Response to Public Comments on Draft Synthetic Minor Air Operating Permit

Empire Lumber Company; Permit R10TNSR03000

July 01, 2022

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I. Introduction – Summary of the Public Participation Process

On April 29, 2022, the U.S. Environmental Protection Agency (EPA), Region 10 (Region 10) provided public notice of, and requested public comment on, Region 10's proposed action to issue a Clean Air Act (CAA) synthetic minor operating permit and to rescind a CAA Title V operating permit for the Empire Lumber Company (Empire or Permittee) facility in Kamiah, Idaho (facility). The facility consists of a biomass boiler, lumber dry kilns and a planer mill. The permit would limit the potential to emit of the facility.

Region 10 announced its proposed permit decisions and the public comment period, which included an opportunity for public hearing[1], through a public notice published on Region 10's website on April 29, 2022 (and continuing to appear through May 31, 2022) and in both the Idaho County Free Press and Clearwater Progress newspapers on April 27 and April 28, respectively. Public notices were physically posted on notice boards throughout the cities of Kamiah in city libraries, post offices and tribal headquarters. Region 10 also distributed the public notices to the necessary parties via email in accordance with 40 CFR parts 71 and 49.158, thus satisfying Title V and synthetic minor permit issuance requirements, respectively.

All data submitted by the Permittee as part of the synthetic minor permit application through the date of the notice of public comment was made available for public review as part of the administrative record for the synthetic minor permit. The administrative record also includes all information exchanged between the Permittee and Region 10 relating to the rescinding of the Title V permit. The administrative record, including the draft synthetic minor permit, documentation of Region 10's analysis (a draft synthetic minor Technical Support Document as provided in 40 CFR 49.157(a)(3)), the application, and other supporting information was made available through the Region 10 public notice website.

II. Responses to Public Comments

The purpose of this document is to respond to significant issues raised in the public comments received during the public comment period and to explain what changes have been made in the synthetic minor permit as compared with the draft permit. All timely comments were fully considered, regardless of the method used to submit them. This section presents all public comments received by Region 10 on our proposed permit decisions and provides our responses to the comments, including an explanation of what changes have been made, if any, in the final permits as a result of those comments. Comments were only received from Empire Lumber Company, the Permittee.

A. Comments from the Empire Lumber Company

Comment A1) Table 1. EU-01 capacity: Empire Lumber Company reiterates the following regarding the capacity of the EU-01 system, which includes the Convert-a-Kiln wood gasifier feeding a Superior gas boiler: The manufacturer's capacity for the Superior gas boiler is listed as

[1] No public hearing was scheduled due to lack of public interest.

29.9MMbtu/hr. Nothing in the installation or operation at Kamiah Mills has changes that capacity. The provider of the entire system, Convert-a-kiln, listed the capacity of the entire system as 25MMbtu/hr because that was the capacity of the gasifier system they delivered, and Empire Lumber Company had installed. Empire Lumber's combustion consultant, McCune Instruments, one of the most experienced experts in the country, has helped automate and upgrade the system controls and parts of the gasifier, including the air feed system, with the intent of increasing the gasifier's MMbtu/hr potential, making more complete use of the Superior boiler's potential, and supporting facility-wide processing reaching kiln throughput goals. We believe that some increase in potential of the gasifier / boiler system has been achieved, though that is not quantified because we have not yet needed to push the system's heat and steam production capacity. Empire Lumber recommended during the permit preparation process that the rated capacity of the system be 29.9MMbtu/hr, as it had been in all previous air permits, to make sure that anticipated success in enhancing the gasifiers capacity can be utilized without permit penalties, consequences, or the need to reopen the permit. Potential emission calculations clearly show that retaining the historic permit capacity rating for EU-01 would not change any regulatory category or cause potential emissions to reach any different regulatory threshold than with EPA's proposed reduction in permit rated capacity for EU-01. Recent FHISOR readings during source tests have shown efficiencies at or near the top in the industry, a sign of the success of our efficiency efforts which hint at progress in enhancing the gasifier's capabilities. The synthetic minor air permit should not discourage Empire's efforts to maximize the system's efficiency, nor require a submit permit modification as progress is made.

<u>*Combustion consultant Mike McCune's Comments on EU-01 system efficiency and capacity*</u>

Efficiency is the key word for why Empire Lumber should be allowed the full boiler output rating of 29.9MMbtu/hr. Efficiency is advantageous to the environment as well as Empire Lumber. Empire Lumber wishes to achieve maximum potential from the EU-01 gasifier / boiler system. This can only be done by increasing the efficiency of the gasifier or improving the water side efficiency. Increasing the efficiency, be it combustion or water delivery, also improves emissions. We have been seeking to enhance gasifier and EU-01 system efficiency by allowing more retention time in the gasifier chamber for more complete combustion, and by increasing the temperature of the water in the steam delivery system which would lower heat input required to make the same amount of steam. Combustion efficiency is normally defined by the unburned fuel divided by the fuel input. Unburned fuel is CO, H2, VOCs H2s etc. in the outlet gas. These gases are going to decrease with increased efficiency. During the combustion process, most of the fuel gets burned but some of the fuel particles remain unburned and are deposited along with the ash. If the size of fuel particles fed to the furnace is large, the surface area of contact with air and fuel particles decreases and the quantity of unburned increases. This accounts for potential fuel losses which would otherwise have been burned to generate heat, and more particulate exhausted toward the multiclone.

If the gasifier only has a combustion efficiency of 70% and it is improved to 85%, that equates out to 15% less unburned fuel exiting the boiler and potentially being emitted into atmosphere. It also equates to a steam production increase because the fuel was burnt and not sent out the exhaust as CO, particulate and/or Ash. This ash will coat and insulate the tubes of the boiler and over time make the heat transfer less efficient. I am working with fan controls to enhance

retention time and therefore improve efficiency. It is in both parties'interest for this boiler/gasifier system to operate at the highest efficiency that can be achieved. It will produce more for Empire Lumber in terms of steam. It will produce less in terms of emissions.

There is another contributor to steam flow: the water delivery system. Empire Lumber will be able to increase the boiler steam flow by increasing how hot the water delivered to the boiler is. The hotter the feedwater, the less fuel is used heating it to produce steam. Improving this system will increase the boilers capability to deliver more steam. It has nothing to do with the gasifier except to cut back fuel demand, but enhances overall steam production and usage efficiency.

Here again less fuel will be used to make more steam. Less fuel equates to less emissions. There are many ideas that will be considered to improve the efficiency of this boiler. Including improving the gasifier efficiency. We have made improvements toward this goal and can make many more. Allowing Empire to achieve the max rated capacity of the boiler is encouraging them to get more with less. Less fuel = Higher Efficiency, Higher Efficiency = Less Emissions but more Steam.

