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PRELIMINARY DETERMINATION to APPROVE:

Lumber Dry Kilns - Replacement

Sierra Pacific Industries
Aberdeen Division - Lumbermill
301 Hagara Street, Aberdeen

20NOC1449
December 8, 2020

NOTICE OF CONSTRUCTION

Preliminary Determination

Olympic Region Clean Air Agency

Issued to:	**Sierra Pacific Industries – Lumber Mill**	**County:**	**27**
Location:	**301 Hagara Street** **Aberdeen, WA 98520**	**Source:**	**28**
		RC:	**OP1**
Application #:	**20NOC1449**	**File:**	**209**
Prepared on:	**December 8, 2020**		

1. Summary of Proposed Project

Sierra Pacific Industries (SPI) requests approval to replace the eight existing lumber dry kilns at their lumber manufacturing facility (Mill) located in Aberdeen, Washington. SPI also requests approval of an increase in the current permitted lumber drying limit at the Mill from 315 million board feet per year (MMbf/yr) to 415 MMbf/yr. ORCAA is setting a kiln emissions limit equivalent to 415 MMbf/yr that will allow SPI the flexibility to use other emissions factors as they become available. Both aspects of SPI's request require replacing equipment that emits air pollution which are referred to as "Stationary Sources" of air emissions. Whether the action results in an increase in air pollution emissions rates or not, replacing stationary sources of emissions requires prior approval by Olympic Region Clean Air Agency (ORCAA) through an air permit process generally referred to as New Source Review (NSR).

2. Regulatory Background

Pursuant to the Washington Clean Air Act under chapter 70.94 of the Revised Code of Washington (chapter 70.94 RCW, which is now reformatted to 70A.15 RCW), ORCAA's Rule 6.1 requires New Source Review (NSR) for new stationary sources of air pollution in ORCAA's jurisdiction. NSR entails evaluating air quality implications prior to constructing, installing or otherwise establishing any new stationary source of air pollution, modifying an existing stationary source or replacing or substantially altering air pollution control technology. The goal of NSR is to implement air pollution control technology that meets the standard of "Best Available Control Technology" (referred to as BACT), and to assure projects comply with other applicable air regulations and standards, including equipment performance standards and ambient air quality standards.

NSR is initiated by a project proponent submitting a Notice of Construction (NOC) application, which includes information on the proposed project of sufficient detail to characterize air impacts. NOC applications are posted on ORCAA's website and may undergo a public notice and comment period if requested by the public or if emissions increases trigger an automatic public

notice. Approval of a NOC is contingent on verifying the proposed new source or modification meets the following criteria for approval from ORCAA's Rule 6.1:

1. ***Performance Standards -*** The new stationary source will likely comply with applicable air-performance standards such as federal new source performance standards (NSPS), national emission standards for hazardous air pollutants (NESHAPs), or any performance standards adopted under chapter 70.94 RCW (which is now chapter 70A.15 RCW);
2. ***BACT -*** The new stationary source will employ "Best Available Control Technology" (BACT) to control all air pollutants emitted;
3. ***Ambient Air Quality –*** Emissions from the new stationary source will not cause or contribute to a violation of any ambient air quality standard;
4. ***Federal Air Permitting Requirements -*** The new stationary source secures all applicable federal air permits that may apply; and,
5. ***Air Toxics -*** If there is a potential for toxic air pollutant (TAP) emissions, the stationary source meets all applicable requirements of the State's regulations for new TAP sources under Chapter 173-460 WAC.

SPI's proposal involves replacing eight (8) lumber dry kilns that emit air pollution. These replacement lumber dry kilns are considered new stationary sources of emissions and trigger NSR, even though they will be replacing preexisting similar equipment and systems at the Mill. SPI's request for an increase in the Mill's permitted dried lumber production limit will result in a proportionate increase in emissions of regulated pollutants from kiln-drying activities. Both aspects of SPI's request trigger the requirement to secure ORCAA's approval though a NOC.

The removal of the production limit for dimensional lumber will also "de-bottleneck" the associated fungicide and wood brightener spray application systems, both of which will result in increasing VOC emissions. ORCAA's determinations are based on an understanding that SPI estimates they can apply fungicide and wood brightener spray to approximately ten (10) percent, or 41.5 MMbf of green lumber, in addition to the requested 415 MMbf of kiln dried lumber. There is no associated or permitted production limit on dimensional lumber production; these estimates were only used as a basis upon which to calculate emissions. SPI spray-applies a proprietary product called Workhorse III, manufactured by Kop-Coat, Inc. Email correspondence with Kop-Coat, Inc. dated July 17, 2020 guaranteed there are no toxic air pollutants as defined by WAC 173-460-150 in their Workhorse III product. Kop-Coat, Inc. provided the guarantee certification through completing and returning ORCAA Form 5B. Therefore, based on the confirmation from Kop-Coat Inc., the only emissions increase associated with the increased application of Workhorse III will be VOCs. ORCAA is permitting an 'as-reviewed' 20,000 gallon annual limit on the material usage of the Workhorse III product. The highest historical annual usage of Workhorse III was less than 10,000 gallons, and ORCAA believes 20,000 gallons should be more than adequate for any future demand.

The natural gas-fired package boiler was permitted at its full PTE of 40 MMBtu/hr in 01NOC192. Per a conversation with boiler operator staff on July 15, 2020, the package boiler is only capable

of adequately providing steam to five or six of the eight existing kilns at a time. Therefore, increasing kiln capacity through this permitting action will not de-bottleneck the package boiler.

Equipment and systems at the mill that will not be replaced, re-constructed or modified, but will be retained and integrated into future operation of the Mill, are not subject to NSR. Equipment not subject to NSR includes the natural gas-fired package boiler, the planer mill and associated dust collection system, and the diesel engine powering the emergency fire pump. This equipment will not be replaced or modified and, therefore, is not be subject to NSR.

Public notice and an opportunity to express interest in a NOC application is required for all NOC applications ORCAA receives. ORCAA accomplishes this by posting NOC fact sheets for all applications received on ORCAA's website. NOC fact sheets include a brief summary of the proposal and how to submit comments and/or request a public hearing. During the NOC application noticing period, interested persons may request a formal 30-day public comment period and may also request a public hearing. A formal 30-day public comment period is required if a NOC application generates significant public interest during the application noticing period, or if the project triggers an automatic 30-day comment period. ORCAA is required to hold a public hearing before ORCAA taking final action on any NOC application that generates significant public concern. This case triggers an automatic public comment period due to a significant increase in Volatile Organic Compound (VOC) emissions.

