]
Throughput			3.96 (ODT/hr) [8]	95.0 (ODT/day) [o]	8,554 (ODT/yr) [q]	--	95.0 (ODT/day) [o]	11,880 (ODT/yr) [q]
Startup/Shutdown (SU/SD) Operations - CAO Only								
Hours of Operation			--	--	--	--	16.0 (hrs/day) [20]	3,000 (hrs/yr) [21]
Throughput			3.96 (ODT/hr) [8]	--	--	--	63.4 (ODT/day) [o]	11,880 (ODT/yr) [21]
Lumber Kilns								
Normal Operations								
Hours of Operation	BLR-DK	--	--	24 (hrs/day) [1]	--	--	24.0 (hrs/day) [1]	--
Total Kiln Throughput			40.0 (Mbdft/hr) [8]	960 (Mbdft/day) [8]	180,000 (Mbdft/yr) [9]	43.6 (Mbdft/hr) [r]	1,047 (Mbdft/day) [22]	280,000 (Mbdft/yr) [23]
Kiln - Douglas Fir	LBR-DK_DF	LBR-DK_DF	--	960 (Mbdft/day) [24]	146,160 (Mbdft/yr) [s]	--	1,047 (Mbdft/day) [24]	227,360 (Mbdft/yr) [26]
Kiln - Hemlock	LBR-DK_HL	LBR-DK_HL	--	960 (Mbdft/day) [24]	30,456 (Mbdft/yr) [t]	--	1,047 (Mbdft/day) [24]	47,380 (Mbdft/yr) [26]
Kiln - True Fir	LBR-DK_TF	LBR-DK_TF	--	960 (Mbdft/day) [24]	3,384 (Mbdft/yr) [u]	--	1,047 (Mbdft/day) [24]	5,270 (Mbdft/yr) [26]
Startup/Shutdown (SU/SD) Operations - CAO Only								
Hours of Operation	BLR-DK	--	--	--	--	--	16.0 (hrs/day) [27]	--
Total Kiln Throughput			--	--	--	43.6 (Mbdft/hr) [r]	698 (Mbdft/day) [v]	238,122 (Mbdft/yr) [w]
Kiln - Douglas Fir	LBR-DK_DF	LBR-DK_DF	--	--	--	--	698 (Mbdft/day) [24]	193,355 (Mbdft/yr) [28]
Kiln - Hemlock	LBR-DK_HL	LBR-DK_HL	--	--	--	--	698 (Mbdft/day) [24]	40,300 (Mbdft/yr) [28]
Kiln - True Fir	LBR-DK_TF	LBR-DK_TF	--	--	--	--	698 (Mbdft/day) [24]	4,480 (Mbdft/yr) [28]
Existing Sawmill								
S-62 (Stud Planer Baghouse)	S-62	--	--	24 (hrs/day) [1]	3,600 (hrs/yr) [9]	--	24.0 (hrs/day) [1]	6,240 (hrs/yr) [29]
S-200 Stud Planer Baghouse	S-200	--	--	24 (hrs/day) [1]	6,240 (hrs/yr) [9]	No proposed change		
S-182 Cyclone (PSEL-basis)	S-182	--	--	960 (Mbdft/day) [8]	180,000 (Mbdft/yr) [9]	--	1,047 (Mbdft/day) [22]	280,000 (Mbdft/yr) [23]
S-182 Cyclone (CAO-basis)		S-CYC	--	340 (ODT/day) [8]	63,720 (ODT/yr) [8]	--	371 (ODT/day) [x]	99,120 (ODT/yr) [x]
S-164 (Cyclone - Studmill)	S-164	--	--	--	180,000 (Mbdft/yr) [9]	S-164 Cyclone will be decomissioned and removed from the facility.		
Hardboard Plant								
Normal Operations								
Hours of Operation	H-PVUV	H-PVUV	--	24 (hrs/day) [30]	5,500 (hrs/yr) [30]	No proposed change		
Press	H-PVUV	H-PVUV	--	587 (Msf 1/8-in/day) [30]	105,000 (Msf 1/8-in/yr) [30]	No proposed change		
Refiner	H-RF12	H-RF12	7.64 (ODT/hr) [31]	183 (ODT/day) [y]	35,640 (ODT/yr) [z]	No proposed change		
Forming Line	H-HMS	FORMER	7.64 (ODT/hr) [31]	183 (ODT/day) [y]	35,640 (ODT/yr) [z]	No proposed change		
Startup/Shutdown (SU/SD) Operations - CAO Only								
Hours of Operation	H-PVUV	H-PVUV	--	--	--	--	16.0 (hrs/day) [27]	5,500 (hrs/yr) [21]
Press	H-PVUV	H-PVUV	--	--	--	24.4 (Msf 1/8-in/hr) [aa]	391 (Msf 1/8-in/day) [bb]	105,000 (Msf 1/8-in/yr) [21]
Refiner	H-RF12	H-RF12	--	--	--	7.64 (ODT/hr) [31]	122 (ODT/day) [bb]	35,640 (ODT/yr) [21]
Forming Line	H-HMS	FORMER	--	--	--	7.64 (ODT/hr) [31]	122 (ODT/day) [bb]	35,640 (ODT/yr) [21]
Vehicle Road Dust Emissions								
RD-FUG (Unpaved Roads)	RD-FUG	--	--	960 (Mbdft/day) [8]	180,000 (Mbdft/yr) [9]	--	1,047 (Mbdft/day) [22]	280,000 (Mbdft/yr) [23]
RD-FUG (Paved Roads)		--	--	960 (Mbdft/day) [8]	180,000 (Mbdft/yr) [9]	--	1,047 (Mbdft/day) [22]	280,000 (Mbdft/yr) [23]
Lumber Surface Treatment - Material Balance								
Mycostat P51 Treating Solution	LSP-MB	LSP-MB	--	250 (gal/day) [8]	62,500 (gal/yr) [8]	[33]		
AntiBlu M6 Concentrate (VOC PSEL)	Misc-VOC	--	--	500 (gal/day) [8]	80,500 (gal/yr) [8]	[34]		
AntiBlu M6 Treating Solution (CAO)	--	LSP-MB	--	500 (gal/day) [8]	80,500 (gal/yr) [8]	[34]		
AntiBlu M3 Concentrate (VOC PSEL)	Misc-VOC	--	--	--	--	--	45.8 (gal/day) [cc]	4,000 (gal/yr) [cc]
AntiBlu M3 Treating Solution (CAO)	--	LSP-MB	--	--	--	--	1,146 (gal/day) [dd]	99,500 (gal/yr) [dd]
Resin Storage Tanks								
Tank 1 (BK 276A30)	--	R1	--	4,763 (gal/day) [38]	157,853 (gal/yr) [2]	No proposed change		
Tank 2 (BK 276A30)	--	R2	--	5,195 (gal/day) [38]	157,853 (gal/yr) [2]	No proposed change		
Tank 3 (BK 276A30)	--	R3	--	5,223 (gal/day) [38]	157,853 (gal/yr) [2]	No proposed change		
Tank 4 (BK 254A20)	--	R4	--	--	--	--	1,469 (gal/day) [38]	19,365 (gal/yr) [2]

Notes

Mbdft = thousand board feet; BDT = bone-dry ton (0% moisture content); Mlb-steam = thousand pounds of steam; MMBtu = million British thermal unit; ODT = oven-dry ton (0% moisture content).

[a] Requested PTE daily throughput (Mbdft/day) = (PTE hourly total throughput [Mbdt/hr]) x (maximum potential daily hours of operation [hr/day])

[b] Proposed throughput (BDT/"period") = (proposed throughput [Mbdft/"period"]) x (volume-to-mass conversion factor BDT/Mbdft)
Volume-to-mass conversion factor (BDT/Mbdft) = 0.958 (4)

[c] Requested PTE annual throughput ("units"/yr) = (Proposed PTE annual hours of operation [hrs/yr]) x (hourly throughput ["units"/hr])

[d] Wood fuel usage (MMBtu) = (steam production [Mlb-steam]) x (fuel heat input to steam output ratio [MMBtu/Mlbs-steam])
Fuel heat input to steam output ratio = 2.06 (12)

[e] Proposed PTE Total boiler throughput controlled by dry ESP (MMBtu/day) = (combined boiler throughput [MMBtu/day]) x (percentage of throughout controlled by ESP [%]/100)
Percentage of combined boiler throughput controlled by ESP (%) = 75.3 (13)

[f] Proposed PTE Total boiler throughput controlled by dry ESP (MMBtu/yr) = (combined boiler throughput [MMBtu/yr]) x (percentage of throughout controlled by ESP [%]/100)
Percentage of combined boiler throughput controlled by ESP (%) = 94.3 (14)

[g] Proposed PTE Total boiler throughput controlled by scrubber (MMBtu/day) = (combined boiler throughput [MMBtu/day]) x (percentage of throughout controlled by scrubber [%]/100)
Percentage of combined boiler throughput controlled by scrubber (%) = 24.7 (15)

[h] Proposed PTE Total boiler throughput controlled by scrubber (MMBtu/yr) = (combined boiler throughput [MMBtu/yr]) x (percentage of throughout controlled by scrubber [%]/100)
Percentage of combined boiler throughput controlled by scrubber (%) = 5.75 (16)

[i] Annual hours of operation (Multi-clone control) (SU/SD) = (daily hours of operation [multi-clone control]) x (number of startup events per year)
Number of startup events per year = 80.0 (18)

[j] Hourly throughput during startup (MMBtu/hr) = (steam production during startup [Mlb-steam/hr]) x (fuel heat input to steam output ratio [MMBtu/Mlb-steam])
Steam production during startup (Mlb-steam/hr) = 53.0 (19)
Fuel heat input to steam output ratio (MMBtu/Mlb-steam) = 2.06 (12)

[k] Daily maximum throughput (MMBtu/day) = (hourly maximimum throughput [MMBtu/hr]) x (daily hours of operation [hrs/day])

[l] Annual maximum throughput (MMBtu/yr) = (hourly maximimum throughput [MMBtu/hr]) x (annual hours of operation [hrs/yr])

[m] Annual ESP hours of operation (SU/SD Basis) = ([PTE annual boiler throughput controlled by ESP (MMBtu/yr)] / [maximum hourly rate with ESP control (MMBtu/hr)]) - (annual hours of operation [multi-clone control] [SU/SD basis] [hrs/day])

[n] Annual maximum throughput (MMBtu/yr) = (hourly maximimum throughput [MMBtu/hr]) x (annual hours of operation [hrs/yr]) - (total boiler throughput controlled by scrubber [MMBtu/yr])

[o] Hourly throughput during startup (MMBtu/hr) = (steam production during startup [Mlb-steam]) x (fuel heat input to steam output ratio [MMBtu/Mlbs-steam])
Steam production during startup (Mlb-steam/hr) = 86.1 (7)
Fuel heat input to steam output ratio = 2.06 (12)

[p] PTE daily Throughput (ODT/day) = (hourly throughput [ODT/hr]) x (maximum daily hours of operation [hrs/day])

[q] PTE annual throughput (ODT/yr) = (hourly throughput [ODT/hr]) x (PTE annual hours of operation [hrs/yr])

[r] PTE hourly kiln throughput (Mbdft/hr) = (daily PTE kiln throughput [Mbdft/day]) x (24 hrs/day)

[s] Kiln throughput (Douglas fir) (Mbdft/yr) = (total kiln throughput [Mbdt/yr]) x (average annual percentage of Douglas fir throughput [%]/100)
Average annual percentage of Douglas fir throughput (%) = 81.2 (25)

[t] Kiln throughput (hemlock) (Mbdft/yr) = (total kiln throughput [Mbdt/yr]) x (average annual percentage of hemlock throughput [%]/100)
Average annual percentage of hemlock throughput (%) = 16.9 (25)

[u] Kiln throughput (True fir) (Mbdft/yr) = (total kiln throughput [Mbdt/yr]) x (average annual percentage of true fir throughput [%]/100)
Average annual percentage of True fir throughput (%) = 1.88 (25)

[v] Kiln daily throughput (SU/SD) (Mbdft/day) = (PTE hourly kiln throughput [Mbdft/hr]) x (daily hours of operation [SU/SD] [hrs/day])

[w] Total kiln throughput (SU/SD) (Mbdft/yr) = ([SDU/SD boiler throughput through ESP (MMBtu/yr)] / [PTE total boiler throughput through ESP (MMBtu/yr)]) x (PTE annual kiln throughput [Mbdft/yr])

[x] Chipper material processed (ODT/"period") = (kiln throughput [Mbdft/"period"]) x (chipper conversion factor [ODT chips/Mbdft]) x (percentage of green chips [%] /100)
Chipper conversion factor (ODT chips/Mbdft) = 0.413 (30)
Percentage of green chips (%) = 85.7 (30)

[y] PTE daily (units/day) = (PTE production [ODT/hr]) x (maximum daily hours of operation [hrs/day])

[z] PTE annual throughput (ODT/yr) = (Proposed PTE annual hours of operation [hrs/yr]) x (average hourly throughput [ODT/hr])
Average hourly throughput (ODT/hr)= 6.48 (32)

[aa] Maximum hourly production rate (Msf 1/8-in/hr) = (maximum hourly hardboard press production rate [Msf 1/8-in/day]) / (PTE daily hours of operation [hrs/day])

[bb] Daily production during SD/SU conditions ("units"/day) = (hourly production ["units"/hr]) x (daily hours of operation during SU/SD conditions [hrs/day])

[cc] AntiBlu M3 concentrate (VOC PSEL) (gal/"period") = (AntiBlu M3 concentrate application rate [gal/Mbdft]) x (sawmill production rate [Mbdft/"period"]) (35)
AntiBlue M3 concentrate application rate (gal/Mbdft) = 0.016 (36)

[dd] AntiBlu M3 treating solution (CAO) (gal/"period") = (AntiBlu M3 treating solution application rate [gal/Mbdft]) x (sawmill production rate [Mbdft/"period"])
AntiBlue M3 treating solution application rate (gal/Mbdft) = 0.40 (ee)

[ee] AntiBlu M3 treating solution application rate (gal/Mbdft) = (AntiBlu M3 concentrate usage rate [gal/Mbdft]) / (parts AntiBlu M3 concenrate / parts distilled H_2O)
Parts AntiBlue M3 concentrate = 1.00 (37)
Parts distilled H_2O= 25.0 (37)

References

[1] Information provided by Stimson Lumber Company. Assumes continuous daily operation.
[2] Information provided by Stimson Lumber Company.
[3] Information provided by Stimson Lumber Company. Assumes maximum hourly throughput of proposed sawmill.
[4] Based on True fir wood species as it is the highest density among the three wood species processed at the facility (Douglas fir, Hemlock, True fir).
[5] Information provided by Stimson Lumber Company. Assumes maximum hourly throughput of 160 green-tons/hr or 93 BDT/hr at 42% moisture content of green chips.
[6] Information provided by Stimson Lumber Company. Assumes maximum hourly throughput of 54 green-tons/hr or 27.5 BDT/hr at 50% moisture content of green sawdust.
[7] Stimson Lumber Company - Title V Permit 34-2066 2022 Title V Permit Renewal PSEL detail spreadsheet provided by DEQ. Representative of maximum hourly steam production for all three boilers between annual source tests.
[8] Maximum production value used for the CAO permitting program and the level 3 risk assessment approved by the DEQ on August 5, 2024.
[9] Stimson Lumber Company - Title V Permit 34-2066 2022 Renewal PSEL detail spreadsheet provided by DEQ. Representative of maximum annual production.
[10] Stimson is not proposing an increase in daily production for this source from current PTE levels.
[11] Information provided by Stimson Lumber Company. Representative of proposed PTE production rate.
[12] Representative of maximum average fuel heat input to steam output ratio (FHISOR) based on most recent set of source test data. See the 2022 Renewal PSEL detail spreadsheet to Title V Permit 34-2066.
[13] Information provided by Stimson Lumber Company. Represents the total percentage of boiler exhaust that is controlled by the ESP during periods when the fuel dryer is operating. Value averaged between 2015 to 2020 and is unchanged from what was submitted for the CAO permitting program and level 3 risk assessment approved by the DEQ on August 5, 2024.
[14] Information provided by Stimson Lumber Company. Represents the total annual cumulative percentage of exhaust that is routed through the ESP on average throughout the year. Boiler exhaust is exclusively routed through the ESP during periods when the dryer is not in operation (74.2% per year on average), and 75.3% of the time when the dryer is operational. Value is unchanged from what was submitted for the CAO permitting program and level 3 risk assessment approved by the DEQ on August 5, 2024.
[15] Information provided by Stimson Lumber Company. Represents the total percentage of boiler exhaust that is controlled by the wet scrubber during periods when the fuel dryer is operating. Value averaged between 2015 to 2020. Value is unchanged from what was submitted for the CAO permitting program and level 3 risk assessment approved by the DEQ on August 5, 2024.
[16] Information provided by Stimson Lumber Company. Represents the total annual cumulative percentage of exhaust that is routed through the wet scrubber on average throughout the year. The dryer operates approximately 25.8% of the time during facilty operating hours throughout the year and approximately 24.7% of the exhaust is routed through the scrubber on average when the dryer is operational. Value is unchanged from what was submitted for the CAO permitting program and level 3 risk assessment approved by the DEQ on August 5, 2024.
[17] Representative of the maximum daily hours of operation during startup/shutdown (SU/SD) conditions when boiler exhaust will be routed through the uncharged ESP and will only receive emissions control from the multi-clone.
[18] Information provided by Stimson Lumber Company. Proposed maximum number of planned SU events per year.
[19] Representative of maximum hourly steam rate for a single boiler. Only one boiler is used for SU until ESP becomes charged and fully operational.
[20] Assumes daily operation is remainder of 24 hour day or 16 hours.
[21] Assumes same hours of operation and throughput as during normal operations.
[22] Information provided by Stimson Lumber Company. Representative of maximum capacity of lumber kilns based on 8' 2"x4" lumber.
[23] Information provided by Stimson Lumber Company. Assumes a 10% variability factor.
[24] Assumes maximum daily throughput of wood species is equal to overall maximum daily throughput.
[25] Information provided by Stimson Lumber Company. Represents the distribution of species for the 2019 calendar year. The 2019 calendar year is assumed to be representative of typical annual speciation each year.
[26] PTE annual throughput of each wood species scaled up using ratio between existing PTE (180,000 Mbdft/yr) and proposed PTE (280,000 Mbdft/yr).
[27] Assumes same hours of operation as boiler ESP throughput for SU/SD conditions.
[28] PTE annual throughput of each wood species scaled up using ratio between existing PTE (180,000 Mbdft/yr) and proposed PTE during SU/SD (255,205 Mbdft/yr).
[29] Proposed PTE annual throughput provided by Stimson Lumber Company.
[30] Information used for the CAO permitting program and the level 3 risk assessment approved by the DEQ on August 5, 2024.
[31] Maximum PTE hourly production rate for the refiner and forming line based on 1/4-inch tempered hardboard production.
[32] Average hourly throughput rate is based on review of historical throughput rates of each size hardboard manufactured at the facility and forecasted future product rates.
[33] The Mycostat P51 Treating Solution was discontinued in January 2025. The replacement treating solution, Cellu-Treat Dot Wood Preservative, is a non-VOC/TAC product.
[34] The AntiBlu M6 Treating Solution was discontinued in January 2025 and replaced with AntiBlu M3 Treating Solution.
[35] Stimson maintains compliance with the VOC PSEL by tracking AntiBlu M6 concentrate usagerates.
[36] Application rate provided by Stimson Lumber Company. Rate was derivied using 2024 AntiBlu M6 concentrate usage rate and sawmill production.
[37] Dilution ratio provided by chemical manufacturer, Arch Wood Protection, Inc.
[38] Conservatively assumes one turnover per day for daily throughput.

Table 2
Input Parameters for Vehicle Road Dust Calculations
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Vehicle Type [1]	Route ID	Vehicle Weight			Updated Travel Route		Number of Trips		Vehicle Miles Traveled [a]		Mean Vehicle Weight [b] (tons)
		Unloaded (tons)	Loaded (tons)	Average (tons)	Route Length (ft)	One-Way or Round-Trip Travel [1]	Daily (trips/day)	Annual (trips/yr)	Daily (VMT/day)	Annual (VMT/yr)	
Paved Roads											
HARDBOARD PLANT											
Incoming Sawdust Trucks	PH_ISDT1	17.0 [1]	45.5 [1]	31.3	635 [1]	Round Trip	1.00 [4]	50.0 [1]	0.12	6.01	-
Incoming Sawdust Trucks	PH_ISDT2	15.0 [1]	44.3 [1]	29.7	635 [1]	Round Trip	1.00 [4]	50.0 [1]	0.12	6.01	-
Outbound Bark Trucks	Vehicle discontinued since 2021.										
Outbound Bark Trucks	Vehicle discontinued since 2021.										
Outbound Residual Trucks	PH_ORT1	17.0 [1]	49.3 [1]	33.2	2,461 [1]	Round Trip	3.00 [4]	750 [1]	1.40	350	-
Outbound Residual Trucks	PH_ORT2	15.0 [1]	48.3 [1]	31.7	2,461 [1]	Round Trip	3.00 [4]	750 [1]	1.40	350	-
Fox Lumber Residual Trucks	PH_LRT	14.5 [1]	48.3 [5]	31.4	4,278 [1]	Round Trip	3.00 [1]	750 [1]	2.43	608	-
Shavings+Chips to PH	PH_SCPH	15.0 [1]	34.8 [1]	24.9	5,286 [1]	Round Trip	5.00 [1]	1,250 [1]	5.01	1,251	-
To HB Chip Pile	PH_HBCP	15.0 [1]	35.2 [1]	25.1	2,496 [1]	Round Trip	3.00 [1]	750 [1]	1.42	355	-
To HB Sawdust Pile	PH_HBSP	15.0 [1]	35.6 [1]	25.3	2,520 [1]	Round Trip	1.00 [1]	250 [1]	0.48	119	-
M&M Ash Truck(s)	PH_ASH	17.0 [1]	50.0 [1]	33.5	4,320 [1]	Round Trip	1.00 [4]	50.0 [1]	0.82	40.9	-
W-M Garbage Truck(s)	PH_GARB	17.3 [1]	18.2 [1]	17.8	2,568 [1]	Round Trip	1.00 [4]	100.0 [1]	0.49	48.6	-
GPAC Resin Trucks	PH_RES	14.8 [1]	39.4 [1]	27.1	3,430 [1]	Round Trip	2.00 [6]	100.0 [1]	1.30	65.0	-
Walker Emulsions Trucks	PH_WET	14.8 [1]	39.4 [7]	27.1	3,430 [1]	Round Trip	2.00 [6]	100.0 [1]	1.30	65.0	-
Front Loader (Chips/Dust)	PH_FLO	20.9 [1]	21.9 [1]	21.4	1,276 [1]	Round Trip	50.0 [1]	12,500 [1]	12.1	3,021	-
Delivery Trucks	PH_DEL	7.50 [8]	13.0 [8]	10.3	3,400 [1]	Round Trip	2.00 [4]	500 [1]	1.29	322	-
Metal Recycling	PH_MET	16.0 [1]	50.0 [9]	33.0	5,180 [1]	Round Trip	1.00 [4]	24.0 [1]	0.98	23.5	-
SAWMILL											
Inbound Whole Log Trucks	P_LOG	16.5 [1]	42.5 [1]	29.5	1,142 [1]	Round Trip	89.0 [1]	22,250 [1]	19.2	4,812	-
Wood Chunk Box Trucks	PS_WCBT	20.9 [1]	45.5 [10]	33.2	3,467 [1]	Round Trip	3.00 [4]	750 [1]	1.97	492	-
Outgoing Lumber MaxiTrucks	PS_OLM	18.5 [1]	51.5 [1]	35.0	1,755 [1]	Round Trip	20.0 [1]	5,000 [1]	6.65	1,662	-
Outgoing Lumber Semis/Vans	PS_LSV	16.5 [1]	39.0 [1]	27.8	1,831 [1]	Round Trip	5.00 [1]	1,250 [1]	1.73	433	-
Hysters loading lumber	PS_HYS	4.50 [11]	15.0 [11]	9.75	200 [1]	Round Trip	524 [1]	131,000 [1]	19.8	4,962	-
Log Truck Unloaders	PS_LOGU	59.2 [1]	69.9 [12]	64.5	2,400 [13]	Round Trip	45.0 [1]	11,250 [1]	20.5	5,114	-
Debarker Blank Transporters	PS_DEBT	20.9 [1]	21.8 [14]	21.3	600 [1]	Round Trip	1,666 [1]	416,500 [1]	189	47,330	-
Stud mill Forklift: Mill to kilns	PS_FMK	4.50 [11]	15.0 [11]	9.75	990 [1]	Round Trip	324 [1]	81,000 [1]	60.8	15,188	-
Stud mill Forklift: Kilns to Planer	PS_FKP	4.50 [11]	15.0 [11]	9.75	200 [1]	Round Trip	381 [1]	95,250 [1]	14.4	3,608	-
Paved Road Fleet Total/Average									**365**	**90,231**	**21.7**
Unpaved Roads											
SAWMILL											
Log Truck Unloaders	US_LOGU	59.2 [1]	69.9 [12]	64.5	4,465 [13]	Round Trip	45.0 [1]	11,250 [1]	38.1	9,513	-
Maintenance Truck	US_MAIN	2.00 [15]	2.00 [15]	2.00	4,465 [13]	Round Trip	4.00 [1]	1,000 [1]	3.38	846	-
Unpaved Road Fleet Total/Average									**41.4**	**10,359**	**59.4**

Notes

VMT = vehicle miles traveled.

[a] Vehicle miles traveled (VMT/day or VMT/yr) = (route length [ft]) x (number of trips [trips/day or trips/yr]) / (5,280 [ft/mile])

[b] Mean vehicle weight = Σ{[average vehicle type weight {tons}] x [annual vehicle type miles traveled {VMT/yr}]) / (total annual vehicle miles traveled [VMT/yr])

References

[1] Information provided by Stimson Lumber Company.

[2] AP-42 Chapter 13.2.1 (January 2011), Section 13.2.1.3. See note to equation (1).

[3] Length of route measured in Google Earth.

[4] Assumes one truck per day as worst-case short term trip frequency since actual trip frequency is less than once daily.

[5] Assumes that loaded weight of residuals truck is equal to loaded weight of other residual trucks.

[6] Estimated value based on facility usage and production rates, and reported route lengths and trip frequencies.

[7] Assumes that loaded weight of wax truck is equal to loaded weight of resin truck.

[8] Assumes typical truck weight and maximum operating weight for 26 ft model delivery box truck.

[9] Assumes that loaded weight of metal recycling truck is equal to loaded weight of garbage truck.

[10] Assumes that loaded weight of box truck is equal to loaded weight of incoming sawdust truck.

[11] Based on equipment specs for Hyster Model H210 lumber forklift. Represent maximum operating weight and load capacity.

[12] Assumes manufacturer maximum operating weight for Cat 980 with mill yard arrangement (i.e., log unloading) equipment.

[13] Estimated based on aerial imagery and typical vehicle route for log handling.

[14] Based on the maximum operating weight from manufacturer specification log for Caterpillar Model 950.

[15] Estimated based on plant passenger truck.

Table 3
Permitting Applicability Summary
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Emission Unit	EU ID	Annual Emission Estimates (tons/yr)							
		PM	PM_{10}	$PM_{2.5}$	VOC	CO	NO_X	SO_2	GHG (CO_2e)
EXISTING EMISSIONS ESTIMATES									
Steam Production									
H-BLR [1]	ESP	7.80	7.78	7.43	30.9	80.2	77.3	3.33	92,106
Fuel Dryer									
H-DRY Fuel Dryer (H-140) [1]	S-400	4.30	3.91	0.87	9.29	5.2	6.34	--	--
Hardboard Plant									
Parallel Scrubbers (H-PVUV) [1]	S-123	8.77	7.89	1.75	5.25	--	--	--	--
Storage Piles (SPF) [1]	--	3.68	1.84	0.28	--	--	--	--	--
H-RF12 Refiners [1]	S-5	0.61	0.61	0.12	5.25	--	--	--	--
PH Baghouse [1]	H-BGH	0.02	0.02	0.02	--	--	--	--	--
Large Torit Baghouse [1]	H-202	1.29	1.29	1.29	--	--	--	--	--
Small Torit Baghouse [1]	H-203	0.62	0.62	0.62	--	--	--	--	--
Existing Sawmill (Permitted)									
Lumber Kilns [1]	LBR-DK	4.50	4.50	4.50	89.2	--	--	--	--
Stud Planer Baghouse [1]	S-62	0.099	0.099	0.099	--	--	--	--	--
S-CYC Stud Mill [1]	S-164	0.045	0.045	0.045	--	--	--	--	--
S-CYC S-182 Cyclone [1]	S-182	0.045	0.045	0.045	--	--	--	--	--
S-200 Baghouse (FJLB) [2]	S-200	1.37 [3]	1.37 [3]	1.37 [3]	--	--	--	--	--
RD-FUG (Unpaved Roads) [1]	--	8.6	2.4	0.3	--	--	--	--	--
RD-FUG (Paved Roads) [1]	--	13.2	2.6	0.6	--	--	--	--	--
Miscellaneous Sources									
B-GEN [1]	BGEN	1.20E-02	1.20E-02	1.20E-02	1.20E-02	0.20	0.40	0.01	46.7
EGEN01 [4]	EGEN01	4.17E-03 [5]	4.17E-03 [5]	4.17E-03 [5]	6.60E-03 [5]	0.042 [5]	0.12 [5]	0.032 [5]	26.2 [5]
FIREPUMP [4]	FIRE	3.13E-03 [5]	3.13E-03 [5]	3.13E-03 [5]	0.020 [5]	0.055 [5]	0.063 [5]	0.020 [5]	8.11 [5]
Misc-VOC [1]	--	--	--	--	5.00	--	--	--	--
Aggregate Insignificant		1.00	1.00	1.00	1.00	1.00	1.00	1.00	--
Existing Facility-Wide PTE		**55.0**	**35.0**	**19.0**	**146**	**86.6**	**85.2**	**4.4**	**92,187**
PROPOSED MODIFICATION									
Steam Production									
H-BLR [6]	ESP	10.9	10.9	10.2	42.9	112	109	4.62	142,480
Fuel Dryer									
H-DRY Fuel Dryer (H-140) [7]	S-400	6.03	5.43	1.20	12.9	7.20	8.81	--	--
Existing Sawmill (Proposed Emissions)									
Lumber Kilns [8]	LBR-DK	7.00	7.00	7.00	139	--	--	--	--
Stud Planer Baghouse [9]	S-62	0.17	0.17	0.17	--	--	--	--	--
S-CYC Stud Mill [10]	S-164	0	0	0	--	--	--	--	--
S-CYC S-182 Cyclone [11]	S-182	0.07	0.07	0.07	--	--	--	--	--
RD-FUG (Unpaved Roads) [12]	RD-FUG_UP	21.3	6.06	0.61	--	--	--	--	--
RD-FUG (Paved Roads) [12]	RD-FUG_P	31.1	6.21	1.52	--	--	--	--	--
Proposed New Sawmill									
Sawmill Baghouse [13]	SM-BGH	0.12	0.12	0.12	--	--	--	--	--
Green Residuals Screen 1 [14]	SM-SCN1	0.61	0.61	0.101	--	--	--	--	--
Green Residuals Screen 2 [14]	SM-SCN2	0.61	0.61	0.101	--	--	--	--	--
Overs Chipper [15]	SM-CHP	0.091	0.091	0.015	0.019	--	--	--	--
Truck Bin Baghouse 1 [16]	TB-BGH1	0.028	0.028	0.028	--	--	--	--	--
Truck Bin Baghouse 2 [16]	TB-BGH2	0.028	0.028	0.028	--	--	--	--	--
Truck Bin Cyclone 1 [17]	TB-CYC1	0.60	0.57	0.48	--	--	--	--	--
Truck Bin Cyclone 2 [17]	TB-CYC2	0.60	0.57	0.48	--	--	--	--	--
Proposed Material Drop [18]	DROP	9.5E-02	4.4E-02	6.3E-03	--	--	--	--	--
Proposed Emissions New or Modified Units		**79.2**	**38.5**	**22.2**	**195**	**119**	**118**	**4.62**	**142,480**
Proposed Facility-Wide PTE [19]		**95.3**	**51.8**	**27.3**	**211**	**121**	**119**	**5.68**	**142,561**

Regulatory Analysis	Annual Emission Estimates (tons/yr)							
	PM	PM_{10}	$PM_{2.5}$	VOC	CO	NO_X	SO_2	(GHG) CO_2e
Existing PSEL [20]	55	35	19	146	86	85	4	92,200
Proposed PSEL [21]	95	52	27	211	121	119	6	142,560
Proposed PSEL Exceeds Current PSEL?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SER [22]	25	15	10	40	100	40	40	75,000
Netting Basis [23]	212	173	154	187	245	80	33	152,000
Proposed Emissions Minus Netting Basis > SER?	No	No	No	No	No	No	No	No

Notes

PSEL = Plant Site Emission Limit; SER = Significant Emission Rate; PTE = Potential to Emit; EU = emission unit.