Response: Region 10 is issuing the permit without making the requested changes to the draft permit. As an initial matter, the information presented in Table 1 of the permit describes the emission generating activities. The capacities listed in Table 1 are not limitations. Converta Kiln, Inc., manufacturer of the gasifier, identifies the gasifier as a 25 mmBtu burner system. If the Permittee intends to make any physical or operational changes at the facility that would cause an increase in allowable emissions, a minor NSR permit for the changes may be required prior to making the changes. See definition of "modification" at 40 CFR 49.152 and the minor NSR permit program's applicability provisions in 40 CFR 49.153. See response to comment 1 in the attached appendix containing Region 10's response to Empire's pre-draft permit comments for additional information.

Comment A2) Tied in with this recommendation on boiler capacity, Empire Lumber recommends that in Item 17.2 of the proposed permit, the requirement to source test "within 10% of the maximum operating rate" of EU-01 be changed to "within 10% of the maximum 24 hour average steam production rate achieved during the previous 12 months". That language is consistent with actual determination of required steam production rate during source tests EPA concurred with for all source tests performed under the facility's current air permit R10T5070100. This change would remove potential ambiguity associated with the potential MMbtu/hr capacity of the EU-01 system.

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17.2 While the permitted source is operating within 10% of maximum operating rate, unless EPA determines in writing that other operating conditions are representative of normal operations or unless specified in the emission unit sections of this permit;

Response: Region 10 is issuing the permit without making the requested changes to the draft permit. As an initial matter, the permit does not require that any source testing be performed. Moreover, Condition 17.2 expressly provides the permittee the opportunity to request an alternative operating ratethat the facility thinks is more representative of the facility's operations under which to conduct testing in the event testing is required under the permit. See response to

comment 4 in the attached appendix containing Region 10's response to Empire's pre-draft permit comments for additional information.

Comment A3) Item 24 requires the permittee to update the rolling 12 month calculation of actual emissions of VOCs and HAPs by the 10th of each month. The facility recommended that the due date for those updates be the end of the month. EPA responded in their Response To Comments (RTC) document, that the recommended change was not made because Empire Lumber did not demonstrate that the 10 day limit was unreasonable. Empire Lumber points out here that we were only given two weeks to coordinate between 5 to 6 reviewers, most of whom were unfamiliar with air permitting process, to prepare and submit our comments on the facility pre-draft. Empire did not have the time to prepare and provide detailed supporting documentation for every comment made. This response documents the practical reasons why a slightly longer period is necessary to safely and accurate maintain the tracking of actual emissions of those two pollutants.

EPA and Empire concurred during pre-draft review that with historic throughput, the maximum rolling 12 month rolling emissions total based upon actual facility throughputs from 2004 through 2021 would have been 5.71 tons methanol/yr, less than 60% of the permit limit, and maximum rolling 12-month emission total for VOCs would have been 29.70 tons/yr, less than 30% of the permit limit. The maximum rolling 12-month methanol emission total using permit calculation methods since 2019 has been 4.43 tons, less than half the permit limit, and the maximum rolling 12 month VOC emission total has been 25.80 tons, less than 30% of the permit limit. It is very unlikely that the facility will be pushing the permit limits for either tracked pollutant.

It will take at least three people coordinating to update the rolling 12-month emission totals, one Empire employee for the kilns, another from the boiler, and the environmental consultants to maintain the calculations and records. The proposed permit requires the updates to be completed by the 10th day of the following month. That time frame would not be possible if any one of those people took a week of vacation time, unless they worked weekends. There is little to no threat the facility will exceed the permit emission limits. The facility should not face the threat of penalty if the monthly emission tracking takes more than 10 days to calculate, especially because of the coordination required by at least three people to make the monthly updates. The facility recommends an increase in the time allowed for updating the monthly emissions tracking, preferably by the end of each month.

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24. By the tenth day of each month, the Permittee shall calculate and record facility-wide 12-month rolling emissions of VOC and methanol by using the emissions calculated for the previous 12 months pursuant to Conditions 14 and 15.

Response: In response to this comment, Region 10 is revising Condition 24 of the draft permit as requested.

*24. By the **final** day of each month, the Permittee shall calculate and record facility-wide 12-month rolling emissions of VOC and methanol by using the emissions calculated for the previous 12 months pursuant to Conditions 14 and 15.*

Comment A4) Item 27 This due date for the annual report required is a month earlier in this proposed permit than in the pre-draft version EPA shared with Empire. Empire's first preference that the annual report be based upon the company's fiscal year, from March 1 through the end of February. A reasonable due date for that report would be by May 15. Otherwise, Empire strongly recommends that the due date for the annual report be returned to March 15 as it was in the draft we reviewed. Empire has at least five other annual reports required by environmental regulators in January and February, with few required thereafter. The collection of information for the permit's required annual report will take a fair amount of effort and quality assurance, as will the effort for other reports. Retaining the report schedule included in the pre-draft permit Empire concurred with, or changing it to coincide with Empire's fiscal year, will help assure a more thorough effort of data collection and review. That will serve the facility and EPA better than having Empire produce all the environmental regulatory reports required from the facility in the same short window at the start of the calendar year.

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27. Annual Reports
The Permittee shall submit an annual report on or before February 15 of each year to the EPA. The annual report shall cover the period from January 1 to December 31 of the previous year and shall include:

Response: In response to this comment, R10 is revising Condition 27 of the draft permit as requested.

27. Annual Reports
The Permittee shall submit an annual report on or before ***March 15*** *of each year to the EPA. The annual report shall cover the period from January 1 to December 31 of the previous year and shall include:*

Comment A5) Item 50.5, kiln charge average moisture content
Empire already has a record keeping file in place that records kiln charge moisture content data via Wellons Temperature Drop Across Load (TDAL) and additional data stored as well. The TDAL in our Wellons kilns is pretty accurate. Empire does a check the TDAL to ensure the kiln load is in fact dried to WWPA specifications in our WWPA Grade Books, which requires a moisture content of 19% or less for most lumber cuts. Use of the handheld moisture meter is to ensure the lumber has gotten down to the appropriate MC for specified species and grades, and to assess variation of moisture content within the charge. The Wellons kilns moisture content on the graphs that track and monitor the progression of each kiln is logged and stored on the computer. You are able to see how exactly the kiln has run from start up to finish. You are not able to change anything on the charts, graphs etc... Comparatively, the hand held monitor check in the kiln is a manual process. The physical nature of the stack of units in a large kiln charge limits access to parts of the charge, as does the temperature in the kilns. The probe on the hand held meter is placed well inside the stickered units, out of sight of the operator. It can hit a knot, an isolated pitch or sap pocket, or some other unrepresentative point without the operator's knowledge. The hand held meter is a reality check to make sure the kiln charge meets market requirements. It isn't 100% accurate, and can not practically sample a kiln charge as completely

as the TDAL calculation built into Wellons kilns. The hand held data is also collected in the field by staff in challenging field conditions. It doesn't seem reasonable for the facility to face penalties if those field employees miss recording a hand held moisture content value for an individual kiln charge.