3. Mill Background

SPI began operation of their Aberdeen lumber mill in February 2003. Including this permitting action, eight NOCs and MODs have been issued by ORCAA for the lumber mill. In August 2010 ORCAA issued the first Title V Air Operating Permit (AOP) to SPI for the lumber mill and the first renewal in 2016. Collocated with the lumber mill is a wood-fired cogeneration plant that provides steam to the mill and also produces electricity sold to the grid. Considered a separate source under Title V definitions and permitted separately, the cogeneration plant received NOC approval from ORCAA and a PSD permit from Ecology in 2002, and began operating in early 2003. In July of 2007 ORCAA issued a Title V AOP to SPI for the cogeneration plant. Following are summaries of the NOCs that ORCAA has issued to SPI concerning the Aberdeen lumber mill:

Table 1: Permitting History with ORCAA

Permit # (date)	Description	Status
01NOC192 (5/8/2002)	ORCAA granted SPI conditional approval to construct a lumber mill and associated equipment.	Active
02NOC268 (12/19/2002)	ORCAA granted conditional approval for SPI to install an in-line, contained anti-mold spray system to treat green lumber downstream of the planer.	Active

04NOC347 (3/1/2004)	ORCAA granted approval for SPI to install an eighth dry kiln, which was needed to fully realize initial production estimates. As no increase in lumber production or boiler use was requested, approval was granted unconditionally.	Active
04NOC392 (2/1/2005)	ORCAA granted SPI conditional approval to replace the planer baghouse, which was under-designed and required frequent maintenance, with a higher capacity model.	Active
06NOC490 (9/29/2006)	ORCAA granted conditional approval for SPI to install a ninth dry kiln, operate kilns at a maximum temperature of 180°F, increase lumber throughput, and change their anti-mold spray formulation. SPI did not install a ninth kiln within 18 months of approval.	Cancelled
06NOC520 (Application cancelled)	In December 2006 SPI proposed to increase their lumber production and increase their maximum kiln operating temperature to 200 ^{0}F through Notice of Construction (NOC) 06NOC520. This increase in Toxic Air Pollutant emissions warranted a Second Tier Analysis, which was performed by the Washington State Department of Ecology (Ecology). On November 6, 2007, ORCAA staff discovered that acetaldehyde factors were not used in the analysis, and required an analysis including acetaldehyde. On November 8, 2007 Ecology withdrew their draft Second Tier Analysis determination when they realized acetaldehyde was not addressed. SPI decided they no longer wished to continue with the project, and cancelled 06NOC520 on January 5, 2009.	Cancelled
11MOD861 (3/20/2012)	ORCAA granted conditional approval for SPI to raise the maximum kiln temperature from 180 ^{0}F to 200 ^{0}F.	Cancelled - Superseded by 15ADM1089
15ADM1089 (6/22/2015)	The ORCAA staff who reviewed the cancelled project 06NOC520 subsequently left the agency, and did not work concurrently with the ORCAA staff who would then review 11MOD861. Through confusion or miscommunication, the ORCAA staff who reviewed 11MOD861 saw the draft Second Tier Analysis, and believed it to be final. Condition 10 of 11MOD861 was based on the cancelled Second Tier Analysis draft performed by Ecology for 06NOC520. ORCAA amended 11MOD861 by removing Condition 10, which set a limit on the amount of Formaldehyde SPI can emit.	Cancelled – Superseded by 20NOC1449
20NOC1449 (<Date Final>)	ORCAA granted SPI conditional approval to replace eight existing lumber dry kilns with larger units, increase the facility-wide production limit of kiln-dried lumber from 315 MMbf/yr to emissions limits equivalent to 415 MMbf/yr, and eliminate the 350 MMbf/yr production limit on dimensional lumber.	Active

Based on “Potential to Emit” (PTE) the Mill is a “Major Source” under Title V of the federal Clean Air Act for hazardous air pollutant (HAP) and volatile organic compound (VOC) emissions and, therefore, is subject to the requirement that the Mill operate under an Air Operating Permit (AOP) issued by ORCAA. PTE refers to the highest amounts of pollutants that a facility could release into the air based on physical and regulatory limitations. The mill has operated under an AOP since August 13, 2010. The current AOP for the Mill was issued on October 4, 2016 and will expire October 4, 2021.

The Mill site includes a cogeneration (Cogen) plant also operated by SPI. The Cogen plant wood-fired boiler generates high-pressure steam, which is sent to a steam turbine to generate both electricity and low-pressure steam. The low-pressure steam goes to the Mill’s lumber dry kilns. The steam turbine generates up to 20MW of electricity, providing power to both facilities. Excess power is sold, typically to the local PUD.

Since the Mill has its own package boiler, the two facilities are able to operate completely independent of one another. The Cogen plant is regulated as a separate “Major Source” by ORCAA, operating under its own AOP. That being said, except during downtime (e.g. malfunction, annual maintenance, etc.), excess steam from the Cogen plant is used to supply the dry kilns with steam for the lumber-drying operations. Further information regarding SPI’s Cogen plant and associated operations is available in the Technical Support Document for the Cogen plant, which is available from ORCAA’s website (www.orcaa.org).

Relevant to this permitting action, removing the dimensional lumber production limit and replacement of the dry kilns will increase steam demand on the Cogen’s boiler. However, because the Cogen plant is regulated as a separate stationary source and will not be physically modified, and because emissions consequences of Cogen’s boiler have already been reviewed and permitted at its max PTE through 02NOC234, increases in emissions from the Cogen’s boiler due to the potential increase in steam sent to the kilns were not considered in this analysis. Therefore, ORCAA’s determinations for this NOC are based on an understanding that SPI already runs the Cogen boiler at or near its maximum heat output, using excess steam to power the 20MW steam turbine, and using or selling the electricity as available.

Air permitting under the federal Prevention of Significant Deterioration (PSD) program, which is administered by Ecology, has never been triggered by the Mill. Based on PTE, SPI’s lumber mill is unable to emit at PSD’s “Major Stationary Source” levels for any applicable pollutant. Therefore, PSD permitting is not triggered by this project.

4. Project Description

SPI requests approval to replace their eight dry kilns with Wellons’ current like-for-like model kilns, which have a slightly larger capacity and greater efficiency. SPI also requests ORCAA increase the Mill-wide dried lumber production capacity limit. In addition to emissions increases from the kilns, the overall Mill production potential will be increased due to replacing existing kilns. Increased production potential will result in a proportional increase in VOC

emissions from applying more fungicide and wood brightener. The following subsections generally describe these changes and implications on air emissions. SPI's NOC application provides a more detailed technical description and accounting of the proposed changes.

4.1. Lumber Dry Kilns:

The Mill includes eight (8) lumber dry kilns (Kilns) that are used to dry Douglas Fir and Western Hemlock. SPI plans on replacing all eight of the existing Kilns with new, slightly larger units. Because the Kilns are new units, they trigger NSR.

The new Kilns will be double-track dry kilns. They will each have a capacity to hold approximately 312,000 bf of lumber, as opposed to the previous kilns which each had a capacity of 300,000 bf. They will be equipped with computerized temperature management systems that will maintain kiln temperatures to 200 ^{o}F or less. They will be sited at about the same location as the kilns they're replacing.

Because the Kilns are new emissions units and trigger NSR, they are subject to the requirement that air emissions be controlled using Best Available Control Technology (BACT). BACT by definition is the most effective control technology that is technically feasible considering economic, energy, and other environmental impacts. SPI proposes kiln temperature management systems and maintaining kiln temperatures to 200 ^{o}F and less as BACT. ORCAA staff reviewed SPI's BACT proposal and concurs. Energy management systems allow lumber drying temperatures to be fine-tuned and regulated so that the lumber is not over-dried or dried too quickly. Maintaining drying temperatures to 200 ^{o}F or less reduces emissions of VOC and Toxic Air Pollutants (TAP).

To ensure proper operation and maintenance of the temperature management system, Staff recommends imposing the following conditions of approval:

- Continuously monitoring dry-bulb temperature in each drying zone of each kiln;
- Maintaining maximum average kiln temperatures to 200 ^{o}F or less in each zone; and,
- Periodic calibration of dry-bulb temperature sensors.

Accordingly, ORCAA made the 200 ^{o}F drying temperature enforceable through Condition #4 (see below).

Regarding federal requirements, even though SPI's plans do not include the manufacture of plywood, the Kilns will be subject to the federal National Emissions Standards for Hazardous Air Pollutants for Plywood and Composite Wood Products (AKA: Plywood MACT) under 40 CFR Part 63, Subpart DDDD. According to 40 CFR § 63.2231(a), facilities that are major sources of HAP and kiln-dry lumber are subject to this subpart. According to 40 CFR § 63.2252, no requirements from this subpart [DDDD] or subpart A other than initial notification apply. Therefore, no ongoing NOC nor AOP conditions are based on this subpart. The only requirement from the Plywood MACT that applies is the one-time initial notification requirement found in 40 CFR § 63.9(b)(iii), which SPI stated was submitted through this Notice of Construction permit

application to ORCAA. ORCAA was delegated administrator authority for Subpart DDDD on May 17, 2018 from the U.S. EPA Region 10.