References

[1] Existing Title V Permit No, 34-2066-TV-01, Detail Sheet.

[2] The S-200 emission unit is not shown in the Detail Sheet for Title V Permit No. 34-2066-TV-01. It is being included with the PSEL calculations for future addition to the Title V permit. Note that $PM_{2.5}$ emissions from S-200 are shown in the $PM_{2.5}$ Netting Basis calculations in the Detail Sheet.

[3] See Table 30, Existing Planer Shaker Baghouse (S-200) Emission Estimates.

[4] Criteria pollutant emissions from EGEN01 or FIREPUMP are not shown in the Detail Sheet for Title V Permit No. 34-2066-TV-01. They are being included with the PSEL calculations for future addition to the Title V permit.

[5] See Table 31, Existing Emergency Engine Criteria Pollutant Emissions Estimates.

[6] See Table 14, Wood-Fired Boiler (H-BLR) Criteria Pollutant Emission Estimates.

[7] See Table 15, Fuel Dryer (H-DRY) Criteria Pollutant Emission Estimates.

[8] See Table 16, Lumber Kilns Criteria Pollutant Emissions Estimate.

[9] See Table 12, Existing Stud Planer Baghouse (S-62) Emission Estimates.

[10] This emission unit will be decomissioned and removed as part of the proposed project.

[11] See Table 13, Existing Planer Mill Cyclone (S-182) Emission Estimates.

[12] See Table 19, Fugitive Road Dust Emissions Summary.

[13] See Table 6, Proposed Sawmill Baghouse Emission Estimates.

[14] See Table 7, Proposed Residuals Screens Emission Estimates.

[15] See Table 8, Proposed Residuals Chipper Emission Estimates.

[16] See Table 10, Proposed Truck Bin Baghouse Emission Estimates.

[17] See Table 9, Proposed Truck Bins Cyclone Emission Estimates.

[18] See Table 11, Proposed Residuals Material Drop Emission Estimates.

[19] Proposed facility-wide PTE represents the sum total of emissions from the proposed new and modified sources, and the existing hardboard plant and existing miscellaneous sources.

[20] Existing Title V Permit No, 34-2066-TV-01, Condition 86. Plant Site Emissions Limits.

[21] Proposed facility-wide PTE rounded to nearest integer.

[22] Oregon Administrative Rule 340-200-0020(160).

[23] Existing Review Report for Title V Permit No, 34-2066-TV-01, condition 40.

Table 4
HAP/TAC Emission Summary (Normal Operations)
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	Proposed Project Impacted TEUs												Existing TEUs with Proposed Changes Not Associated with the Proposed Project																Proposed Total	
			Hogged Fuel-Fired Boiler (ESP Control)		Hogged Fuel-Fired Boiler (Scrubber Control)		Fuel Dryer		Lumber Kiln Total		Existing Planer Mill Cyclone (S-182)		Proposed Sawmill Chipper (SM-CHP)		LSP - AntiBlu M3 Treating Solution		Hardboard Press (Stack)		Hardboard Press (Fugitives)		Hardboard Refiner (Scrubber Stack)		Hardboard Refiner (Fugitives)		Resin Tank 1		Resin Tank 2		Resin Tank 3		Resin Tank 4			
			Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)
Metals																																
Antimony and compounds	7440-36-0	Yes	9.8E-04	0.39	2.1E-03	0.16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.1E-03	0.55
Arsenic and compounds	7440-38-2	Yes	6.1E-03	2.42	0.012	0.87	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.018	3.29
Barium and compounds	7440-39-3	No	0.67	268	0.42	31.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.09	299
Beryllium and compounds	7440-41-7	Yes	9.1E-05	0.037	7.3E-05	5.4E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.6E-04	0.042
Cadmium and compounds	7440-43-9	Yes	1.0E-03	0.42	3.4E-03	0.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.4E-03	0.67
Chromium VI, chromate and dichromate partic	18540-29-9	Yes	8.7E-04	0.35	2.5E-04	0.018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.1E-03	0.37
Cobalt and compounds	7440-48-4	Yes	1.6E-03	0.64	2.1E-03	0.15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.6E-03	0.79
Aluminum and compounds	7429-90-5	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0E+00	0.0E+00
Zinc oxide	1314-13-2	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0E+00	0.0E+00
Copper and compounds	7440-50-8	No	0.012	4.86	0.019	1.42	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.031	6.28
Lead and compounds	7439-92-1	Yes	0.017	6.68	0.032	2.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.048	9.02
Phosphorus and compounds	504	Yes	0.99	397	0.33	24.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.32	421
Manganese and compounds	7439-96-5	Yes	0.31	123	0.26	19.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.57	142
Mercury and compounds	7439-97-6	Yes	2.9E-03	1.18	1.3E-03	0.094	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.2E-03	1.27
Molybdenum trioxide	1313-27-5	No	1.0E-02	3.98	3.3E-03	0.24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.013	4.22
Nickel and compounds	365	Yes	9.0E-03	3.59	7.7E-03	0.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.017	4.16
Selenium and compounds	7782-49-2	Yes	5.2E-03	2.08	1.8E-03	0.13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.0E-03	2.21
Silver and compounds	7440-22-4	No	3.2E-03	1.26	1.0E-03	0.077	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.2E-03	1.34
Thallium and compounds	7440-28-0	No	5.9E-03	2.37	1.9E-03	0.14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.9E-03	2.52
Vanadium (fume or dust)	7440-62-2	No	1.9E-03	0.76	6.2E-04	0.046	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.5E-03	0.81
Zinc and compounds	7440-66-6	No	0.18	73.8	0.24	18.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.43	92.0
Organic Compounds																																
Acetaldehyde	75-07-0	Yes	0.91	363	0.30	22.1	0.59	73.7	118	15,411	--	--	--	--	--	--	1.91	342	0.11	20.2	5.06	984	0.24	45.9	--	--	--	--	--	--	127	17,261
Acetone	67-64-1	No	1.70	678	0.56	41.4	3.20	400	--	--	--	--	--	--	--	--	2.26	405	0.039	6.93	0.61	118	0.77	150	--	--	--	--	--	--	9.13	1,799
Acetophenone	98-86-2	Yes	5.9E-03	2.36	1.9E-03	0.14	2.9E-03	0.36	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.011	2.86
Acrolein	107-02-8	Yes	0.83	333	0.27	20.3	1.00	125	1.88	277	--	--	--	--	--	--	--	--	--	--	0.56	108	--	--	--	--	--	--	--	--	4.55	863
Ammonia	7664-41-7	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0E+00	0.0E+00
Benzene	71-43-2	Yes	3.14	1,256	1.03	76.6	0.25	31.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.42	1,364
Carbon tetrachloride	56-23-5	Yes	0.032	12.6	0.010	0.77	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.042	13.4
Chlorine	7782-50-5	Yes	2.53	1,012	0.83	61.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.36	1,074
Butyl benzyl phthalate	85-68-7	No	0.086	34.3	0.028	2.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.11	36.4
Ethylene glycol monobutyl ether	111-76-2	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0E+00	0.0E+00
Dipropylene glycol monomethyl ether	34590-94-8	No	--	--	--	--	--	--	--	--	--	--	--	--	28.5	2,472	--	--	--	--	--	--	--	--	--	--	--	--	--	--	28.5	2,472
Epichlorohydrin	106-89-8	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.7E-04	6.2E-03	6.7E-04	6.2E-03
Vinyl acetate	108-05-4	Yes	--	--	--	--	2.7E-03	0.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.7E-03	0.33
Chlorobenzene	108-90-7	Yes	0.053	21.3	0.017	1.30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.071	22.6
Chloroform	67-66-3	Yes	0.064	25.8	0.021	1.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.086	27.3
Crotonaldehyde	4170-30-3	No	0.14	57.4	0.047	3.50	0.35	43.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.54	104
Dibutyl phthalate	84-74-2	Yes	0.11	42.7	0.035	2.60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.14	45.3
1,2-Dichloropropane (Propylene dichloride)	78-87-5	Yes	0.054	21.5	0.018	1.31	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.072	22.8
Diethylphthalate	84-66-2	No	0.14	55.9	0.046	3.41	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.19	59.3
Ethyl benzene	100-41-4	Yes	0.039	15.6	0.013	0.95	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.052	16.6
Formaldehyde	50-00-0	Yes	3.37	1,346	1.10	82.1	0.31	38.7	7.64	705	--	--	--	--	--	--	26.4	4,731	0.099	17.6	0.54	124	0.065	12.7	1.32	30.5	1.45	34.0	1.45	34.1	--	--	43.8	7,155
Methyl isobutyl ketone (MIBK, Hexone)	108-10-1	Yes	1.43	570	0.47	34.8	0.25	31.4	--	--	--	--	--	--	--	--	--	--	--	--	0.045	8.83	0.047	9.20	--	--	--	--	--	--	--	--	2.24	654
Isopropylbenzene (Cumene)	98-82-8	Yes	0.057	22.7	0.019	1.38	3.5E-03	0.43	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.079	24.5
Hexane	110-54-3	Yes	0.92	369	0.30	22.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.23	392
Isopropyl alcohol	67-63-0	No	14.5	5,792	4.75	353	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19.2	6,145
Methanol	67-56-1	Yes	2.35	938	0.77	57.2	0.094	11.8	240	23,551	0.37	99.1	0.22	39.0	--	--	21.3	3,807	1.69	302	0.31	71.5	0.23	44.9	0.18	2.71	0.20	3.02	0.20	3.03	--	--	268	28,931
1,3,5-Trimethylbenzene	108-67-8	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0E+00	0.0E+00
Fluorides	FLUORIDES	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0E+00	0.0E+00
1,2,3-Trimethylbenzene	526-73-8	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0E+00	0.0E+00
Cyclohexane	110-82-7	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0E+00	0.0E+00
Bromomethane (Methyl bromide)	74-83-9	Yes	0.036	14.5	0.012	0.88	4.2E-03	0.53	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.052	15.9
Chloromethane (Methyl chloride)	74-87-3	Yes	0.14	55.7	0.046	3.40	0.017	2.18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.20	61.3
1,3-Butadiene	106-99-0	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0E+00	0.0E+00
1,1,1-Trichloroethane (Methyl chloroform)	71-55-6	Yes	0.19	74.1	0.061	4.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.25	78.6
1,2,4-Trimethyl benzene	95-63-6	No	--	--	--	--	6.1E-03	0.77	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.1E-03	0.77
Dichloromethane (Methylene chloride)	75-09-2	Yes	1.28	510	0.42	31.1	0.080	10.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.77	551
2-Butanone (Methyl ethyl ketone)	78-93-3	No	0.022	8.93	7.3E-03	0.54	0.20	24.5	--	--	--	--	--	--	--	--	--	--	--	--	0.026	4.99	0.046	8.91	--	--	--	--	--	--	0.30	47.9
Phenol	108-95-2	Yes	0.51	205	0.17	12.5	1.84	230	--	--	--	--	--	--	--	--	--	--	0.070	12.6	--	--	--	--	2.1E-04	1.5E-03	2.3E-04	1.7E-03	2.3E-04	1.7E-03	--	--	2.59	460
Propylene	115-07-1	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0E+00	0.0E+00
Propionaldehyde	123-38-6	Yes	1.00	399	0.33	24.3	0.33	41.0	1.26	268	--	--	--	--	--	--	--	--	--	--	0.069	13.5	--	--	--	--	--	--	--	--	2.98	745
Styrene	100-42-5	Yes	1.50	601	0.49	36.7	0.011	1.38	--	--	--	--	--	--	--	--	--	--	--	--	0.033	6.49	0.033	6.49	--	--	--	--	--	--	2.07	652
Toluene	108-88-3	Yes	0.037	14.6	0.012	0.89	0.41	51.0	--	--	--	--	--	--	--	--	--	--	7.7E-03	1.39	--	--	--	--	--	--	--	--	--	--	0.46	67.9
Xylene (mixture)	1330-20-7	Yes	0.017	6.69	5.5E-03	0.41	--	--	--	--	--	--	--	--	--	--	--	--	0.037	6.68	--	--	--	--	--	--	--	--	--	--	0.060	13.8
Vinyl Chloride	75-01-4	Yes	0.059	23.6	0.019	1.44	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.078	25.0
Trichloroethene (TCE, Trichloroethylene)	79-01-6	Yes	0.064	25.5	0.021	1.56	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.085	27.1
m-Xylene	108-38-3	Yes	--	--	--	--	0.12	15.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.12	15.4
p-Xylene	106-42-3	Yes	--	--	--	--	0.12	15.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.12	15.4
o-Xylene	95-47-6	Yes	--	--	--	--	2.2E-03	0.27	--	--	--	--	--	--	--	--	--	--	0.025	4.54	--	--	--	--	--	--	--	--	--	--	0.028	4.81

Table 4 (Cont.)
HAP/TAC Emission Summary (Normal Operations)
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Toxic Air Contaminant	CAS	HAP? (Yes/No)	Emission Estimate																													
			Hogged Fuel-Fired Boiler (ESP Control)		Hogged Fuel-Fired Boiler (Scrubber Control)		Fuel Dryer		Lumber Kiln Total		Existing Planer Mill Cyclone (S-182)		Proposed Sawmill Chipper (SM-CHP)		LSP - AntiBlu M3 Treating Solution		Hardboard Press (Stack)		Hardboard Press (Fugitives)		Hardboard Press (Stack)		Hardboard Press (Fugitives)		Resin Tank 1		Resin Tank 2		Resin Tank 3		Resin Tank 4		Facility Total	
			Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)
Inorganic Compounds																																
Hydrogen fluoride	7664-39-3	Yes	0.29	116	0.027	1.99	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.32	118
Hydrochloric acid	7647-01-0	Yes	0.25	99.4	0.12	9.23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.37	109
PAHs																																
Acenaphthene	83-32-9	Yes	2.7E-03	1.09	9.0E-04	0.067	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.6E-03	1.16
Acenaphthylene	208-96-8	Yes	0.015	6.01	4.9E-03	0.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.020	6.38
Anthracene	120-12-7	Yes	8.6E-03	3.43	2.8E-03	0.21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.011	3.64
Benz[a]anthracene	56-55-3	Yes	2.6E-04	0.10	8.5E-05	6.4E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.5E-04	0.11
Benzo[a]pyrene	50-32-8	Yes	7.1E-03	2.84	2.3E-03	0.17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.5E-03	3.02
Benzo[b]fluoranthene	205-99-2	Yes	4.6E-04	0.18	1.5E-04	0.011	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.0E-04	0.19
Benzo[e]pyrene	192-97-2	Yes	6.8E-04	0.27	2.2E-04	0.016	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.0E-04	0.29
Benzo[g,h,i]perylene	191-24-2	Yes	4.8E-04	0.19	1.6E-04	0.012	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.4E-04	0.21
Benzo[j]fluoranthene	205-82-3	Yes	5.0E-04	0.20	1.6E-04	0.012	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.6E-04	0.21
Benzo[k]fluoranthene	207-08-9	Yes	1.7E-04	0.066	5.4E-05	4.0E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.2E-04	0.070
Chrysene	218-01-9	Yes	2.5E-04	0.10	8.3E-05	6.2E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.4E-04	0.11
Fluoranthene	206-44-0	Yes	5.4E-03	2.14	1.8E-03	0.13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.1E-03	2.27
Fluorene	86-73-7	Yes	9.6E-03	3.86	3.2E-03	0.24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.013	4.09
Indeno[1,2,3-cd]pyrene	193-39-5	Yes	3.3E-04	0.13	1.1E-04	8.0E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.3E-04	0.14
2-Methyl naphthalene	91-57-6	Yes	4.5E-03	1.79	1.5E-03	0.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.0E-03	1.90
Naphthalene	91-20-3	Yes	0.32	128	0.10	7.79	0.36	44.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.78	180
Perylene	198-55-0	Yes	1.0E-04	0.041	3.4E-05	2.5E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.4E-04	0.044
Phenanthrene	85-01-8	Yes	0.021	8.28	6.8E-03	0.51	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.027	8.78
Pyrene	129-00-0	Yes	0.011	4.54	3.7E-03	0.28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.015	4.81
Dioxans & Furans																																
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1746-01-6	Yes	3.1E-09	1.2E-06	1.0E-09	7.5E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.1E-09	1.3E-06
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	40321-76-4	No	4.3E-09	1.7E-06	1.4E-09	1.0E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.7E-09	1.8E-06
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD	39227-28-6	No	2.8E-09	1.1E-06	9.1E-10	6.8E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.7E-09	1.2E-06
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD	57653-85-7	No	6.7E-09	2.7E-06	2.2E-09	1.6E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.9E-09	2.8E-06
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD	19408-74-3	No	7.1E-09	2.8E-06	2.3E-09	1.7E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.4E-09	3.0E-06
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpC	35822-46-9	No	3.1E-08	1.3E-05	1.0E-08	7.6E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.2E-08	1.3E-05
Octachlorodibenzo-p-dioxin (OCDD)	3268-87-9	No	7.9E-08	3.2E-05	2.6E-08	1.9E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.0E-07	3.3E-05
2,3,7,8-Tetrachlorodibenzofuran (TcDF)	51207-31-9	No	2.6E-08	1.0E-05	8.5E-09	6.3E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.4E-08	1.1E-05
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	57117-41-6	No	1.3E-08	5.1E-06	4.2E-09	3.1E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.7E-08	5.4E-06
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	57117-31-4	No	2.0E-08	7.8E-06	6.4E-09	4.8E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.6E-08	8.3E-06
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	70648-26-9	No	1.1E-08	4.6E-06	3.7E-09	2.8E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.5E-08	4.8E-06
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	57117-44-9	No	1.0E-08	4.0E-06	3.3E-09	2.5E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.3E-08	4.3E-06
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	72918-21-9	No	2.1E-09	8.5E-07	7.0E-10	5.2E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.8E-09	9.1E-07
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	60851-34-5	No	8.5E-09	3.4E-06	2.8E-09	2.1E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.1E-08	3.6E-06
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	67562-39-4	No	1.8E-08	7.3E-06	6.0E-09	4.5E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.4E-08	7.8E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	55673-89-7	No	2.6E-09	1.0E-06	8.4E-10	6.2E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.4E-09	1.1E-06
Octachlorodibenzofuran (OCDF)	39001-02-0	No	1.6E-08	6.4E-06	5.3E-09	3.9E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.1E-08	6.8E-06
PCBs & Phthalates																																
Total PCBs	1336-36-3	Yes	2.5E-05	0.010	8.3E-06	6.1E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.3E-05	0.011
3-Methylcholanthrene	56-49-5	Yes	2.8E-05	0.011	9.1E-06	6.8E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.7E-05	0.012
7,12-Dimethylbenz[a]anthracene	57-97-6	Yes	1.5E-05	5.9E-03	4.8E-06	3.6E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.9E-05	6.2E-03
1-Methylphenanthrene	832-69-9	No	8.3E-04	0.33	2.7E-04	0.020	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.1E-03	0.35
2,4-Dinitrotoluene	121-14-2	Yes	3.0E-03	1.21	9.9E-04	0.074	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.0E-03	1.28
4,6-Dinitro-o-cresol (and salts)	534-52-1	Yes	6.7E-03	2.69	2.2E-03	0.16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.9E-03	2.86
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	Yes	1.5E-04	0.060	4.9E-05	3.6E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.0E-04	0.063
Hydrogen cyanide	74-90-8	Yes	0.066	26.3	0.022	1.60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.087	27.9
di-n-octylphthalateb	518	No	3.5E-04	0.14	1.2E-04	8.6E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.7E-04	0.15
Ethylene dichloride (EDC, 1,2-dichloroethane)	107-06-2	Yes	0.094	37.4	0.031	2.28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.12	39.7
p-Dichlorobenzene (1,4-Dichlorobenzene)	106-46-7	Yes	0.89	358	0.29	21.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.19	379
4-nitrophenol	100-02-7	Yes	3.7E-04	0.15	1.2E-04	8.9E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.9E-04	0.15
2-Chlorophenol	95-57-8	No	7.5E-05	0.030	2.5E-05	1.8E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.0E-04	0.032
2,4-Dinitrophenol	51-28-5	Yes	5.8E-04	0.23	1.9E-04	0.014	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.7E-04	0.24
Trichlorofluoromethane (Freon 11)	75-69-4	No	0.045	17.8	0.015	1.09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.059	18.9
2,4,6-Trichlorophenol	88-06-2	Yes	6.4E-04	0.26	2.1E-04	0.016	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.5E-04	0.27
Pentachlorophenol	87-86-5	Yes	6.9E-04	0.27	2.3E-04	0.017	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.1E-04	0.29
Tetrachloroethene (Perchloroethylene)	127-18-4	Yes	0.079	31.5	0.026	1.92	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.10	33.4
Total TAC Emissions Estimate			**41.7**	**16,654**	**14.2**	**1,059**	**9.54**	**1,193**	**369**	**40,211**	**0.37**	**99.1**	**0.22**	**39.0**	**28.5**	**2,472**	**51.9**	**9,285**	**2.08**	**372**	**7.25**	**1,439**	**1.43**	**278**	**1.50**	**33.2**	**1.64**	**37.1**	**1.65**	**37.1**	**6.7E-04**	**6.2E-03**	**531**	**73,208**
Total HAP Emissions Estimate			**24.1**	**9,654**	**8.10**	**603**	**5.80**	**725**	**369**	**40,211**	**0.37**	**99.1**	**0.22**	**39.0**	**0**	**0**	**49.6**	**8,880**	**2.04**	**365**	**6.62**	**1,316**	**0.61**	**119**	**1.50**	**33.2**	**1.64**	**37.1**	**1.65**	**37.1**	**6.7E-04**	**6.2E-03**	**472**	**62,118**
Single Highest HAP = Methanol																																**28,931**