EPA's identifies their primary interest for this data as identifying overdried kiln charges, charges with average moisture content less than 13%, because kiln emission factors were based upon drying down from green to no less than 13% and further drying could lead to more emissions. Empire has indicated that less than 5% of kiln charges have been dried to less than 13%, the majority of them cedar that was air dried, then put into the kilns at low moisture content for industry and market required bug kill. Those charges would have lower emissions than those for which the kiln emission factors were derived because they enter the kiln with moisture contents likely half those from which the emission factors were derived, and they remain in the kiln for a short time at low temperatures. Market conditions dictate drying schedules. The wood products industry is a high volume, low margin business. No operator, including Empire, has any incentive to overdry. They couldn't afford to. The increased costs would make the product uncompetitive.

McCune's Instruments Comments on accuracy of hand held moisture content monitors

McCunes Instruments also has a Metrology lab. We calibrate all kinds of equipment and certify them. We are ISO 17025 certified. We are certified in many physical, electrical, mechanical disciplines.

Waggoner, the manufacturer of the hand held moisture meter, states high accuracy instrument. They don't list accuracy specs anywhere we have been able to find. What is high accuracy? These devices are very low accuracy right out of the box. But it gets worse. They rely on humans to get out of the box accuracy. That is a factor they can't put a number to. There are wood variables that render it very inaccurate from the out of the box accuracy. Knots are big one. If you get lots of knots the readings are junk. Areas of dense sap causes problems. Areas of high moisture on surface cause issues.

Then you have the probe itself. It relies on tension. As the springs weaken the readings drift further out and become variable so then you get no repeatability. If one or either probe gets something on it. Sap, excessive sawdust etc.. If the board is warped or uneven in any way. These devices are a tool. They are to give an idea of what is happening. They are a reference device not an instrument used as a data device for accurate totals. To be used as a verified source that can be trusted for an official number. An example of this would be a scale or gas pump. You can verify that it is accurate to charge people for those readings. If this was being used in the billable commerce industry it would be rejected as such an instrument. Well, what is the difference they are using it as a device that if you totaled a certain amount there could be serious ramifications. Just like if you were overcharging someone because you were using a very inaccurate scale.

No, this device should not be used for that application. There is no published data of accuracy because it is impossible to do that without putting some kind of very high uncertainty of measurement.

If they were forced to develop an uncertainty budget when all the above is calculated, it would be impossible, or you would be forced to say some big number like 15% or 30% uncertainty of measurement.

The moisture content determined via the Wellons TDAL for each kiln charge is more accurate than the handheld moisture meter check, and the uneditable nature of the data collection and storage makes the TDAL based moisture content calculations the best and most practical method for tracking kiln charge moisture. No routine tracking of hand held monitor kiln charge moisture content should be required, other than the reporting required in Item 27.6 on charges whose average moisture content is less than 13%.

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50.5 At the conclusion of the charge, the average lumber moisture content using a handheld moisture measurement system according to the O&M plan required in Condition 48.

Response: Region 10 is proceeding without making the requested changes to the draft permit. As an initial matter, the permit does not limit the moisture content of the lumber. However, if monitoring using a handheld moisture measurement system shows a kiln-wide average moisture content below 13% dry basis, then it is likely that the emission factor (used to calculate lumber drying emissions) is underreporting the charge's VOC emissions. The emission factors prescribed in the permit are based upon drying lumber to no less than 15% dry basis. Just as more and more water evaporates, additional volatile organic compounds are also driven from the boards. See response to comment 15 in the attached appendix containing Region 10's response to Empire's pre-draft permit comments for additional information

Temperature drop across the load (TDAL) is a common technique for estimating the moisture content of lumber in the kiln during the drying schedule. Unlike the TDAL technique, the use of handheld moisture meters directly measures the moisture content of the lumber. The handheld meters used by Empire Lumber use the capacitance method for measuring moisture content. The capacitance method uses the relationship between the moisture content and the dielectric properties of wood. The dielectric properties of wood change in direct proportion to its moisture content, within a specific range. Based on a call with Wellons, the manufacturer of the kilns, a moisture meter is typically more accurate when measuring moisture content from a load as compared to a measurement generated from the calculated TDAL. TDAL is used to shut off the kilns as close as possible to the desired finished moisture content based on an operator calculated multiplier and that the multiplier is typically based on external feedback such as that from a moisture content sensor commonly located in a facility's planer mill. Empire has not provided sufficient information to inform Region 10 that the TDAL is more accurate than the handheld moisture content meter.

Comment A6) Items 19, 38, and 48 Empire requests a template or examples of monitoring plans, and boiler and kiln O&M plans required in this permit to facilitate development of those newly required plans.

Response: Empire is requesting no change to the draft permit, and Region 10 is not making any changes based on this comment.

Comment A7) Item 51.2 and Appendix A EPA stated in the RTC document [to the Permittee's comments on the predraft permit that] "each charge's drying schedule is implemented without the use of an entering air set point temperature. In other words, operation of the kiln is not guided by the built-in constraint of a maximum entering air temperature. Because Empire does not implement a maximum entering air set point temperature, the permit does not allow the use of one to calculate kilns EU-02 methanol and VOC EF. In contrast, because Stimson Lumber does implement its drying schedules using an entering air set point temperature, their synthetic minor permit does allow the use of entering air set point temperature (plus 4°F) in lieu of actual temperature measurements to calculate EF."

Please note that Empire's comments on the pre-draft verified that every kiln schedule since early 2020, almost immediately after EPA's site visit on January 8, 2020, has employed a maximum kiln enter air temperature of 190 degrees. EPA contradicted their Response to Comment [on the predraft permit] quote above by acknowledging schedule set enter air temperatures in the Technical Support Document Section 5. Empire also verified in pre-draft comments that no kiln charge since the kiln enter air set point was set at 190 has ever exceeded 191 degrees, and no cedar charge has ever exceeded 185 degrees for actual kiln enter air temperature, mostly because most cedar charges are only in the kilns for market required bug kill after air drying lowered moisture content. Therefore, by the logic EPA laid out in their Response to Comment (RTC)[on the predraft permit], the appropriate kiln enter air temperature for actual emission calculations should be the entering air set point temperature plus 1 degree. Using schedule set temperature is preferable because it does not require as much manual effort as checking actual maximum enter air temperatures monthly.

If EPA decides to break the precedent recently set with their Stimson Lumber permit and discussed in their RTC, by precedent and reason the highest one hour average kiln enter air temperature in emission calculations should be used rather than requiring Empire to use the highest instantaneous temperature during the kiln charge. The one hour average typically represents between 1.5% and 5% of the 20 – 70 hour duration kiln charge, and is more representative of the heat the kiln charge is exposed to than the maximum instantaneous kiln enter air temperature, which represents well under 0.1% of the duration of any kiln charge.

We refer EPA to their discussion of actual vs potential emissions in the TSD Section 6.2, copied below. We point out that these calculations are for actual emissions, which require using a realistic estimate of actual temperature conditions the kiln charge was exposed to rather than a conservative estimate of potential temperature exposure.