Kilns directly emit Particulate Matter (PM) in the form of organic compounds that condense to form particulate in the ambient air, VOC and TAP. Associated TAP include Acetaldehyde, Acrolein, Formaldehyde and Methanol (Acetaldehyde, Acrolein, Formaldehyde and Methanol are all listed Hazardous Air Pollutants (HAP) as well). In addition to direct emissions, the Kilns are indirectly responsible for emissions from the boilers since they are users of steam heat. Air pollutant emissions and impacts from the Kilns were included in the air impacts evaluation supporting this Final Determination. Impacts associated with the package boiler and Cogen boiler were already evaluated when the boilers were permitted.

Emissions factors and the methods used by SPI for estimating short-term and long-term kiln emissions were reviewed and found acceptable for representing worst case emissions from the kilns. Long term emissions rates were based on a maximum annual production rate of 415 million board feet of dried lumber. Except for Acetaldehyde and Formaldehyde, impacts of all associated air pollutants were found to be acceptable with respect to state standards (see Table 12 below). Model-predicted ambient Acetaldehyde and Formaldehyde concentrations triggered a Tier II review with the Washington State Department of Ecology. ORCAA will accept Ecology's findings when they review the Tier II review.

4.2: Anti-Mold Spray System:

ORCAA regulates anti-mold spray systems at lumber mills as stationary sources of emissions due to the presence of VOC in anti-mold products used. Since the anti-mold spray system (Anti-mold System) will be de-bottlenecked through eliminating the Mill's production limit on board feet of lumber produced, the associated increase in emissions triggers NSR and is subject to BACT and an ambient air impacts review. SPI treats all cut lumber (dried as well as green) with water-borne coatings (such as Workhorse III, End Shield, and Azko Nobel Coatings, Inc. H1* F0 R0) that protects the wood against sap-stain, mold, mildew, decay, and bacteria during storage and transit. The Workhorse III product is the product primarily used as it accounts for over 99% of product spray-applied, by mass.

Workhorse III does not contain any TAP or HAP, but does contain ingredients that are VOC. It is spray-applied in a spray chamber which was permitted under 02NOC268. The spray chamber is located at the south end of the saw mill, is enclosed, and exhausts through a mist eliminator. The mist eliminator recycles the solutions back into the spray system. In previous permitting actions, ORCAA staff considered the mist eliminator as meeting the BACT requirement for the Anti-mold System.

Since the Anti-mold system has been de-bottlenecked, there is an associated increase in VOC emissions. The 02NOC268 permit had a VOC PTE of 29.4 TPY for the Anti-mold system. SPI has since transitioned to their current Workhorse III product and has used it for several years, demonstrating its use to be a feasible practice. The associated VOC PTE for the Anti-mold

system while using Workhorse III, which has a VOC content of 0.01 lbs VOC/gallon, and using an enforceable 20,000 gallon material usage limit is 0.1 TPY. Therefore, ORCAA determined a VOC content of 0.01 lbs/gallon to be BACT for the primary coatings applied in the Anti-mold system, in addition to the aforementioned mist eliminator, and made it an enforceable requirement through Condition 9.

5. Emissions

Overview

Air pollutant emissions from the replacement kilns as well as the project-related change in emissions were determined in order to evaluate applicability and compliance with air requirements and to evaluate ambient air impacts of the proposed project. ORCAA staff reviewed SPI's emissions calculations, emissions factors used, and assumptions made and concluded they are appropriate for evaluating ambient air impacts and compliance with air regulations and standards.

Emissions Factors

Emission factors relate the amount of air pollutant emitted in terms of mass (concentration, pounds, grams, or grains) to the amount of production or output of the operation or piece of equipment being evaluated. Emission factors are the starting point for calculating emissions. All emission factors used by SPI were reviewed by ORCAA and determined to be acceptable for making air regulatory determinations and evaluating air impacts. The table below summarizes emission factors used by SPI. The table notes provide details on the origin of each factor and any key assumptions.

Table 2: Emission Factors

	Kilns[3]	Anti-Mold: Kop Koat Workhorse III[4]	Anti-Mold: End Shield[4,5]	Anti-Mold: Azko Nobel Coatings, Inc. Red End Sealer[4]
Units[1]	lbs/Mbf	lbs/gal	lbs/gal	lbs/gal
PM[2]	0.02	0	0	0.1
VOC	1.15	0.01	8.28	0.75
Acetaldehyde	0.0677	0	0	0
Acrolein	0.0012	0	0	0
Formaldehyde	0.0044	0	0	0
Methanol	0.196	0	0	0
Propionaldehyde	0.00040	0	0	0
Chlorothalonil	0	0	0.0828	0.0242

Table Notes:

1. Units: lbs/Mbf = pounds per thousand board feet of lumber, lbs/gal = pounds per gallon.

2. PM reflects total PM (includes filterable and condensable PM) and was assumed for both PM_{10} (Particulate with aerodynamic diameter 10 microns and less) and $PM_{2.5}$ (Particulate with aerodynamic diameter 2.5 microns and less).
3. Kiln VOC and TAP factors from EPA Region 10 (November 2019) Compilation of VOC and HAP (Hazardous Air Pollutant) Emissions Factors for Lumber Drying Kilns. PM emission factors from a source test conducted by ETI for SPI's Burlington facility in 2013. Emissions factors reflect the highest factor of the species dried (Hemlock and Douglas fir) at a maximum drying temperature of 200° F.
4. The Anti-Mold system emission factors for VOC and TAP is based on the data stated in Safety Data Sheets (SDS) for the three products used for this purpose and BACT limits.
5. The SDS for End Shield did not state a VOC content. ORCAA staff conservatively assumed 100% VOC as it has no impact on the health or regulatory outcome of this permitting action.

Project-Related Emissions

Emissions that are a direct result of a project are referred to as Project-Related Emissions (Project Emissions). SPI's plans for operating the Mill will involve using existing equipment at the Mill as well as replacing the kilns. Only emissions from new equipment installed or a result of de-bottlenecking existing equipment triggers NSR and is counted in Project Emissions. Therefore, equipment represented in Project Emissions include only the Kilns, and Anti-Mold System. Emissions from the package boiler at the Mill and from the wood-fired boiler at SPI Cogen were not counted toward Project Emissions since these boilers are existing emissions units that will not be physically modified, were previously reviewed at their respective maximum design capacities, and will be operated the same way they have in the past.

Project Emissions may be used in initial screening-level analyses of air impacts for identifying projects not likely to cause or contribute to significant, measurable ambient air impacts (SIL Analysis). A SIL analysis is accomplished using air dispersion modeling to estimate the maximum ambient impacts caused by the project alone. If estimated impacts of the project alone are above the "Cause or Contribute Threshold Values for Nonattainment Area Impacts" (AKA: Threshold Values) listed in WAC 173-400-113(4)(a), then a more refined ambient air impacts analysis incorporating site-specific meteorology, background pollutant concentrations and impacts from nearby sources is required.

Project Emissions are also used to determine whether TAP emissions rates are sufficiently low to protect human health and safety from potential carcinogenic and/or other toxic effects (AKA: Tier 1 analysis). A Tier 1 analysis is accomplished in a two-step process involving comparing TAP emissions rates with threshold emission rate levels referred to as Small Quantity Emissions Rates (SQER), followed by a screening-level impacts analysis for TAP determined likely to exceed their SQER. Details on both the SIL and Tier 1 analyses are provided in the following sections.