Table 5
HAP/TAC Emission Summary (Boiler SU/SD)
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Toxic Air Contaminant	CAS or DEQ ID	RBC? (Yes/No)	Emissions Estimates Boiler SU/SD Basis																									
			Hogged Fuel-Fired Boiler (ESP Control)		Hogged Fuel-Fired Boiler (MC Control)		Total Boiler Emissions (ESP/MC Control)		Hogged Fuel-Fired Boiler (Scrubber Control)		Fuel Dryer		Total Scrubber		Kilns Total		Press (Stack)		Press (Fugitive)		Refiner (Rotary Valve)		Refiner (Scrubber 5)		Forming Line (Stack)		Forming Line (Fugitives)	
			(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)	(lb/day)	(lb/yr)
Antimony and compounds	7440-36-0	Yes	2.7E-03	0.22	8.7E-04	0.33	3.6E-03	0.55	2.1E-03	0.16	--	--	2.1E-03	0.16	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic and compounds	7440-38-2	Yes	7.5E-03	0.60	5.4E-03	2.06	0.013	2.66	0.012	0.87	--	--	0.012	0.87	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium and compounds	7440-39-3	No	4.22	337	0.59	228	4.81	565	0.42	31.0	--	--	0.42	31.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium and compounds	7440-41-7	Yes	1.2E-04	9.4E-03	8.1E-05	0.031	2.0E-04	0.040	7.3E-05	5.4E-03	--	--	7.3E-05	5.4E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium and compounds	7440-43-9	Yes	4.4E-03	0.35	9.2E-04	0.35	5.3E-03	0.70	3.4E-03	0.25	--	--	3.4E-03	0.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium VI	18540-29-9	Yes	6.1E-03	0.49	7.7E-04	0.30	6.9E-03	0.78	2.5E-04	0.018	--	--	2.5E-04	0.018	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt and compounds	7440-48-4	Yes	1.5E-03	0.12	1.4E-03	0.54	2.9E-03	0.66	2.1E-03	0.15	--	--	2.1E-03	0.15	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aluminum and compounds	7429-90-5	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc oxide	1314-13-2	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper and compounds	7440-50-8	Yes	0.072	5.76	0.011	4.13	0.083	9.89	0.019	1.42	--	--	0.019	1.42	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead and compounds	7439-92-1	Yes	0.027	2.17	0.015	5.68	0.042	7.84	0.032	2.35	--	--	0.032	2.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phosphorus and compounds	504	No	4.76	381	0.88	338	5.64	719	0.33	24.2	--	--	0.33	24.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Manganese and compounds	7439-96-5	Yes	1.62	129	0.27	104	1.89	234	0.26	19.5	--	--	0.26	19.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mercury and compounds	7439-97-6	Yes	1.5E-03	0.12	2.6E-03	1.00	4.2E-03	1.13	1.3E-03	0.094	--	--	1.3E-03	0.094	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Molybdenum trioxide	1313-27-5	No	2.8E-03	0.22	8.8E-03	3.38	0.012	3.60	3.3E-03	0.24	--	--	3.3E-03	0.24	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel and compounds	365	Yes	0.012	0.92	7.9E-03	3.05	0.019	3.97	7.7E-03	0.57	--	--	7.7E-03	0.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium and compounds	7782-49-2	Yes	6.3E-04	0.051	4.6E-03	1.77	5.2E-03	1.82	1.8E-03	0.13	--	--	1.8E-03	0.13	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver and compounds	7440-22-4	No	0.82	65.5	2.8E-03	1.07	0.82	66.5	1.0E-03	0.077	--	--	1.0E-03	0.077	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thalium and compounds	7440-28-0	No	1.6E-03	0.13	5.3E-03	2.02	6.9E-03	2.15	1.9E-03	0.14	--	--	1.9E-03	0.14	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium (fume or dust)	7440-62-2	Yes	8.6E-04	0.068	1.7E-03	0.65	2.5E-03	0.72	6.2E-04	0.046	--	--	6.2E-04	0.046	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc and compounds	7440-66-6	No	0.50	39.8	0.16	62.8	0.66	103	0.24	18.2	--	--	0.24	18.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Acetaldehyde	75-07-0	Yes	0.25	19.8	0.80	308	1.05	328	0.30	22.1	0.39	73.7	0.69	95.8	78.7	13,107	1.28	342	0.075	20.2	0.16	45.9	3.37	984	0.89	259	0.089	25.9
Acetone	67-64-1	Yes	0.46	37.0	1.50	576	1.96	613	0.56	41.4	2.13	400	2.69	441	--	--	1.51	405	0.026	6.93	0.51	150	0.41	118	0.39	114	0.039	11.4
Acetophenone	98-86-2	No	1.6E-03	0.13	5.2E-03	2.01	6.8E-03	2.13	1.9E-03	0.14	1.9E-03	0.36	3.9E-03	0.50	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Acrolein	107-02-8	Yes	0.23	18.2	0.74	283	0.96	302	0.27	20.3	0.67	125	0.94	145	1.26	235	--	--	--	--	--	--	0.37	108	0.075	22.0	7.5E-03	2.20
Ammonia	7664-41-7	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	71-43-2	Yes	0.86	68.5	2.78	1,068	3.64	1,136	1.03	76.6	0.17	31.1	1.20	108	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbon tetrachloride	56-23-5	Yes	8.6E-03	0.69	0.028	10.8	0.037	11.4	0.010	0.77	--	--	0.010	0.77	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chlorine	7782-50-5	Yes	0.69	55.2	2.24	861	2.93	916	0.83	61.8	--	--	0.83	61.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Butyl benzyl phthalate	85-68-7	No	0.023	1.87	0.076	29.2	0.099	31.1	0.028	2.10	--	--	0.028	2.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethylene glycol monobutyl ether	111-76-2	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Epichlorohydrin	106-89-8	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dipropylene glycol monomethyl ether	34590-94-8	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vinyl acetate	108-05-4	Yes	--	--	--	--	--	--	--	--	1.8E-03	0.33	1.8E-03	0.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	108-90-7	Yes	0.014	1.16	0.047	18.1	0.062	19.3	0.017	1.30	--	--	0.017	1.30	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chloroform	67-66-3	Yes	0.018	1.40	0.057	21.9	0.075	23.3	0.021	1.57	--	--	0.021	1.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Crotonaldehyde	4170-30-3	No	0.039	3.13	0.13	48.8	0.17	52.0	0.047	3.50	0.23	43.4	0.28	46.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibutyl phthalate	84-74-2	No	0.029	2.33	0.095	36.3	0.12	38.6	0.035	2.60	--	--	0.035	2.60	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane (Propylene dichloride)	78-87-5	Yes	0.015	1.17	0.048	18.3	0.062	19.5	0.018	1.31	--	--	0.018	1.31	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Diethylphthalate	84-66-2	No	0.038	3.05	0.12	47.5	0.16	50.6	0.046	3.41	--	--	0.046	3.41	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethyl benzene	100-41-4	Yes	0.011	0.85	0.035	13.3	0.045	14.1	0.013	0.95	--	--	0.013	0.95	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Formaldehyde	50-00-0	Yes	0.92	73.4	2.98	1,144	3.90	1,218	1.10	82.1	0.21	38.7	1.31	121	5.10	600	17.6	4,731	0.066	17.6	0.044	12.7	0.36	124	0.35	103	0.035	10.3
Methyl isobutyl ketone (MIBK, Hexone)	108-10-1	Yes	0.39	31.1	1.26	485	1.65	516	0.47	34.8	0.17	31.4	0.64	66.2	--	--	--	--	--	--	0.032	9.20	0.030	8.83	0.028	8.16	2.8E-03	0.82
Isopropylbenzene (Cumene)	98-82-8	Yes	0.015	1.24	0.050	19.3	0.066	20.5	0.019	1.38	2.3E-03	0.43	0.021	1.82	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hexane	110-54-3	Yes	0.25	20.1	0.82	314	1.07	334	0.30	22.5	--	--	0.30	22.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Isopropyl alcohol	67-63-0	Yes	3.95	316	12.8	4,926	16.8	5,242	4.75	353	--	--	4.75	353	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Methanol	67-56-1	Yes	0.64	51.1	2.08	798	2.72	849	0.77	57.2	0.063	11.8	0.83	69.0	160	20,029	14.2	3,807	1.13	302	0.15	44.9	0.21	71.5	2.01	586	0.20	58.6
1,3,5-Trimethylbenzene	108-67-8	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluorides	FLUORIDES	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-Trimethylbenzene	526-73-8	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cyclohexane	110-82-7	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bromomethane (Methyl bromide)	74-83-9	Yes	9.9E-03	0.79	0.032	12.3	0.042	13.1	0.012	0.88	2.8E-03	0.53	0.015	1.41	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chloromethane (Methyl chloride)	74-87-3	Yes	0.038	3.04	0.12	47.4	0.16	50.4	0.046	3.40	0.012	2.18	0.057	5.58	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Butadiene	106-99-0	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane (Methyl chloroform)	71-55-6	Yes	0.050	4.04	0.16	63.0	0.21	67.0	0.061	4.52	--	--	0.061	4.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trimethyl benzene	95-63-6	Yes	--	--	--	--	--	--	--	--	4.1E-03	0.77	4.1E-03	0.77	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dichloromethane (Methylene chloride)	75-09-2	Yes	0.35	27.8	1.13	434	1.48	462	0.42	31.1	0.054	10.1	0.47	41.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone)	78-93-3	Yes	6.1E-03	0.49	0.020	7.60	0.026	8.08	7.3E-03	0.54	0.13	24.5	0.14	25.1	--	--	--	--	--	--	0.031	8.91	0.017	4.99	0.055	16.0	5.5E-03	1.60
Phenol	108-95-2	Yes	0.14	11.2	0.45	174	0.59	186	0.17	12.5	1.23	230	1.39	242	--	--	--	--	0.047	12.6	--	--	--	--	--	--	--	--
Propylene	115-07-1	Yes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Propionaldehyde	123-38-6	Yes	0.27	21.7	0.88	339	1.15	361	0.33	24.3	0.22	41.0	0.55	65.4	0.84	228	--	--	--	--	--	--	0.046	13.5	--	--	--	--
Styrene	100-42-5	Yes	0.41	32.8	1.33	511	1.74	544	0.49	36.7	7.3E-03	1.38	0.50	38.0	--	--	--	--	--	--	0.022	6.49	0.022	6.49	--	--	--	--
Toluene	108-88-3	Yes	1.0E-02	0.80	0.032	12.4	0.042	13.2	0.012	0.89	0.27	51.0	0.28	51.9	--	--	--	--	5.2E-03	1.39	--	--	--	--	0.055	16.1	5.5E-03	1.61
Xylene (mixture)	1330-20-7	Yes	4.6E-03	0.36	0.015	5.69	0.019	6.05	5.5E-03	0.41	--	--	5.5E-03	0.41	--	--	--	--	0.025	6.68	--	--	--	--	--	--	--	--
Vinyl Chloride	75-01-4	Yes	0.016	1.29	0.052	20.1	0.068	21.3	0.019	1.44	--	--	0.019	1.44	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene (TCE, Trichloroethylene)	79-01-6	Yes	0.017	1.39	0.056	21.7	0.074	23.1	0.021	1.56	--	--	0.021	1.56	--	--	--	--	--	--	--	--	--	--	--	--	--	--
m-Xylene	108-38-3	Yes	--	--	--	--	--	--	--	--	0.082	15.4	0.082	15.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--
p-Xylene	106-42-3	Yes	--	--	--	--	--	--	--	--	0.082	15.4	0.082	15.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	95-47-6	Yes	--	--	--	--	--	--	--	--	1.4E-03	0.27	1.4E-03	0.27	--	--	--	--	0.017	4.54	--	--	--	--	--	--	--	--
Hydrogen fluoride	7664-39-3	Yes	0.079	6.32	0.26	98.6	0.34	105	0.027	1.99	--	--	0.027	1.99	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hydrochloric acid	7647-01-0	Yes	3.81	305	0.22	84.6	4.03	389	0.12	9.23	--	--	0.12	9.23	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DPM	200	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PAHs (excluding Naphthalene)	401	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthene	83-32-9	No	7.5E-04	0.060	2.4E-03	0.93	3.2E-03	0.99	9.0E-04	0.067	--	--	9.0E-04	0.067	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthylene	208-96-8	No	4.1E-03	0.33	0.013	5.11	0.017	5.44	4.9E-03	0.37	--	--	4.9E-03	0.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Anthracene	120-12-7	No	2.3E-03	0.19	7.6E-03	2.92	9.9E-03	3.11	2.8E-03	0.21	--	--	2.8E-03	0.21	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benz[a]anthracene	56-55-3	Yes	7.1E-05	5.7E-03	2.3E-04	0.089	3.0E-04	0.094	8.5E-05	6.4E-03	--	--	8.5E-05	6.4E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo[a]pyrene	50-32-8	Yes	1.9E-03	0.16	6.3E-03	2.42	8.2E-03	2.57	2.3E-03	0.17	--	--	2.3E-03	0.17	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo[b]fluoranthene	205-99-2	Yes	1.2E-04	9.9E-03	4.0E-04	0.15	5.3E-04	0.16	1.5E-04	0.011	--	--	1.5E-04	0.011	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo[e]pyrene	192-97-2	No	1.8E-04	0.015	6.0E-04	0.23	7.8E-04	0.24	2.2E-04	0.016	--	--	2.2E-04	0.016	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo[g,h,i]perylene	191-24-2	Yes	1.3E-04	0.011	4.3E-04	0.16	5.6E-04	0.18	1.6E-04	0.012	--	--	1.6E-04	0.012	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo[j]fluoranthene	205-82-3	Yes	1.4E-04	0.011	4.4E-04	0.17	5.8E-04	0.18	1.6E-04	0.012	--	--	1.6E-04	0.012	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo[k]fluoranthene	207-08-9	Yes	4.5E-05	3.6E-03	1.5E-04	0.056	1.9E-04	0.060	5.4E-05	4.0E-03	--	--	5.4E-05	4.0E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chrysene	218-01-9	Yes	6.9E-05	5.5E-03	2.2E-04	0.086	2.9E-04	0.092	8.3E-05	6.2E-03	--	--	8.3E-05	6.2E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluoranthene	206-44-0	Yes	1.5E-03	0.12	4.7E-03	1.82	6.2E-03	1.94	1.8E-03	0.13	--	--	1.8E-03	0.13	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluorene	86-73-7	No	2.6E-03	0.21	8.5E-03	3.28	0.011	3.49	3.2E-03	0.24	--	--	3.2E-03	0.24	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Indeno[1,2,3-cd]pyrene	193-39-5	Yes	8.9E-05	7.1E-03	2.9E-04	0.11	3.8E-04	0.12	1.1E-04	8.0E-03	--	--	1.1E-04	8.0E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methyl naphthalene	91-57-6	No	1.2E-03	0.098	4.0E-03	1.53	5.2E-03	1.62	1.5E-03	0.11	--	--	1.5E-03	0.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	Yes	0.087	6.96	0.28	109	0.37	116	0.10	7.79	0.24	44.7	0.34	52.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Perylene	198-55-0	No	2.8E-05	2.2E-03	9.1E-05	0.035	1.2E-04	0.037	3.4E-05	2.5E-03	--	--	3.4E-05	2.5E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	No	5.6E-03	0.45	0.018	7.04	0.024	7.49	6.8E-03	0.51	--	--	6.8E-03	0.51	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pyrene	129-00-0	No	3.1E-03	0.25	0.010	3.86	0.013	4.11	3.7E-03	0.28	--	--	3.7E-03	0.28	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1746-01-6	Yes	8.3E-10	6.7E-08	2.7E-09	1.0E-06	3.5E-09	1.1E-06	1.0E-09	7.5E-08	--	--	1.0E-09	7.5E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	40321-76-4	Yes	1.2E-09	9.3E-08	3.8E-09	1.4E-06	4.9E-09	1.5E-06	1.4E-09	1.0E-07	--	--	1.4E-09	1.0E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	39227-28-6	Yes	7.6E-10	6.1E-08	2.5E-09	9.5E-07	3.2E-09	1.0E-06	9.1E-10	6.8E-08	--	--	9.1E-10	6.8E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	57653-85-7	Yes	1.8E-09	1.5E-07	5.9E-09	2.3E-06	7.8E-09	2.4E-06	2.2E-09	1.6E-07	--	--	2.2E-09	1.6E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	19408-74-3	Yes	1.9E-09	1.5E-07	6.3E-09	2.4E-06	8.2E-09	2.6E-06	2.3E-09	1.7E-07	--	--	2.3E-09	1.7E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	35822-46-9	Yes	8.5E-09	6.8E-07	2.8E-08	1.1E-05	3.6E-08	1.1E-05	1.0E-08	7.6E-07	--	--	1.0E-08	7.6E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Octachlorodibenzo-p-dioxin (OCDD)	3268-87-9	Yes	2.1E-08	1.7E-06	7.0E-08	2.7E-05	9.1E-08	2.9E-05	2.6E-08	1.9E-06	--	--	2.6E-08	1.9E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,3,7,8-Tetrachlorodibenzofuran (TcDF)	51207-31-9	Yes	7.0E-09	5.6E-07	2.3E-08	8.8E-06	3.0E-08	9.3E-06	8.5E-09	6.3E-07	--	--	8.5E-09	6.3E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	57117-41-6	Yes	3.5E-09	2.8E-07	1.1E-08	4.3E-06	1.5E-08	4.6E-06	4.2E-09	3.1E-07	--	--	4.2E-09	3.1E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	57117-31-4	Yes	5.3E-09	4.3E-07	1.7E-08	6.6E-06	2.3E-08	7.1E-06	6.4E-09	4.8E-07	--	--	6.4E-09	4.8E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	70648-26-9	Yes	3.1E-09	2.5E-07	1.0E-08	3.9E-06	1.3E-08	4.1E-06	3.7E-09	2.8E-07	--	--	3.7E-09	2.8E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	57117-44-9	Yes	2.8E-09	2.2E-07	9.0E-09	3.4E-06	1.2E-08	3.7E-06	3.3E-09	2.5E-07	--	--	3.3E-09	2.5E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	72918-21-9	Yes	5.8E-10	4.7E-08	1.9E-09	7.3E-07	2.5E-09	7.7E-07	7.0E-10	5.2E-08	--	--	7.0E-10	5.2E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	60851-34-5	Yes	2.3E-09	1.9E-07	7.5E-09	2.9E-06	9.9E-09	3.1E-06	2.8E-09	2.1E-07	--	--	2.8E-09	2.1E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	67562-39-4	Yes	5.0E-09	4.0E-07	1.6E-08	6.2E-06	2.1E-08	6.6E-06	6.0E-09	4.5E-07	--	--	6.0E-09	4.5E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	55673-89-7	Yes	7.0E-10	5.6E-08	2.3E-09	8.7E-07	3.0E-09	9.3E-07	8.4E-10	6.2E-08	--	--	8.4E-10	6.2E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Octachlorodibenzofuran (OCDF)	39001-02-0	Yes	4.4E-09	3.5E-07	1.4E-08	5.4E-06	1.9E-08	5.8E-06	5.3E-09	3.9E-07	--	--	5.3E-09	3.9E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs	1336-36-3	Yes	6.9E-06	5.5E-04	2.2E-05	8.6E-03	2.9E-05	9.1E-03	8.3E-06	6.1E-04	--	--	8.3E-06	6.1E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3-Methylcholanthrene	56-49-5	No	7.6E-06	6.1E-04	2.5E-05	9.5E-03	3.2E-05	0.010	9.1E-06	6.8E-04	--	--	9.1E-06	6.8E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7,12-Dimethylbenz[a]anthracene	57-97-6	No	4.0E-06	3.2E-04	1.3E-05	5.0E-03	1.7E-05	5.3E-03	4.8E-06	3.6E-04	--	--	4.8E-06	3.6E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1-Methylphenanthrene	832-69-9	No	2.3E-04	0.018	7.4E-04	0.28	9.6E-04	0.30	2.7E-04	0.020	--	--	2.7E-04	0.020	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	121-14-2	Yes	8.2E-04	0.066	2.7E-03	1.03	3.5E-03	1.09	9.9E-04	0.074	--	--	9.9E-04	0.074	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4,6-Dinitro-o-cresol (and salts)	534-52-1	No	1.8E-03	0.15	6.0E-03	2.29	7.8E-03	2.44	2.2E-03	0.16	--	--	2.2E-03	0.16	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	Yes	4.1E-05	3.2E-03	1.3E-04	0.051	1.7E-04	0.054	4.9E-05	3.6E-03	--	--	4.9E-05	3.6E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hydrogen cyanide	74-90-8	Yes	0.018	1.43	0.058	22.3	0.076	23.8	0.022	1.60	--	--	0.022	1.60	--	--	--	--	--	--	--	--	--	--	--	--	--	--
di-n-octylphthalateb	518	No	9.6E-05	7.7E-03	3.1E-04	0.12	4.1E-04	0.13	1.2E-04	8.6E-03	--	--	1.2E-04	8.6E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethylene dichloride (EDC, 1,2-dichloroethane)	107-06-2	Yes	0.026	2.04	0.083	31.8	0.11	33.9	0.031	2.28	--	--	0.031	2.28	--	--	--	--	--	--	--	--	--	--	--	--	--	--
p-Dichlorobenzene (1,4-Dichlorobenzene)	106-46-7	Yes	0.24	19.5	0.79	304	1.04	324	0.29	21.8	--	--	0.29	21.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-nitrophenol	100-02-7	No	1.0E-04	8.0E-03	3.2E-04	0.12	4.2E-04	0.13	1.2E-04	8.9E-03	--	--	1.2E-04	8.9E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Chlorophenol	95-57-8	No	2.1E-05	1.6E-03	6.7E-05	0.026	8.7E-05	0.027	2.5E-05	1.8E-03	--	--	2.5E-05	1.8E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4-Dinitrophenol	51-28-5	No	1.6E-04	0.013	5.1E-04	0.20	6.7E-04	0.21	1.9E-04	0.014	--	--	1.9E-04	0.014	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trichlorofluoromethane (Freon 11)	75-69-4	No	0.012	0.97	0.039	15.1	0.052	16.1	0.015	1.09	--	--	0.015	1.09	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	88-06-2	Yes	1.7E-04	0.014	5.7E-04	0.22	7.4E-04	0.23	2.1E-04	0.016	--	--	2.1E-04	0.016	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pentachlorophenol	87-86-5	Yes	1.9E-04	0.015	6.1E-04	0.23	7.9E-04	0.25	2.3E-04	0.017	--	--	2.3E-04	0.017	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethene (Perchloroethylene)	127-18-4	Yes	0.021	1.72	0.070	26.8	0.091	28.5	0.026	1.92	--	--	0.026	1.92	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total TAC Emissions Estimate			**26.5**	**2,123**	**36.9**	**14,163**	**63.4**	**16,286**	**14.2**	**1,059**	**6.36**	**1,193**	**20.6**	**2,252**	**246**	**34,198**	**34.6**	**9,285**	**1.39**	**372**	**0.95**	**278**	**4.83**	**1,439**	**3.85**	**1,124**	**0.39**	**112**

Notes

lb = pounds; RBC = risk-based concentration; TAC = toxic air contaminant

Table 6
Proposed Sawmill Baghouse Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter		Value
Proposed Daily Throughput (BDT/day)	(1)	2,760
Proposed Annual Throughput (BDT/yr)	(1)	239,500

Pollutant	Emission Factor (2) (lb/BDT)	Emissions Estimate	
		Daily (a) (lb/day)	Annual (b) (tons/yr)
PM	1.0E-03	2.76	0.12
PM_{10}	1.0E-03	2.76	0.12
$PM_{2.5}$	1.0E-03	2.76	0.12

Notes

BDT = bone-dry ton (0% moisture content).

(a) Daily emissions estimate (lb/day) = (emission factor [lb/BDT]) x (daily sawmill throughput [BDT/day])

(b) Annual emissions estimate (tons/yr) = (emission factor [lb/BDT]) / (2,000 lb/ton) x (annual sawmill throughput [BDT/yr])

References

(1) See Table 1, Input Process Rates and Parameters.

(2) Oregon DEQ Form AQ-EF02. Representative of green sawdust with baghouse control. Assumes all PM is $PM_{2.5}$.

Table 7
Proposed Residuals Screens Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Emission Unit		Daily (tons/day)	Annual (tons/yr)
Proposed Total Green Chip Throughput	(1)	3,840	672,000
Proposed Total Green Sawdust Throughput	(1)	1,296	226,800
Proposed Green Residuals Throughput (Screen 1)	(a)	2,568	449,400
Proposed Green Residuals Throughput (Screen 2)	(a)	2,568	449,400

Pollutant	Emission Factor [3] (lb/ton)	Emissions Estimate	
		Daily [b] (lb/day)	Annual [c] (tons/yr)
Proposed Screen 1			
PM	2.70E-03	6.93	0.61
PM_{10}	2.70E-03	6.93	0.61
$PM_{2.5}$	4.50E-04	1.16	0.10
Proposed Screen 2			
PM	2.70E-03	6.93	0.61
PM_{10}	2.70E-03	6.93	0.61
$PM_{2.5}$	4.50E-04	1.16	0.10

Notes

[a] Proposed green residuals throughput (Screen 1 or 2) (tons/"period") = (proposed total green chip throughput (tons/"period") + (proposed total green sawdust throughput [tons/"period"]) x (percentage through screen [%] /100)

Percentage through screen 1 (%) = 50.0 (2)

Percentage through screen 2 (%) = 50.0 (2)

[b] Daily emissions estimate (lb/day) = (emission factor [lb/ton]) x (daily screen throughput [tons/day])

[c] Annual emissions estimate (tons/yr) = (emission factor [lb/ton]) / (2,000 lb/ton) x (annual screen throughput [tons/yr])

References

[1] See Table 1, Input Process Rates and Parameters.

[2] Assumes total green residuals throughput is conveyed to one of the two sceens. If both screens are operational, assumes an even distribution.

[3] NCASI Special Report No. 15-01 (April 2015) "Estimating the Potential for PM Emissions from Wood and Bark Handling", Table 6-1. Conservatively assumes fresh bark for as it represents the highest emission factor.

Table 8
Proposed Residuals Chipper Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Proposed Throughput (Units)		Daily	Annual
Proposed Total Green Chip Throughput (Green-tons)	(1)	3,840	672,000
Green Chip Overs Throughput (Green-tons)	(a)	384	67,200
Green Chip Overs Throughput (ODT)	(b)	223	38,976

Pollutant	Emission Factor (3)			Emissions Estimate		Emissions Estimate	
				Daily (lb/day)		Annual (tons/yr)	
PM	2.70E-03	(lb/tons)	(4)	1.04	(c)	0.091	(d)
PM_{10}	2.70E-03	(lb/tons)	(4)	1.04	(c)	0.091	(d)
$PM_{2.5}$	4.50E-04	(lb/tons)	(4)	0.17	(c)	0.015	(d)
VOC	1.0E-03	(lb/ODT)	(5)	0.22	(e)	0.019	(f)

Notes

ODT = oven-dry ton (0% moisture content).

(a) Proposed green chip overs throughput (tons/"period") = (proposed total green chip throughput (tons/"period") x (estimated percentage of overs [%] /100)

Estimated percentage of overs (%) = 10.0 (2)

(b) Green chip overs throughput (ODT) = (estimated green chip overs throughput (green-tons/"period") x (1 - moisture content [%] / 100)

Moisture content (%) = 42.0 (3)

(c) Daily emissions estimate (lb/day) = (emission factor [lb/ton]) x (daily chipper throughput [ton/day])

(d) Annual emissions estimate (tons/yr) = (emission factor [lb/ton]) / (2,000 lb/ton) x (annual chipper throughput [ton/yr])

(e) Daily emissions estimate (lb/day) = (emission factor [lb/BDT]) x (daily chipper throughput [BDT/day])

(f) Annual emissions estimate (tons/yr) = (emission factor [lb/BDT]) / (2,000 lb/ton) x (annual chipper throughput [BDT/yr])

References

(1) See Table 1, Input Process Rates and Parameters.

(2) Information provided by Stimson Lumber Company. Assumes a conservative estimate of 10% of green chips will require resizing.

(3) Information provided by Stimson Lumber Company.

(4) NCASI Special Report No. 15-01 (April 2015) "Estimating the Potential for PM Emissions from Wood and Bark Handling", Table 6-1. Conservatively assumes fresh bark for as it is the highest emission factor. Assumes all PM is PM_{10}.

(5) AP-42 Chapter 10 (October 2002), Table 10.6.4-9 "Emission Factors for Hardboard and Fiberboard Miscellaneous Sources -- Organics" Representative of methanol emissions from whole log chipper. Assumes VOC emission factor is equal to methanol.

Table 9
Proposed Truck Bins Cyclone Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Emission Unit		Daily (BDT/day)	Annual (BDT/yr)
Proposed Total Green Chip Bin Throughput	(1)	2,232	390,600
Proposed Chip Bin Cyclone 1	(2)	1,116	195,300
Proposed Chip Bin Cyclone 2	(2)	1,116	195,300

Pollutant	Emission Factor (lb/BDT)		Emissions Estimate	
			Daily [a] (lb/day)	Annual [b] (tons/yr)
Proposed Chip Bin Cyclone 1				
PM	6.11E-03	(3)	6.82	0.60
PM_{10}	5.80E-03	(c)	6.48	0.57
$PM_{2.5}$	4.89E-03	(c)	5.46	0.48
Proposed Chip Bin Cyclone 2				
PM	6.11E-03	(3)	6.82	0.60
PM_{10}	5.80E-03	(c)	6.48	0.57
$PM_{2.5}$	4.89E-03	(c)	5.46	0.48

Notes

BDT = bone-dry ton (0% moisture content).

[a] Daily emissions estimate (lb/day) = (emission factor [lb/BDT]) x (daily cyclone throughput [BDT/day])

[b] Annual emissions estimate (tons/yr) = (emission factor [lb/BDT]) / (2,000 lb/ton) x (annual cyclone throughput [BDT/yr])

[c] PM_{10} or $PM_{2.5}$ emission factor (lb/BDT) = (PM emission factor [lb/BDT]) x (PM_{10} or $PM_{2.5}$ percentage of PM [%] / 100)

PM_{10} percentage of PM (%) = 95.0 (4)

$PM_{2.5}$ percentage of PM (%) = 80.0 (4)

References

(1) See Table 1, Input Process Rates and Parameters.

(2) Assumes total green chip throughput is distributed evenly between both cyclones.

(3) NCASI Wood Products Emission Factor database (2024). Representative of Pneumatic Transport System - Green Chips with cyclone control.

(4) Emission factor derived from percentages presented in DEQ AQ-EF03. Assumes high efficiency cyclone.

Table 10
Proposed Truck Bin Baghouse Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter		Daily (BDT/day)	Annual (BDT/yr)
Proposed Total Green Sawdust Throughput	(1)	648	113,400
Proposed Truck Bin Baghouse 1	(2)	324	56,700
Proposed Truck Bin Baghouse 2	(2)	324	56,700

Pollutant	Emission Factor (3) (lb/BDT)	Emissions Estimate	
		Daily (a) (lb/day)	Annual (b) (tons/yr)
Proposed Truck Bin Baghouse 1			
PM	1.0E-03	0.32	0.028
PM_{10}	1.0E-03	0.32	0.028
$PM_{2.5}$	1.0E-03	0.32	0.028
Proposed Truck Bin Baghouse 2			
PM	1.0E-03	0.32	0.028
PM_{10}	1.0E-03	0.32	0.028
$PM_{2.5}$	1.0E-03	0.32	0.028

Notes

BDT = bone-dry ton (0% moisture content).

(a) Daily emissions estimate (lb/day) = (emission factor [lb/BDT]) x (daily baghouse throughput [BDT/day])

(b) Annual emissions estimate (tons/yr) = (emission factor [lb/BDT]) / (2,000 lb/ton) x (annual baghouse throughput [BDT/yr])

References

(1) See Table 1, Input Process Rates and Parameters.

(2) Assumes total green sawdust throughput is distributed evenly between both baghouses.

(3) Oregon DEQ Form AQ-EF02. Representative of green sawdust with baghouse control. Assumes all PM is $PM_{2.5}$.

Table 11
Proposed Residuals Material Drop Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter		Daily (BDT/day)		Annual (BDT/yr)	
Proposed Total Green Chip Throughput	(1)	2,232		390,600	
Proposed Total Green Sawdust Throughput	(1)	648		113,400	
Proposed Green Residuals Throughput (Screen 2)	(2)	**1,440**	(a)	**252,000**	(a)

Pollutant	Emission Factor [4] (lb/BDT)	Emissions Estimate	
		Daily [b] (lb/day)	Annual [c] (tons/yr)
PM	7.5E-04	1.08	0.095
PM_{10}	3.5E-04	0.50	0.044
$PM_{2.5}$	5.0E-05	0.072	6.3E-03

Notes

BDT = bone-dry ton (0% moisture content).

[a] Proposed green residuals throughput (Screen 2) (BDT/"period") = (proposed total green chip throughput (BDT/"period") + (proposed total green sawdust throughput [BDT/"period"]) x (percentage through screen 2 [%] /100)

Percentage through screen 2 (%) = 50.0 (3)

[b] Daily emission estimate (lb/day) = (emission factor [lb/ton]) x (daily throughput [tons/day])

[c] Annual emission estimate (ton/yr) = (emission factor [lb/ton]) x (annual throughput [ton/yr]) / (2,000 lb/ton)

References

[1] See Table 1, Input Process Rates and Parameters. Throughput based on BDT basis for chips or sawdust.

[2] Only green wood residuals going through screen 2 can be pneumatically conveyed to the existing storage pile.

[3] Assumes total green residuals throughput is split distributed between both screens.

[4] EPA Region 10 Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country, May 2014. Representative of "Drop" of "wet" material from one surface to another.

Table 12
Existing Stud Planer Baghouse (S-62) Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter		Value
Maximum Daily Operation (hr/day)	(1)	24
Permitted Annual Operation (hr/yr)	(1)	3,600
Proposed Daily Operation (hr/day)	(2)	24
Proposed Annual Operation (hr/yr)	(1)	6,240

Pollutant	Emission Rate (lb/hr)		Emissions Estimate			
			Daily (lb/day)		Annual (tons/yr)	
Permitted Emissions						
PM	0.055	(3)	1.32	(a)	0.099	(b)
PM_{10}	0.055	(3)	1.32	(a)	0.099	(b)
$PM_{2.5}$	0.055	(3)	1.32	(a)	0.099	(b)
Proposed Emissions						
PM	0.055	(4)	1.32	(a)	0.17	(b)
PM_{10}	0.055	(4)	1.32	(a)	0.17	(b)
$PM_{2.5}$	0.055	(4)	1.32	(a)	0.17	(b)
Proposed Increase						
PM			**0**	(5)	**0.073**	(c)
PM_{10}			**0**	(5)	**0.073**	(c)
$PM_{2.5}$			**0**	(5)	**0.073**	(c)

Notes

(a) Daily emissions estimate (lb/day) = (emission rate [lb/hr]) x (daily hours of operation [hr/day])

(b) Annual emissions estimate (tons/yr) = (emission rate [lb/hr]) x (annual hours of operation [hr/yr]) / (2,000 lb/ton)

(c) Proposed increase (tons/yr) = (permitted emissions [tons/yr]) - (proposed emissions [tons/yr])

References

(1) See Table 1, Input Process Rates and Parameters.

(2) The maximum daily hours of operation for this emission unit will not change.

(3) Existing Title V Permit No, 34-2066-TV-01, condition 87.a. Representative of S-62 (Stud Planer Baghouse).

(4) Stimson is not requesting a change in emission factors for this emission unit.

(5) The proposed increase in hours of operation will have no impact on daily emissions from this emission unit.

Table 13
Existing Planer Mill Cyclone (S-182) Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter		Value
Daily Operation (Mbdft/day)	(1)	960
Permitted Annual Operation (Mbdft/yr)	(1)	180,000
Proposed Daily Operation (Mbdft/day)	(1)	1,047
Proposed Annual Operation (Mbdft/yr)	(1)	280,000

Pollutant	Emission Rate (lb/Mbdft)		Emissions Estimate			
			Daily (lb/day)		Annual (tons/yr)	
Permitted Emissions						
PM	5.0E-04	(2)	0.48	(a)	0.045	(b)
PM_{10}	5.0E-04	(2)	0.48	(a)	0.045	(b)
$PM_{2.5}$	5.0E-04	(2)	0.48	(a)	0.045	(b)
Proposed Emissions						
PM	5.0E-04	(3)	0.52	(a)	0.070	(b)
PM_{10}	5.0E-04	(3)	0.52	(a)	0.070	(b)
$PM_{2.5}$	5.0E-04	(3)	0.52	(a)	0.070	(b)
Proposed Increase						
PM			**0.044**	(c)	**0.025**	(c)
PM_{10}			**0.044**	(c)	**0.025**	(c)
$PM_{2.5}$			**0.044**	(c)	**0.025**	(c)

Notes

Mbdft = thousand board feet.