<u>R10 Draft Permit</u>

51.2 For each product, the month's highest kiln-wide average instantaneous dry bulb temperature (°F) of air entering a load of lumber for all charges containing that product initiated that month.

Response: Region 10 is issuing the permit without making the requested changes to the draft permit. Empire Lumber's kiln management software does not use entering air set point temperatures to guide the drying schedule. Empire Lumber's schedule is driven by exiting air set point temperatures. What Empire Lumber refers to as its entering air temperature is a maximum temperature it generally does not exceed. That is different from a maximum temperature that is programmed into kiln management software (used by Stimson Lumber, the facility referenced in Empire Lumber's comments). Because Empire Lumber does not use entering air set point temperatures in its kiln management system, the permit does not prescribe their use (plus 1, 2, 3… °F) to derive emission factors for lumber drying.

Empire Lumber has requested to use the maximum 60-minute kiln-wide average temperature rather than maximum instantaneous kiln-wide average temperature measurement to derive emission factors. That approach may be appropriate for a facility, like the facility mentioned in the comment, that already has or is required to install as a condition of the permit monitoring equipment (data acquisition and handling system) that would calculate a 60-minute kiln-wide average temperature. The Empire Lumber facility is not equipped with a data acquisition and handling system that routinely calculates 60-minute kiln-wide average temperatures, and Empire Lumber is not proposing to install such a system as part of this permitting action. Because Empire Lumber has not offered a viable alternative to the methodology in the draft permit for calculating emission factors for lumber drying, Condition 51.2 and Appendix A are unchanged. See response to comment 16 in the attached appendix containing Region 10's response to Empire's pre-draft permit comments for additional information.

Comment A8) Section 5 Markup of EPA Facility Description, with recommended changes highlighted

The facility produces dry dimensional lumber by first kiln-drying and then planning green lumber received from its Weippe, Idaho sawmill approximately 11 miles away (straight-line distance). Wood residue (primarily planer shavings, sawdust, hogged edgings and hogged trim ends) is either (a) combusted in the facility's biomass gasifier and boiler ("EU-01") to generate steam for use in the lumber drying kilns ("EU-02"), or (b) sold to outside companies. The facility can infrequently purchase biomass to combust in EU-01. The facility has the capability of drying approximately 120 million board feet of lumber annually, resulting in maximum annual production of approximately 100 million board feet of planed-dried lumber.

Rough green lumber is transported from an off-site sawmill to the facility on trucks in large bundles that are sometimes "stickered." Stickering consists of placing small pieces of wood between each piece of lumber to allow air flow by each side of each piece of lumber to provide for thorough and complete drying throughout the stack of lumber. If not stickered, the incoming green lumber is stickered in the onsite sticker building (P1). Stickered lumber is stored across the facility lumber yards (ST1). In warmer weather, stickered lumber is air dried to reduce the moisture content of the lumber. Until 2008, some lumber (primarily cedar) was dried to market

moisture content without needing kiln drying. Market requirements now necessitate heat treatment of all lumber to prevent insect infestation. For example, cedar is already air dried in warm months to market moisture content levels and is then entered into the facility's dry kilns at 160 degrees for only 2 - 8 hours or less to ensure sterilization.

The stickered lumber is loaded into one of the facility's lumber dry kilns (P14, P15, P16, P31 and P32) to remove moisture from the lumber. The heat source for the dry kilns is steam generated in the ConvertaKiln wood gasification boiler (EU-01), which is fueled by burning dry, clean lumber byproducts generated onsite. Automated controls open or close the dry kiln vents to generate the scheduled drying temperature (never more than 190 degrees) and humidity and indicate to operators when the moisture content is estimated (by temperature drop across load) to reach the targeted moisture content. Moisture contents of lumber entering the kilns are lowered by air drying, with the lumber being stored in the air-dry yards on average for a month or more before entering the kilns. Maintaining the proper temperature and humidity in the dry kilns is necessary because excess moisture can stain the lumber being dried, lowering its grade and market value. Drying of lumber (that has not been air dried) is typically completed in 30 to 75 hours. Up to half of that time is spent getting the kiln up to temperature. After the kiln reaches and holds full schedule temperature, steam demanded from the boiler is reduced.

Removed EPA's first sentence here on shifts, which are subject to change. The facility operates for 52 weeks per year; however, boiler EU-01 is shut down for maintenance activities on average once per quarter for three to four days. Processes other than boiler EU-01 and kilns EU-02 would not be expected to be continuous year-round. The permittee indicates that it is not practical and may not even be possible to operate the planers and sources other than the boiler and kilns more than 5,500 hours per year. The permittee further indicates that increases in throughput, if any, would be expected to be gained from operational efficiencies or production of larger diameter product if the market supported it, rather than increased time of operations.

The air pollution emission units and control devices that exist at the facility are listed in Table 5-1 below by emission unit identification (EU ID). None of the emission units vent through a stack shared with another emission unit. Installation dates for each emission unit, to the extent known, are listed because they are important in determining applicability of federal standards and requirements. Capacities are listed for several emission units based on the best information available from the applicant.

Response: In response to this comment, R10 is revising Section 5 of the draft TSD as requested.

Comment A9) Section 6.2 EPA describes the difference between potential and actual emissions at the start of Section 6.1, saying "*Actual emissions generally represent a specific period of time and are based on actual operation and controls. Potential emissions, referred to as PTE, generally represent the maximum capacity of a source to emit a pollutant under its physical and operational design, taking into consideration regulatory restrictions, including required control devices*." Yet Table 6-2, labeled Non-HAP Potential Emissions shows EPA has ignored the Empire comment, made first in 2020 and again in review of the facility pre-draft permit, that the potential emissions of NO_2 from the EU-01 gasifier / boiler should be based

upon the "maximum capacity of the boiler to emit" NO_2 rather than the measurement of actual emissions from an early 2000s source test.

EPA's AP-42, the EPA's base source of potential emission factors, lists potential NOx emissions from a dry wood fired boilers as 0.49 lbs./MMbtu. Per EPA's definition of potential vs actual emissions, that is the recommended potential emission rate for NO_2 from the facilities EU-01 gasifier / boiler, not the very clean actual emission rate of 0.12 lbs./MMbtu measured decades ago when the EU-01 gasifier / boiler system was new. Failure to make the change clearly justified by EPA's definition of potential emissions for NOx rather than a single, decades old actual measurement would mean Empire Lumber could be subject to penalties if their boiler tested as 4 times cleaner for NO_2 than EPA's documented potential for boilers fueled with dry wood fuel. The EU-01 potential emission rate for NO_2 must be based upon referenced potential emissions data, not a single decades old actual emissions measurement.