Project Emissions for SPI's proposed kiln replacement project in terms of tons per year (tpy) are summarized in the following table. These annual emissions reflect the PTE of equipment involved in SPI's proposed project. Emissions factors, calculation methods, and assumptions used by SPI were reviewed by ORCAA staff and found to be consistent with established practices for calculating PTE.

The Kilns will emit VOC including TAP (some of which are also HAP), and particulate. Kiln emissions were based on emission factors reflecting a maximum drying temperature of 200° F. Even though both Douglas Fir and Hemlock will be dried, SPI conservatively assumed the highest or "worst case" emissions factor between Douglas Fir and Hemlock to calculate emissions. Annual kiln emissions limits are based on a maximum of 415 MMbf of lumber dried per year, which is a voluntary production cap requested by SPI and is made enforceable through condition #2 (see below). Hourly emission rates were based on the annual emissions divided by 8,760 hours per year, which assumes continuous, normalized operation of the kilns. ORCAA staff agree with SPI that continuous and normalized operation of the kilns is a reasonable assumption.

The Anti-Mold coating system will emit VOC and some TAP. All lumber is treated with water-based coatings to promote brightness and resist mildew. Boards are sent through an automated spray box where two spray bars, each 40 inches long by 37.5 inches wide, apply the dilute solution to planed lumber. The spray box is flanked at the infeed and outfeed by air chambers operated at negative pressure and the collected mist is vented to a squirrel cage-type mist eliminator with an estimated control efficiency of 99.97% for droplets with a diameter of 0.3 µm or larger. Collected mist is recycled. Emissions are calculated using a mass-balance approach, incorporating the VOC content stated on the associated SDS, and conservatively assumes all VOC is emitted.

In addition, SPI uses a Lumber Red End Sealer and End Shield product to treat the ends of boards. The products both contain VOC and the TAP Chlorothalonil, though in such small quantities so as not to trip the associated de minimis values in WAC 173-460-150.

Table 3: Project Emissions[1] at PTE

	PM (tpy)	VOC (tpy)	Acetaldehyde (tpy)	Acrolein (tpy)	Formaldehyde (tpy)	Methanol (tpy)	Propionaldehyde (tpy)	Chlorothalonil (tpy)
Kilns[2]	4.2	238	14.0	0.25	0.905	40.8	0.083	0
Anti-Mold System[3]	0	0.1	0	0	0	0	0	0.0006
Project Total	4.2	238	14.0	0.25	0.905	40.8	0.083	0.0006

Table Notes:

1. NOx, CO, and SO2 emissions are not shown since the project proposed by SPI does not have any implications on these emissions.
2. Kiln emissions factors represent drying the species with the highest emissions rate, drying at 200° F and an annual production drying cap of 415 MMbf/yr. PM from Kilns represents the condensable organic fraction of VOC.
3. Anti-mold system emissions were calculated using mass-balance and pollutant information on SDS's, an enforceable 20,000 gallon annual material usage limit and BACT limits.
4. Kiln Emissions limits in Condition 2 are based on PTE emissions from this table as-reviewed.

Facility-Wide PTE

Annual Facility-Wide emissions of criteria air pollutants and TAP are provided in the following tables. These emissions estimates reflect the PTE of the Mill and were used to determine applicability of air regulatory requirements and air permitting programs such as PSD and Title V.

Table 4: Facility Criteria PTE

	NOx (tpy)	CO (tpy)	PM (tpy)	SO2 (tpy)	VOC (tpy)
Package Boiler[1]	8.8	8.8	1.3	1.0	0.9
Kilns[2]	0	0	4.2	0	238
Planer Mill[3]	0	0	9.5	0	0
Anti-Mold System[4]	0	0	0	0	0.1
Fugitives[5]	0	0	26.5	0	0
Facility-Wide Sum	8.8	8.8	41.5	1.0	239

Table Notes:

1. Package boiler emissions based on 8,760 hours of operation per year at maximum firing rate. NOx and CO emissions based on BACT limits. SO2, PM, and VOC emissions based on AP-42 factors.
2. Kiln VOC based on production rate limit of 415 MMbf.
3. Planer Mill emissions based on a warranted 0.005 gr/dscfm, 50,440 ACFM, and 8,760 hours/year operation.
4. Anti-Mold system VOC based on SDS of specific products applied, an enforceable 20,000 gallon material usage limit, and BACT limits.
5. Negligible increase in PM_{10} and $PM_{2.5}$ expected from Log Yard, debarking, truck bin loadout, chip pile, and barge loading. Prorated 2019 actuals up to a facility-wide production of 456.5 MMbf/yr throughput for PTE estimate.

Table 5: Facility-Wide PTE for Project-Related TAP

	Acetaldehyde (tpy)	Acrolein (tpy)	Formaldehyde (tpy)	Methanol (tpy)	Propionaldehyde (tpy)	Chlorothalonil (tpy)
Package Boiler[1]	0	0	0.013	0	0	0
Kilns[2]	14.0	0.25	0.905	40.8	0.083	0
Planer Mill[3]	0	0	0	0	0	0
Anti-Mold System[4]	0	0	0	0	0	0.0006
Fugitives[3]	0	0	0	0	0	0
Project Total	14.0	0.25	0.918	40.8	0.083	0.0006

Table Notes:

1. TAP emissions from Package Boiler based on emission factors from EPA AP-42 and continuous operation at maximum heat-rate.
2. Kiln TAP emissions calculated using emission factors of the species with the highest emissions rate, drying at 200 °F and an annual kiln drying production maximum of 415 MMbf/yr.
3. No TAP emissions expected from Planer Mill or Fugitives.
4. Anti-Mold system TAP based on SDS of specific products applied.

WAC 173-460-080(3) allows for a reduction of TAPs from existing emission units. An applicant may include in an acceptable source impact analysis proposed reductions in actual emissions of a particular TAP from emission units at the source that are not new or modified for the purpose of offsetting emissions of that TAP caused by the new or modified source. The reductions in TAP emissions authorized by this subsection must be included in the approval order as enforceable emission limits and must meet all the requirements of WAC 173-460-071. In this

case, WAC 173-460-080(3) allows TAP reductions from removing the existing dry kilns to be netted out of project emissions from the kilns. This was accomplished through the modeling analysis by conducting two modeling runs: one reflecting operation of the existing dry kilns; and, the second reflecting operation of the new kilns at their maximum permitted capacity.

Therefore, Emissions increases reviewed in the Tier 1 TAP analysis are the difference in emissions between future projected emissions at PTE minus past actual emissions. SPI based past actual emissions on the highest 2-year average of lumber dried in the existing kilns for the time period 2009-2019.