(a) Daily emissions estimate (lb/day) = (emission factor [lb/Mbdft]) x (daily throughput [Mbdft/day])

(b) Annual emissions estimate (tons/yr) = (emission factor [lb/Mbdft]) x (annual throughput [Mbdft/yr]) / (2,000 lb/ton)

(c) Proposed increase (tons/yr) = (permitted emissions [tons/yr]) - (proposed emissions [tons/yr])

References

(1) See Table 1, Input Process Rates and Parameters.

(2) Existing Title V Permit No, 34-2066-TV-01, condition 87.a. Representative of S-182 (Cyclone).

(3) Stimson is not requesting a change in emission factors for this emission unit.

Table 14
Wood-Fired Boiler (H-BLR) Criteria Pollutant Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter		Permitted Rate	Proposed Rate
Annual Steam Production (Mlb-steam/yr)	(1)	475,000	660,000

Pollutant	Emission Factor (2) (lb/Mlb-steam)		Annual Emissions Estimates (tons/yr)		Proposed Emissions Increase (tons/yr)
			Permitted	Proposed	
PM	0.033	(2)	7.84 (a)	10.9 (a)	3.05
PM_{10}	0.033	(2)	7.84 (a)	10.9 (a)	3.05
$PM_{2.5}$	0.031	(2)	7.36 (a)	10.2 (a)	2.87
SO_2	0.014	(2)	3.33 (a)	4.62 (a)	1.30
NO_X	0.33	(2)	78.4 (a)	109 (a)	30.5
CO	0.34	(2)	80.8 (a)	112 (a)	31.5
VOC	0.13	(2)	30.9 (a)	42.9 (a)	12.0
CO_2e (Biogenic)	--		101,191 (b)	140,602 (b)	39,411
CO_2e (Anthropogenic)	--		1,352 (c)	1,878 (c)	526
CO_2e (Total)	--		102,543 (d)	142,480 (d)	39,938

Notes

Mlb = thousand pounds; FHISO = fuel heat input to steam output ratio.

(a) Annual emissions estimate (tons/yr) = (emission factor [lb/Mlb-steam]) x (annual steam production [Mlb-steam/yr])

(b) CO_2e emissions (biogenic) (tons/yr) = (CO_2 emission factor [kg/MMBtu]) x (2.205 lb/kg) x (FHISO [MMBtu/Mlb-steam]) x (annual steam production [Mlb-steam/yr]) / (2,000 lb/ton)

FHISO (MMBtu/Mlb-steam) =	2.06	(3)
CO_2 emission factor (kg/MMBtu) =	93.8	(4)

(c) CO_2e emissions (anthropogenic) (tons/yr) = ([CH_4 emission factor {lb/MMBtu}] x [CH_4 global warming potential] + [N_2O emission factor {lb/MMBtu}] x [N_2O global warming potential]) x (2.205 lb/kg) x (FHISO [MMBtu/Mlb-steam]) / (2,000 lb/ton)

FHISO (MMBtu/Mlb-steam) =	2.06	(3)
CH_4 emission factor (kg/MMBtu) =	7.20E-03	(5)
N_2O emission factor (kg/MMBtu) =	3.60E-03	(5)
Global warming potential of CH_4 =	25.0	(6)
Global warming potential of N_2O =	298	(6)

(d) CO_2e emissions (total) (tons/yr) = (annual biogenic CO_2e emissions [tons/yr]) + (annual anthropogenic CO_2e emissions [tons/yr])

References

(1) See Table 1, Input Process Rates and Parameters.

(2) Title V Permit No. 34-2066-TV-01. Condition 87.a. Representative of H-BLR (Boilers 1, 2 & 3) ESP Exhaust.

(3) Detail sheet to existing Title V Permit No, 34-2066-TV-01.

(4) 40 CFR Part 98 Subpart C, Table C-1, "Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel."

(5) 40 CFR Part 98 Subpart C, Table C-2, "Default CH_4 and N_2O Emission Factors for Various Types of Fuel."

(6) 40 CFR Part 98 Subpart A, Table A-1, "Global Warming Potentials."

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Table 15
Fuel Dryer (H-DRY) Criteria Pollutant Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter	Permitted Rate	Proposed Rate
Annual operation (hr/yr) [1]	2,160	3,000

Pollutant	Emission Factor [2] (lb/hr)	Annual Emissions Estimates (tons/yr)		Proposed Emissions Increase (tons/yr)
		Permitted [a]	Proposed [b]	
PM	4.02	4.34	6.03	1.69
PM_{10}	3.62	3.91	5.43	1.52
$PM_{2.5}$	0.80	0.86	1.20	0.34
NO_X	5.87	6.34	8.81	2.47
CO	4.80	5.18	7.20	2.02
VOC	8.60	9.29	12.9	3.61

Notes

Mlb = thousand pounds.

[a] Permitted annual emissions estimate (tons/yr) = (emission factor [lb/hr]) x (permitted annual hours of operation [hr/yr])

[b] Proposed annual emissions estimate (tons/yr) = (emission factor [lb/hr]) x (proposed annual hours of operation [hr/yr])

References

[1] See Table 1, Input Process Rates and Parameters.

[2] Title V Permit No. 34-2066-TV-01. Condition 87.a. Representative of H-DRY Fuel Dryer/S-400 Wet Scrubber Exhaust.

Table 16
Lumber Kilns Criteria Pollutant Emissions Estimate
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter	Throughput	
	Daily (Mbdft/day)	Annual (Mbdft/yr)
Permitted Douglas Fir Throughput	960 (1)	146,160 (2)
Permitted Hemlock Throughput		30,456 (2)
Permitted True Fir Throughput		3,384 (2)
Proposed Douglas Fir Throughput	1,047 (1)	227,360 (2)
Proposed Hemlock Throughput		47,380 (2)
Proposed True Fir Throughput		5,270 (2)

Pollutant	Wood Species	Emission Rate (lb/Mbdft)	Emissions Estimate	
			Maximum Daily (a) (lb/day)	Annual (b) (tons/yr)
Permitted Emissions				
$PM/PM_{10}/PM_{2.5}$	Douglas Fir	0.050 (3)	48.0	3.65
VOC		1.12 (3)	1,075	81.8
$PM/PM_{10}/PM_{2.5}$	Hemlock	0.050 (4)	48.0	0.76
VOC		0.40 (4)	384	6.09
$PM/PM_{10}/PM_{2.5}$	True Fir	0.050 (5)	48.0	0.085
VOC		0.76 (5)	730	1.29
Total Permitted Emissions				
$PM/PM_{10}/PM_{2.5}$			**48.0** (6)	**4.50** (7)
VOC			**1,075** (6)	**89.2** (7)
Proposed Emissions				
$PM/PM_{10}/PM_{2.5}$	Douglas Fir	0.050 (3)	52.4	5.68
VOC		1.12 (3)	1,173	127
$PM/PM_{10}/PM_{2.5}$	Hemlock	0.050 (4)	52.4	1.18
VOC		0.40 (4)	419	9.48
$PM/PM_{10}/PM_{2.5}$	True Fir	0.050 (5)	52.4	0.13
VOC		0.76 (5)	796	2.00
Total Proposed Emissions				
$PM/PM_{10}/PM_{2.5}$			**52.4** (6)	**7.00** (7)
VOC			**1,173** (6)	**139** (7)
Proposed Increase				
$PM/PM_{10}/PM_{2.5}$			**4.35** (c)	**2.50** (d)
VOC			**97.4** (c)	**49.6** (d)

Notes

Mbdft = thousand board feet.

(a) Daily emissions estimate (lb/day) = (emission factor [lb/MBF]) x (daily throughput [MBF/day])

(b) Annual emissions estimate (tons/yr) = (emission factor [MBF/hr]) x (annual throughput [MBF/yr]) / (2,000 lb/ton)

(c) Proposed increase (lb/day) = (total permitted emissions [lb/day]) - (total proposed emissions [lb/day])

(d) Proposed increase (tons/yr) = (total permitted emissions [tons/yr]) - (total proposed emissions [tons/yr])

References

(1) See Table 1, Input Process Rates and Parameters. Representative of maximum daily throughput regardless of wood species.

(2) See Table 1, Input Process Rates and Parameters.

(3) Existing Title V Permit No, 34-2066-TV-01, condition 87.a. Emission unit LBR-DK. Representative of Douglas Fir.

(4) Existing Title V Permit No, 34-2066-TV-01, condition 87.a. Emission unit LBR-DK. Representative of Hemlock.

(5) Existing Title V Permit No, 34-2066-TV-01, condition 87.a. Emission unit LBR-DK. Representative of True Fir.

(6) Equal to highest daily emission rate between wood species.

(7) Equal to the sum of annual emission rates between wood species.

Table 17
Paved Road Fugitive Dust Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter	Units	Process Rate	
		Daily	Annual
Permitted			
Vehicle Miles Travelled	(VMT)	163 (1)	38,238 (1)
Mean Vehicle Weight	(tons)	21.9 (1)	21.9 (1)
Proposed			
Vehicle Miles Travelled	(VMT)	365 (2)	90,231 (2)
Mean Vehicle Weight	(tons)	21.7 (2)	21.7 (2)

Pollutant	Emission Factor (lb/VMT)	Emission Estimates	
		Daily (lb/day)	Annual (tons/yr)
Permitted Paved Road Dust Emissions			
PM	1.39 (1)	113 (1)	13.2 (1)
PM_{10}	0.28 (1)	22.5 (1)	2.65 (1)
$PM_{2.5}$	0.068 (1)	5.53 (1)	0.65 (1)
Proposed Paved Road Dust Emissions			
PM	1.38 (a)	251 (b)	31.1 (c)
PM_{10}	0.28 (a)	50.3 (b)	6.21 (c)
$PM_{2.5}$	0.068 (a)	12.3 (b)	1.52 (c)
Proposed Increase			
PM	--	138	17.9
PM_{10}	--	27.8	3.56
$PM_{2.5}$	--	6.81	0.87

Notes

VMT = vehicle miles traveled.

(a) Particulate emission factor (lb/VMT) = ([particle size multiplier {lb/VMT}] x [silt loading {g/m^2}]$^{0.91}$ x [mean vehicle weight {tons}]$^{1.02}$) x (1 - [number of days with at least 0.01 inches of precipitation {days}] / [4 x {number of days in the averaging period | days | }])

PM particle size multiplier (lb/VMT) =	0.011	(3)
PM_{10} particle size multiplier (lb/VMT) =	2.2E-03	(3)
$PM_{2.5}$ particle size multiplier (lb/VMT) =	5.4E-04	(3)
sL = road surface silt loading (g/m^2) =	7.40	(4)
P = days with at least 0.01 inches of precipitation (days) =	180	(5)
N = number of days in the averaging period (days) =	365	(5)

(b) Daily emissions estimate (lb/day) = (particulate emission factor [lb/VMT]) x (daily vehicle miles traveled [VMT/day]) x (1 -[control efficiency {%} / 100])

Control efficiency (%) =	50.0	(6)

(c) Annual emissions estimate (tons/yr) = (particulate emission factor [lb/VMT]) x (annual vehicle miles traveled [VMT/yr]) x (1 -[control efficiency {%} / 100]) / (2,000 [lb/ton])

Control efficiency (%) =	50.0	(6)

References

(1) See Review Report to existing Title V Permit No. 34-2066, Appendix B.

(2) See Table 2, Input Parameters for Vehicle Road Dust Calculations.

(3) AP-42 Chapter 13.2.1 (January 2011), Table 13.2.1-1 "Particle Size Multiplier for Paved Roads Equation."

(4) AP-42 Chapter 13.2.1 (January 2011), Table 13.2.1-3. Road surface silt loading mean value for municipal landfills is used.

(5) Number of days of precipitation extrapolated from AP-42 Chapter 13.2.1 (January 2011), Figure 13.2.1-2.

(6) Control efficiency estimated based on the control technology and efficiency information presented in the WRAP Fugitive Dust Handbook (September 2006). Represents estimated control resulting from the implementation of a regular sweeping program to minimize trackout and wet suppression of paved roads.

Table 18
Unpaved Road Fugitive Dust Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter	Units	Process Rate	
		Daily	Annual
Permitted			
Vehicle Miles Travelled	(VMT)	16.7 (1)	4,199 (1)
Mean Vehicle Weight	(tons)	60.2 (1)	60.2 (1)
Proposed			
Vehicle Miles Travelled	(VMT)	41.4 (2)	10,359 (2)
Mean Vehicle Weight	(tons)	59.4 (2)	59.4 (2)

Pollutant	Emission Factor (lb/VMT)	Emission Estimates	
		Daily (lb/day)	Annual (tons/yr)
Permitted Unpaved Road Dust Emissions			
PM	7.46 (1)	68.6 (1)	8.62 (1)
PM_{10}	2.13 (1)	19.6 (1)	2.46 (1)
$PM_{2.5}$	0.21 (1)	1.96 (1)	0.25 (1)
Proposed Unpaved Road Dust Emissions			
PM	7.46 (a)	170 (b)	21.3 (c)
PM_{10}	2.13 (a)	48.5 (b)	6.06 (c)
$PM_{2.5}$	0.21 (a)	4.85 (b)	0.61 (c)
Proposed Increase			
PM	--	101	12.6
PM_{10}	--	28.9	3.60
$PM_{2.5}$	--	2.89	0.36

Notes

VMT = vehicle miles traveled.

(a) Particulate emission factor (lb/VMT) = ([particle size multiplier {lb/VMT}] x [surface material silt content {%} /12]^{a} x [mean vehicle weight {tons} /3]$^{0.45}$) x ([365 - {number of days with at least 0.01 inches of precipitation |days|}] / 365)

PM particle size multiplier (lb/VMT) =	4.90	(3)
PM_{10} particle size multiplier (lb/VMT) =	1.50	(3)
$PM_{2.5}$ particle size multiplier (lb/VMT) =	0.15	(3)
PM aerodynamic particle size constant "a" =	0.70	(3)
$PM_{10}/PM_{2.5}$ aerodynamic particle size constant "a" =	0.90	(3)
s = surface material silt content (%) =	8.40	(4)
P = days with at least 0.01 inches of precipitation (days) =	180	(5)

(b) Daily emissions estimate (lb/day) = (particulate emission factor [lb/VMT]) x (daily vehicle miles traveled [VMT/day]) x (1 -[control efficiency {%} / 100])

Control efficiency (%) =	45.0	(6)

(c) Annual emissions estimate (tons/yr) = (particulate emission factor [lb/VMT]) x (annual vehicle miles traveled [VMT/yr]) x (1 -[control efficiency {%} / 100]) / (2,000 [lb/ton])

Control efficiency (%) =	45.0	(6)

References

(1) See Review Report to existing Title V Permit No. 34-2066, Appendix B.

(2) See Table 2, Input Parameters for Vehicle Road Dust Calculations.

(3) AP-42 Chapter 13.2.2 (November 2006), Table 13.2.2-2 "Constants for Equations 1a and 1b."

(4) AP-42 Chapter 13.2.2. (November 2006), Table 13.2.2-1. Road surface silt content mean value for lumber sawmills is used.

(5) Number of days of precipitation extrapolated from AP-42 Chapter 13.2.2 (November 2006), Figure 13.2.2-1.

(6) Control efficiency estimated based on the control technology and efficiency information presented in the WRAP Fugitive Dust Handbook (September 2006). Represents estimated control resulting from the implementation of a regular program for the wet suppression of unpaved roads and implementation of a facility wide speed limit of 10 miles per hour.

Table 19
Fugitive Road Dust Emissions Summary
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Source	Daily Emissions Estimates (lb/day)		
	PM	PM_{10}	$PM_{2.5}$
Permitted			
Paved Roads [1]	113	22.5	5.53
Unpaved Roads [1]	68.6	19.6	1.96
Total Emissions Estimate	**181**	**42.1**	**7.48**
Proposed			
Paved Roads [2]	251	50.3	12.3
Unpaved Roads [2]	170	48.5	4.85
Total Emissions Estimate	**421**	**98.7**	**17.2**

Source	Annual Emissions Estimates (tons/yr)		
	PM	PM_{10}	$PM_{2.5}$
Permitted			
Paved Roads [1]	13.2	2.65	0.65
Unpaved Roads [1]	8.62	2.46	0.25
Total Emissions Estimate	**21.9**	**5.10**	**0.90**
Proposed			
Paved Roads [3]	31.1	6.21	1.52
Unpaved Roads [3]	21.3	6.06	0.61
Total Emissions Estimate	**52.3**	**12.3**	**2.13**

References

[1] See Review Report to existing Title V Permit No. 34-2066, Appendix B.

[2] See Table 17, Paved Road Fugitive Dust Emission Estimates.

[3] See Table 18, Unpaved Road Fugitive Dust Emission Estimates.

Table 20
Fugitive Road Dust Emissions Factor Summary
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Pollutant	Paved Roads			Unpaved Roads		
	Annual Emissions (tons/yr)	Annual Kiln Production (Mbdft/yr)	Emission Factor [a] (lb/Mbdft)	Annual Emissions (tons/yr)	Annual Kiln Production (Mbdft/yr)	Emission Factor [a] (lb/Mbdft)
Permitted						
PM	13.2 [1]	180,000 [1]	0.15	8.62 [1]	180,000 [1]	0.096
PM_{10}	2.65 [1]	180,000 [1]	0.029	2.46 [1]	180,000 [1]	0.027
$PM_{2.5}$	0.65 [1]	180,000 [1]	7.2E-03	0.25 [1]	180,000 [1]	2.7E-03
Proposed						
PM	31.1 [1]	280,000 [2]	0.22	21.3 [2]	280,000 [2]	0.15
PM_{10}	6.21 [1]	280,000 [2]	0.044	6.06 [2]	280,000 [2]	0.043
$PM_{2.5}$	1.52 [1]	280,000 [2]	0.011	0.61 [2]	280,000 [2]	4.3E-03

Notes

Mbdft = thousand board feet.

[a] Emission factor (lb/Mbdft) = (annual emissions [tons/yr]) / (annual kiln production [Mbdft/yr])

References

[1] See Review Report to existing Title V Permit No. 34-2066, Appendix B.

[2] See Table 1, Input Process Rates and Parameters.

[3] Proposed maximum annual kiln throughput.

Table 21
Wood-Fired Boiler (H-BLR-ESP) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter		Permitted Input	Proposed Input
Maximum Daily Heat Input to ESP (MMBtu/day)	(1)	3,205	3,205
Annual Heat Input to ESP(MMBtu/yr)	(1)	922,236	1,281,430

Toxic Air Contaminant	CAS	HAP?	Emission Factor (lb/MMBtu)	Permitted Emissions Estimates		Proposed Emissions Estimates	
				Daily [a] (lb/day)	Annual [b] (lb/yr)	Daily [a] (lb/day)	Annual [b] (lb/yr)
Metals							
Antimony	7440-36-0	Yes	3.1E-07 [2]	9.8E-04	0.28	9.8E-04	0.39
Arsenic	7440-38-2	Yes	1.9E-06 [2]	6.1E-03	1.74	6.1E-03	2.42
Barium	7440-39-3	No	2.1E-04 [2]	0.67	193	0.67	268
Beryllium	7440-41-7	Yes	2.9E-08 [2]	9.1E-05	0.026	9.1E-05	0.037
Cadmium	7440-43-9	Yes	3.2E-07 [2]	1.0E-03	0.30	1.0E-03	0.42
Chromium VI	18540-29-9	Yes	2.7E-07 [2]	8.7E-04	0.25	8.7E-04	0.35
Cobalt	7440-48-4	Yes	5.0E-07 [2]	1.6E-03	0.46	1.6E-03	0.64
Copper and compounds	7440-50-8	No	3.8E-06 [2]	0.012	3.50	0.012	4.86
Lead	7439-92-1	Yes	5.2E-06 [2]	0.017	4.80	0.017	6.68
Manganese	7439-96-5	Yes	9.6E-05 [2]	0.31	88.3	0.31	123
Mercury	7439-97-6	Yes	9.2E-07 [3]	2.9E-03	0.85	2.9E-03	1.18
Molybdenum trioxide	1313-27-5	No	3.1E-06 [2]	1.0E-02	2.86	1.0E-02	3.98
Nickel	365	Yes	2.8E-06 [2]	9.0E-03	2.58	9.0E-03	3.59
Selenium	7782-49-2	Yes	1.6E-06 [2]	5.2E-03	1.49	5.2E-03	2.08
Silver	7440-22-4	No	9.9E-07 [4]	3.2E-03	0.91	3.2E-03	1.26
Thallium and compounds	7440-28-0	No	1.9E-06 [2]	5.9E-03	1.71	5.9E-03	2.37
Vanadium (fume or dust)	7440-62-2	No	5.9E-07 [2]	1.9E-03	0.55	1.9E-03	0.76
Zinc	7440-66-6	No	5.8E-05 [2]	0.18	53.1	0.18	73.8
Organics							
1,2-Dichloropropane	78-87-5	Yes	1.7E-05 [5]	0.054	15.5	0.054	21.5
Acetaldehyde	75-07-0	Yes	2.8E-04 [5]	0.91	261	0.91	363
Acetone	67-64-1	No	5.3E-04 [5]	1.70	488	1.70	678
Acetophenone	98-86-2	Yes	1.8E-06 [5]	5.9E-03	1.70	5.9E-03	2.36
Acrolein	107-02-8	Yes	2.6E-04 [5]	0.83	240	0.83	333
Benzene	71-43-2	Yes	9.8E-04 [5]	3.14	904	3.14	1,256
Carbon tetrachloride	56-23-5	Yes	9.9E-06 [5]	0.032	9.10	0.032	12.6
Chlorine	7782-50-5	Yes	7.9E-04 [6]	2.53	729	2.53	1,012
Chlorobenzene	108-90-7	Yes	1.7E-05 [5]	0.053	15.3	0.053	21.3
Chloroform	67-66-3	Yes	2.0E-05 [5]	0.064	18.5	0.064	25.8
Crotonaldehyde	4170-30-3	No	4.5E-05 [5]	0.14	41.3	0.14	57.4
Dibutyl phthalate	84-74-2	Yes	3.3E-05 [5]	0.11	30.7	0.11	42.7
Diethylphthalate	84-66-2	No	4.4E-05 [5]	0.14	40.2	0.14	55.9
Ethyl benzene	100-41-4	Yes	1.2E-05 [5]	0.039	11.3	0.039	15.6
Formaldehyde	50-00-0	Yes	1.1E-03 [5]	3.37	968	3.37	1,346
Hexane	110-54-3	Yes	2.9E-04 [5]	0.92	266	0.92	369
Isopropyl alcohol	67-63-0	No	4.5E-03 [5]	14.5	4,169	14.5	5,792
Methanol	67-56-1	Yes	7.3E-04 [5]	2.35	675	2.35	938
Methyl bromide	74-83-9	Yes	1.1E-05 [5]	0.036	10.4	0.036	14.5
Methyl chloride	74-87-3	Yes	4.4E-05 [5]	0.14	40.1	0.14	55.7
Methyl chloroform	71-55-6	Yes	5.8E-05 [5]	0.19	53.3	0.19	74.1
Methylene chloride	75-09-2	Yes	4.0E-04 [5]	1.28	367	1.28	510
Methyl isobutyl ketone	108-10-1	Yes	4.5E-04 [5]	1.43	410	1.43	570
Methyl ethyl ketone	78-93-3	No	7.0E-06 [5]	0.022	6.43	0.022	8.93
Phenol	108-95-2	Yes	1.6E-04 [5]	0.51	148	0.51	205
Phosphorus	504	Yes	3.1E-04 [5]	0.99	286	0.99	397
Propionaldehyde	123-38-6	Yes	3.1E-04 [5]	1.00	287	1.00	399
Styrene	100-42-5	Yes	4.7E-04 [5]	1.50	433	1.50	601
Toluene	108-88-3	Yes	1.1E-05 [5]	0.037	10.5	0.037	14.6
Xylene (mixture)	1330-20-7	Yes	5.2E-06 [5]	0.017	4.81	0.017	6.69
Inorganic Compounds							
Hydrogen fluoride	7664-39-3	Yes	9.1E-05 [7]	0.29	83.5	0.29	116
Hydrochloric acid	7647-01-0	Yes	7.8E-05 [3]	0.25	71.6	0.25	99.4

Table 21 (Cont.)
Wood-Fired Boiler (H-BLR-ESP) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Toxic Air Contaminant	CAS	HAP?	Emission Factor (lb/MMBtu)	Permitted Emissions Estimates		Proposed Emissions Estimates	
				Daily [a] (lb/day)	Annual [b] (lb/yr)	Daily [a] (lb/day)	Annual [b] (lb/yr)
PAHs							
Acenaphthene	83-32-9	Yes	8.5E-07 [5]	2.7E-03	0.79	2.7E-03	1.09
Acenaphthylene	208-96-8	Yes	4.7E-06 [5]	0.015	4.33	0.015	6.01
Anthracene	120-12-7	Yes	2.7E-06 [5]	8.6E-03	2.47	8.6E-03	3.43
Benz[a]anthracene	56-55-3	Yes	8.1E-08 [5]	2.6E-04	0.075	2.6E-04	0.10
Benzo[a]pyrene	50-32-8	Yes	2.2E-06 [5]	7.1E-03	2.05	7.1E-03	2.84
Benzo[b]fluoranthene	205-99-2	Yes	1.4E-07 [5]	4.6E-04	0.13	4.6E-04	0.18
Benzo[e]pyrene	192-97-2	Yes	2.1E-07 [5]	6.8E-04	0.19	6.8E-04	0.27
Benzo[g,h,i]perylene	191-24-2	Yes	1.5E-07 [5]	4.8E-04	0.14	4.8E-04	0.19
Benzo[j]fluoranthene	205-82-3	Yes	1.6E-07 [5]	5.0E-04	0.14	5.0E-04	0.20
Benzo[k]fluoranthene	207-08-9	Yes	5.2E-08 [5]	1.7E-04	0.048	1.7E-04	0.066
Chrysene	218-01-9	Yes	7.9E-08 [5]	2.5E-04	0.073	2.5E-04	0.10
Fluoranthene	206-44-0	Yes	1.7E-06 [5]	5.4E-03	1.54	5.4E-03	2.14
Fluorene	86-73-7	Yes	3.0E-06 [5]	9.6E-03	2.78	9.6E-03	3.86
Indeno[1,2,3-cd]pyrene	193-39-5	Yes	1.0E-07 [5]	3.3E-04	0.094	3.3E-04	0.13
2-Methyl naphthalene	91-57-6	Yes	1.4E-06 [5]	4.5E-03	1.29	4.5E-03	1.79
Naphthalene	91-20-3	Yes	1.0E-04 [5]	0.32	91.9	0.32	128
Perylene	198-55-0	Yes	3.2E-08 [5]	1.0E-04	0.030	1.0E-04	0.041
Phenanthrene	85-01-8	Yes	6.5E-06 [5]	0.021	5.96	0.021	8.28
Pyrene	129-00-0	Yes	3.5E-06 [5]	0.011	3.26	0.011	4.54
Dioxans & Furans							
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	Yes	9.5E-13 [5]	3.1E-09	8.8E-07	3.1E-09	1.2E-06
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	No	1.3E-12 [5]	4.3E-09	1.2E-06	4.3E-09	1.7E-06
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	No	8.7E-13 [5]	2.8E-09	8.0E-07	2.8E-09	1.1E-06
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	No	2.1E-12 [5]	6.7E-09	1.9E-06	6.7E-09	2.7E-06
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	No	2.2E-12 [5]	7.1E-09	2.0E-06	7.1E-09	2.8E-06
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	No	9.8E-12 [5]	3.1E-08	9.0E-06	3.1E-08	1.3E-05
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	No	2.5E-11 [5]	7.9E-08	2.3E-05	7.9E-08	3.2E-05
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No	8.0E-12 [5]	2.6E-08	7.4E-06	2.6E-08	1.0E-05
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No	4.0E-12 [5]	1.3E-08	3.7E-06	1.3E-08	5.1E-06
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No	6.1E-12 [5]	2.0E-08	5.6E-06	2.0E-08	7.8E-06
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No	3.6E-12 [5]	1.1E-08	3.3E-06	1.1E-08	4.6E-06
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No	3.2E-12 [5]	1.0E-08	2.9E-06	1.0E-08	4.0E-06
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No	6.7E-13 [5]	2.1E-09	6.2E-07	2.1E-09	8.5E-07
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No	2.7E-12 [5]	8.5E-09	2.5E-06	8.5E-09	3.4E-06
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No	5.7E-12 [5]	1.8E-08	5.3E-06	1.8E-08	7.3E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No	8.0E-13 [5]	2.6E-09	7.4E-07	2.6E-09	1.0E-06
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	No	5.0E-12 [5]	1.6E-08	4.6E-06	1.6E-08	6.4E-06
PCBs & Phthalates							
dichlorobiphenyl	--	No	7.4E-10 [5]	2.4E-06	6.8E-04	2.4E-06	9.4E-04
hexachlorobiphenyl	--	No	5.5E-10 [5]	1.7E-06	5.0E-04	1.7E-06	7.0E-04
pentachlorobiphenyl	--	No	1.2E-09 [5]	3.8E-06	1.1E-03	3.8E-06	1.5E-03
tetrachlorobiphenyl	--	No	2.5E-09 [5]	8.0E-06	2.3E-03	8.0E-06	3.2E-03
trichlorobiphenyl	--	No	2.6E-09 [5]	8.4E-06	2.4E-03	8.4E-06	3.3E-03
decachlorobiphenyl	--	No	2.7E-10 [5]	8.5E-07	2.4E-04	8.5E-07	3.4E-04
Total PCBs	1336-36-3	Yes	7.9E-09 [9]	2.5E-05	7.2E-03	2.5E-05	0.010
1-Methylphenanthrene	832-69-9	No	2.6E-07 [5]	8.3E-04	0.24	8.3E-04	0.33
3-Methylcholanthrene	56-49-5	Yes	8.7E-09 [5]	2.8E-05	8.0E-03	2.8E-05	0.011
7,12-Dimethylbenz[a]anthracene	57-97-6	Yes	4.6E-09 [5]	1.5E-05	4.2E-03	1.5E-05	5.9E-03
2,4-Dinitrotoluene	121-14-2	Yes	9.4E-07 [5]	3.0E-03	0.87	3.0E-03	1.21
4,6-Dinitro-o-cresol (and salts)	534-52-1	Yes	2.1E-06 [5]	6.7E-03	1.94	6.7E-03	2.69
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	Yes	4.7E-08 [5]	1.5E-04	0.043	1.5E-04	0.060
Butyl benzyl phthalate	85-68-7	No	2.7E-05 [5]	0.086	24.7	0.086	34.3
Hydrogen cyanide	74-90-8	Yes	2.1E-05 [5]	0.066	18.9	0.066	26.3
di-n-octylphthalateb	518	No	1.1E-07 [5]	3.5E-04	0.10	3.5E-04	0.14
Ethylene dichloride (EDC, 1,2-dichloroethane)	107-06-2	Yes	2.9E-05 [5]	0.094	26.9	0.094	37.4
Isopropylbenzene (Cumene)	98-82-8	Yes	1.8E-05 [5]	0.057	16.3	0.057	22.7
p-Dichlorobenzene (1,4-Dichlorobenzene)	106-46-7	Yes	2.8E-04 [5]	0.89	257	0.89	358
Vinyl Chloride	75-01-4	Yes	1.8E-05 [5]	0.059	17.0	0.059	23.6
Trichloroethene (TCE, Trichloroethylene)	79-01-6	Yes	2.0E-05 [5]	0.064	18.4	0.064	25.5
4-nitrophenol	100-02-7	Yes	1.1E-07 [5]	3.7E-04	0.11	3.7E-04	0.15
2-Chlorophenol	95-57-8	No	2.4E-08 [5]	7.5E-05	0.022	7.5E-05	0.030
2,4-Dinitrophenol	51-28-5	Yes	1.8E-07 [5]	5.8E-04	0.17	5.8E-04	0.23
Trichlorofluoromethane (Freon 11)	75-69-4	No	1.4E-05 [5]	0.045	12.8	0.045	17.8
2,4,6-Trichlorophenol	88-06-2	Yes	2.0E-07 [5]	6.4E-04	0.18	6.4E-04	0.26
Pentachlorophenol	87-86-5	Yes	2.1E-07 [5]	6.9E-04	0.20	6.9E-04	0.27
Tetrachloroethene (Perchloroethylene)	127-18-4	Yes	2.5E-05 [5]	0.079	22.7	0.079	31.5
Total TAC Emissions Estimate				**41.7**	**11,986**	**41.7**	**16,654**
Total HAP Emissions Estimate				**24.1**	**6,948**	**24.1**	**9,654**

Notes

MMBtu = million British-thermal units;, TAC = toxic air contaminant; HAP = hazardous air pollutant; lb = pound; PCBs = Polychlorinated Biphenyls; PAHs = Polyaromatic Hydrocarbons.