Response: Region 10 is proceeding without making the requested changes to the draft permit or TSD. As an initial matter, the 0.12 lb/mmBtu NOx emission factor is not an emission limit. It is an emission factor included in Empire's application that Region 10 is using to estimate EU-01's NOx PTE. EU-01 emitting NOx in amounts greater than 0.12 lb/mmBtu is not a violation of any permit term or condition. Estimating facility-wide PTE is necessary to determine whether Empire is subject to the title V operating permit program. It is unnecessary for Empire Lumber to apply for a synthetic minor source permit for NOx because NOx PTE is less than 100 tpy title V threshold for NOx even using the higher 0.49 lb/mmBtu emission factor requested by Empire. Empire does not adequately explain why it is more appropriate to use the 0.49 lb/mmBtu emission factor for calculating actual and potential emissions. The gasifer and boiler setup that Empire employs is a unique setup that is very different from the more standard types of boilers (spreader stokers, dutch ovens, or fuel cells) that were tested to derive the AP-42 emission factor Empire proposes for estimating emissions. Empire has also not provided sufficient information to show that the 0.12 lb/mmBtu emission factor measured during a source test of its gasifier/boiler is no longer representative of NOx emissions from this unit. See response to comment 17 in the attached appendix containing Region 10's response to Empire's pre-draft permit comments for additional information.

Comment A10) Section 7.1 In second sentence and again in the third to last paragraph, correct initial 2018 methanol and VOC values from EPA's first draft with correct values resulting from Q/A by EPA and the facility, as shown in Table 7-2

Response: In response to this comment, Region 10 is revising Section 7.1 of the draft TSD as requested.

Comment A11) Section 7.3 Add "if any such conveyance occurs' to the discussion of requirement for conveying green wood, which Empire has not done for quite a while and does not plan to do in the future.

Response: In response to this comment, Region 10 is revising Section 7.3 of the draft TSD as requested.

Comment A12) Section 11 Changes in permit conditions consistent with comments above on the permit

Response: In response to this comment, Region 10 is revising Section 11 of the draft TSD as requested.

Comment A13) See discussion above for Technical Support Document Section 6.2, which recommends the EPA potential emission rate for NO2 from the boiler rather than a measured actual emission rate EPA guidance, repeated in the TSD Section 6.1, clearly shows is inappropriate.

Response: See response to Comment 10.

Appendix – April 29, 2022 EPA Region 10 Document 7m from Administrative Record Supporting Permit Action

Empire Lumber Company's (Empire) comments on pre-draft permit and PTE calculations are in black regular font.
Text of February 22, 2022 pre-draft permit and technical support document (TSD) is in green italics.
EPA Region 10 (R10) responses to Empire comments are in green bold.

Empire Lumber Company's Comments on Pre-Draft Air Permit and PTE Calculations

A. Pre-draft Permit

1) Table 1. Remove calculated steam production capacity, go with manufacturer's specification mmbtu/hr capacity. Adjust steam pressure from 100 to 100 – 110 psi, use Superior gas boiler spec of 29.29MMbtu/hr, gasifier specs had lowered system capacity to 25 MMbtu, combustion consultant is working on gasifier controls to enhance potential. Tis will have ripple effects everywhere potential emissions from the boiler are listed or calculated

R10 02/22/22 Pre-Draft Permit

Table 1: Source Information and Emission Units

Emission Unit (EU) ID	*Unit Description*	*Manufacturer & Construction Date*	*Capacity*	*Control Technology & Pollutant Reduced*	*Fuel Type*
EU-01	*Biomass Gasifier and Boiler. Steam generating unit consisting of a biomass gasifier and a scotch marine fire-tube boiler. The gasifier produces gas from biomass, and the boiler combusts the produced gas. A pipe conveys the gas from the gasifier to the boiler where it is*	*Converta Kiln, Inc. biomass gasifier and Superior Boiler Works, Inc. Mohawk Scotch Marine fire-tube boiler. Installed November 1999.*	*25 mmBtu/hr heat input capacity steam. Maximum steam production of 18,061 lb/hr generating 100 psi saturated steam.*	*PM including trace metal HAP: Multiclone manufactured by Boiler & Steam Systems, LLC. Model: MC-60-UP 46-7-7-4.0. Installed June 6, 2006.*	*Biomass*

	introduced through a burner. Boiler exhaust is routed to a multiclone and exhausted to the atmosphere via an induced draft fan.[1]				
***	***	***	***	***	***

[1] The gas produced by the gasifier may be diverted away from the boiler and released directly to atmosphere via a pressure relief stack as necessary to maintain safe operation. In the permit and the permit analysis, use of the term "boiler" refers to the boiler section of this emission unit. Use of the term "gasifier" refers to the gasifier section of this emission unit. Use of the term "EU-01" refers to the single emission unit consisting of both the gasifier and boiler.

Response: R10 is proceeding to public comment without making the requested changes to the pre-draft permit. Steam generating capacity is a useful parameter to note in describing boiler EU-01. Although the Superior boiler's heat input capacity may be rated at 29.29 mmBtu/hr, the gasifier is unable to deliver fuel in sufficient quantity to achieve that heat input. Table 1 correctly reflects that the gasifier can currently deliver up to 25 mmBtu/hr heat input to the boiler.

2) Add in 500,000 btu/hr shop waste oil heater space heater as insignificant source

Response: In response to this comment, R10 is including PTE calculations for this emission unit in Appendix A (PTE Emissions Inventory) to the TSD. R10 is revising Table 5-1 and Section 7.4 of the pre-draft TSD as follows:

Table 5-1: Emission Units (EU) & Control Devices

EU ID	*Emission Unit Description*	*Control Device*
***	***	***
EU-07	*Used Oil-Fired Heater: 500,000 Btu/hr.*	*None*

7.4 Other Emission Units

***In addition to EU-01 through EU-03, Table 5-1 lists activities at Empire that may generate a relatively small amount of non-fugitive VOC emissions and fugitive/non-fugitive HAP emissions. For instance, EU-07 may emit up to 0.02 tpy non-fugitive VOC and similarly small amounts of non-fugitive HAP (no methanol) based upon AP-42 EF and the unit's rated heat input capacity. T~~t~~he evaporation of organic HAP and VOC from bark and wood residue (fuel for boiler EU-01) stored in a partially enclosed building may generate organic HAP and VOC emissions. Loading wood residue into trucks and railcars may also generate organic HAP and VOC emissions. EF have not been developed for these activities. Filling, dispensing and breathing losses from fossil fuel tanks generates a relatively small amount of organic HAP and VOC emissions. Rather than requiring the permittee to track these emissions by (a) conducting source testing of piles and wood residue loading to develop EF, and (b) monitoring throughput, the EPA is requiring the permittee to limit emissions from Table 5-1 activities with EF assigned in the permit (EU-01 through EU-03) to levels slightly less than the individual HAP and VOC major source thresholds. The EPA estimates that activities at the facility listed in Table 5-1 with no assigned HAP or VOC EF in the permit (EU-04 through EU-07~~6~~) do not have the potential to emit more than 0.5 tons (1,000 lb) of HAP or VOC annually. Thus, the EPA is limiting 12-month*

rolling methanol and VOC emissions generated by EU-01 through EU-03 to no more than 9 and 99 tons, respectively. These are effectively 9.5 and 99.5 tpy limits due to rounding conventions.