Table 6: Net Emission Increases for Project-Related TAP

Pollutant	Acetaldehyde	Acrolein	Formaldehyde	Methanol	Propionaldehyde	Chlorothalonil
Emission rate	Lb/year	Lb/24-hr	Lb/year	Lb/24-hr	Lb/24-hr	Lb/year
Past Actual Emissions[1]						
Kilns[2]	15,000	0.73	970	116	0.30	0
Anti-Mold System[3]	0	0	0	0	0	9.37
Proposed Increase[4]						
Kilns[5]	28,100	1.4	1,810	223	0.45	0
Anti-Mold System[6]	0	0	0	0	0	12.2
Project Net Total[7]						
	13,100	0.67	840	107	0.15	2.85
SQER[8]	60	0.026	27	1,500	0.59	180
Project Net Total Exceeds SQER?[9]	Yes	Yes	Yes	No	No	No

Table Notes:

1. Actual TAP emissions based on actual throughput and material use averaged over two consecutive years of data for period 2009-2019, taking the highest two-year average for each pollutant.
2. Kiln actual TAP emissions calculated using emission factors of the actual species dried, and worst-case factors from drying at 200 °F.
3. Actual TAP emissions from anti-mold system created using mass-balance analysis of pollutant concentrations found on SDSs and facility reported annual maximum use of products. TAP appears only in board end products. No TAP in Workhorse III, the primary coating applied.
4. Proposed increase assumes full PTE of the associated emission units at physical and regulatory limits.
5. Kiln increase assumes 415 MMbf/yr and associated worst-case emission factors for each pollutant.
6. Anti-mold system PTE uses mass-balance analysis of pollutant concentrations found on SDSs and assumes prorated increase in material usage commensurate with raising board feet coatings from 350 MMbf/yr to new kiln-dried limit of 415 MMbf/yr plus an additional 10% green lumber for a total of 456.5 MMbf/yr coated.
7. Project net total calculated by subtracting past actual emissions from proposed increase, as allowed under WAC 173-460-080(3).
8. SQER is the Small Quantity Emission Rate found in WAC 173-460-150.
9. If net TAP emission are less than their corresponding SQER, emissions of that particular TAP are considered sufficiently low to ensure compliance with the ASIL without further analysis. Otherwise, a 'second tier review is required. See Section 9 below for more information.

Emission Rates Used in Modeling

Since the equipment triggering NSR (kilns, debottlenecking Anti-Mold System) does not include combustion equipment, only PM, TAP, and VOC triggered NSR and required evaluation of ambient air impacts through ambient air dispersion modeling. The following tables summarize the emissions rates used in the modeling analyses supporting approval of SPI's proposal. Table notes summarize the assumptions, parameters, and emissions factors used by SPI.

Table 7: PM[1] Modeled Emissions

	Hourly Rate (lbs/hr)	Daily Rate (lbs/day)	Annual (tpy)	Modeled Rate (g/s, short term)	Modeled Rate (g/s, long term)
Kilns[2]	0.947	22.7	4.15	0.119	0.119
Anti-Mold System[3]	N/A	N/A	N/A	N/A	N/A
Facility-Wide Sum	0.947	22.7	4.15	0.119	0.119

Table Notes:

1. $PM_{2.5}$ and PM_{10} assumed to equal total PM emissions.
2. Kiln annual PM rate based on drying at 200 °F, production maximum of 415 million bf per year and assuming worst-case wood species for each pollutant. Kiln hourly and daily rates are annual average rates and based on annual tpy distributed evenly over entire year. Both short term and long term rates used for modeling reflect the annual average hourly emissions rate converted to grams/second.
3. Assumed no PM emissions from Anti-Mold System.

Table 8: Modeled TAP Emission Rates[1]

Pollutant	Proposed Lumber Dry Kilns[2]		Existing Lumber Dry Kilns to be Removed[3]	
	(lb/hr)	(g/s)	(lb/hr)	(g/s)
Acetaldehyde	3.21	0.404	1.71	0.216
Acrolein	0.0568	0.00716	0.0305	0.00384
Formaldehyde	0.207	0.0260	0.11	0.0139

Table Notes:

1. Only includes emission rates for the TAP requiring modeling. TAP emissions requiring modeling come only from the kilns. See Section 9 below for more information.
2. Assumes all proposed lumber dry kilns combined.
3. Assumes all existing lumber dry kilns combined.

Output Based Emission Factors

Output based emission factors refer to the amount of emissions per unit of output or production such as pounds per million board foot of lumber (lbs/MMbf) or grains per dry standard cubic foot (gr/dscf) of exhaust.

New kilns proposed by SPI will be state-of-the-art. The Lumber kilns proposed by SPI will be equipped with computerized energy management systems and SPI proposes to limit average drying temperatures to no more than 200 °F.

6. Applicability of Prevention of Significant Deterioration (PSD)

The Prevention of Significant Deterioration (PSD) program is a federal air permitting program that applies in areas with relatively good air quality to proposed new "PSD Major" facilities and proposed "Major Modifications" to existing PSD Major facilities. The PSD program in Washington has been delegated to and is administered by the Washington Department of Ecology (Ecology). When applicable, obtaining a PSD permit through Ecology is a prerequisite to ORCAA issuing a NOC permit. Like ORCAA's NSR program, the objective of PSD is to protect public health and welfare. In addition, PSD includes special provisions designed to ensure air emissions from new facilities do not significantly degrade existing clean air resources. PSD also includes review requirements designed to preserve, protect, and enhance the air quality in areas of special natural, recreational, scenic, or historic value, which are referred to as "Class I" areas. Class I areas are defined in the CAA as National Parks over 6,000 acres and wilderness areas and memorial parks over 5,000 acres that were established as of 1977. Class I areas in Washington nearer to SPI include Olympic National Park, Mt Rainier National Park, the Goat Rocks Wilderness, Mt. Adams Wilderness and the Alpine Lakes Wilderness.

Grays Harbor County and the City of Aberdeen qualify as areas with relatively good air quality since there have been no documented violations of the National Ambient Air Quality Standards (NAAQS). Therefore, new PSD Major Sources and Major Modifications would trigger the requirement for obtaining a PSD permit prior to commencing construction or modification.

SPI's lumber mill is a natural minor source with respect to the PSD program for all pollutants. Therefore, this project does not trigger a PSD permit.

7. Performance Standards

ORCAA's Rule 6.1.4(a)(1) requires a finding that any new or modified stationary source will likely comply with applicable state, federal and local performance standards for air emissions including emission standards adopted under chapter 70A.15 of the Revised Code of Washington (RCW), emissions standard of ORCAA, and federal emission standards including new source performance standards (NSPS), national emission standards for hazardous air pollutants (NESHAP), national emission standards for hazardous air pollutants for source categories (MACT standards).

SPI's proposed kiln replacement project does not trigger any new applicable performance standard: The same performance standards will continue to apply to both existing equipment and the equipment proposed to be replaced. All emissions units at the Mill are subject to the generally applicable air requirements from ORCAA's regulations and from the State's General Regulations for Air Pollution Sources under Chapter 173-400 of the Washington Administrative Code (WAC). In addition, the performance standards listed in the following table will continue to apply. Regarding equipment intended to be replaced and, therefore, subject to NSR, ORCAA staff's conclusion is that compliance with applicable performance standards is likely. This conclusion satisfies the criteria of approval required under ORCAA Rule 6.1.4(a)(1).

Table 9: List of Project-Applicable Performance Standards

Regulation/Rule Citation	Description	Applies:
Chapter 173-400 WAC	General Regulations for Air Pollution Sources	Facility-Wide
ORCAA Regulation 8	Performance Standards	Facility-Wide
40 CFR Part 63, Subpart DDDD	National Emissions Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products	Applies to Kilns.

8. Best Available Control Technology (BACT)

In addition to applicable performance standards, Best Available Control Technology (BACT) is the required level of control for emissions of Criteria Air Pollutants from new emissions units. Likewise, Best Available Control Technology for Toxic Air Pollutants (tBACT) is the required level of control for TAP emissions from new emissions units that will emit TAP. BACT and tBACT share the same definition from Chapter 173-400-030 WAC as, *"an emission limitation based on the maximum degree of reduction for each air pollutant subject to regulation under chapter 70A.15 RCW emitted from or which results from any new or modified stationary source, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each pollutant."*

In a December 1, 1987 memorandum from the U.S. Environmental Protection Agency (USEPA) Assistant Administrator for Air and Radiation, the agency provided guidance on the "top-down" methodology for determining BACT. The "top-down" process involves the identification of all applicable control technologies according to control effectiveness. Evaluation begins with the "top," or most stringent, control alternative. If the most stringent option is shown to be technically or economically infeasible, or if environmental impacts are severe enough to preclude its use, then it is eliminated from consideration and then the next most stringent control technology is similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by technical or economic considerations, energy impacts, or environmental impacts. The top control alternative that is not eliminated in this process becomes the proposed BACT basis.