[a] Daily emissions estimate (lb/day) = (emission factor [lb/MMBtu]) x (maximum daily heat input [MMBtu/day])

[b] Annual emissions estimate (lb/yr) = (emission factor [lb/MMBtu]) x (annual heat input [MMBtu/yr])

References

[1] See Table 1, Input Process Rates and Parameters.

[2] NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler with ESP or fabric filter control.

[3] Boiler MACT compliance Source Test Reports dated November 5, 2019 and December 1, 2022. Representative of the average between the two 3-run average from the ESP outlet.

[4] NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler with wet scrubber control.

[5] NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler.

[6] AP-42 Chapter 1 (March 2022), Table 1.6-3, "Emission Factors for Speciated Organic Compounds, TOC, VOC, Nitrous Oxide, and Carbon Dioxide from Wood Residue Combustion."

[7] Emission factors are for uncontrolled sources.

[8] NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler with dry ESP control device.

[9] Equal to sum of speciated PCB compounds.

Table 23
Fuel Dryer (H-DRY) TAC Emissions Estimate
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter		Permitted Throughput	Proposed Throughput
Daily Wood Fuel Throughput (ODT/day)	(1)	95.0	95.0
Annual Wood Fuel Throughput (ODT/yr)	(1)	8,554	11,880

Toxic Air Contaminant	CAS	HAP? (Yes/No)	Uncontrolled Emission Factor (2) (lb/ODT)	Estimated Control (3) Efficiency (%)	Permitted Emissions Estimates		Proposed Emissions Estimates	
					Daily (a) (lb/day)	Annual (b) (lb/yr)	Daily (a) (lb/day)	Annual (b) (lb/yr)
Organic Compounds								
Acetaldehyde	75-07-0	Yes	7.9E-03 (4)	21.0	0.59	53.0	0.59	73.7
Acetophenone	98-86-2	Yes	3.1E-05 (5)	1.00	2.9E-03	0.26	2.9E-03	0.36
Acetone	67-64-1	No	0.043 (5)	21.0	3.20	288	3.20	400
Acrolein	107-02-8	Yes	0.019 (6)	44.0	1.00	90.1	1.00	125
Benzene	71-43-2	Yes	2.6E-03 (5)	0	0.25	22.4	0.25	31.1
Bromomethane (Methyl bromide)	74-83-9	Yes	4.6E-05 (5)	3.00	4.2E-03	0.38	4.2E-03	0.53
Chloromethane (Methyl chloride)	74-87-3	Yes	1.9E-04 (5)	1.00	0.017	1.57	0.017	2.18
Crotonaldehyde	4170-30-3	No	5.5E-03 (5)	33.0	0.35	31.2	0.35	43.4
Cumene	98-82-8	Yes	3.7E-05 (5)	0	3.5E-03	0.31	3.5E-03	0.43
Formaldehyde	50-00-0	Yes	0.022 (4)	85.0	0.31	27.8	0.31	38.7
Methanol	67-56-1	Yes	0.020 (4)	95.0	0.094	8.47	0.094	11.8
Methylene chloride	75-09-2	Yes	8.6E-04 (5)	2.00	0.080	7.24	0.080	10.1
Methyl ethyl ketone	78-93-3	No	3.7E-03 (5)	44.0	0.20	17.7	0.20	24.5
Methyl isobutyl ketone	108-10-1	Yes	2.8E-03 (5)	4.00	0.25	22.6	0.25	31.4
Naphthalene	91-20-3	Yes	3.8E-03 (5)	0	0.36	32.2	0.36	44.7
Phenol	108-95-2	Yes	0.023 (6)	17.0	1.84	165	1.84	230
Propionaldehyde	123-38-6	Yes	9.9E-03 (6)	65.0	0.33	29.5	0.33	41.0
Styrene	100-42-5	Yes	1.2E-04 (5)	0	0.011	0.99	0.011	1.38
Toluene	108-88-3	Yes	4.3E-03 (5)	0	0.41	36.7	0.41	51.0
1,2,4-Trimethyl benzene	95-63-6	No	6.4E-05 (5)	0	6.1E-03	0.55	6.1E-03	0.77
Vinyl acetate	108-05-4	Yes	2.9E-05 (5)	4.00	2.7E-03	0.24	2.7E-03	0.33
m-Xylene	108-38-3	Yes	1.3E-03 (7)	0	0.12	11.1	0.12	15.4
p-Xylene	106-42-3	Yes	1.3E-03 (7)	0	0.12	11.1	0.12	15.4
o-Xylene	95-47-6	Yes	2.3E-05 (5)	0	2.2E-03	0.20	2.2E-03	0.27
Total TAC Emissions Estimate					**9.54**	**859**	**9.54**	**1,193**
Total HAP Emissions Estimate					**5.80**	**522**	**5.80**	**725**

Notes

ODT = oven-dry ton (0% moisture content).

(a) Daily emissions estimate (lb/day) = (uncontrolled emission factor [lb/MMBtu]) x (1- estimated control efficiency [%]/100) x (maximum daily heat input [MMBtu/day])

(b) Annual emissions estimate (lb/yr) = (uncontrolled emission factor [lb/MMBtu]) x (1- estimated control efficiency [%]/100) x (annual heat input [MMBtu/yr])

References

(1) See Table 1, Input Process Rates and Parameters.

(2) Emissions factors were included assuming the following heirchy: 1) NCASI Wood Products database ("direct wood-fired green pre-dryer"), 2) NCASI Wood Products database ("direct wood-fired, green dryer"), and 3) NCASI Wood Products database ("rotary dryer").

(3) Control efficiency estimated using solubility rates of organic TAPs.

(4) NCASI Air Emissions Databases - Wood Products. Representative of uncontrolled, direct wood-fired, green pre-dryer.

(5) NCASI Air Emissions Databases - Wood Products. Representative of uncontrolled, rotary dryer.

(6) NCASI Air Emissions Databases - Wood Products. Representative of uncontrolled, direct wood-fired, green dryer. See NCASI Master Summary spreadsheet dated February, 2013.

(7) NCASI Air Emissions Databases - Wood Products. Representative of uncontrolled, rotary dryer. Assumes that emission factor is one-half of emission factor for m.p-xylene.

Table 22
Wood-Fired Boiler (H-BLR-SCR) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter		Permitted Input	Proposed Input
Maximum Daily Heat Input to SCR (MMBtu/day)	(1)	1,051	1,051
Annual Heat Input to SCR(MMBtu/yr)	(1)	56,264	78,180

Toxic Air Contaminant	CAS	HAP?	Emission Factor (lb/MMBtu)	Permitted Emissions Estimates		Proposed Emissions Estimates	
				Daily [a] (lb/day)	Annual [b] (lb/yr)	Daily [a] (lb/day)	Annual [b] (lb/yr)
Metals							
Antimony	7440-36-0	Yes	2.0E-06 (2)	2.1E-03	0.11	2.1E-03	0.16
Arsenic	7440-38-2	Yes	1.1E-05 (2)	0.012	0.62	0.012	0.87
Barium	7440-39-3	No	4.0E-04 (2)	0.42	22.3	0.42	31.0
Beryllium	7440-41-7	Yes	6.9E-08 (2)	7.3E-05	3.9E-03	7.3E-05	5.4E-03
Cadmium	7440-43-9	Yes	3.2E-06 (2)	3.4E-03	0.18	3.4E-03	0.25
Chromium VI	18540-29-9	Yes	2.4E-07 (2)	2.5E-04	0.013	2.5E-04	0.018
Cobalt	7440-48-4	Yes	2.0E-06 (2)	2.1E-03	0.11	2.1E-03	0.15
Copper and compounds	7440-50-8	No	1.8E-05 (2)	0.019	1.02	0.019	1.42
Lead	7439-92-1	Yes	3.0E-05 (2)	0.032	1.69	0.032	2.35
Manganese	7439-96-5	Yes	2.5E-04 (2)	0.26	14.1	0.26	19.5
Mercury	7439-97-6	Yes	1.2E-06 (3)	1.3E-03	0.068	1.3E-03	0.094
Molybdenum trioxide	1313-27-5	No	3.1E-06 (4)	3.3E-03	0.17	3.3E-03	0.24
Nickel	365	Yes	7.3E-06 (2)	7.7E-03	0.41	7.7E-03	0.57
Selenium	7782-49-2	Yes	1.7E-06 (2)	1.8E-03	0.096	1.8E-03	0.13
Silver and compounds	7440-22-4	No	9.9E-07 (2)	1.0E-03	0.055	1.0E-03	0.077
Thailium and compounds	7440-28-0	No	1.9E-06 (2)	1.9E-03	0.10	1.9E-03	0.14
Vanadium (fume or dust)	7440-62-2	No	5.9E-07 (4)	6.2E-04	0.033	6.2E-04	0.046
Zinc	7440-66-6	No	2.3E-04 (2)	0.24	13.1	0.24	18.2
Organics							
1,2-Dichloropropane	78-87-5	Yes	1.7E-05 (5)	0.018	0.95	0.018	1.31
Acetaldehyde	75-07-0	Yes	2.8E-04 (5)	0.30	15.9	0.30	22.1
Acetone	67-64-1	No	5.3E-04 (5)	0.56	29.8	0.56	41.4
Acetophenone	98-86-2	Yes	1.8E-06 (5)	1.9E-03	0.10	1.9E-03	0.14
Acrolein	107-02-8	Yes	2.6E-04 (5)	0.27	14.6	0.27	20.3
Benzene	71-43-2	Yes	9.8E-04 (5)	1.03	55.1	1.03	76.6
Carbon tetrachloride	56-23-5	Yes	9.9E-06 (5)	0.010	0.56	0.010	0.77
Chlorine	7782-50-5	Yes	7.9E-04 (7)	0.83	44.4	0.83	61.8
Chlorobenzene	108-90-7	Yes	1.7E-05 (5)	0.017	0.93	0.017	1.30
Chloroform	67-66-3	Yes	2.0E-05 (5)	0.021	1.13	0.021	1.57
Crotonaldehyde	4170-30-3	No	4.5E-05 (5)	0.047	2.52	0.047	3.50
Dibutyl phthalate	84-74-2	Yes	3.3E-05 (5)	0.035	1.87	0.035	2.60
Diethylphthalate	84-66-2	No	4.4E-05 (5)	0.046	2.45	0.046	3.41
Ethyl benzene	100-41-4	Yes	1.2E-05 (5)	0.013	0.69	0.013	0.95
Formaldehyde	50-00-0	Yes	1.1E-03 (5)	1.10	59.1	1.10	82.1
Hexane	110-54-3	Yes	2.9E-04 (5)	0.30	16.2	0.30	22.5
Isopropyl alcohol	67-63-0	No	4.5E-03 (5)	4.75	254	4.75	353
Methanol	67-56-1	Yes	7.3E-04 (5)	0.77	41.2	0.77	57.2
Methyl bromide	74-83-9	Yes	1.1E-05 (5)	0.012	0.64	0.012	0.88
Methyl chloride	74-87-3	Yes	4.4E-05 (5)	0.046	2.45	0.046	3.40
Methyl chloroform	71-55-6	Yes	5.8E-05 (5)	0.061	3.25	0.061	4.52
Methylene chloride	75-09-2	Yes	4.0E-04 (5)	0.42	22.4	0.42	31.1
Methyl isobutyl ketone	108-10-1	Yes	4.5E-04 (5)	0.47	25.0	0.47	34.8
Methyl ethyl ketone	78-93-3	No	7.0E-06 (5)	7.3E-03	0.39	7.3E-03	0.54
Phenol	108-95-2	Yes	1.6E-04 (5)	0.17	9.00	0.17	12.5
Phosphorus	504	Yes	3.1E-04 (5)	0.33	17.4	0.33	24.2
Propionaldehyde	123-38-6	Yes	3.1E-04 (5)	0.33	17.5	0.33	24.3
Styrene	100-42-5	Yes	4.7E-04 (5)	0.49	26.4	0.49	36.7
Toluene	108-88-3	Yes	1.1E-05 (5)	0.012	0.64	0.012	0.89
Xylene (mixture)	1330-20-7	Yes	5.2E-06 (5)	5.5E-03	0.29	5.5E-03	0.41
Inorganic Compounds							
Hydrogen fluoride	7664-39-3	Yes	2.5E-05 (6)	0.027	1.43	0.027	1.99
Hydrochloric acid	7647-01-0	Yes	1.2E-04 (3)	0.12	6.64	0.12	9.23

Table 22 (Cont.)
Wood-Fired Boiler (H-BLR-SCR) TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Toxic Air Contaminant	CAS	HAP?	Emission Factor (lb/MMBtu)	Permitted Emissions Estimates		Proposed Emissions Estimates	
				Daily [a] (lb/day)	Annual [b] (lb/yr)	Daily [a] (lb/day)	Annual [b] (lb/yr)
PAHs							
Acenaphthene	83-32-9	Yes	8.5E-07 [5]	9.0E-04	0.048	9.0E-04	0.067
Acenaphthylene	208-96-8	Yes	4.7E-06 [5]	4.9E-03	0.26	4.9E-03	0.37
Anthracene	120-12-7	Yes	2.7E-06 [5]	2.8E-03	0.15	2.8E-03	0.21
Benz[a]anthracene	56-55-3	Yes	8.1E-08 [5]	8.5E-05	4.6E-03	8.5E-05	6.4E-03
Benzo[a]pyrene	50-32-8	Yes	2.2E-06 [5]	2.3E-03	0.12	2.3E-03	0.17
Benzo[b]fluoranthene	205-99-2	Yes	1.4E-07 [5]	1.5E-04	8.0E-03	1.5E-04	0.011
Benzo[e]pyrene	192-97-2	Yes	2.1E-07 [5]	2.2E-04	0.012	2.2E-04	0.016
Benzo[g,h,i]perylene	191-24-2	Yes	1.5E-07 [5]	1.6E-04	8.5E-03	1.6E-04	0.012
Benzo[j]fluoranthene	205-82-3	Yes	1.6E-07 [5]	1.6E-04	8.8E-03	1.6E-04	0.012
Benzo[k]fluoranthene	207-08-9	Yes	5.2E-08 [5]	5.4E-05	2.9E-03	5.4E-05	4.0E-03
Chrysene	218-01-9	Yes	7.9E-08 [5]	8.3E-05	4.4E-03	8.3E-05	6.2E-03
Fluoranthene	206-44-0	Yes	1.7E-06 [5]	1.8E-03	0.094	1.8E-03	0.13
Fluorene	86-73-7	Yes	3.0E-06 [5]	3.2E-03	0.17	3.2E-03	0.24
Indeno[1,2,3-cd]pyrene	193-39-5	Yes	1.0E-07 [5]	1.1E-04	5.7E-03	1.1E-04	8.0E-03
2-Methyl naphthalene	91-57-6	Yes	1.4E-06 [5]	1.5E-03	0.079	1.5E-03	0.11
Naphthalene	91-20-3	Yes	1.0E-04 [5]	0.10	5.60	0.10	7.79
Perylene	198-55-0	Yes	3.2E-08 [5]	3.4E-05	1.8E-03	3.4E-05	2.5E-03
Phenanthrene	85-01-8	Yes	6.5E-06 [5]	6.8E-03	0.36	6.8E-03	0.51
Pyrene	129-00-0	Yes	3.5E-06 [5]	3.7E-03	0.20	3.7E-03	0.28
Dioxans & Furans							
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	Yes	9.5E-13 [5]	1.0E-09	5.4E-08	1.0E-09	7.5E-08
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	No	1.3E-12 [5]	1.4E-09	7.5E-08	1.4E-09	1.0E-07
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	No	8.7E-13 [5]	9.1E-10	4.9E-08	9.1E-10	6.8E-08
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	No	2.1E-12 [5]	2.2E-09	1.2E-07	2.2E-09	1.6E-07
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	No	2.2E-12 [5]	2.3E-09	1.2E-07	2.3E-09	1.7E-07
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	No	9.8E-12 [5]	1.0E-08	5.5E-07	1.0E-08	7.6E-07
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	No	2.5E-11 [5]	2.6E-08	1.4E-06	2.6E-08	1.9E-06
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No	8.0E-12 [5]	8.5E-09	4.5E-07	8.5E-09	6.3E-07
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No	4.0E-12 [5]	4.2E-09	2.2E-07	4.2E-09	3.1E-07
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No	6.1E-12 [5]	6.4E-09	3.4E-07	6.4E-09	4.8E-07
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No	3.6E-12 [5]	3.7E-09	2.0E-07	3.7E-09	2.8E-07
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No	3.2E-12 [5]	3.3E-09	1.8E-07	3.3E-09	2.5E-07
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No	6.7E-13 [5]	7.0E-10	3.8E-08	7.0E-10	5.2E-08
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No	2.7E-12 [5]	2.8E-09	1.5E-07	2.8E-09	2.1E-07
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No	5.7E-12 [5]	6.0E-09	3.2E-07	6.0E-09	4.5E-07
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No	8.0E-13 [5]	8.4E-10	4.5E-08	8.4E-10	6.2E-08
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	No	5.0E-12 [5]	5.3E-09	2.8E-07	5.3E-09	3.9E-07
PCBs & Phthalates							
dichlorobiphenyl	--	No	7.4E-10 [5]	7.7E-07	4.1E-05	7.7E-07	5.7E-05
hexachlorobiphenyl	--	No	5.5E-10 [5]	5.7E-07	3.1E-05	5.7E-07	4.3E-05
pentachlorobiphenyl	--	No	1.2E-09 [5]	1.3E-06	6.8E-05	1.3E-06	9.4E-05
tetrachlorobiphenyl	--	No	2.5E-09 [5]	2.6E-06	1.4E-04	2.6E-06	2.0E-04
trichlorobiphenyl	--	No	2.6E-09 [5]	2.7E-06	1.5E-04	2.7E-06	2.0E-04
decachlorobiphenyl	--	No	2.7E-10 [5]	2.8E-07	1.5E-05	2.8E-07	2.1E-05
Total PCBs	1336-36-3	Yes	7.9E-09 [8]	8.3E-06	4.4E-04	8.3E-06	6.1E-04
1-Methylphenanthrene	832-69-9	No	2.6E-07 [2]	2.7E-04	0.015	2.7E-04	0.020
3-Methylcholanthrene	56-49-5	Yes	8.7E-09 [5]	9.1E-06	4.9E-04	9.1E-06	6.8E-04
7,12-Dimethylbenz[a]anthracene	57-97-6	Yes	4.6E-09 [5]	4.8E-06	2.6E-04	4.8E-06	3.6E-04
2,4-Dinitrotoluene	121-14-2	Yes	9.4E-07 [2]	9.9E-04	0.053	9.9E-04	0.074
4,6-Dinitro-o-cresol (and salts)	534-52-1	Yes	2.1E-06 [2]	2.2E-03	0.12	2.2E-03	0.16
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	Yes	4.7E-08 [2]	4.9E-05	2.6E-03	4.9E-05	3.6E-03
Butyl benzyl phthalate	85-68-7	No	2.7E-05 [2]	0.028	1.51	0.028	2.10
Hydrogen cyanide	74-90-8	Yes	2.1E-05 [2]	0.022	1.15	0.022	1.60
di-n-octylphthalateb	518	No	1.1E-07 [2]	1.2E-04	6.2E-03	1.2E-04	8.6E-03
Ethylene dichloride (EDC, 1,2-dichloroethane)	107-06-2	Yes	2.9E-05 [2]	0.031	1.64	0.031	2.28
Isopropylbenzene (Cumene)	98-82-8	Yes	1.8E-05 [2]	0.019	1.00	0.019	1.38
p-Dichlorobenzene (1,4-Dichlorobenzene)	106-46-7	Yes	2.8E-04 [2]	0.29	15.7	0.29	21.8
Vinyl Chloride	75-01-4	Yes	1.8E-05 [2]	0.019	1.04	0.019	1.44
Trichloroethene (TCE, Trichloroethylene)	79-01-6	Yes	2.0E-05 [2]	0.021	1.12	0.021	1.56
4-nitrophenol	100-02-7	Yes	1.1E-07 [2]	1.2E-04	6.4E-03	1.2E-04	8.9E-03
2-Chlorophenol	95-57-8	No	2.4E-08 [2]	2.5E-05	1.3E-03	2.5E-05	1.8E-03
2,4-Dinitrophenol	51-28-5	Yes	1.8E-07 [2]	1.9E-04	0.010	1.9E-04	0.014
Trichlorofluoromethane (Freon 11)	75-69-4	No	1.4E-05 [2]	0.015	0.78	0.015	1.09
2,4,6-Trichlorophenol	88-06-2	Yes	2.0E-07 [2]	2.1E-04	0.011	2.1E-04	0.016
Pentachlorophenol	87-86-5	Yes	2.1E-07 [2]	2.3E-04	0.012	2.3E-04	0.017
Tetrachloroethene (Perchloroethylene)	127-18-4	Yes	2.5E-05 [2]	0.026	1.38	0.026	1.92
Total TAC Emissions Estimate				**14.2**	**762**	**14.2**	**1,059**
Total HAP Emissions Estimate				**8.10**	**434**	**8.10**	**603**

Notes

MMBtu = million British-thermal units;, TAC = toxic air contaminant; HAP = hazardous air pollutant; lb = pound; PCBs = Polychlorinated Biphenyls; PAHs = Polyaromatic Hydrocarbons.

[a] Daily emissions estimate (lb/day) = (emission factor [lb/MMBtu]) x (maximum daily heat input [MMBtu/day])

[b] Annual emissions estimate (lb/yr) = (emission factor [lb/MMBtu]) x (annual heat input [MMBtu/yr])

References

[1] See Table 1, Input Process Rates and Parameters.

[2] NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler with wet scrubber control.

[3] Boiler MACT compliance Source Test Reports dated November 5, 2019 and December 1, 2022. Representative of the average between the two 3-run average from the scrubber outlet.

[4] NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler with ESP or fabric filter control.

[5] NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler.

[6] NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler with wet control device.

[7] AP-42 Chapter 1 (March 2022), Table 1.6-3, "Emission Factors for Speciated Organic Compounds, TOC, VOC, Nitrous Oxide, and Carbon Dioxide from Wood Residue Combustion." Emission factors are for uncontrolled sources.

[8] Equal to sum of speciated PCB compounds.

Table 24
Lumber Kilns (LBR-DK) TAC Emissions Estimate
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter	Throughput	
	Daily (Mbdft/day)	Annual (Mbdft/yr)
Permitted Douglas Fir Throughput	960 (1)	146,160 (2)
Permitted Hemlock Throughput		30,456 (2)
Permitted True Fir Throughput		3,384 (2)
Proposed Douglas Fir Throughput	1,047 (1)	227,360 (2)
Proposed Hemlock Throughput		47,380 (2)
Proposed True Fir Throughput		5,270 (2)

Toxic Air Contaminant	CAS	HAP	Emission Rate (lb/Mbdft)	Permitted Emissions Estimate		Proposed Emissions Estimate	
				Maximum Daily (lb/day)	Annual (lb/yr)	Maximum Daily (lb/day)	Annual (lb/yr)
Douglas Fir							
Acetaldehyde	75-07-0	Yes	0.043 (3)	41.3 (a)	6,285 (b)	45.0 (a)	9,776 (b)
Acrolein	107-02-8	Yes	8.0E-04 (3)	0.77 (a)	117 (b)	0.84 (a)	182 (b)
Formaldehyde	50-00-0	Yes	2.5E-03 (3)	2.40 (a)	365 (b)	2.62 (a)	568 (b)
Methanol	67-56-1	Yes	0.075 (3)	72.4 (a)	11,020 (b)	78.9 (a)	17,143 (b)
Propionaldehyde	123-38-6	Yes	9.0E-04 (3)	0.86 (a)	132 (b)	0.94 (a)	205 (b)
Hemlock							
Acetaldehyde	75-07-0	Yes	0.11 (4)	108 (a)	3,435 (b)	118 (a)	5,344 (b)
Acrolein	107-02-8	Yes	1.8E-03 (4)	1.73 (a)	54.8 (b)	1.88 (a)	85.3 (b)
Formaldehyde	50-00-0	Yes	2.1E-03 (4)	1.99 (a)	63.1 (b)	2.17 (a)	98.2 (b)
Methanol	67-56-1	Yes	0.11 (4)	105 (a)	3,342 (b)	115 (a)	5,199 (b)
Propionaldehyde	123-38-6	Yes	1.2E-03 (4)	1.15 (a)	36.5 (b)	1.26 (a)	56.9 (b)
True Fir							
Acetaldehyde	75-07-0	Yes	0.055 (5)	52.8 (a)	186 (b)	57.6 (a)	290 (b)
Acrolein	107-02-8	Yes	1.8E-03 (6)	1.73 (a)	6.09 (b)	1.88 (a)	9.49 (b)
Formaldehyde	50-00-0	Yes	7.3E-03 (5)	7.01 (a)	24.7 (b)	7.64 (a)	38.5 (b)
Methanol	67-56-1	Yes	0.23 (5)	220 (a)	777 (b)	240 (a)	1,209 (b)
Propionaldehyde	123-38-6	Yes	1.2E-03 (6)	1.15 (a)	4.06 (b)	1.26 (a)	6.32 (b)
Total							
Acetaldehyde	75-07-0	Yes	--	108 (7)	9,906 (8)	118 (7)	15,411 (8)
Acrolein	107-02-8	Yes	--	1.73 (7)	178 (8)	1.88 (7)	277 (8)
Formaldehyde	50-00-0	Yes	--	7.01 (7)	453 (8)	7.64 (7)	705 (8)
Methanol	67-56-1	Yes	--	220 (7)	15,139 (8)	240 (7)	23,551 (8)
Propionaldehyde	123-38-6	Yes	--	1.15 (7)	172 (8)	1.26 (7)	268 (8)

Notes

Mbdft = thousand board feet.

(a) Daily emissions estimate (lb/day) = (maximum emission factor of Douglas Fir [lb/Mbdft]) x (maximum daily throughput [Mbdft/day])

(b) Annual emissions estimate (lb/yr) = (maximum emission factor of wood species [lb/Mbdft]) x (annual throughput [Mbdft/yr])

References

(1) See Table 1, Input Process Rates and Parameters. Representative of maximum daily throughput regardless of wood species.

(2) See Table 1, Input Process Rates and Parameters.

(3) AQ-EF09, "DEQ HAP and VOC Emission Factors for Lumber Drying" Emission factors representative of Douglas Fir species with a maximum inlet temperature of 200°F.

(4) AQ-EF09, "DEQ HAP and VOC Emission Factors for Lumber Drying" Emission factors representative of Western Hemlock species with a maximum inlet temperature of 200°F.

(5) AQ-EF09, "DEQ HAP and VOC Emission Factors for Lumber Drying" Emission factors representative of Western True Fir species with a maximum inlet temperature of 200°F.

(6) AQ-EF09, "DEQ HAP and VOC Emission Factors for Lumber Drying" Emission factors representative of Western Hemlock species with a maximum inlet temperature of 200°F.

(7) Equal to highest daily emission rate between wood species.

(8) Equal to the sum of annual emission rates between wood species.

Table 25
Green Wood Cyclones TAC Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter	Permitted Throughput	Proposed Throughput
Existing Planer Mill Cyclone (S-182)		
Daily Throughput (ODT/day)	340 [1]	371 [1]
Annual Throughput (ODT/yr)	63,720 [1]	99,120 [1]
Proposed Sawmill Cyclone (SM-CHP)		
Daily Throughput (ODT/day)	--	223 [2]
Annual Throughput (ODT/yr)	--	38,976 [2]

Toxic Air Contaminant	CAS	HAP? (Yes/No)	Emission Factor [3] (lb/ODT)	Permitted Emission Estimates		Proposed Emission Estimates	
				Daily [a] (lb/day)	Annual [b] (lb/yr)	Daily [a] (lb/day)	Annual [b] (lb/yr)
Existing Planer Mill Cyclone (S-182)							
Methanol	67-56-1	Yes	1.0E-03	0.34	63.7	0.37	99.1
Proposed Sawmill Cyclone (SM-CHP)							
Methanol	67-56-1	Yes	1.0E-03	--	--	0.22	39.0

Notes

ODT = oven-dry ton (0% moisture content).