3) 14., 15. Would prefer wording saying less than 10 tons/yr methanol, less than 100 tons/yr VOCs

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14. Source Wide 12-Month Rolling Methanol Emission Limit
Methanol emissions from the facility shall not exceed 9 tons per year as determined on a rolling 12-month basis by calculating the emissions (tons) for each month and adding the emissions (tons) for the previous eleven months. For the months preceding and including the month in which the permit becomes effective, monthly methanol emissions (tons) shall be determined consistent with how they were determined to comply with Condition 3.41 of Permit No. R10T5070101. Beginning the month after the month this permit becomes effective, monthly methanol emissions (tons) shall be determined in accordance with Conditions 39, 40, 49, and 52.

15. Source Wide 12-Month Rolling VOC Emission Limit
VOC emissions from the facility shall not exceed 99 tons per year as determined on a rolling 12-month basis by calculating the emissions (tons) for each month and adding the emissions (tons) for the previous eleven months. For the months preceding and including the month in which the permit becomes effective, monthly VOC emissions (tons) shall be determined consistent with how they were determined to comply with Condition 3.41 of Permit No. R10T5070101. Beginning the month after the month this permit becomes effective, monthly VOC emissions (tons) shall be determined in accordance with Conditions 39, 40, 49, and 52.

Response: R10 is proceeding to public comment without making the requested changes to the pre-draft permit. The permit has created synthetic minor methanol HAP PTE and VOC PTE limitations of 9 tons of methanol HAP and 99 tons of VOC in order for the facility to avoid being considered a major source of HAP and VOC emissions. Using rounding conventions, the permit allows the facility to emit up to 9.5 and 99.5 tpy of methanol and VOC, respectively. This is just below the 10 and 100 tpy major source thresholds for methanol and VOC, respectively. The 0.5 tpy "buffer" for each pollutant is necessary to account for methanol and VOC emissions generated by units EU-04 through EU-07. Potential methanol and VOC emissions generated by EU-04 through EU-07 are estimated to be less than 0.5 tpy.

4) 17.2 Source test steaming rate: change to within 5% of maximum 24 hour average steaming rate over the last 12 months

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17. Performance Tests
17.1 If the Permittee is required to conduct a performance test, the performance test shall be conducted according to a test protocol as follows:
17.2 While the permitted source is operating within 10% of maximum operating rate;

Response: In response to this comment, R10 is revising Condition 17.2 of the pre-draft permit as follows:

17.2 While the permitted source is operating within 10% of maximum operating rate, unless EPA determines in writing that other operating conditions are representative of normal operations or unless specified in the emission unit sections of this permit;

The revised permit condition recognizes that the permittee may request boiler performance testing be conducted at less than 90% of its maximum steaming rate. The revised permit also recognizes that EU-specific testing requirements supersede general testing requirements. It is important to note that the pre-draft permit currently does not require any testing be performed of any emission unit.

5) 19., 30., 38., and 48. Monitoring and O&M plans due six months from permit issuance, not 3 months

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19. The Permittee shall develop and implement a monitoring plan demonstrating that each monitoring system required in Sections 3, 4, and 5 of the permit complies with Condition 18. All elements of the plan shall be implemented no later than the third calendar month after the month in which the permit becomes effective. The monitoring plan shall be updated as necessary and shall address design, data collection and quality assurance and quality control elements of each monitoring system consistent with manufacturer's specifications and recommendations including, but not limited to the following:

30. The boiler EU-01 O&M plan required pursuant to Condition 38, kilns EU-2 O&M plan required pursuant to Condition 48 and the monitoring plan required pursuant to Condition 19 shall be submitted to the EPA no later than the third calendar month after the month in which the permit becomes effective.

38. No later than the third calendar month after the month in which the permit becomes effective, the Permittee shall develop and implement an O&M plan for the boiler and multiclone (including the multiclone ash hopper airlock) that describes the methods and procedures that will be followed to assure good air pollution control practices and efficient operation in accordance with manufacturer specifications and recommendations. The O&M plan shall be updated as necessary and shall include the following, at a minimum:

48. No later than the third calendar month after the month in which the permit becomes effective, the Permittee shall develop and implement an O&M plan for the lumber drying kilns that describes the methods and procedures that will be followed to assure good air pollution control practices and efficient operation in accordance with manufacturer specifications and recommendations. The O&M plan shall be updated as necessary and shall include the following, at a minimum:

Response: In response to this comment, R10 is revising Conditions 19, 30, 38, and 48 of the pre-draft permit as requested. "Third" will be replaced with "sixth" in each of the referenced permit conditions.

6) 24. HAP and VOC tracking updated by the end of the next month, not 10th of month

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24. By the tenth day of each month, the Permittee shall calculate and record facility-wide 12-month rolling emissions of VOC and methanol by using the emissions calculated for the previous 12 months pursuant to Conditions 14 and 15.

Response: R10 is proceeding to public comment without making the requested change to the pre-draft permit. Empire has not demonstrated that the 10-day timeframe is unreasonable.

7) 27.6 Comment "Most instances of average measured moisture content <13% will be market required bug kill on cedar that entered kiln with low moisture content, potentially at or below 13% when entering kiln

Response: R10 is proceeding to public comment without making the requested change to the pre-draft permit. The Permit does not prohibit Empire from drying lumber to less than 13 percent, but these instances are required to be reported annually. The annual report may (but is not required to) include the moisture content of lumber entering the kiln.

8) 30. monitoring plans 6 months rather than 3 months. Plans mostly in place and implemented, small busy staff needs time to get the multiple plans on paper and QAed

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30. The boiler EU-01 O&M plan required pursuant to Condition38, kilns EU-2 O&M plan required pursuant to Condition 48 and the monitoring plan required pursuant to Condition 19 shall be submitted to the EPA no later than the third calendar month after the month in which the permit becomes effective.
30.1 The Permittee shall review each plan at least annually, update it as needed, and submit updates to the EPA within 30 days of the update.
30.2 The Permittee shall revise any of these plans at any time if the EPA determines that a plan does not achieve the goal of the plan. In such event, the EPA will notify the Permittee of the specified deficiencies, and the Permittee shall submit a revised plan to the EPA within 30 days.

Response: See response to comment #5.

9) 31., 53. Plan for counting green residue transported by pneumatic system only due by three months after any conveyance of green wood residue occurs. No such conveyance has occurred, nor is planned.

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31. The plan for determining monthly GWR_{EQP} required pursuant to Conditions 53 shall be submitted to the EPA for approval by the end of the third calendar month after the month in which the permit becomes effective.

53. For WRC&PMCS EU-03, no later than the third calendar month after the month in which the permit becomes effective, the Permittee shall develop and implement a plan for determining monthly the mass of green wood residue pneumatically conveyed to a piece of equipment that either exhausts to the atmosphere or is open to the atmosphere. The plan shall be updated as necessary and shall include the following, at a minimum:

Response: In response to this comment, R10 is revising Conditions 31 and 53 of the pre-draft permit as follows:

31. The plan for determining monthly GWR_{EQP} required pursuant to Conditions 53 shall be submitted to the EPA for approval ~~by the the end of the third calendar month after the month in which the permit becomes effective~~ before the activity occurs.