Under this permitting action, emissions units subject to BACT and tBACT include the kilns and Anti-Mold System. The rest of the emissions units at the Mill are not subject to BACT or tBACT since they are existing emissions units that will not be replaced or altered and, therefore, do not trigger NSR. ORCAA staff reviewed SPI's BACT and tBACT determinations and concurs with the technologies and control limits proposed. The following table summarizes BACT and tBACT for proposed new and modified emissions units at the Mill.

Table 11: BACT and tBACT Determinations

Emissions Units	BACT & tBACT Description	BACT/tBACT Limits & Work Practice Standards

Lumber Dry Kilns	Use of an energy management system to control drying temperatures.	• Kiln dry-bulb set point temperature must not exceed 200 °F. • Kiln average dry-bulb temperatures must be maintained at 200 °F or less. • Drying temperature shall be continuously monitored and recorded. • Temperature sensors shall be maintained and positioned to accurately monitor drying temperatures.
Anti-Mold System	1. Equipped with mist eliminator 2. Use of low-VOC solutions (0.01 lb VOC/gallon) for primary coatings applied	• Equipped with mist eliminator and stack • Maintain use records and SDS of solutions used

9. Requirements for New Toxic Air Pollutant (TAP) Sources

Washington's regulations titled Controls for New Sources of Toxic Air Pollutants (Air Toxics Regulation) under Chapter 173-460 of the Washington Administrative Code apply to new stationary sources of TAP. The purpose of this regulation is to, "… maintain such levels of air quality as will protect human health and safety." The TAP covered under the regulation include carcinogens and non-carcinogens. The regulation allows for a multi-tiered approach to assess potential health and safety impacts from TAP increases.

The "First Tier Review" involves comparing estimated ambient TAP impacts with the Acceptable Source Impact Levels (ASIL), which are established in the Air Toxics Regulation on a pollutant-by-pollutant basis. If the modeled impact of the increase in emissions of a TAP does not exceed its corresponding ASIL, the First Tier Review is passed for that TAP. This analysis typically involves the use of an ambient air quality model to predict ambient concentrations of the pollutant followed by a comparison with the ASIL. However, the Air Toxics Regulation also provides that if the calculated emission rate is less than the Small Quantity Emission Rate (SQER) for any TAP, then emissions are sufficiently low to ensure compliance with the ASIL without further analysis (WAC 173-460-020(7)). SQERs are listed in the Air Toxics Regulation for all TAP.

For TAP with an ambient concentration found to be greater than their ASIL, a "Second Tier Review" is required by the Air Toxics Regulation. Second Tier Reviews require more refined modeling analyses and approval by the Washington Department of Ecology in addition to ORCAA's review. Lastly, for those pollutants that cannot pass a Second Tier Review, the Air Toxics Regulation requires an even more refined "Third Tier Review."

ORCAA staff reviewed SPI's First Tier Review and concluded that it is consistent with requirements in Chapter 173-460 WAC. SPI based the first Tier Review on net TAP emissions from the Kilns as provided by WAC 173-460-080(3). Net TAP emissions were based on the difference between future PTE of the kilns minus past actual emissions from the kilns. Past actual emissions from the kilns were based on the highest 2-year average of actual emissions

over the last ten years. Past actual emissions from the kilns were calculated based on records of the actual quantities and species of lumber dried and emission factors representative of lumber drying temperatures at 200 °F. Future potential emissions were calculated based on a maximum annual lumber drying production rate maximum of 415 million board feet and emissions factors representative of lumber drying temperatures 200 °F or less. Since TAP emissions rates are based on these two conditions (415 MMbf production equivalent and drying temperatures of 200 °F or less), ORCAA staff is recommending a maximum kiln drying temperature be made enforceable (condition #4).

Table 12 below summarizes results from SPI's First Tier Review. Based on this outcome, approval of a Second Tier analysis by Ecology is required for Acetaldehyde and Formaldehyde.

Table 12: Results of First Tier Review

TAP (averaging period)	Net Change (lbs)	SQER (lbs)	Modeling Required? (yes/no)	Modeled Impact (µg/m3)	ASIL (µg/m3)	Tier 2 Required (yes/no)
Acetaldehyde (annual)	13,100	60	Yes	2.99	0.37	Yes
Acrolein (24-hr)	0.67	0.026	Yes	0.219	0.35	No
Formaldehyde (annual)	840	27	Yes	0.192	0.17	Yes
Methanol (24-hr)	107	1,500	No	N/A	N/A	No
Propionaldehyde (24-hr)	0.15	0.59	No	N/A	N/A	No
Chlorothalonil (annual)	2.85	180	No	N/A	N/A	No

Table Notes:

1. Net change in emissions based demonstrated in Table 6 above
2. Modeled impacts represent the net change in ambient impacts. The net change was determined by modeling the new Kilns at PTE and the existing Kilns at their PTE, but with a negative emissions rate.
3. SPI modeled impacts at both ground level and 1.5m receptor flagpoles; used maximum value

10. Ambient Air Quality Analysis

Ambient Air Quality Standards (AAQS) that apply in Grays Harbor County include both the National Ambient Air Quality Standards (NAAQS) and Washington Ambient Air Quality Standards (WAAQS). ORCAA's Rule 6.1.4(a)(3) requires demonstration that any new stationary source of air pollution or modification to an existing stationary source of air pollution not delay the attainment date for an area not in attainment, or cause or contribute to a violation of any AAQS. This is typically accomplished through an Ambient Air Quality Impacts Analysis (Impacts Analysis). Typically, Impacts Analyses requires use of air dispersion models to predict concentrations of air pollutants at the fence line of a facility and beyond. Air dispersion models take into account the air pollutant emissions rate of the new source being evaluated, characteristics of the new source, topography and local meteorological data, and use this

information to predict the maximum concentrations of pollutants outside the property line of the facility.

Regulatory standards for conducting Impacts Analyses are largely dictated by EPA through formal guidance on ambient air dispersion modeling techniques. EPA's Guideline on Air Quality Models in 40 CFR 51 Appendix W (The Guideline) addresses the regulatory application of air quality models for assessing air pollutant impacts under the Clean Air Act. The objective of EPA's guidance on air dispersion modeling is to ensure consistent Impacts Analyses under the Clean Air Act. EPA's guidelines also help ensure Impacts Analyses provide reliable results that can be used to protect air quality and maintain compliance with the NAAQS. ORCAA is responsible for reviewing all modeling decisions and data used in the Impacts Analysis with respect to the regulatory standards and practices recommended by EPA. Any deviation from recommendations in The Guideline must be justified for a particular Impacts Analysis.

SPI provided an Impacts Analysis in their NOC application for PM that demonstrates the Mill will not cause or contribute to violation of the PM_{10} (Particulate with an aerodynamic diameter 10 microns and less) or $PM_{2.5}$ (Particulate with an aerodynamic diameter 2.5 microns and less) AAQSs. Table 13 below provides a summary of results. Only PM (PM_{10} and $PM_{2.5}$) impacts were analyzed since it is the only pollutant emitted by equipment subject to NSR that has an associated AAQS. SPI's Impacts Analysis is thoroughly described in their NOC application, and modeling input and output files were provided. ORCAA staff reviewed SPI's Impacts Analysis and concludes that it conforms to The Guideline and provides results that can be relied on for air regulatory determinations.