[a] Daily emissions estimate (lb/day) = (emissions factor [lb/ODT]) x (maximum daily throughput [ODT/day])

[b] Annual emissions estimate (lb/yr) = (emission factor [lb/ODT]) x (annual throughput [ODT/yr])

References

[1] See Table 1, Input Process Rates and Parameters.

[2] See Table 8, Proposed Residuals Chipper Emission Estimates.

[3] AP-42 Chapter 10 (October 2002), Table 10.6.4-9 "Emission Factors for Hardboard and Fiberboard Miscellaneous Sources -- Organics" Representative of whole log chipper.

Table 26
Hardboard Plant Press TAC Emissions Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter	Daily Throughput (Msf 1/8-in/day)	Annual Throughput (Msf 1/8-in/yr)
PTE Hardboard Press Production Rate	587 [1]	105,000 [1]
PTE Hardboard Press Production Rate (Stack Basis)	580 [a]	103,740 [a]
PTE Hardboard Press Production Rate (Fugitives Basis)	7.04 [b]	1,260 [b]

Toxic Air Contaminant	CAS	HAP?	Hardboard Press (Stack Basis)			Hoardboard Press (Fugitives Basis)		
			Emission Factor (lb/Msf 1/8-in)	Daily Emissions (lb/day)	Annual Emissions (lb/yr)	Emission Factor [5] (lb/Msf 1/8-in)	Daily Emissions (lb/day)	Annual Emissions (lb/yr)
Acetaldehyde	75-07-0	Yes	3.3E-03 [5]	1.91 [d]	342 [d]	0.016 [6]	0.11 [e]	20.2 [d]
Acetone	67-64-1	No	3.9E-03 [5]	2.26 [d]	405 [d]	5.5E-03 [6]	0.039 [e]	6.93 [d]
Formaldehyde	50-00-0	Yes	0.046 [7]	26.4 [d]	4,731 [d]	0.014 [6]	0.099 [e]	17.6 [d]
Methanol	67-56-1	Yes	0.037 [7]	21.3 [d]	3,807 [d]	0.24 [6]	1.69 [e]	302 [d]
m,p-Xylene	1330-20-7	Yes	--	--	--	5.3E-03 [6]	0.037 [e]	6.68 [d]
o-Xylene	95-47-6	Yes	--	--	--	3.6E-03 [6]	0.025 [e]	4.54 [d]
Phenol	108-95-2	Yes	--	--	--	0.010 [6]	0.070 [e]	12.6 [d]
Toluene	108-88-3	Yes	--	--	--	1.1E-03 [6]	7.7E-03 [e]	1.39 [d]
Total TAC Emissions Estimate			**--**	**51.9**	**9,285**	**--**	**2.08**	**372**
Total HAP Emissions Estimate			**--**	**49.6**	**8,880**	**--**	**2.04**	**365**

Notes

TAC = toxic air contaminant; HAP = hazardous air pollutant; Msf = thousand square feet.

[a] Hardboard press production rate (stack basis) (Msf 1/8-in/[day or yr]) = (maximum hourly hardboard press production rate [Msf 1/8-in/[day or yr]]) x (percentage of emissions through stack [%] /100)

Percentage of emissions through stack (%) = 98.8 (2)

[b] Maximum hourly production rate (fugitives basis) (Msf 1/8-in/[day or yr]) = (maximum hourly hardboard press production rate [Msf 1/8-in/[day or yr]]) x (fugitive emissions loss percentage [%] /100)

Fugitive emissions loss (%) = 1.2 (3)

[c] Daily throughput during boiler startup days (Msf/day) = (daily hours of operation [hrs/day]) x (maximum hourly production rate [Mbdft/hr])

[d] Hardboard press daily emissions estimate through stack (SU basis) (lb/day) = (emission factor [lb/Msf 1/8-in]) x (hoardboard press throughput (SU basis) [Msf 1/8-in/day])

[e] Hardboard press fugitives daily emissions estimate (SU basis) (lb/day) = (emission factor [lb/Msf 1/8-in]) x (hoardboard press fugitives throughput (SU basis) [Msf 1/8-in/day])

References

[1] See Table 1, Input Process Rates and Parameters.

[2] Capture efficiency demonstrated in a January 2009 source test.

[3] Non-captured amount as calculated using the capture efficiency demonstrated in a January 2009 source test.

[4] All emission factors are from the CAO permitting program and the level 3 risk assessment approved by the DEQ on August 5, 2024.

[5] See DEQ-approved CAO emissions inventory. AP-42 Chapter 10 (October 2002), Table 10.6.4-6, "Emission Factors for Hardboard Presses - Organics." Representative of Hardboard hot press, PF resin with scrubber control.

[6] See DEQ-approved CAO emissions inventory. AP-42 Chapter 10 (October 2002), Table 10.6.4-6, "Emission Factors for Hardboard Presses - Organics." Representative of Hardboard hot press, PF resin with no control.

[7] Emission factors from VOC compliance and emission factor verification tests conducted on the press vent scrubber (H-S123) on June 27, 2023. Representative of the average of the three test runs.

Table 27
Hardboard Plant Refiner TAC Emissions Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter	Daily	Annual
PTE Refiner Hours of Operation (hrs/"period")	24 [1]	5,500 [1]
PTE Refiner Production Rate (ODT/"period")	183 [a]	35,640 [b]

Toxic Air Contaminant	CAS	HAP?	Refiner (Scrubber Stack)					Refiner (Rotary Valve)		
			Emission Factor (Units)		Estimated Control Efficiency (%)	Daily Emissions (lb/day)	Annual Emissions (lb/yr)	Emission Factor [3] (lb/ODT)	Daily Emissions (lb/day)	Annual Emissions (lb/yr)
Acetaldehyde	75-07-0	Yes	0.035	(lb/ODT) [5]	21.0 [6]	5.06 [c]	984 [d]	1.3E-03 [7]	0.24 [e]	45.9 [f]
Acetone	67-64-1	No	4.2E-03	(lb/ODT) [8]	21.0 [6]	0.61 [c]	118 [d]	4.2E-03 [9]	0.77 [e]	150 [f]
Acrolein	107-02-8	Yes	5.4E-03	(lb/ODT) [5]	44.0 [6]	0.56 [c]	108 [d]	[10]	--	--
Formaldehyde	50-00-0	Yes	0.023	(lb/hr) [11]	[12]	0.54 [g]	124 [h]	3.6E-04 [7]	0.065 [e]	12.7 [f]
Methanol	67-56-1	Yes	0.013	(lb/hr) [11]	[12]	0.31 [g]	71.5 [h]	1.3E-03 [7]	0.23 [e]	44.9 [f]
Methyl ethyl ketone	78-93-3	No	2.5E-04	(lb/ODT) [13]	44.0 [6]	0.026 [c]	4.99 [d]	2.5E-04 [13]	0.046 [e]	8.91 [f]
Methyl isobutyl ketone	108-10-1	Yes	2.6E-04	(lb/ODT) [13]	4.00 [6]	0.045 [c]	8.83 [d]	2.6E-04 [13]	0.047 [e]	9.20 [f]
Propionaldehyde	123-38-6	Yes	1.1E-03	(lb/ODT) [5]	65.0 [6]	0.069 [c]	13.5 [d]	[10]	--	--
Styrene	100-42-5	Yes	1.8E-04	(lb/ODT) [13]	--	0.033 [i]	6.49 [j]	1.8E-04 [13]	0.033 [e]	6.49 [f]
Total TAC Emissions Estimate			**--**		**--**	**7.25**	**1,439**	**--**	**1.43**	**278**
Total HAP Emissions Estimate			**--**		**--**	**6.62**	**1,316**	**--**	**0.61**	**119**

Notes

TAC = toxic air contaminant; HAP = hazardous air pollutant; ODT = oven-dry ton (0% moisture content).

[a] PTE daily (ODT/day) = (maximum hourly production rate [ODT/hr]) x (PTE daily hours of operation [hrs/day])

PTE Refiner Hourly Production Rate (ODT/hr) = 7.64 (2)

[b] PTE annual production rate (ODT/yr) = (maximum hourly production rate [ODT/hr]) x (PTE annual hours of operation [hrs/yr])

Average Hourly Production Rate (ODT/hr) = 6.48 (3)

[c] Refiner (scrubber basis) daily emissions (lb/day) = (uncontrolled emission factor [lb/ODT]) x (PTE daily refiner throughput [ODT/day]) x (1- estimated control efficiency [%]/100))

[d] Refiner (scrubber basis) annual emissions (lb/yr) = (uncontrolled emission factor [lb/ODT]) x (PTE annual refiner throughput [ODT/yr]) x (1- estimated control efficiency [%]/100))

[e] Refiner (rotary valve basis) daily emissions (lb/day) = (emission factor [lb/ODT]) x (PTE daily refiner throughput [ODT/day])

[f] Refiner (rotary valve basis) annual emissions (lb/yr) = (emission factor [lb/ODT]) x (PTE annual refiner throughput [ODT/yr])

[g] Refiner (scrubber basis) daily emissions (lb/day) = (emission rate [lb/hr]) x (PTE refiner daily hours of operation [hrs/day])

[h] Refiner (scrubber basis) annual emissions (lb/yr) = (emission rate [lb/hr]) x (PTE refiner annual hours of operation [hrs/yr])

[i] Refiner (scrubber basis) daily emissions (lb/day) = (uncontrolled emission factor [lb/ODT]) x (PTE daily refiner throughput [ODT/day])

[j] Refiner (scrubber basis) annual emissions (lb/yr) = (uncontrolled emission factor [lb/ODT]) x (PTE annual refiner throughput [ODT/yr])

References

[1] Information provided by Stimson Lumber Company. Representative of the daily and annual hours of operation as submitted with the level 3 risk assessment approved by the DEQ on August 5, 2024.

[2] Maximum PTE hourly production rate for the refiner and forming line based on 1/4-inch tempered hardboard production.

[3] Average hourly throughput rate is based on review of historical throughput rates of each size hardboard manufactured at the facility and forecasted future product rates.

[4] All emission factors are from the CAO permitting program and the level 3 risk assessment approved by the DEQ on August 5, 2024.

[5] Emission factors are derived from Source Test Evaluation Report (2007). Emissions factors are based on testing performed on the mixing chest outlet, which at the time, was uncontrolled. Since 2007, the mixing chest outlet now vents to scrubber 5.

[6] Control efficiency estimated using solubility rates of organic TAPs.

[7] Emission factors are from Source Test Evaluation Report (2007). Emissions factors are based on testing performed on the rotary valve outlet.

[8] AP-42 Chapter 10 (October 2002), Table 10.6.4-9 "Emission Factors for Hardboard and Fiberboard Miscellaneous Sources -- Organics" Representative of uncontrolled Hardboard pressurized digester/refiner, hardwood.

[9] AP-42 Chapter 10 (October 2002), Table 10.6.4-9 "Emission Factors for Hardboard and Fiberboard Miscellaneous Sources -- Organics" Representative of uncontrolled Hardboard pressurized digester/refiner, hardwood.

[10] Emission factors are from Source Test Evaluation Report (2007). Emissions factors are based on testing performed on the rotary valve outlet. Test results for this TAC were below the detection limit.

[11] Emission Factor Verification Source Test Reports dated July 9, 2007 and August 1, 2023. Representative of the average between the two 3-run average from the scrubber outlet.

[12] Emission factor is representative of wet scrubber control for this pollutant.

[13] NCASI Air Emissions Databases - Pullp and Paper. Representative of an uncontrolled hardboard refiner. Represents mean emission factor.

[14] Control efficiency estimated using solubility rates of organic TAPs. No control is assumed for this TAC.

Table 28
Surface Treatment VOC/TAC Emissions Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Product	Proposed PTE	
	Daily (gal/day)	Annual (gal/yr)
AntiBlu M3 Concentrate (VOC PSEL)	45.83 [1]	4,000 [1]
AntiBlu M3 Treating Solution (CAO)	1,146 [1]	99,500 [1]

Product	Vendor	Pollutant	CAS	HAP? (Yes/No)	% Weight Pollutant	Product Density (lb/gallon)	Proposed PTE Emissions	
							Daily [a] (lb/day)	Annual [b] (tons/yr)
AntiBlu M3 Concentrate (VOC PSEL) [2]	Arch Wood Protection, Inc.	VOC	--	--	29.8 [3]	8.23 [3]	112	4.90
AntiBlu M3 Treating Solution (CAO) [4]	Arch Wood Protection, Inc.	DGME [5]	34590-94-8	No	0.30 [d]	8.28 [8]	28.5	1.24

Notes

DGME = Dipropylene glycol monomethyl ether.

[b] Daily emissions estimate (lb/day) = (maximum daily product usage [gal/day]) x (product density [lb/gal]) x (percent weight pollutant [%] / 100)

[c] Annual emissions estimate (lb/yr) = (product usage [gal/yr]) x (product density [lb/gal]) x (weight percent [%] / 100)

[d] TAC concentration (% by wt) = (TAC concentration in AntiBlu M3 concentrate [% by wt]) / (parts AntiBlu M3 concentrate / parts distilled H_2O)

TAC concentration in concentrate [% by wt] =	7.50	(6)
Parts AntiBlu M3 concentrate =	1.00	(7)
Parts distilled H_2O=	25.0	(7)

References

[1] See Table 1, Input Process Rates and Parameters.

[2] VOC emissions for PSEL compliance tracking are estimated using a material balance and the concentrate form of the chemical compound. The concentrate is used as it is easier to track the amount used. Blending occurs in a fully sealed metal container. Therefore, there are no actual VOC emissions associated with blending of the concentrate. However, VOC emissions are estimated assuming this methodology.

[3] Information obtained from the safety data sheet for the AntiBlu M3 concentrate compound manufactured by Arch Wood Protection, Inc.

[4] TAC emissions for the CAO program were estimated for periods when the AntiBlu solution is applied to the lumber via atomized spraying. Therefore, the AntiBlu M3 treating solution is used as the basis for TAC emissions for CAO permitting.

[5] Information obtained from the safety data sheet for the AntiBlu M3 treating solution. The treating solution SDS assumes the manufacturers recommended mixture of 1 part concentrate to 25 parts distilled water for the final solution.

[6] Information obtained from the safety data sheet for the AntiBlu M3 concentrate compound manufactured by Arch Wood Protection, Inc. Value representative of average of range.

[7] Dilution ratio provided by chemical manufacturer, Arch Wood Protection, Inc.

[8] Exact product density unavailable at this time. MFA proposes to use the same product density as AntiBlu M6 treating solution as a surrogate to the AntiBlue M3 treating solution.

Table 29
Bulk Resin Storage Tanks TAC Emissions Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter		(Units)	Resin Storage Tanks				AP-42 Variable
			Resin Tank 1	Resin Tank 2	Resin Tank 3	Resin Tank 4	
PRODUCTION VALUES							
Resin Stored		--	BK 276A30	BK 276A30	BK 276A30	BK 254A20	--
Storage Tank IDs		--	R1	R2	R3	R4	--
Total Annual Throughput	(1)	(gal/yr)	157,853	157,853	157,853	19,365	--
Total Annual Throughput	(a)	(bbl/yr)	3,758	3,758	3,758	461	Q
Maximum Daily Throughput	(1)	(gal/day)	4,763	5,195	5,223	1,469	--
Maximum Daily Throughput	(a)	(bbl/day)	113	124	124	34.98	--
Annual Days of Operation	(2)	(days/yr)	365	365	365	365	--
TANK PROPERTIES							
Tank Type (Fixed Roof or Internal Floating Roof Tank)	(3)	--	Fixed-Roof	Fixed-Roof	Fixed-Roof	Fixed-Roof	--
Heated or Not Heated?	(3)	--	Not Heated	Not Heated	Not Heated	Not Heated	--
Controlled or Fugitive?	(3)	--	Fugitive	Fugitive	Fugitive	Fugitive	--
Control Efficiency		(%)	0	0	0	0	--
Tank Roof Color	(3)	--	Aluminum-Diffuse	Aluminum-Diffuse	Aluminum-Diffuse	Aluminum-Diffuse	--
Tank Roof Condition	(3)	--	Average	Average	Average	Average	--
Tank Shell Color	(3)	--	Aluminum-Diffuse	Aluminum-Diffuse	Aluminum-Diffuse	Poly-Diffuse	--
Tank Shell Condition	(3)	--	Average	Average	Average	Average	--
Horizontal or Vertical	(3)	--	Vertical	Vertical	Vertical	Vertical	--
Tank Diameter	(3)	(ft)	6.80	8.10	8.10	5.00	D
Tank Shell Height	(3)	(ft)	17.3	13.6	13.7	11.33	H_S
Roof Type	(3)	--	Flat	Flat	Flat	Flat	--
Maximum Liquid Height	(4)	(ft)	16.30	12.60	12.70	10.33	H_{LX}
Minimum Liquid Height	(5)	(ft)	1.00	1.00	1.00	1.00	H_{LN}
TANK CONTENT PROPERTIES							
Average Daily Liquid Surface Temperature	(b)	(°R)	519				T_{LA}
Maximum Liquid Surface Temperature	(7)	(°R)	555				T_{MAX}
Liquid Molecular Weight	(8)	(lb/lb-mole)	134.13				M_L
Vapor Molecular Weight	(8)	(lb/lb-mole)	134.13				M_V
True Vapor Pressure	(9)	(psia)	0.46				P_{VA}
ENVIRONMENTAL FACTORS							
Average Daily Maximum Ambient Temperature	(10)	(°R)	528				T_{AX}
Average Daily Minimum Ambient Temperature	(10)	(°R)	499				T_{AN}
Average Daily Total Insolation on a Horizontal Surface	(11)	(Btu/ft^2-day)	1,145				I
CALCULATED VARIABLES							
Standing Loss Calculations							
Average Daily Ambient Temperature Range	(c)	(°R)	29.13	29.13	29.13	29.13	ΔT_A
Tank Roof Surface Solar Absorptance	(13)	--	0.64	0.64	0.64	0.64	a_R
Tank Shell Surface Solar Absorptance	(13)	--	0.64	0.64	0.64	0.64	a_S
Average Tank Surface Solar Absorptance	(d)	--	0.64	0.64	0.64	0.64	a
Average Daily Vapor Temperature Range	(e)	(°R)	35.0	35.0	35.0	35.0	ΔT_V
Vapor Space Expansion Factor	(f)	--	0.063	0.063	0.063	0.063	K_E
Liquid Height	(16)	(ft)	8.65	6.80	6.85	5.67	H_L
Tank Shell Radius	(3)	(ft)	3.40	4.05	4.05	2.50	R_S
Tank Roof Height	(17)	(ft)	0	0	0	0	H_R
Roof Outage	(17)	(ft)	0	0	0	0	H_{RO}
Vapor Space Outage	(g)	(ft)	8.65	6.80	6.85	5.67	H_{VO}
Vented Vapor Saturation Factor	(h)	--	0.82	1.00	1.00	1.00	K_S
Average Daily Ambient Temperature	(i)	(°R)	514	514	514	514	T_{AA}
Liquid Bulk Temperature	(j)	(°R)	516	516	516	516	T_B
Average Vapor Temperature	(k)	(°R)	519	520	520	519	T_V
Stock Vapor Density	(l)	(lb/ft^3)	1.1E-02	1.1E-02	1.1E-02	1.1E-02	W_V
Annual Standing Loss	(m)	(lb/yr)	66.7	90.2	90.9	28.6	L_S
Daily Standing Loss	(n)	(lb/day)	0.18	0.25	0.25	0.078	--
Working Loss Calculations							
Annual Net Working Loss Throughput	(o)	(ft^3/yr)	21,100	21,100	21,100	2,588	V_Q
Annual Sum of the Increase in Liquid Level	(p)	(ft/yr)	581	409	409	132	ΣH_{QI}
Number of Turnovers per Year	(q)	--	38.0	35.3	35.0	14.1	N
Working Loss Turnover (Saturation) Factor per Year	(r)	--	0.96	1.00	1.00	1.00	K_N
Daily Net Working Loss Throughput	(o)	(ft^3/day)	637	694	698	196	V_Q
Daily Sum of the Increase is Liquid Level	(p)	(ft/day)	17.5	19.1	19.2	5.4	ΣH_{QI}
Number of Turnovers per Day	(q)	--	1.15	1.65	1.64	0.58	N
Working Loss Turnover (Saturation) Factor per Day	(r)	--	1.00	1.00	1.00	1.00	K_N
Working Loss Product Factor	(29)	--	1.00	1.00	1.00	1.00	K_P
Breather Vent Range	(30)	--	0.06	0.06	0.06	0.06	K_B
Vent Setting Correction Factor	(31)	--	1.00	1.00	1.00	1.00	K_B
Annual Working Loss	(s)	(lb/yr)	226	236	236	28.9	L_W
Daily Working Loss	(t)	(lb/day)	6.66	7.26	7.30	2.05	--
Annual Total Tank Routine Losses	**(u)**	**(lb/yr)**	**292**	**326**	**327**	**57.6**	**L_T**
Daily Total Tank Routine Losses	**(u)**	**(lb/day)**	**6.84**	**7.51**	**7.55**	**2.13**	**--**

All notes and references are provided on the following page. See Table 29 (Continued), Bulk Resin Storage Tanks TAC Emissions Estimates.

Table 29 (Continued)
Bulk Resin Storage Tanks TAC Emissions Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Component	CAS	Regulatory Category (Yes/No)			Physical Characteristics			EPA Tanks Methodology (Annual Calculations)				EPA Tanks Methodology (Daily Calculations)				Emissions Estimate	
					Z_{ll}	M_l	x_l	P	P_l	y_l	Z_{Vl}	P	P_i	y_l	Z_{Vl}	L_{Tl} (Requested PTE)	
		TAC	HAP	RBC	Liquid Weight Fraction	Molecular Weight (lb/lb-mol)	Liquid Mole Fraction	Vapor Pressure (psi)	Partial Pressure (psi)	Vapor Mole Fraction of Component	Vapor Weight Fraction of Component	Vapor Pressure (psi)	Partial Pressure (psi)	Vapor Mole Fraction of Component	Vapor Weight Fraction of Component	Maximum Daily (lb/day)	Annual (lb/yr)
Tank 1 (BK 276A30)																	
Phenol	108-95-2	Yes	Yes	Yes	9.0E-04 [35]	94.11 [36]	1.3E-03 [v]	2.7E-03 [38]	3.5E-06 [w]	7.5E-06 [x]	5.23E-06 [y]	1.6E-02 [42]	2.0E-05 [w]	4.3E-05 [x]	3.0E-05 [y]	2.1E-04 [z]	1.5E-03 [z]
Formaldehyde	50-00-0	Yes	Yes	Yes	9.0E-04 [35]	30.03 [36]	4.0E-03 [v]	53.8 [38]	2.2E-01 [w]	0.47 [x]	0.10 [y]	99.3 [42]	4.0E-01 [w]	0.9 [x]	0.19 [y]	1.32 [z]	30.51 [z]
Methanol	67-56-1	Yes	Yes	Yes	3.0E-03 [35]	32.04 [36]	1.3E-02 [v]	1.43 [38]	1.8E-02 [w]	0.04 [x]	0.01 [y]	4.05 [42]	5.1E-02 [w]	0.11 [x]	0.03 [y]	0.18 [z]	2.71 [z]
Tank 2 (BK 276A30)																	
Phenol	108-95-2	Yes	Yes	Yes	9.0E-04 [35]	94.11 [36]	1.3E-03 [v]	2.7E-03 [38]	3.5E-06 [w]	7.5E-06 [x]	5.23E-06 [y]	1.6E-02 [42]	2.0E-05 [w]	4.3E-05 [x]	3.0E-05 [y]	2.3E-04 [z]	1.7E-03 [z]
Formaldehyde	50-00-0	Yes	Yes	Yes	9.0E-04 [35]	30.03 [36]	4.0E-03 [v]	53.8 [38]	2.2E-01 [w]	0.5 [x]	0.10 [y]	99.3 [42]	4.0E-01 [w]	0.9 [x]	0.19 [y]	1.45 [z]	34.03 [z]
Methanol	67-56-1	Yes	Yes	Yes	3.0E-03 [35]	32.04 [36]	1.3E-02 [v]	1.43 [38]	1.8E-02 [w]	0.04 [x]	0.01 [y]	4.05 [42]	5.1E-02 [w]	0.11 [x]	0.03 [y]	0.20 [z]	3.02 [z]
Tank 3 (BK 276A30)																	
Phenol	108-95-2	Yes	Yes	Yes	9.0E-04 [35]	94.11 [36]	1.3E-03 [v]	2.7E-03 [38]	3.5E-06 [w]	7.5E-06 [x]	5.23E-06 [y]	1.6E-02 [42]	2.0E-05 [w]	4.3E-05 [x]	3.0E-05 [y]	2.3E-04 [z]	1.7E-03 [z]
Formaldehyde	50-00-0	Yes	Yes	Yes	9.0E-04 [35]	30.03 [36]	4.0E-03 [v]	53.8 [38]	2.2E-01 [w]	0.5 [x]	0.10 [y]	99.3 [42]	4.0E-01 [w]	0.9 [x]	0.19 [y]	1.45 [z]	34.10 [z]
Methanol	67-56-1	Yes	Yes	Yes	3.0E-03 [35]	32.04 [36]	1.3E-02 [v]	1.43 [38]	1.8E-02 [w]	0.04 [x]	0.01 [y]	4.05 [42]	5.1E-02 [w]	0.11 [x]	0.03 [y]	0.20 [z]	3.03 [z]
Tank 4 (BK 254A20)																	
Epichlorohydrin	106-89-8	Yes	Yes	Yes	2.7E-04 [35]	92.52 [36]	3.8E-04 [v]	0.19 [38]	7.2E-05 [w]	1.6E-04 [x]	1.08E-04 [y]	0.55 [42]	2.1E-04 [w]	4.6E-04 [x]	3.2E-04 [y]	6.75E-04 [z]	6.2E-03 [z]
Total																	
Phenol	**108-95-2**															**6.61E-04**	**4.94E-03**
Formaldehyde	**50-00-0**															**4.22**	**98.6**
Methanol	**67-56-1**															**0.57**	**8.77**
Epichlorohydrin	**106-89-8**															**6.75E-04**	**6.19E-03**

Notes

TAC = toxic air contaminant; HAP = hazardous air pollutant; PTE = potential to emit; bbl = barrel; °R = degrees Rankin; Btu = British-thermal unit;

[a] Total annual or daily throughput (bbl/"unit") = (total annual or daily throughput [gal/"unit"]) x (bbl/42 gal)

[b] Average daily liquid surface temperature (°R) = ([0.4] x [average daily ambient temperature {°R}]) + ([0.6] x [liquid bulk temerature {°R}) + ([0.005] X [tank shell surface solar absorptance {°R}] x [average daily total insolation factor {Btu/ft2-day}]); See reference (6).

[c] Average daily ambient temperature range (°R) = ([daily maximum ambient temperature {°R}] - [daily minimum ambient temperature {°R}]); See reference (12).

[d] Average tank surface solar absorptance = ([tank roof surface solar absorptance] + [tank shell surface solar absorptance]) / (2)

[e] Average daily vapor temperature range (°R) = ([0.7] x [average daily temperature range {°R}]) + ([0.02] x [average tank surface solar absorptance] x [average daily total insolation factor {Btu/ft²-d}]); See reference (14).

[f] Vapor space expansion factor = (0.0018) x (average daily vapor temperature range [°R]); See reference (15).

[g] Vapor space outage (ft) = (tank shell height [ft]) - (liquid height [ft]) + (roof outage [ft]); See reference (18).

[h] Vented vapor saturation factor = (1) / ([1] + [0.053] x [vapor pressure at average daily liquid surface temperature {psia}] x [vapor space outage {ft}]); See reference (19).

[i] Average daily ambient temperature (°R) = ([average daily maximum ambient temperature {°R}] + [average daily minimum ambient temperature {°R}]) / (2); See reference (20).

[j] For non-heated tank: Liquid bulk temperature (°R) = (average daily ambient temperature [°R]) + ([0.003] x [tank shell surface solar absorptance {°R}] x [average daily total insolation factor {Btu/ft²-day}]); See reference (21).

[k] Average vapor temperature (°R) = ([2.2 x {tank shell height |ft|} / {tank diameter |ft|} + 1.1] x [average daily ambient temperature {°R}] + [0.8 x {liquid bulk temperature |°R|}] + [0.021 x {tank roof surface solar absorptance} x {average daily total insolation factor |Btu/ft²-day|}] + [0.013 x {tank shell height |ft|} / {tank diameter |ft|} x {tank shell surface solar absorptance} x {average daily total insolation factor {|Btu/ft²-day|}}]) / (2.2 x [tank shell height {ft}] / [tank diameter {ft}] + 1.9); See Reference (22).

[l] Stock vapor density (lb/ft³) = ([vapor molecular weight {lb/lb-mole}] x [true vapor pressure {psia}]) / ([10.731 psia-ft³/lb-mole-°R] x [average vapor temperature {°R}]); See reference (23).

[m] Annual standing loss (lb/yr) = (365) x (vapor space exp. factor per day) x ([π/4] x [diameter {ft}]²) x (vapor space outage [ft]) x (vented vapor sat. factor) x (stock vapor density [lb/ft³]); See reference (24).

[n] Daily standing loss (lb/day) = (annual standing loss [lb/yr]) / (365 days/yr)

[o] Net working loss throughput (ft³/yr or ft³/day) = (5.614 ft³/bbl) x (total annual or daily throughput [bbl/yr or bbl/day]); See reference (25).

[p] Annual or daily sum of the increases in liquid level (ft/yr or ft/day) = ([5.614 ft³/bbl] x [total annual or daily throughput {bbl/yr or bbl/day}]) / ([π/4] x [tank diameter {ft}]²); See reference (26).

[q] Number of turnovers per year or day = (annual or daily sum of the increases in liquid level [ft/yr or ft/day]) / ([maximum liquid height {ft}] - [minimum liquid height {ft}]); See reference (27).

[r] If N <= 36, working loss turnover factor equal to 1, or working loss turnover factor = ([180] + [number of turnovers per year or day]) / ([6] x [number of turnovers per year or day]); See reference (28).