53. For WRC&PMCS EU-03, no later than the ~~third calendar month after the month in which the permit becomes effective~~day in which the activity first occurs at the facility, the Permittee shall develop and implement a plan for determining monthly the mass of green wood residue pneumatically

conveyed to a piece of equipment that either exhausts to the atmosphere or is open to the atmosphere. The plan shall be updated as necessary and shall include the following, at a minimum:

R10 is revising Section 11.1 of the TSD as follows:

Conditions 31 requires that a plan to determine the planer mill's GWR_{EQP} be submitted to the EPA for approval ~~by the end of the third calendar month after the permit becomes effective~~ before the activity occurs.

Determining monthly GWR_{EQP} is necessary to calculate emissions attributable to the pneumatic conveyance of green wood residue. At a minimum, the facility's plan for determining GWR_{EQP} must be in place and implemented (and submitted to R10) by the time the activity occurs for the first time at the facility.

10) 34. Except deviation reports from certification signature requirement because of the short turn around time required

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28. Deviation Reports

The Permittee shall promptly report to the EPA any deviations (as the term is defined in the following paragraph) from permit requirements including deviations attributable to upset conditions. For the purposes of this permit, "promptly" shall be defined to mean to notify the EPA within 15 days of any deviation. Deviation reports shall include:

34. Signature Verifying Truth, Accuracy, and Completeness

All reports and notifications required by this permit shall be signed by a responsible official as to the truth, accuracy and completeness of the information. The certification must state that, based on information and belief formed after reasonable inquiry, the statements and information in the documents are true, accurate, and complete. Any applicant who fails to submit any relevant facts or who has submitted incorrect information in a permit application shall, upon becoming aware of such failure or incorrect submittal, promptly submit such supplementary facts or corrected information.

Response: R10 is proceeding to public comment without making the requested change to the pre-draft permit. Empire has not demonstrated that the 15-day timeframe needed to obtain this signature from the responsible official is unreasonable.

11) 35.1, Add manager to the list of potential responsible officials. They are the ones onsite, aware f operational circumstances, and available to provide signatures

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35. Responsible official means one of the following:

35.1 For a corporation: a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is directly responsible for the overall operation of the permitted source.

Response: R10 is proceeding to public comment without making the requested change to the pre-draft permit. The plant manager in Kamiah, if directly responsible for the overall operation of the

facility, is eligible to be considered the responsible official. EPA notes that this is the definition of "responsible official" for other CAA certification requirements. See., e.g., 40 CFR 71.2 and 71.5(d).

12) Strike 41.2 Volume of fuel burnt while not generating steam will represent less than 1% of total fuel burnt, would require rough estimate to calculate volume during each restart, and there would be no use for the calculated total…

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41. At the end of each month, for the fuel fired in boiler EU-01 during that month, the Permittee shall estimate and record the following:

*****

41.2 The volume of fuel fired (wet basis) while not generating steam (ft3/event, ft3/month); and

Response: R10 is proceeding to public comment without making the requested change to the pre-draft permit. The permit limits methanol and VOC emission to just below the major source thresholds as discussed in response to comments #2 and #3. The permit does not limit frequency and duration of startup/shutdown events when fuel is combusted, emissions are generated, but no steam is generated. During these periods, it is necessary to estimate the volume of fuel fed to the gasifier to ensure overall emissions from the facility remain below permitted limits.

13) 42.1.1 Instead of average steam production rates before and after to calculate rates for missing period, allow either backfill duplicating previous hours (monitoring experts say this is more practical than averaging). Allow the option to use average of instantaneous steam production readings recorded in writing at least every 3 hours

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42. For boiler EU-01, the Permittee shall install, calibrate, operate, and maintain, in accordance with manufacturer specifications, equipment and procedures necessary to measure, display, calculate, and record (including the date and time of measurements or records and, if applicable, the company or entity that performed the analyses and the analytical techniques or methods used) the following while the boiler is operating:

42.1 Steam production (lb/hr): Using a totalizer, measure and display continuously, and record hourly and monthly with a 90% minimum monthly data capture based upon availability of hourly recordings;

42.1.1 For those hours in which no measurements have been recorded by the totalizer, the steam production rate for each hour in the missing data period shall be equal to the average of the steam production rates for the hour immediately preceding the period and the hour immediately following the period.

Response: In response to this comment, R10 is revising Condition 42.1.1 of the pre-draft permit as follows:

42.1.1 For those hours in which no measurements have been recorded by the totalizer, the steam production rate for each hour in the missing data period shall be equal to the average of either of the following: (a) the steam production rates recorded by the totalizer for the hour immediately preceding the period and the hour immediately following the period, or (b) all instantaneous steam production rates displayed by the totalizer and manually recorded during the period.

Empire is not required to manually record steaming rates displayed by the totalizer. But if Empire elects to make such recordings during periods when the totalizer is displaying steaming rates but not

recording them, then Empire would have the option to use those manual recordings to fill in missing data. For the purposes of satisfying condition 42.1, data generated by equipment other than the totalizer cannot be considered.

14) 46. Facility has never fired gasifier with anything other than non-resinated wood residue or bark, and has no intention to. We recommend striking this section because we wonder what kind of records could prove that.

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46. The Permittee shall keep records showing that only non-resinated wood residue and bark are fed into the gasifier.

Response: R10 is proceeding to public comment without making the requested change to the pre-draft permit. The records required by Condition 46 are necessary to assure compliance with Condition 36's prohibition from combusting any fuel other than non-resinated wood residue and bark. Boiler EU-01 EF specified in Conditions 39 and 40 and used in the PTE emission inventory of Appendix A to the TSD assume combustion of non-resinated wood and bark. An example of a record satisfying Condition 46 is a form, completed for each work shift by the boiler operator, with check boxes next to general categories of fuels fed to the gasifier during that person's shift. Categories include, "resinated wood residue", "non-resinated wood residue" and "bark". Completing the form each shift and preserving the completed forms allows inspectors to verify and see that nothing other than non-resinated wood residue or bark is fired in the gasifier.

15) 50.5 No recordkeeping for hand held moisture content check unless kiln wide average is lower than 13%. Market requires <19%, ELC targets close to 19% for all charges, has cost disincentive against drying to <13% kiln wide average. Moisture content on all kiln charges is verified with hand held monitor that doesn't share data with other computer systems. Market further verifies appropriate moisture content, rejecting anything over 19%, making charges with much lower moisture content non-competitive due to added drying cost or degradation of lumber grade. Most kiln charges with kiln wide average moisture content <13% are expected to be market required cedar bug kill on cedar that entered kiln with low moisture content, potentially at or below 13% when entering kiln

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50. For kilns EU-02, the Permittee shall install, calibrate, operate, and maintain, in accordance with manufacturer specifications, equipment and procedures necessary to measure, display, calculate and record (including the date and time of measurements or records and, if applicable, the company or entity that performed the analyses and the analytical techniques or methods used) the following for each charge of lumber dried:

*****

50.5 At the conclusion of the charge, the average lumber moisture content using a handheld moisture measurement system according to the O&M plan required in Condition 48.