Table 13: Predicted Facility-Wide PM Concentrations

Pollutant	Averaging Period	Concentrations ($\mu g/m^3$)				Over AAQS?
		Mill Impact[1]	Background	Total	AAQS ($\mu g/m^3$)	
PM_{10}	24-hour	7.96	42.1	50.1	150	No
$PM_{2.5}$	24-hour	6.66	15.4	22.1	35	No
	Annual	1.93	5.9	7.83	12	No

Table Notes:

1. Design concentrations are the highest maximum 24-hour average PM_{10} concentration over five modeled years, the highest 5-year average of the maximum 24-hour average $PM_{2.5}$ concentrations at each receptor, and the highest 5-year average of the annual average $PM_{2.5}$ concentrations at each receptor (based on guidance in the "Modeling Procedures for Demonstrating Compliance with the $PM_{2.5}$ NAAQS" memorandum issued on March 23, 2010 by Stephen Page, Director of OAQPS). Used higher value of modeled ground level design or flagpole design (1.5m receptors).
2. Background data obtained from NW Airquest (https://arcg.is/1jXmHH) for latitude 46.96° N and longitude 123.78° W.
3. Total concentration is the sum of the design concentration and the background concentration.

SPI's Impacts Analysis reflect worst case PM impacts attributable to the project. For all emissions units, SPI assumed $PM_{2.5}$ and PM_{10} equal the rate of PM. ORCAA staff concurs with the choices of emissions factors, assumptions and calculations SPI used in calculating emissions.

The kiln PM emission rates used by SPI for modeling long term and short-term impacts were the same and were based on annual maximum production of 415 MMbf of kiln dried lumber. The annual PM rate at 415 MMbf was normalized over an entire year to an equivalent gram per second rate. This was the rate used in SPI's modeling runs for both long term and short-term impacts. This was determined acceptable by ORCAA staff since lumber drying at SPI necessary to achieve a maximum production rate of 415 MMbf per year will need to be fairly continuous. Also, it is not possible for all the kilns to be loaded and started simultaneously. Since loading and starting of kilns will be staggered, drying cycles will also be staggered, which will tend to normalize emissions from the kilns. Therefore, the PM emissions rates used by SPI in their modeling runs are acceptable.

The Anti-Mold system is not expected to contribute to PM emissions from the Mill. For this reason, these emissions units were not modeled. The Anti-Mold system will be equipped with a mist eliminator to reclaim airborne mist vapors in its exhaust, which will be recycled back into the usable Anti-Mold solution. The solutions proposed by SPI contain minimal amounts of dissolved or suspended solids that could potentially contribute to PM emissions from the system.

SPI's Impact Analysis conservatively predicts PM impacts from the project, and adequately incorporates local background ambient air concentrations. As stated previously, ORCAA staff reviewed SPI's Impacts Analysis including emissions calculations, modeling input files and supporting information provided in SPI's NOC application, and concludes it conforms to regulatory standards and provides results that can be relied on for air regulatory determinations. ORCAA staff's conclusion is that SPI's Impacts Analysis provides sufficient demonstration that the operation of the Mill will not cause or contribute to violation of either the WAAQS or NAAQS for $PM_{2.5}$ or PM_{10}.

11. Public Involvement

A formal public comment period and opportunity for a public hearing were automatically triggered since the project required a Tier II analysis by the Washington State Department of Ecology (Ecology). A 30-day public commenting period following Ecology's Tier II determination was initiated December 8, 2020. A public hearing will be held if significant public interest exists. Comments from the public <were/were not> received.

12. Recommended Conditions of Approval

20NOC1449 will supersede 15ADM1089. Therefore, ongoing and otherwise applicable conditions from 15ADM1089 will be incorporated into this permit. ORCAA staff recommend the following conditions of approval be adopted into the Approval Order issued to SPI for their kiln replacement project:

1. **Approved Stationary Sources:** The equipment and activities described in the following table are identified as stationary sources of air emissions and are conditionally approved by this Order. Deviations from conditions in this Order, or from operating specifications documented in either the application or Final Determination for Notice of Construction No. 20NOC1449 may constitute violation of this Order and ORCAA's regulations unless prior approval is granted.

Table 1 Approved Stationary Sources

STATIONARY SOURCES	EQUIPMENT SPECIFICATIONS
Lumber Dry Kilns	• Eight (8), double-track dry kilns • Each with approximately 312,000 bf of lumber capacity • Equipped with computerized temperature management systems

[Regulatory Basis: ORCAA 6.1(a)(1); ORCAA 6.1.2(l); WAC 173-400-110(2)(a)]

2. **Kiln Emissions Limits:** Cumulative emissions from the lumber dry kilns shall not exceed the limits in Table 2. Compliance with these limits shall be determined monthly according to condition 11.

Table 2: Kiln Emissions Limits

Pollutant	Limit	Units
Volatile Organic Compounds (VOC)	238	Tons per consecutive 12-month period (tpy)
Acetaldehyde	14	Tons per consecutive 12-month period (tpy)
Formaldehyde	0.9	Tons per consecutive 12-month period (tpy)
Acrolein	6	Tons per consecutive 12-month period (tpy)

[Regulatory Basis: WAC 173-460-070]

3. **Material Limitation:** The facility is permitted to dry hemlock and Douglas Fir. SPI may dry other species of wood if they can demonstrate that it results in equal or lower emission rates of each TAP, overall VOC, and PM_{10} compared to the maximum of either Hemlock or Douglas Fir, by providing ORCAA with acceptable emission factors for the other species of wood.

   [Regulatory Basis: ORCAA Rule 6.1.2(l)]

4. **Kiln Temperature:** Each Kiln shall be operated at an average temperature of 200 ^{o}F or less at all times. If a kiln temperature rises above 200 ^{o}F action shall be taken to reduce the

temperature immediately. If an overheated kiln cannot be returned to a temperature of 200 ^{o}F or lower and maintained at such a temperature within 24-hours, all wood shall be removed until the issue has been resolved.

*For purposes of this condition, kiln temperature means the dry-bulb kiln temperature and average kiln temperature means the daily average dry-bulb kiln temperature.

[Regulatory Basis: ORCAA Rule 6.1.4(a)(2); WAC 173-400-113(2); WAC 173-460-040(3)(a)]

5. **Dust Management Plan:** The owner or operator shall implement a plan for controlling emissions of fugitive dust. The plan shall include, but is not limited to, the following:
   a. Replacing cleated belts with smooth belts;
   b. Installing heavy-duty belt wipers/cleaners on all outside conveyor belts;
   c. Sealing up transition points on outside fuel conveyors;
   d. Installing water-misting systems at transition points;
   e. Erecting a tunnel to enclose infeed to the planer hog;
   f. Installing bottom covers on belts that deliver fuel from the sawmill to the fuel house;
   g. Enclosing all conveyors at the lower level inside the sawmill; and,
   h. Operating a street sweeper on a daily basis.

   [Regulatory Basis: WAC 173-400-040(4)&(9), ORCAA Rule 8.3(c)]

6. **Operation and Maintenance Plan**: The owner or operator shall develop, implement, and modify when necessary an operation and maintenance plan to assure continuous compliance with the kiln temperature limitation. The plan shall include regularly scheduled testing of the temperature monitoring system.

   [Regulatory Basis: ORCAA Rule 4.3(g); WAC 173-400-101]

7. **Reporting Excess Emissions:** Excess emissions shall be reported to ORCAA as soon as possible and within 24 hours. It shall be the burden of the owner or operator to prove that excess emissions were unavoidable consistent with WAC 173-400-107(4) – (6) and ORCAA Rule 8.7(c).