[s] Annual working loss (lb/yr) = (net working loss throughput [ft³/yr]) x (working loss turnover factor) x (working loss product factor) x (stock vapor density [lb/ft³]) x (vent set. correction factor); See reference (32).

[t] Daily working loss (lb/day) = ([vapor molecular weight {lb/lbmol} x worst case vapor pressure {psia}] / [80.273] x [worst case liquid surface temperature {R}]) x (daily filling rate [gal/day]; See reference (33).

[u] Annual or daily total tank routine losses (lb/yr or lb/day) = (annual or daily standing losses [lb/yr or lb/day]) + (annual or daily working losses [lb/yr or lb/day]); See reference (34).

[v] Liquid mole fraction of component (lb-mol/lb-mol) = (weight fraction of component in the liquid [lb/lb]) x (molecular weight of liquid stock [lb/lb-mol]) / (moleclular weight of component [lb/lb-mol]); See reference (37).

[w] Partial pressure of component (psia) = (vapor pressure [psia]) x (liquid mole fraction [lb-mol/lb-mol]); See reference (39).

[x] Vapor mole fraction (lb-mol/lb-mol) =(partial vapor pressure of component [psia]) / (total vapor pressure of liquid mixture [psia]); See reference (40).

[y] Vapor weight fraction of component (lb/lb) = (vapor mole fraction of component [lb-mol/lb-mol]) x (molecular weight of component [lb/lb-mol]) / (molecular weight of vapor stock [lb/lb-mol]); See reference (41).

[z] Emission rate of component (lb/yr or lb/day) = (vapor weight fraction of component [lb/lb]) x (annual or daily total routine losses [lb/yr or lb/day]); See reference (43).

References

[1] See Table 1, Input Process Rates and Parameters.

[2] Based on continuous annual operation.

[3] Information provided by Stimson Lumber Company.

[4] AP-42 Chapter 7 (October 2024); see equation 1-36 notes. For vertical tanks, value is set to one minus the tank shell height.

[5] AP-42, Chapter 7 (October 2024); see equation 1-36. For vertical tanks, value set to 1.

[6] AP-42, Chapter 7 (October 2024); see notes for equation 1-30.

[7] Assumes maximum liquid surface temperature of 95°F per "TCEQ Estimating Short Term Emission Rates from Fixed Roof Tanks." Converted to degrees Rankin.

[8] Liquid molecular weight obtained from the National Center for Biotechnology Information, PubChem online chemistry database. Representative of phenol-formaldehyde resin. Vapor molecular weight is assumed as as liquid.

[9] Vapor pressure of BK 254A20 and BK 276A30 estimated at 20°C as surrogate for true vapor pressure. Vapor pressures provided by the product manufacturer, Bakelite Synthetics. Converted from kPa to psia.

[10] Representative of average daily minimum and maximum daily temperatures for the 30-year period between 1992 and 2021 for Forest Grove, Oregon (Station ID 352997). Data obtained from the WRCC.

[11] AP-42, Chapter 7 (October 2024); Table 7.1-7. Assumes Salem, Oregon as it is the nearest city in the table to the facility .

[12] AP-42, Chapter 7 (October 2024); see equation 1-11.

[13] AP-42, Chapter 7 (October 2024); Table 7.1-6.

[14] AP-42, Chapter 7 (October 2024); see equation 1-35.

[15] AP-42, Chapter 7 (October 2024); see equation 1-12.

[16] AP-42, Chapter 7 (October 2024); see equation 1-16. Per equation 1-16 notes, liquid height typically assumed to be at the half full level in the absence of site-specific data.

[17] AP-42, Chapter 7 (October 2024); see Note 3 to Equation 1-18. Roof is flat. Therefore, tank roof height and roof outage equal zero.

[18] AP-42, Chapter 7 (October 2024); see equation 1-18.

[19] AP-42, Chapter 7 (October 2024); see equation 1-23.

[20] AP-42, Chapter 7 (October 2024); see equation 1-32.

[21] AP-42, Chapter 7 (October 2024); see equation 1-33.

[22] AP-42, Chapter 7 (October 2024); see equation 1-34.

[23] AP-42, Chapter 7 (October 2024); see equation 1-24.

[24] AP-42, Chapter 7 (October 2024); see equation 1-4.

[25] AP-42, Chapter 7 (October 2024); see note 1 to equation 1-37.

[26] AP-42, Chapter 7 (October 2024); see equation 1-39.

[27] AP-42, Chapter 7 (October 2024); see equation 1-38.

[28] AP-42, Chapter 7 (October 2024); see note for K_N to equation 1-37.

[29] AP-42, Chapter 7 (October 2024); see notes for equation 1-35. Assumes working loss product factor is 0.75 for crude oils, or 1 for all other organic liquids.

[30] AP-42, Chapter 7 (October 2024); see note to equation 1-10.

[31] AP-42, Chapter 7 (October 2024); see note 2 to equation 1-37.

[32] AP-42, Chapter 7 (October 2024); see equation 1-37.

[33] TCEQ Estimating Short Term Emission Rates from Fixed Roof Tanks. Equation 1.

[34] AP-42, Chapter 7 (October 2024); see equation 1-1.

[35] See VOC and HAPs report prepared by Bakelite Sythetics dated March 28, 2024. Information obtained from safety data sheet for product.

[36] Molecular weights obtained from National Institute of Standards and Technology Chemistry WebBook.

[37] AP-42, Chapter 7 (October 2024); see equation 40-4.

[38] AP-42 Chapter 7 (October 2024); Table 7.1-3. Vapor pressure derived from parameters presented in Table 7.1-3, or from publicly-available chemical data, using the Antoine Equation at the specified tank temperature. Assumes average liquid temperature of 519 °R.

[39] AP-42, Chapter 7 (October 2024); see equation 40-3.

[40] AP-42, Chapter 7 (October 2024); see equation 40-5.

[41] AP-42, Chapter 7 (October 2024); see equation 40-6.

[42] AP-42 Chapter 7 (October 2024); Table 7.1-3. Vapor pressure derived from parameters presented in Table 7.1-3, or from publicly-available chemical data, using the Antoine Equation at the specified tank temperature. Assumes average liquid temperature of 555 °R.

[43] AP-42, Chapter 7 (October 2024); see equation 40-1.

Table 30
Existing Planer Shaker Baghouse (S-200) Emission Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter		Value
Maximum Daily Operation (hr/day)	(1)	24
Permitted Annual Operation (hr/yr)	(1)	6,240
Proposed Daily Operation (hr/day)	(1)	24
Proposed Annual Operation (hr/yr)	(1)	6,240

Pollutant	Emission Rate (lb/hr)		Emissions Estimate			
			Daily (lb/day)		Annual (tons/yr)	
Permitted Emissions						
PM	0.44	(2)	10.6	(a)	1.37	(b)
PM_{10}	0.44	(2)	10.6	(a)	1.37	(b)
$PM_{2.5}$	0.44	(2)	10.6	(a)	1.37	(b)

Notes

(a) Daily emissions estimate (lb/day) = (emission rate [lb/hr]) x (daily hours of operation [hr/day])

(b) Annual emissions estimate (tons/yr) = (emission rate [lb/hr]) x (annual hours of operation [hr/yr]) / (2,000 lb/ton)

References

(1) Stimson is not requesting a change in daily or annual emissions for this emission unit.

(2) Existing Title V Permit No, 34-2066-TV-01, condition 87.a. Representative of S-200 (FJLB Baghouse).

Table 31
Existing Emergency Engine Criteria Pollutant Emissions Estimates
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter	Feedwater Pump Emergency Generator	Backup Emergency Generator	Emergency Fire Pump
	EGEN01	BGEN	FIRE
Engine Size (kW) [1]	235	805	142
Engine Size (hp) [a]	315	1,080	190
Hourly Fuel Consumption (gal/hr) [1]	14.9	40.8	7.20
Annual Fuel Usage (gal/yr) [b]	1,490	4,083	720
NORMAL OPERATION			
Annual Hours of Operation (hrs/yr) [2]	100	100	100

Pollutant	Emission Estimates								
	Feedwater Pump Emergency Generator			Backup Emergency Generator		Emergency Fire Pump			
	Emission Factor (g/hp-hr)	Hourly (lb/hr)	Annual (tons/yr)	Hourly (lb/hr)	Annual (tons/yr)	Emission Factor (units)		Hourly (lb/hr)	Annual (tons/yr)
PM	0.12 [3]	0.083 [c]	4.2E-03 [d]	0.24 [4]	0.012 [d]	0.20	(g/kW-hr) [5]	0.063 [e]	3.1E-03 [d]
PM_{10}	0.12 [3]	0.083 [c]	4.2E-03 [d]	0.24 [4]	0.012 [d]	0.20	(g/kW-hr) [5]	0.063 [e]	3.1E-03 [d]
$PM_{2.5}$	0.12 [3]	0.083 [c]	4.2E-03 [d]	0.24 [4]	0.012 [d]	0.20	(g/kW-hr) [5]	0.063 [e]	3.1E-03 [d]
NO_X	3.39 [3]	2.36 [c]	0.12 [d]	7.77 [4]	0.39 [d]	4.00	(g/kW-hr) [5]	1.25 [e]	0.063 [d]
CO	1.20 [3]	0.83 [c]	0.042 [d]	3.30 [4]	0.17 [d]	3.50	(g/kW-hr) [5]	1.10 [e]	0.055 [d]
SO_2	0.93 [6]	0.65 [c]	0.032 [d]	0.21 [4]	0.011 [d]	1.25	(g/kW-hr) [7]	0.39 [e]	0.020 [d]
VOC	0.19 [3]	0.13 [c]	6.6E-03 [d]	0.20 [4]	0.010 [d]	1.30	(g/kW-hr) [5]	0.41 [e]	0.020 [d]
CO_2	755 [3]	524 [c]	26.2 [d]	934 [4]	46.7 [d]	22.5	(lb/gal) [f]	162 [g]	8.11 [d]

Notes

g/kW-hr = grams per kilowatt-hour; ULSD = ultra-low sulfur diesel.

[a] Engine size (hp) = (kW) x (1.341 hp/kW)

[b] Annual fuel consumption (gal/yr) = (hourly fuel consumption [gal/hr]) x (annual hours of operation [hrs/yr])

[c] Hourly emissions estimate (lb/hr) = (emission factor [lb/hp-hr]) x (hourly power rating [hp/hr])

[d] Annual emissions estimate (tons/yr) = (hourly emissions rate [lb/hr]) x (annual hours of operation [hrs/yr]) / (2,000 lb/ton)

[e] Hourly emissions estimate (lb/hr) = (emission factor [lb/kW-hr]) x (hourly energy rating [kW/hr])

[f] CO_2 emission factor (lb/gal) = (CO_2 emission factor [kg/MMBtu]) x (default high heat value [MMBtu/gal]) x (2.205 lb/kg)

CO_2 emission factor (kg/MMBtu) = 73.96 (8)

Default high heat value (MMBtu/gal) = 0.138 (8)

[g] Hourly emissions estimate (lb/hr) = (emission factor [lb/gal]) x (hourly fuel consumption [gal/hr])

References

[1] Information provided by Stimson Lumber Company.

[2] Assumes maximum allowable operation of emergency engines at 100 hrs/yr.

[3] Information provided with Notice of Intent to Construct application for EGEN01 submitted to DEQ in November, 2023.

[4] Existing Title V Permit No, 34-2066-TV-01, condition 87.a. Representative of B-GEN.

[5] USEPA Nonroad Compression-Ignition Engines: Exhaust Emission Standards (EPA-420-B-16-022) dated March 2016. Representative of Tier 3 emission factors.

[6] AP-42 Chapter 3.3 (October 1996), Table 3.3-1 "Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines." Converted from lb/hp-hr to g/kW-hr.

[7] AP-42 Chapter 3.3 (October 1996), Table 3.3-1 "Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines." Converted to g/kW-hr using note 1.a.

[8] 40 CFR Part 98 Subpart C, Table C-1, "Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel." Assumes Distillate Fuel Oil No.2.

Table 32
Wood-Fired Boilers SU/SD TAC Emissions Estimates (CAO Only)
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter	Throughput (SU/SD)	
	Daily (MMBtu/day)	Annual (MMBtu/yr)
Multi-Clone Control (SU/SD)	873 (1)	69,875 (1)
Scrubber Control (SU/SD)	1,051 (1)	78,180 (1)
ESP Control (SU/SD)	2,838 (1)	1,089,775 (1)

Toxic Air Contaminant	CAS	HAP? (Yes/No)	Emission Factor			Emission Estimates (SU/SD)					
						Multi-Clone Only		Scrubber Control		ESP Control	
			Multi-Clone Only (lb/MMBtu)	Scrubber Control (lb/MMBtu)	ESP Control (lb/MMBtu)	Daily Emissions (a) (lb/day)	Annual Emissions (b) (lb/yr)	Daily Emissions (c) (lb/day)	Annual Emissions (d) (lb/yr)	Daily Emissions (e) (lb/day)	Annual Emissions (f) (lb/yr)
Metals											
Antimony	7440-36-0	Yes	3.1E-06 (2)	2.00E-06 (3)	3.1E-07 (4)	2.7E-03	0.22	2.1E-03	0.16	8.7E-04	0.33
Arsenic	7440-38-2	Yes	8.6E-06 (2)	1.11E-05 (3)	1.9E-06 (4)	7.5E-03	0.60	0.012	0.87	5.4E-03	2.06
Barium	7440-39-3	No	4.8E-03 (2)	3.97E-04 (3)	2.1E-04 (4)	4.22	337	0.42	31.0	0.59	228
Beryllium	7440-41-7	Yes	1.4E-07 (2)	6.90E-08 (3)	2.9E-08 (4)	1.2E-04	9.4E-03	7.3E-05	5.4E-03	8.1E-05	0.031
Cadmium	7440-43-9	Yes	5.0E-06 (2)	3.20E-06 (3)	3.2E-07 (4)	4.4E-03	0.35	3.4E-03	0.25	9.2E-04	0.35
Chromium VI	18540-29-9	Yes	7.0E-06 (2)	2.35E-07 (3)	2.7E-07 (4)	6.1E-03	0.49	2.5E-04	0.018	7.7E-04	0.30
Cobalt	7440-48-4	Yes	1.7E-06 (2)	1.95E-06 (3)	5.0E-07 (4)	1.5E-03	0.12	2.1E-03	0.15	1.4E-03	0.54
Copper and compounds	7440-50-8	No	8.3E-05 (2)	1.82E-05 (3)	3.8E-06 (4)	0.072	5.76	0.019	1.42	0.011	4.13
Lead	7439-92-1	Yes	3.1E-05 (2)	3.00E-05 (3)	5.2E-06 (4)	0.027	2.17	0.032	2.35	0.015	5.68
Manganese	7439-96-5	Yes	1.9E-03 (2)	2.50E-04 (3)	9.6E-05 (4)	1.62	129	0.26	19.5	0.27	104
Mercury	7439-97-6	Yes	1.8E-06 (2)	1.20E-06 (5)	9.2E-07 (6)	1.5E-03	0.12	1.3E-03	0.094	2.6E-03	1.00
Molybdenum trioxide	1313-27-5	No	3.2E-06 (4)	3.11E-06 (4)	3.1E-06 (4)	2.8E-03	0.22	3.3E-03	0.24	8.8E-03	3.38
Nickel	365	Yes	1.3E-05 (2)	7.34E-06 (3)	2.8E-06 (4)	0.012	0.92	7.7E-03	0.57	7.9E-03	3.05
Selenium	7782-49-2	Yes	7.3E-07 (2)	1.71E-06 (3)	1.6E-06 (4)	6.3E-04	0.051	1.8E-03	0.13	4.6E-03	1.77
Silver	7440-22-4	No	9.4E-04 (2)	9.85E-07 (3)	9.9E-07 (3)	0.82	65.5	1.0E-03	0.077	2.8E-03	1.07
Thalium and compounds	7440-28-0	No	1.9E-06 (2)	1.85E-06 (3)	1.9E-06 (4)	1.6E-03	0.13	1.9E-03	0.14	5.3E-03	2.02
Vanadium (fume or dust)	7440-62-2	No	9.8E-07 (2)	5.94E-07 (4)	5.9E-07 (4)	8.6E-04	0.068	6.2E-04	0.046	1.7E-03	0.65
Zinc	7440-66-6	No	5.7E-04 (2)	2.33E-04 (3)	5.8E-05 (4)	0.50	39.8	0.24	18.2	0.16	62.8
Organics											
1,2-Dichloropropane	78-87-5	Yes	1.7E-05 (7)	1.68E-05 (7)	1.7E-05 (7)	0.015	1.17	0.018	1.31	0.048	18.3
Acetaldehyde	75-07-0	Yes	2.8E-04 (7)	2.83E-04 (7)	2.8E-04 (7)	0.25	19.8	0.30	22.1	0.80	308
Acetone	67-64-1	No	5.3E-04 (7)	5.29E-04 (7)	5.3E-04 (7)	0.46	37.0	0.56	41.4	1.50	576
Acetophenone	98-86-2	Yes	1.8E-06 (7)	1.84E-06 (7)	1.8E-06 (7)	1.6E-03	0.13	1.9E-03	0.14	5.2E-03	2.01
Acrolein	107-02-8	Yes	2.6E-04 (7)	2.60E-04 (7)	2.6E-04 (7)	0.23	18.2	0.27	20.3	0.74	283
Benzene	71-43-2	Yes	9.8E-04 (7)	9.80E-04 (7)	9.8E-04 (7)	0.86	68.5	1.03	76.6	2.78	1,068
Carbon tetrachloride	56-23-5	Yes	9.9E-06 (7)	9.87E-06 (7)	9.9E-06 (7)	8.6E-03	0.69	0.010	0.77	0.028	10.8
Chlorine	7782-50-5	Yes	7.9E-04 (7)	7.90E-04 (8)	7.9E-04 (9)	0.69	55.2	0.83	61.8	2.24	861
Chlorobenzene	108-90-7	Yes	1.7E-05 (7)	1.66E-05 (7)	1.7E-05 (7)	0.014	1.16	0.017	1.30	0.047	18.1
Chloroform	67-66-3	Yes	2.0E-05 (7)	2.01E-05 (7)	2.0E-05 (7)	0.018	1.40	0.021	1.57	0.057	21.9
Crotonaldehyde	4170-30-3	No	4.5E-05 (7)	4.48E-05 (7)	4.5E-05 (7)	0.039	3.13	0.047	3.50	0.13	48.8
Dibutyl phthalate	84-74-2	Yes	3.3E-05 (7)	3.33E-05 (7)	3.3E-05 (7)	0.029	2.33	0.035	2.60	0.095	36.3
Diethylphthalate	84-66-2	No	4.4E-05 (7)	4.36E-05 (7)	4.4E-05 (7)	0.038	3.05	0.046	3.41	0.12	47.5
Ethyl benzene	100-41-4	Yes	1.2E-05 (7)	1.22E-05 (7)	1.2E-05 (7)	0.011	0.85	0.013	0.95	0.035	13.3
Formaldehyde	50-00-0	Yes	1.1E-03 (7)	1.05E-03 (7)	1.1E-03 (7)	0.92	73.4	1.10	82.1	2.98	1,144
Hexane	110-54-3	Yes	2.9E-04 (7)	2.88E-04 (7)	2.9E-04 (7)	0.25	20.1	0.30	22.5	0.82	314
Isopropyl alcohol	67-63-0	No	4.5E-03 (7)	4.52E-03 (7)	4.5E-03 (7)	3.95	316	4.75	353	12.8	4,926
Methanol	67-56-1	Yes	7.3E-04 (7)	7.32E-04 (7)	7.3E-04 (7)	0.64	51.1	0.77	57.2	2.08	798
Methyl bromide	74-83-9	Yes	1.1E-05 (7)	1.13E-05 (7)	1.1E-05 (7)	9.9E-03	0.79	0.012	0.88	0.032	12.3
Methyl chloride	74-87-3	Yes	4.4E-05 (7)	4.35E-05 (7)	4.4E-05 (7)	0.038	3.04	0.046	3.40	0.12	47.4
Methyl chloroform	71-55-6	Yes	5.8E-05 (7)	5.78E-05 (7)	5.8E-05 (7)	0.050	4.04	0.061	4.52	0.16	63.0
Methylene chloride	75-09-2	Yes	4.0E-04 (7)	3.98E-04 (7)	4.0E-04 (7)	0.35	27.8	0.42	31.1	1.13	434
Methyl isobutyl ketone	108-10-1	Yes	4.5E-04 (7)	4.45E-04 (7)	4.5E-04 (7)	0.39	31.1	0.47	34.8	1.26	485
Methyl ethyl ketone	78-93-3	No	7.0E-06 (7)	6.97E-06 (7)	7.0E-06 (7)	6.1E-03	0.49	7.3E-03	0.54	0.020	7.60
Phenol	108-95-2	Yes	1.6E-04 (7)	1.60E-04 (7)	1.6E-04 (7)	0.14	11.2	0.17	12.5	0.45	174
Phosphorus	504	Yes	5.5E-03 (7)	3.10E-04 (7)	3.1E-04 (7)	4.76	381	0.33	24.2	0.88	338
Propionaldehyde	123-38-6	Yes	3.1E-04 (7)	3.11E-04 (7)	3.1E-04 (7)	0.27	21.7	0.33	24.3	0.88	339
Styrene	100-42-5	Yes	4.7E-04 (7)	4.69E-04 (7)	4.7E-04 (7)	0.41	32.8	0.49	36.7	1.33	511
Toluene	108-88-3	Yes	1.1E-05 (7)	1.14E-05 (7)	1.1E-05 (7)	1.0E-02	0.80	0.012	0.89	0.032	12.4
Xylene (mixture)	1330-20-7	Yes	5.2E-06 (7)	5.22E-06 (7)	5.2E-06 (7)	4.6E-03	0.36	5.5E-03	0.41	0.015	5.69
Inorganic Compounds											
Hydrogen fluoride	7664-39-3	Yes	9.1E-05 (7)	2.54E-05 (10)	9.1E-05 (3)	0.079	6.32	0.027	1.99	0.26	98.6
Hydrochloric acid	7647-01-0	Yes	4.4E-03 (7)	1.18E-04 (5)	7.8E-05 (11)	3.81	305	0.12	9.23	0.22	84.6

Table 32 (Cont.)
Wood-Fired Boilers SU/SD TAC Emissions Estimates (CAO Only)
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

PAHs											
Acenaphthene	83-32-9	Yes	8.5E-07 [7]	8.53E-07 [7]	8.5E-07 [7]	7.5E-04	0.060	9.0E-04	0.067	2.4E-03	0.93
Acenaphthylene	208-96-8	Yes	4.7E-06 [7]	4.69E-06 [7]	4.7E-06 [7]	4.1E-03	0.33	4.9E-03	0.37	0.013	5.11
Anthracene	120-12-7	Yes	2.7E-06 [7]	2.68E-06 [7]	2.7E-06 [7]	2.3E-03	0.19	2.8E-03	0.21	7.6E-03	2.92
Benz[a]anthracene	56-55-3	Yes	8.1E-08 [7]	8.13E-08 [7]	8.1E-08 [7]	7.1E-05	5.7E-03	8.5E-05	6.4E-03	2.3E-04	0.089
Benzo[a]pyrene	50-32-8	Yes	2.2E-06 [7]	2.22E-06 [7]	2.2E-06 [7]	1.9E-03	0.16	2.3E-03	0.17	6.3E-03	2.42
Benzo[b]fluoranthene	205-99-2	Yes	1.4E-07 [7]	1.42E-07 [7]	1.4E-07 [7]	1.2E-04	9.9E-03	1.5E-04	0.011	4.0E-04	0.15
Benzo[e]pyrene	192-97-2	Yes	2.1E-07 [7]	2.11E-07 [7]	2.1E-07 [7]	1.8E-04	0.015	2.2E-04	0.016	6.0E-04	0.23
Benzo[g,h,i]perylene	191-24-2	Yes	1.5E-07 [7]	1.51E-07 [7]	1.5E-07 [7]	1.3E-04	0.011	1.6E-04	0.012	4.3E-04	0.16
Benzo[j]fluoranthene	205-82-3	Yes	1.6E-07 [7]	1.56E-07 [7]	1.6E-07 [7]	1.4E-04	0.011	1.6E-04	0.012	4.4E-04	0.17
Benzo[k]fluoranthene	207-08-9	Yes	5.2E-08 [7]	5.18E-08 [7]	5.2E-08 [7]	4.5E-05	3.6E-03	5.4E-05	4.0E-03	1.5E-04	0.056
Chrysene	218-01-9	Yes	7.9E-08 [7]	7.90E-08 [7]	7.9E-08 [7]	6.9E-05	5.5E-03	8.3E-05	6.2E-03	2.2E-04	0.086
Fluoranthene	206-44-0	Yes	1.7E-06 [7]	1.67E-06 [7]	1.7E-06 [7]	1.5E-03	0.12	1.8E-03	0.13	4.7E-03	1.82
Fluorene	86-73-7	Yes	3.0E-06 [7]	3.01E-06 [7]	3.0E-06 [7]	2.6E-03	0.21	3.2E-03	0.24	8.5E-03	3.28
Indeno[1,2,3-cd]pyrene	193-39-5	Yes	1.0E-07 [7]	1.02E-07 [7]	1.0E-07 [7]	8.9E-05	7.1E-03	1.1E-04	8.0E-03	2.9E-04	0.11
2-Methyl naphthalene	91-57-6	Yes	1.4E-06 [7]	1.40E-06 [7]	1.4E-06 [7]	1.2E-03	0.098	1.5E-03	0.11	4.0E-03	1.53
Naphthalene	91-20-3	Yes	1.0E-04 [7]	9.96E-05 [7]	1.0E-04 [7]	0.087	6.96	0.10	7.79	0.28	109
Perylene	198-55-0	Yes	3.2E-08 [7]	3.20E-08 [7]	3.2E-08 [7]	2.8E-05	2.2E-03	3.4E-05	2.5E-03	9.1E-05	0.035
Phenanthrene	85-01-8	Yes	6.5E-06 [7]	6.46E-06 [7]	6.5E-06 [7]	5.6E-03	0.45	6.8E-03	0.51	0.018	7.04
Pyrene	129-00-0	Yes	3.5E-06 [7]	3.54E-06 [7]	3.5E-06 [7]	3.1E-03	0.25	3.7E-03	0.28	0.010	3.86
Dioxans & Furans											
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	Yes	9.5E-13 [7]	9.5E-13 [7]	9.5E-13 [7]	8.3E-10	6.7E-08	1.0E-09	7.5E-08	2.7E-09	1.0E-06
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	No	1.3E-12 [7]	1.3E-12 [7]	1.3E-12 [7]	1.2E-09	9.3E-08	1.4E-09	1.0E-07	3.8E-09	1.4E-06
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	No	8.7E-13 [7]	8.7E-13 [7]	8.7E-13 [7]	7.6E-10	6.1E-08	9.1E-10	6.8E-08	2.5E-09	9.5E-07
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	No	2.1E-12 [7]	2.1E-12 [7]	2.1E-12 [7]	1.8E-09	1.5E-07	2.2E-09	1.6E-07	5.9E-09	2.3E-06
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	No	2.2E-12 [7]	2.2E-12 [7]	2.2E-12 [7]	1.9E-09	1.5E-07	2.3E-09	1.7E-07	6.3E-09	2.4E-06
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	No	9.8E-12 [7]	9.8E-12 [7]	9.8E-12 [7]	8.5E-09	6.8E-07	1.0E-08	7.6E-07	2.8E-08	1.1E-05
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	No	2.5E-11 [7]	2.5E-11 [7]	2.5E-11 [7]	2.1E-08	1.7E-06	2.6E-08	1.9E-06	7.0E-08	2.7E-05
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No	8.0E-12 [7]	8.0E-12 [7]	8.0E-12 [7]	7.0E-09	5.6E-07	8.5E-09	6.3E-07	2.3E-08	8.8E-06
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No	4.0E-12 [7]	4.0E-12 [7]	4.0E-12 [7]	3.5E-09	2.8E-07	4.2E-09	3.1E-07	1.1E-08	4.3E-06
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No	6.1E-12 [7]	6.1E-12 [7]	6.1E-12 [7]	5.3E-09	4.3E-07	6.4E-09	4.8E-07	1.7E-08	6.6E-06
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No	3.6E-12 [7]	3.6E-12 [7]	3.6E-12 [7]	3.1E-09	2.5E-07	3.7E-09	2.8E-07	1.0E-08	3.9E-06
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No	3.2E-12 [7]	3.2E-12 [7]	3.2E-12 [7]	2.8E-09	2.2E-07	3.3E-09	2.5E-07	9.0E-09	3.4E-06
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No	6.7E-13 [7]	6.7E-13 [7]	6.7E-13 [7]	5.8E-10	4.7E-08	7.0E-10	5.2E-08	1.9E-09	7.3E-07
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No	2.7E-12 [7]	2.7E-12 [7]	2.7E-12 [7]	2.3E-09	1.9E-07	2.8E-09	2.1E-07	7.5E-09	2.9E-06
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No	5.7E-12 [7]	5.7E-12 [7]	5.7E-12 [7]	5.0E-09	4.0E-07	6.0E-09	4.5E-07	1.6E-08	6.2E-06
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No	8.0E-13 [7]	8.0E-13 [7]	8.0E-13 [7]	7.0E-10	5.6E-08	8.4E-10	6.2E-08	2.3E-09	8.7E-07
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	No	5.0E-12 [7]	5.0E-12 [7]	5.0E-12 [7]	4.4E-09	3.5E-07	5.3E-09	3.9E-07	1.4E-08	5.4E-06
PCBs & Phthalates											
Total PCBs	1336-36-3	Yes	7.9E-09 [7]	7.9E-09 [7]	7.9E-09 [7]	6.9E-06	5.5E-04	8.3E-06	6.1E-04	2.2E-05	8.6E-03
1-Methylphenanthrene	832-69-9	No	2.6E-07 [7]	2.6E-07 [7]	2.6E-07 [7]	2.3E-04	0.018	2.7E-04	0.020	7.4E-04	0.28
3-Methylcholanthrene	56-49-5	Yes	8.7E-09 [7]	8.7E-09 [7]	8.7E-09 [7]	7.6E-06	6.1E-04	9.1E-06	6.8E-04	2.5E-05	9.5E-03
7,12-Dimethylbenz[a]anthracene	57-97-6	Yes	4.6E-09 [7]	4.6E-09 [7]	4.6E-09 [7]	4.0E-06	3.2E-04	4.8E-06	3.6E-04	1.3E-05	5.0E-03
2,4-Dinitrotoluene	121-14-2	Yes	9.4E-07 [7]	9.4E-07 [7]	9.4E-07 [7]	8.2E-04	0.066	9.9E-04	0.074	2.7E-03	1.03
4,6-Dinitro-o-cresol (and salts)	534-52-1	Yes	2.1E-06 [7]	2.1E-06 [7]	2.1E-06 [7]	1.8E-03	0.15	2.2E-03	0.16	6.0E-03	2.29
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	Yes	4.7E-08 [7]	4.7E-08 [7]	4.7E-08 [7]	4.1E-05	3.2E-03	4.9E-05	3.6E-03	1.3E-04	0.051
Butyl benzyl phthalate	85-68-7	No	2.7E-05 [7]	2.7E-05 [7]	2.7E-05 [7]	0.023	1.87	0.028	2.10	0.076	29.2
Hydrogen cyanide	74-90-8	Yes	2.1E-05 [7]	2.1E-05 [7]	2.1E-05 [7]	0.018	1.43	0.022	1.60	0.058	22.3
di-n-octylphthalateb	518	No	1.1E-07 [7]	1.1E-07 [7]	1.1E-07 [7]	9.6E-05	7.7E-03	1.2E-04	8.6E-03	3.1E-04	0.12
Ethylene dichloride (EDC, 1,2-dichloroethane)	107-06-2	Yes	2.9E-05 [7]	2.9E-05 [7]	2.9E-05 [7]	0.026	2.04	0.031	2.28	0.083	31.8
Isopropylbenzene (Cumene)	98-82-8	Yes	1.8E-05 [7]	1.8E-05 [7]	1.8E-05 [7]	0.015	1.24	0.019	1.38	0.050	19.3
p-Dichlorobenzene (1,4-Dichlorobenzene)	106-46-7	Yes	2.8E-04 [7]	2.8E-04 [7]	2.8E-04 [7]	0.24	19.5	0.29	21.8	0.79	304
Vinyl Chloride	75-01-4	Yes	1.8E-05 [7]	1.8E-05 [7]	1.8E-05 [7]	0.016	1.29	0.019	1.44	0.052	20.1
Trichloroethene (TCE, Trichloroethylene)	79-01-6	Yes	2.0E-05 [7]	2.0E-05 [7]	2.0E-05 [7]	0.017	1.39	0.021	1.56	0.056	21.7
4-nitrophenol	100-02-7	Yes	1.1E-07 [7]	1.1E-07 [7]	1.1E-07 [7]	1.0E-04	8.0E-03	1.2E-04	8.9E-03	3.2E-04	0.12
2-Chlorophenol	95-57-8	No	2.4E-08 [7]	2.4E-08 [7]	2.4E-08 [7]	2.1E-05	1.6E-03	2.5E-05	1.8E-03	6.7E-05	0.026
2,4-Dinitrophenol	51-28-5	Yes	1.8E-07 [7]	1.8E-07 [7]	1.8E-07 [7]	1.6E-04	0.013	1.9E-04	0.014	5.1E-04	0.20
Trichlorofluoromethane (Freon 11)	75-69-4	No	1.4E-05 [7]	1.4E-05 [7]	1.4E-05 [7]	0.012	0.97	0.015	1.09	0.039	15.1
2,4,6-Trichlorophenol	88-06-2	Yes	2.0E-07 [7]	2.0E-07 [7]	2.0E-07 [7]	1.7E-04	0.014	2.1E-04	0.016	5.7E-04	0.22
Pentachlorophenol	87-86-5	Yes	2.1E-07 [7]	2.1E-07 [7]	2.1E-07 [7]	1.9E-04	0.015	2.3E-04	0.017	6.1E-04	0.23
Tetrachloroethene (Perchloroethylene)	127-18-4	Yes	2.5E-05 [7]	2.5E-05 [7]	2.5E-05 [7]	0.021	1.72	0.026	1.92	0.070	26.8
Total TAC Emissions Estimate			**--**	**--**		**26.5**	**2,123**	**14.2**	**1,059**	**36.9**	**14,163**
Total HAP Emissions Estimate			**--**	**--**		**16.4**	**1,311**	**8.10**	**603**	**21.4**	**8,210**

Notes

FHISOR = fuel heat input to steam output ratio; MMBtu = million British-thermal units; TAC = toxic air contaminant; HAP = hazardous air pollutant;

lb = pound; PCBs = Polychlorinated Biphenyls; PAHs = Polyaromatic Hydrocarbons; SU = Startup; Mlb-steam = thousand pounds of steam.