Response: R10 is proceeding to public comment without making the requested change to the pre-draft permit. Recordkeeping is necessary to assure that information in the annual report reflects monitoring results. Recordkeeping is necessary to assure that the kilns EU-02 methanol and VOC EF (that assume drying to no less than 15% moisture content) are representative. Use of representative EF is necessary to assure that kilns EU-02 emission calculations are technically accurate and that

facility-wide emissions remain less than the NESHAP and title V major source thresholds. Empire has not demonstrated that the recordkeeping requirement is either unnecessary or unreasonable.

16) 51.2 use max schedule point temperature in emission calculations per precedent set by EPA in 2021 Stimson Lumber non-Title V permit, not instantaneous actual maximum kiln enter air temperature. As noted, max schedule set temperature for any species processed since start of 2020 has been 190 degrees, max actual enter air temperature for any species since then has been 191 degrees, for cedar max actual enter air temperature has been 185 degrees.

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51. For kilns EU-02, the Permittee shall conduct the following monthly monitoring, calculations and recordkeeping:

***

51.2 For each product, the month's highest kiln-wide average instantaneous dry bulb temperature (°F) of air entering a load of lumber for all charges containing that product initiated that month.

***

Appendix A: Calculation of Kilns EU-02 Monthly Methanol & VOC EF

"$EF_{X,product\ i}$" is monthly EF for pollutant X (methanol or VOC) for product i in units of "lb/mbf"' determined as follows:

- For each species in product i, calculate EF_X using the equations in Table A-1 below and using the higher of the following two values for variable "x":
  - 190°F; or
  - The month's highest kiln-wide average instantaneous dry bulb temperature (°F) of air entering a load of lumber of product i.
- $EF_{X,product\ i}$ is the highest EF_X calculated from among the different species in product i.

Table A-1: Equations to Determine EF_X

Species	Methanol[1] (lb/mbf)	VOC[1,2] (lb/mbf)
Non-Resinous Softwood Species		
Western True Firs[3]	0.00465x - 0.73360	0.00817x - 1.02133
Western Hemlock	0.00249x - 0.39750	0.00369x - 0.39197
Species not otherwise listed	0.00465x - 0.73360	0.00817x - 1.02133
Resinous Softwood Species (Non-Pine Family)		
Douglas Fir	0.00114x - 0.16090	0.01460x - 1.77130
Engelmann Spruce	0.00088x - 0.13526	0.1769
Species not otherwise listed	0.00114x - 0.16090	0.01460x - 1.77130
Resinous Softwood Species (Pine Family)		
Lodgepole Pine	0.0550	1.1352
Ponderosa Pine	0.00137x - 0.18979	0.02083x - 1.30029
Species not otherwise listed	0.00137x - 0.18979	0.02083x - 1.30029

Response: R10 is proceeding to public comment without making the requested change to the pre-draft permit. Based upon R10's review of the kiln charts provided by Empire that are in the

administrative record for this permit action, each charge's drying schedule is implemented without the use of an entering air set point temperature. In other words, operation of the kiln is not guided by the built-in constraint of a maximum entering air temperature. Because Empire does not implement a maximum entering air set point temperature, the permit does not allow the use of one to calculate kilns EU-02 methanol and VOC EF. In contrast, because Stimson Lumber does implement its drying schedules using an entering air set point temperature, their synthetic minor permit does allow the use of entering air set point temperature (plus 4°F) in lieu of actual temperature measurements to calculate EF.

B. PTE Calculations

17) Boiler potential NOx emission rate of 0.49 lbs/mmbtu from AP-42 Table 1.6-2 for dry wood-fired boilers, in place of actual source test measured of 0.12 lbs/mmbtu

R10 02/22/22 Pre-Draft Technical Support Document, Appendix A

Non-HAP Potential to Emit		
Emission Unit:	***EU-01***	
Description:	*Superior Boiler Works Mohawk 3-pass dryback scotch marine fire-tube boiler with upstream Converta Kiln wood gas generator*	
	Induced draft boiler employing oxygen trim system	
Maximum Steam Production:	*18,061 lb/hr at 100 psig*	
Particulate Matter Control Device:	*Multiclone (Use of multiclone is required to comply with FARR PM limit for wood-fired boiler stacks.)*	
Fuel:	*Biomass*	
Commence Construction:	*After NSPS Dc applicabity*	
Startup:	*December 1999*	
Design Maximum Heat Input Capacity:	*25*	*MMBtu/hr*
Operation:	*8760*	*hours per year*

NON-FUGITIVE EMISSIONS
Potential to Emit, (tons per year)

Pollutant Emissions	*EF (lb/MMBtu)*	*PTE (tpy)*	*EF Reference*
Carbon Monoxide (CO)	*0.074*	*8.1*	*4 - No controls employed to reduce CO. The boiler is not subject to a CO emission limit. An emission-unit-specific EF is preferable to a source-category-specific EF. Testing of the boiler has been conducted to measure CO emissions. EU specific testing indicates that the actual emission factor .068 for May 2018 test and .080 for September 2014 test. 0.074 lb/MMBtu steam EF is average across two tests.*
Lead (Pb)	*0.000048*	*0.01*	*1 - Pb Option 1 because no specific limits apply.*
Nitrogen Oxides (NO_X)	*0.12*	*13.1*	*2 - NO_X EF is based upon site-specific test results; the AVERAGE value for three runs.*

EF Reference	*Description*
2	*December 21, 2006 Source Evaluation Report. Project No. 2709. Horizon Engineering, LLC. Kamiah Mills. Kamiah, Idaho. Wood Gasification Burner/Boiler System (B-1). Particulate Matter, CO, NO_X, SO_2 and opacity testing conducted November 8, 2006. Only NO_X test results employed to determine PTE. Because test conducted while burning dry wood (not worst-case fuel for CO), results not employed to determine CO PTE. Although SO_2 not detected during test, this does not represent reasonable worst-case emissions. Because the facilty employs a multiclone to reduce PM emissions to comply with an applicable emission limit, the limit is employed to determine PTE.*

Response: R10 is proceeding to public comment without making the requested change to the pre-draft PTE inventory in Appendix A to the TSD. Because boiler EU-01 is not subject to a NOx emission limit, it is necessary to select a representative EF from available resources to estimate potential emissions. Pursuant to 40 CFR 49.158(a)(2), EPA ranks source-specific emission tests as the most preferable for estimating emissions. The EF R10 used in the PTE inventory reflects 2006 performance test results for boiler EU-01. Empire has provided no information to suggest that the source-specific test-derived EF is not representative of emissions today. Empire's request that R10 use an AP-42 EF (rather than a source-specific test-derived EF) to estimate potential emissions in this case is not supported.