   [Regulatory Basis: WAC 173-400-107; ORCAA Rule 8.7]

8. **Emissions Inventory:** No later than March 1st of each year, the owner or operator shall submit an inventory of the actual amount of pollutants emitted during the previous calendar year. The inventory shall be submitted to ORCAA on standard inventory reporting forms and be accompanied by associated calculations, data or other information used in calculating the reported emissions. A request for an extension may be considered if a request from the Responsible Official is received by ORCAA prior to February 25th. The request must include a statement of the unexpected circumstances that occurred, how this

affected the Permittee's ability to submit the report on time, and the number of additional days needed.

[Regulatory Basis: WAC 173-400-105(1); ORCAA 8.11]

9. **Anti-Mold System Coatings Application:**
   a. Spray coatings applied in Anti-mold system spray box/spray chamber must contain a VOC content of 0.01 lbs/gallon or less, as identified on the associated Safety Data Sheet (SDS).
   b. Spray coatings applied in Anti-mold system spray box/spray chamber are limited to 20,000 gallons in any rolling 12-month period.

   [Regulatory Basis: WAC 173-400-113(2); ORCAA 6.1.4(a)(2)]

10. **Kiln Temperature Monitoring.** The following applies:
    a. Drying temperatures in each kiln shall be monitored continuously.
    b. Temperature sensors shall be maintained and positioned to accurately monitor drying temperatures in accordance with the Operation and Maintenance plan required by Condition 6.
    c. All required temperature monitoring devices shall be calibrated or replaced annually.
    d. The following shall be monitored and recorded for each kiln-charge of lumber dried: wood species, amount in board feet of each species, kiln identification number, date of charge, and duration of drying cycle.

    [Regulatory Basis: WAC 173-400-040; ORCAA Rule 8.8]

11. **Kiln Emissions Monitoring.** On a monthly basis, the owner or operator shall determine by calculation the cumulative total Volatile Organic Compounds (VOC), Acetaldehyde, Acrolein and Formaldehyde emitted by the kilns over the previous month and 12-consecutive month periods. Emissions shall be calculated based on the actual amounts of wood species dried and ORCAA-approved emissions factors.

    [Regulatory Basis: ORCAA Rule 8.11]

12. **Record Keeping:** The owner or operator shall maintain the following records and make them available to ORCAA upon request:
    a. Monthly and running 12-month quantities in thousand board feet (Mbf) of dimensional green lumber produced;
    b. Monthly and running 12-month quantities in thousand board feet (Mbf) of dimensional kiln-dried lumber produced by species;
    c. Monthly and running 12-month quantities in undiluted gallons of anti-mold solution used;
    d. Monthly and running 12-month cumulative total emissions of VOC, Acetaldehyde, Acrolein and Formaldehyde from the dry kilns;

e. For each kiln, daily 24-hour average kiln drying temperatures for times during which the kiln is operating;
f. Electronic record of continuous air temperature monitoring for each zone of each kiln; and,
g. The date, location, proof of calibration and specifications for each temperature sensor installed in each kiln.

[Regulatory Basis: WAC 173-400-105, ORCAA Rule 8.11]

13. Final Determination

<add final determination after public comment period completed>

ATTACHMENTS

☒ **Abbreviations and Acronyms**

☒ **Fungicide Calculations**

☒ **Approval Order**

Abbreviations and Acronyms

AOP	Air Operating Permit
AP-42	Compilation of Emission Factors, AP-42, Fifth Edition, Volume I, Stationary Point and Area Sources – Published by EPA
ASIL	Acceptable Source Impact Level pursuant to Chapter 173-460 WAC
BACT	Best Available Control Technology
CAM	Compliance assurance monitoring (40 CFR 64)
CFR	Code of Federal Regulations
CO	Carbon monoxide
EPA	United States Environmental Protection Agency
FCAA	Federal Clean Air Act
HAP	Hazardous air pollutant listed pursuant to Section 112 FCAA
MACT	Maximum Achievable Control Technology
NAAQS	National Ambient Air Quality Standard
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NOC	Notice of Construction application
NO_X	Nitrogen oxides
NSPS	New Source Performance Standards
NSR	New Source Review
ORCAA	Olympic Region Clean Air Agency
PM	Total particulate matter (filterable + condensable particulate matter)
PM_{10}	Particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (filterable + condensable particulate matter)
$PM_{2.5}$	Particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers (filterable + condensable particulate)
PSD	Prevention of Significant Deterioration
RACT	Reasonably Available Control Technology
RBLC	RACT/BACT/LEAR Clearinghouse
RCW	Revised Code of Washington
SO_2	Sulfur Dioxide
SQER	Small Quantity Emission Rate listed in Chapter 173-460 WAC
TAP	Toxic Air Pollutant pursuant to Chapter 173-460 WAC
T-BACT	Best Available Control Technology for toxic air pollutants
VOC	Volatile Organic Compound
WAC	Washington Administrative Code

Units of Measurement

‘	minute (measurement of angle)
‘’	second (measurement of angle)
°	degree
acfm	actual cubic feet per minute
atm	atmosphere
Bhp	Brake horse power
Btu	British thermal units
cfm	cubic feet per minute
dscfm	dry standard cubic feet per minute
°F	degree Fahrenheit
ft	feet
g	grams
gal	gallon
gr	grain
g/s	grams per second
hp	horsepower
hr	hour
in	inches
K	degree Kelvin
kg	kilograms
km	kilometers
kW	kilowatt
L	liter
lb	pounds
m	meters
M	thousand
Mbf	thousand board feet
min	minute
MM	million
MMbf	million board feet
MMBtu	million British thermal units
ug	micrograms
ppb	parts per billion
ppm	parts per million
ppmvd	parts per million, dry volume
psi	pounds per square inch
s	second
scfm	standard cubic feet per minute
tpy	tons per year

Calculations

Fungicide VOC Calculations – Workhorse III

Highest annual product usage: 2018: 9,538 gallons.

Rounded up to 10,000 gallons, then doubled to 20,000 gallons to create a conservative 'as reviewed' annual limit.

Given: enforceable permit BACT Limit of 0.01 lbs VOC/gallon

$$\frac{20{,}000 \text{ gallons}}{\text{Year}} \times \frac{0.01 \text{ lbs VOC}}{\text{gallon}} = \frac{200 \text{ lbs VOC}}{\text{year}} = \textbf{0.1 TPY VOC}$$

Kilns TAP limit calculations:

Kilns Acetaldehyde annual limit:

$$\frac{28{,}100 \text{ lbs}}{\text{Year}} \times \frac{1 \text{ Ton}}{2{,}000 \text{ lbs}} = \frac{14.05 \text{ tons}}{\text{year}} = \textbf{14 TPY Acetaldehyde}$$

Kilns Formaldehyde annual limit:

$$\frac{1{,}810 \text{ lbs}}{\text{Year}} \times \frac{1 \text{ Ton}}{2{,}000 \text{ lbs}} = \frac{0.905 \text{ tons}}{\text{year}} = \textbf{0.9 TPY Formaldehyde}$$

Kilns Acrolein annual limit:

$$\frac{1.4 \text{ lbs}}{\text{hour}} \times \frac{1 \text{ Ton}}{2{,}000 \text{ lbs}} \times \frac{8{,}760 \text{ hours}}{\text{year}} = \frac{6.132 \text{ tons}}{\text{year}} = \textbf{6 TPY Acrolein}$$

*Limits based on PTE assumptions reviewed as gross increase associated with new kilns for each pollutant