[a] Multi-clone daily emissions estimate (SU/SD) (lb/day) = (emission factor for multi-clone control [lb/MMBtu]) x (multi-clone daily heat input (SU/SD) [MMBtu/day])

[b] Multi-clone annual emissions estimate (SU/SD) (lb/yr) = (emission factor for multi-clone control [lb/MMBtu]) x (multi-clone annual heat input (SU/SD) [MMBtu/yr])

[c] Scrubber daily emissions estimate (SU/SD) (lb/day) = (emission factor for scrubber control [lb/MMBtu]) x (scrubber daily heat input (SU/SD) [MMBtu/day])

[d] Scrubber annual emissions estimate (SU/SD) (lb/yr) = (emission factor for scrubber control [lb/MMBtu]) x (scrubber annual heat input (SU/SD) [MMBtu/yr])

[e] ESP daily emissions estimate (SU/SD) (lb/day) = (emission factor for ESP control [lb/MMBtu]) x (ESP daily heat input (SU/SD) [MMBtu/day])

[f] ESP annual emissions estimate (SU/SD) (lb/yr) = (emission factor for ESP control [lb/MMBtu]) x (ESP annual heat input (SU/SD) [MMBtu/yr])

References

[1] See Table 1, Input Process Rates and Parameters.

[2] NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler with mechanical collector control.

[3] NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler with wet scrubber control.

[4] NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler with ESP or fabric filter control.

[5] Boiler MACT compliance Source Test Reports dated November 5, 2019 and December 1, 2022. Representative of the average between the two 3-run average from the scrubber outlet.

[6] Boiler MACT compliance Source Test Reports dated November 5, 2019 and December 1, 2022. Representative of the average between the two 3-run average from the ESP outlet.

[7] NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler.

[8] AP-42 Chapter 1 (March 2022), Table 1.6-3, "Emission Factors for Speciated Organic Compounds, TOC, VOC, Nitrous Oxide, and Carbon Dioxide from Wood Residue Combustion." Emission factors are for uncontrolled sources.

[9] AP-42 Chapter 1 (March 2022), Table 1.6-3, "Emission Factors for Speciated Organic Compounds, TOC, VOC, Nitrous Oxide, and Carbon Dioxide from Wood Residue Combustion."

[10] NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler with wet control device.

[11] NCASI Technical Bulletin 1050 (September 2018). Emission factor for wood-fired boiler with wet scrubber control.

Table 33
Lumber Kilns SU/SD TAC Emissions Estimate (CAO Only)
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter	SU/SD Throughput	
	Daily (Mbdft/day)	Annual (Mbdft/yr)
Proposed Douglas Fir Throughput (SU/SD)	698 (1)	193,355 (2)
Proposed Hemlock Throughput (SU/SD)		40,300 (2)
Proposed True Fir Throughput (SU/SD)		4,480 (2)

Toxic Air Contaminant	CAS	HAP	Emission Rate (lb/Mbdft)	Permitted Emissions Estimate	
				Maximum Daily (lb/day)	Annual (lb/yr)
Douglas Fir					
Acetaldehyde	75-07-0	Yes	0.043 (3)	30.0 (a)	8,314 (b)
Acrolein	107-02-8	Yes	8.0E-04 (3)	0.56 (a)	155 (b)
Formaldehyde	50-00-0	Yes	2.5E-03 (3)	1.75 (a)	483 (b)
Methanol	67-56-1	Yes	0.075 (3)	52.6 (a)	14,579 (b)
Propionaldehyde	123-38-6	Yes	9.0E-04 (3)	0.63 (a)	174 (b)
Hemlock					
Acetaldehyde	75-07-0	Yes	0.11 (4)	78.7 (a)	4,546 (b)
Acrolein	107-02-8	Yes	1.8E-03 (4)	1.26 (a)	72.5 (b)
Formaldehyde	50-00-0	Yes	2.1E-03 (4)	1.45 (a)	83.5 (b)
Methanol	67-56-1	Yes	0.11 (4)	76.6 (a)	4,422 (b)
Propionaldehyde	123-38-6	Yes	1.2E-03 (4)	0.84 (a)	48.4 (b)
True Fir					
Acetaldehyde	75-07-0	Yes	0.055 (5)	38.4 (a)	246 (b)
Acrolein	107-02-8	Yes	1.8E-03 (6)	1.26 (a)	8.06 (b)
Formaldehyde	50-00-0	Yes	7.3E-03 (5)	5.10 (a)	32.7 (b)
Methanol	67-56-1	Yes	0.23 (5)	160 (a)	1,028 (b)
Propionaldehyde	123-38-6	Yes	1.2E-03 (6)	0.84 (a)	5.38 (b)
Total					
Acetaldehyde	75-07-0	Yes	--	78.7 (7)	13,107 (8)
Acrolein	107-02-8	Yes	--	1.26 (7)	235 (8)
Formaldehyde	50-00-0	Yes	--	5.10 (7)	600 (8)
Methanol	67-56-1	Yes	--	160 (7)	20,029 (8)
Propionaldehyde	123-38-6	Yes	--	0.84 (7)	228 (8)

Notes

Mbdft = thousand board feet.

(a) Daily emissions estimate (lb/day) = (maximum emission factor of Douglas Fir [lb/Mbdft]) x (maximum daily throughput [Mbdft/day])

(b) Annual emissions estimate (lb/yr) = (maximum emission factor of wood species [lb/Mbdft]) x (annual throughput [Mbdft/yr])

References

(1) See Table 1, Input Process Rates and Parameters. Representative of maximum daily throughput regardless of wood species.

(2) See Table 1, Input Process Rates and Parameters.

(3) AQ-EF09, "DEQ HAP and VOC Emission Factors for Lumber Drying" Emission factors representative of Douglas Fir species with a maximum inlet temperature of 200°F.

(4) AQ-EF09, "DEQ HAP and VOC Emission Factors for Lumber Drying" Emission factors representative of Western Hemlock species with a maximum inlet temperature of 200°F.

(5) AQ-EF09, "DEQ HAP and VOC Emission Factors for Lumber Drying" Emission factors representative of Western True Fir species with a maximum inlet temperature of 200°F.

(6) AQ-EF09, "DEQ HAP and VOC Emission Factors for Lumber Drying" Emission factors representative of Western Hemlock species with a maximum inlet temperature of 200°F.

(7) Equal to highest daily emission rate between wood species.

(8) Equal to the sum of annual emission rates between wood species.

Table 34
Fuel Dryer SU/SD TAC Emissions Estimate (CAO Only)
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter	Daily (ODT/day)	Annual (ODT/yr)
Fuel Dryer Throughput during Boiler SU/SD Conditions	63.4 (1)	11,880 (1)

Toxic Air Contaminant	CAS	HAP?	Uncontrolled Emission Factor (lb/ODT)	Estimated Control Efficiency (%)	Daily (lb/day)	Annual (lb/yr)
Organics						
Acetaldehyde	75-07-0	Yes	7.9E-03 (3)	21.0 (4)	0.39 (a)	73.7 (c)
Acetone	67-64-1	No	0.043 (5)	21.0 (4)	2.13 (a)	400 (c)
Acetophenone	98-86-2	Yes	3.1E-05 (6)	1.00 (4)	1.9E-03 (a)	0.36 (c)
Acrolein	107-02-8	Yes	0.019 (3)	44.0 (4)	0.67 (a)	125 (c)
Benzene	71-43-2	Yes	2.6E-03 (6)	--	0.17 (b)	31.1 (d)
Crotonaldehyde	4170-30-3	No	5.5E-03 (6)	33.0 (4)	0.23 (a)	43.4 (c)
Formaldehyde	50-00-0	Yes	0.022 (3)	85.0 (4)	0.21 (a)	38.7 (c)
Methanol	67-56-1	Yes	0.020 (3)	95.0 (4)	0.063 (a)	11.8 (c)
Methyl bromide	74-83-9	Yes	4.6E-05 (5)	3.00 (4)	2.8E-03 (a)	0.53 (c)
Methyl chloride	74-87-3	Yes	1.9E-04 (5)	1.00 (4)	0.012 (a)	2.18 (c)
Methylene chloride	75-09-2	Yes	8.6E-04 (5)	2.00 (4)	0.054 (a)	10.1 (c)
Methyl isobutyl ketone	108-10-1	Yes	2.8E-03 (6)	4.00 (4)	0.17 (a)	31.4 (c)
Methyl ethyl ketone	78-93-3	No	3.7E-03 (6)	44.0 (4)	0.13 (a)	24.5 (c)
Phenol	108-95-2	Yes	0.023 (6)	17.0 (4)	1.23 (a)	230 (c)
Propionaldehyde	123-38-6	Yes	9.9E-03 (6)	65.0 (4)	0.22 (a)	41.0 (c)
Styrene	100-42-5	Yes	1.2E-04 (6)	--	7.3E-03 (a)	1.38 (c)
Toluene	108-88-3	Yes	4.3E-03 (6)	--	0.27 (a)	51.0 (c)
1,2,4-Trimethyl benzene	95-63-6	No	6.4E-05 (6)	--	4.1E-03 (a)	0.77 (c)
Vinyl acetate	108-05-4	Yes	2.9E-05 (6)	4.00 (4)	1.8E-03 (a)	0.33 (c)
m-Xylene	108-38-3	Yes	1.3E-03 (7)	--	0.082 (a)	15.4 (c)
p-Xylene	106-42-3	Yes	1.3E-03 (7)	--	0.082 (a)	15.4 (c)
o-Xylene	95-47-6	Yes	2.3E-05 (6)	--	1.4E-03 (a)	0.27 (c)
Naphthalene	91-20-3	Yes	3.8E-03 (6)	--	0.24 (b)	44.7 (d)
Cumene	98-82-8	Yes	3.7E-05 (6)	--	2.3E-03 (b)	0.43 (d)
Total TAC Emissions Estimate			**--**	**--**	**6.36**	**1,193**
Total HAP Emissions Estimate			**--**	**--**	**3.86**	**725**

Notes

TAC = toxic air contaminant; HAP = hazardous air pollutant; lb = pound; PCBs = Polychlorinated Biphenyls; ODT = oven-dry ton (0% moisture content).

(a) Fuel dryer daily emissions estimate (SU/SD) (lb/day) = (uncontrolled emission factor [lb/ODT]) x (1- estimated control efficiency [%]/100)) x (fuel dryer daily throughput (SU/SD) [ODT/day])

(b) Fuel dryer daily emissions estimate (SU/SD) (lb/day) = (uncontrolled emission factor [lb/ODT]) x (fuel dryer daily throughput (SU/SD) [ODT/day])

(c) Fuel dryer annual emissions estimate (SU/SD) (lb/day) = (uncontrolled emission factor [lb/ODT]) x (1- estimated control efficiency [%]/100)) x (fuel dryer daily throughput (SU/SD) [ODT/day])

(d) Fuel dryer annual emissions estimate (SU/SD) (lb/day) = (uncontrolled emission factor [lb/ODT]) x (fuel dryer annual throughput (SU/SD) [ODT/day])

References

(1) See Table 1, Input Process Rates and Parameters.

(2) Representative of maximum daily hours of operation during boiler startup days. Assumes boiler startup requires 8 hours.

(3) NCASI Air Emissions Databases - Wood Products. Representative of uncontrolled, direct wood-fired, green pre-dryer.

(4) Control efficiency estimated using solubility rates of organic TAPs.

(5) NCASI Air Emissions Databases - Wood Products. Representative of uncontrolled, direct wood-fired, green dryer. See NCASI Master Summary spreadsheet dated February, 2013.

(6) NCASI Air Emissions Databases - Wood Products. Representative of uncontrolled, rotary dryer.

(7) NCASI Air Emissions Databases - Wood Products. Representative of uncontrolled, rotary dryer. Assumes that emission factor is one-half of emission factor for m.p-xylene.

Table 35
Hardboard Press SU/SD TAC Emissions Estimate (CAO Only)
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter	SU/SD Daily Throughput (Msf 1/8-in/day)	SU/SD Annual Throughput (Msf 1/8-in/yr)
Hardboard Press Production Rate During SU/SD Conditions	391 (1)	105,000 (1)
Hardboard Press Production Rate During SU/SD Conditions (Stack Basis)	386 (a)	103,740 (a)
Hardboard Press Production Rate During SU/SD Conditions (Fugitives Basis)	4.69 (b)	1,260 (b)

Toxic Air Contaminant	CAS	HAP?	Hardboard Press (Stack Basis)			Hoardboard Press (Fugitives Basis)		
			Emission Factor (lb/Msf 1/8-in)	Daily Emissions (lb/day)	Annual Emissions (lb/yr)	Emission Factor (5) (lb/Msf 1/8-in)	Daily Emissions (lb/day)	Annual Emissions (lb/yr)
Acetaldehyde	75-07-0	Yes	3.3E-03 (5)	1.28 (d)	342 (d)	0.016 (6)	0.075 (e)	20.2 (d)
Acetone	67-64-1	No	3.9E-03 (5)	1.51 (d)	405 (d)	5.5E-03 (6)	0.026 (e)	6.93 (d)
Formaldehyde	50-00-0	Yes	0.046 (7)	17.6 (d)	4,731 (d)	0.014 (6)	0.066 (e)	17.6 (d)
Methanol	67-56-1	Yes	0.037 (7)	14.2 (d)	3,807 (d)	0.24 (6)	1.13 (e)	302 (d)
m,p-Xylene	1330-20-7	Yes	--	--	--	5.3E-03 (6)	0.025 (e)	6.68 (d)
o-Xylene	95-47-6	Yes	--	--	--	3.6E-03 (6)	0.017 (e)	4.54 (d)
Phenol	108-95-2	Yes	--	--	--	0.010 (6)	0.047 (e)	12.6 (d)
Toluene	108-88-3	Yes	--	--	--	1.1E-03 (6)	5.2E-03 (e)	1.39 (d)
Total TAC Emissions Estimate			**--**	**34.6**	**9,285**	**--**	**1.39**	**372**
Total HAP Emissions Estimate			**--**	**33.1**	**8,880**	**--**	**1.36**	**365**

Notes

TAC = toxic air contaminant; HAP = hazardous air pollutant; Msf = thousand square feet.

(a) Hardboard press production rate (stack basis) (Msf 1/8-in/[day or yr]) = (maximum hourly hardboard press production rate [Msf 1/8-in/[day or yr]]) x (percentage of emissions through stack [%] /100)

Percentage of emissions through stack (%) = 98.8 (2)

(b) Maximum hourly production rate (fugitives basis) (Msf 1/8-in/[day or yr]) = (maximum hourly hardboard press production rate [Msf 1/8-in/[day or yr]]) x (fugitive emissions loss percentage [%] /100)

Fugitive emissions loss (%) = 1.2 (3)

(c) Daily throughput during boiler startup days (Msf/day) = (daily hours of operation [hrs/day]) x (maximum hourly production rate [Mbdft/hr])

(d) Hardboard press daily emissions estimate through stack (SU basis) (lb/day) = (emission factor [lb/Msf 1/8-in]) x (hoardboard press throughput (SU basis) [Msf 1/8-in/day])

(e) Hardboard press fugitives daily emissions estimate (SU basis) (lb/day) = (emission factor [lb/Msf 1/8-in]) x (hoardboard press fugitives throughput (SU basis) [Msf 1/8-in/day])

References

(1) See Table 1, Input Process Rates and Parameters.

(2) Capture efficiency demonstrated in a January 2009 source test.

(3) Non-captured amount as calculated using the capture efficiency demonstrated in a January 2009 source test.

(4) All emission factors are from the CAO permitting program and the level 3 risk assessment approved by the DEQ on August 5, 2024.

(5) See DEQ-approved CAO emissions inventory. AP-42 Chapter 10 (October 2002), Table 10.6.4-6, "Emission Factors for Hardboard Presses - Organics." Representative of Hardboard hot press, PF resin with scrubber control.

(6) See DEQ-approved CAO emissions inventory. AP-42 Chapter 10 (October 2002), Table 10.6.4-6, "Emission Factors for Hardboard Presses - Organics." Representative of Hardboard hot press, PF resin with no control.

(7) Emission factors from VOC compliance and emission factor verification tests conducted on the press vent scrubber (H-S123) on June 27, 2023. Representative of the average of the three test runs.

Table 36
Hardboard Refiner SU/SD TAC Emissions Estimate (CAO Only)
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter	Daily	Annual
Refiner Hours of Operation During SU/SD Operations (hrs/"period")	16.0 (1)	5,500 (1)
Refiner Production Rate During SU/SD Operations (ODT/"period")	122 (1)	35,640 (1)

Toxic Air Contaminant	CAS	HAP?	Refiner SU/SD (Scrubber Stack)					Refiner SU/SD (Rotary Valve)		
			Emission Factor (Units)		Estimated Control Efficiency (%)	Daily Emissions (lb/day)	Annual Emissions (lb/yr)	Emission Factor (lb/ODT)	Daily Emissions (lb/day)	Annual Emissions (lb/yr)
Acetaldehyde	75-07-0	Yes	0.035	(lb/ODT) (2)	21.0 (3)	3.37 (a)	984 (b)	1.3E-03 (4)	0.16 (c)	45.9 (d)
Acetone	67-64-1	No	4.2E-03	(lb/ODT) (5)	21.0 (3)	0.41 (a)	118 (b)	4.2E-03 (6)	0.51 (c)	150 (d)
Acrolein	107-02-8	Yes	5.4E-03	(lb/ODT) (2)	44.0 (3)	0.37 (a)	108 (b)	(7)	--	--
Formaldehyde	50-00-0	Yes	0.023	(lb/hr) (8)	(9)	0.36 (e)	124 (f)	3.6E-04 (4)	0.044 (c)	12.7 (d)
Methanol	67-56-1	Yes	0.013	(lb/hr) (8)	(9)	0.21 (e)	71.5 (f)	1.3E-03 (4)	0.15 (c)	44.9 (d)
Methyl ethyl ketone	78-93-3	No	2.5E-04	(lb/ODT) (10)	44.0 (3)	0.017 (a)	4.99 (b)	2.5E-04 (10)	0.031 (c)	8.91 (d)
Methyl isobutyl ketone	108-10-1	Yes	2.6E-04	(lb/ODT) (10)	4.00 (3)	0.030 (a)	8.83 (b)	2.6E-04 (10)	0.032 (c)	9.20 (d)
Propionaldehyde	123-38-6	Yes	1.1E-03	(lb/ODT) (2)	65.0 (3)	0.046 (a)	13.5 (b)	(7)	--	--
Styrene	100-42-5	Yes	1.8E-04	(lb/ODT) (10)	(11)	0.022 (g)	6.49 (h)	1.8E-04 (10)	0.022 (c)	6.49 (d)
Total TAC Emissions Estimate			--		--	**4.83**	**1,439**	--	**0.95**	**278**
Total HAP Emissions Estimate			--		--	**4.41**	**1,316**	--	**0.41**	**119**

Notes

TAC = toxic air contaminant; HAP = hazardous air pollutant; ODT = oven-dry ton (0% moisture content).

(a) Refiner SU/SD (scrubber basis) daily emissions (lb/day) = (uncontrolled emission factor [lb/ODT]) x (PTE daily refiner throughput [ODT/day]) x (1- estimated control efficiency [%]/100))

(b) Refiner SU/SD (scrubber basis) annual emissions (lb/yr) = (uncontrolled emission factor [lb/ODT]) x (PTE annual refiner throughput [ODT/yr]) x (1- estimated control efficiency [%]/100))

(c) Refiner SU/SD (rotary valve basis) daily emissions (lb/day) = (emission factor [lb/ODT]) x (PTE daily refiner throughput [ODT/day])

(d) Refiner SU/SD (rotary valve basis) annual emissions (lb/yr) = (emission factor [lb/ODT]) x (PTE annual refiner throughput [ODT/yr])

(e) Refiner SU/SD (scrubber basis) daily emissions (lb/day) = (emission rate [lb/hr]) x (PTE refiner daily hours of operation [hrs/day])

(f) Refiner SU/SD (scrubber basis) annual emissions (lb/yr) = (emission rate [lb/hr]) x (PTE refiner annual hours of operation [hrs/yr])

(g) Refiner SU/SD (scrubber basis) daily emissions (lb/day) = (uncontrolled emission factor [lb/ODT]) x (PTE daily refiner throughput [ODT/day])

(h) Refiner SU/SD (scrubber basis) annual emissions (lb/yr) = (uncontrolled emission factor [lb/ODT]) x (PTE annual refiner throughput [ODT/yr])

References

(1) See Table 1, Input Process Rates and Parameters.

(2) Emission factors are derived from Source Test Evaluation Report (2007). Emissions factors are based on testing performed on the mixing chest outlet, which at the time, was uncontrolled. Since 2007, the mixing chest outlet now vents to scrubber 5.

(3) Control efficiency estimated using solubility rates of organic TAPs.

(4) Emission factors are from Source Test Evaluation Report (2007). Emissions factors are based on testing performed on the rotary valve outlet.

(5) AP-42 Chapter 10 (October 2002), Table 10.6.4-9 "Emission Factors for Hardboard and Fiberboard Miscellaneous Sources -- Organics" Representative of uncontrolled Hardboard pressurized digester/refiner, hardwood.

(6) AP-42 Chapter 10 (October 2002), Table 10.6.4-9 "Emission Factors for Hardboard and Fiberboard Miscellaneous Sources -- Organics" Representative of uncontrolled Hardboard pressurized digester/refiner, hardwood.

(7) Emission factors are from Source Test Evaluation Report (2007). Emissions factors are based on testing performed on the rotary valve outlet. Test results for this TAC were below the detection limit.

(8) Emission Factor Verification Source Test Reports dated July 9, 2007 and August 1, 2023. Representative of the average between the two 3-run average from the scrubber outlet.

(9) Emission factor is representative of wet scrubber control for this pollutant.

(10) NCASI Air Emissions Databases - Pullp and Paper. Representative of an uncontrolled hardboard refiner. Represents mean emission factor.

(11) Control efficiency estimated using solubility rates of organic TAPs. No control is assumed for this TAC.

Table 37
Hardboard Former SU/SD TAC Emissions Estimate (CAO Only)
Stimson Lumber Company Forest Grove Complex—Gaston, Oregon

Parameter	Daily (ODT/day)	Annual (ODT/yr)
Former Throughput (SU/SD basis)	122 (1)	35,640 (1)
Former Fugitives Throughput (SU/SD basis)	12.2 (a)	3,564 (a)

Toxic Air Contaminant	CAS	HAP?	Emission Factor (3) (lb/ODT)	Former Stack Emissions		Former Fugitives Emissions	
				Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)
Acetaldehyde	75-07-0	Yes	7.3E-03 (4)	0.89 (b)	259 (c)	0.089 (d)	25.9 (e)
Acetone	67-64-1	No	3.2E-03 (5)	0.39 (b)	114 (c)	0.039 (d)	11.4 (e)
Acrolein	107-02-8	Yes	6.2E-04 (4)	0.075 (b)	22.0 (c)	7.5E-03 (d)	2.20 (e)
Formaldehyde	50-00-0	Yes	2.9E-03 (4)	0.35 (b)	103 (c)	0.035 (d)	10.3 (e)
Methanol	67-56-1	Yes	0.016 (4)	2.01 (b)	586 (c)	0.20 (d)	58.6 (e)
Methyl Ethyl Ketone	78-93-3	No	4.5E-04 (5)	0.055 (b)	16.0 (c)	5.5E-03 (d)	1.60 (e)
Methyl Isobutyl Ketone	108-10-1	Yes	2.3E-04 (5)	0.028 (b)	8.16 (c)	2.8E-03 (d)	0.82 (e)
Phenol	108-95-2	Yes	BDL (6)	--	--	--	--
Propionaldehyde	123-38-6	Yes	BDL (6)	--	--	--	--
Toluene	108-88-3	Yes	4.5E-04 (5)	0.055 (b)	16.1 (c)	5.5E-03 (d)	1.61 (e)
Total TAC Emissions Estimate			--	**3.85**	**1,124**	**0.39**	**112**
Total HAP Emissions Estimate			--	**3.41**	**993**	**0.34**	**99.3**

Notes

TAC = toxic air contaminant; HAP = hazardous air pollutant; ODT = oven-dried ton.

(a) Former Fugitives throughput (SU/SD basis) (ODT/"period") = (former throughput [ODT/"period"]) x (fugitive emissions loss [%] / 100)

Fugitive emissions loss (%) = 10.0 (2)

(b) Former daily emissions estimate (SU/SD basis) (lb/day) = (emission factor [lb/ODT]) x (former throughput (SU/SD basis) [ODT/day])

(c) Former annual emissions estimate (SU/SD basis) (lb/yr) = (emission factor [lb/ODT]) x (former throughput (SU/SD basis) [ODT/yr])

(d) Former fugitive daily emissions estimate (SU/SD basis) (lb/day) = (emission factor [lb/ODT]) x (former fugitives throughput (SU/SD basis) [ODT/day])

(e) Former fugitives annual emissions estimate (SU/SD basis) (lb/yr) = (emission factor [lb/ODT]) x (former fugitives throughput (SU/SD basis) [ODT/yr])

References

(1) See Table 1, Input Process Rates and Parameters.

(2) Fugitive emissions from the forming line have been conservatively estimated as 10% of form line emissions.

(3) All emission factors are from the CAO permitting program and the level 3 risk assessment approved by the DEQ on August 5, 2024.

(4) Source Test Evaluation Report prepared by Horizon Engineering LLC. for Stimson Lumber Company dated July 12, 2007. Source test conducted on forming line vacuum pump.

(5) AP-42 Chapter 10 (October 2002), Table 10.6.4-9 "Emission Factors for Hardboard and Fiberboard Miscellaneous Sources -- Organics" Representative of uncontrolled hardboard former vacuum system, wet, PF resin.

(6) Source Test Evaluation Report prepared by Horizon Engineering LLC. for Stimson Lumber Company dated July 12, 2007. Source test conducted on forming line vacuum pump. Test results for this TAC were below the detection limit.