Trinity Consultants

MEMORANDUM

To: Aaron Manley, Olympic Region Clean Air Agency

cc: Jennifer DeMay, Olympic Region Clean Air Agency; Michael Nolan and Christine Yanik, Weyerhaeuser NR Company

From: Nancy Liang and Matt Goldman, Trinity Consultants

Date: March 15, 2024

RE: Weyerhaeuser Raymond NOC Application Addendum (23NOC1614) – ORCAA Comments

On March 11, 2024 and March 12, 2024, Weyerhaeuser NR Company (Weyerhaeuser) received draft comments from Aaron Manley of the Olympic Region Clean Air Agency (ORCAA) regarding Notice of Construction (NOC) application #23NOC1614. The NOC application was submitted by Weyerhaeuser to authorize the installation of a direct-fired continuous dry kiln (CDK) at the Raymond facility (the "Facility"). This memo serves as an addendum to the NOC permit application and provides Weyerhaeuser's responses to ORCAA's comments.

ORCAA Comment 1 – Emission Capture

ORCAA: There is concern regarding the ratio of emissions exiting the vapor extraction points. Please provide documentation how the '80% of emissions are extracted through the vapor extraction units' number was reached (HVAC calculations, computation via fluid dynamics, etc.).

Response: Following Georgia Environmental Protection Division's (EPD) procedure for modeling the continuous drying lumber kilns with powered vents, the total air toxic emissions are split assuming 80% exit through powered vents and 20% exit through doors. A copy of the referenced procedure, *Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions,* is provided in Attachment A. This ratio is further confirmed based on visual observation of CDKs with and without vapor extraction points as shown in Figures 1 & 2 below[1]. Please note, the ratio of emissions existing the vapor extraction points only impacts the modeling results, and does not impact emissions calculation.

ORCAA Comment 2 – BACT Cost Analysis

ORCAA: As discussed in the meeting last week, ORCAA is still waiting on the BACT cost analysis with vendor-invoices/cost estimates to demonstrate economic feasibility/infeasibility of add-on controls. The results should be in current (2023 or 2024) dollars.

Response: See the following responses for updates regarding the existing Best Available Control Technology (BACT) cost analysis.

- **Particulate Matter (PM)**:
  - Wet Electrostatic Precipitator (WESP)

[1] Based on visual observations, a small amount of emissions (<5%) exits through the doors of the CDKs while the majority of emissions exits through the vaport extraction points. The modeling analysis conservatively assumed 20% of total emissions exits through the doors of the CDKs.

  - For PM BACT, Weyerhaeuser had previously submitted recent cost estimates with the BACT addendum, dated February 26, 2024. A vendor quote was obtained from the installation of a wet electrostatic precipitator (WESP) at Weyerhaeuser's Sutton lumber mill. Using the most recent 2023 vendor data and costs, Weyerhaeuser determined the cost effectiveness for a WESP to be $91,285 per ton of PM controlled (in 2023 dollars), so a WESP is not cost effective for PM emission control on the CDK. The cost calculations are provided again in Attachment B to this letter and the vendor quote has been added in Attachment C.
- Wet Scrubber
  - Based on Weyerhaeuser's communications with a prominent control device vendor on March 6, 2024, the wet scrubber is not a feasible control option due to the small particle size of kiln emissions. As shared in our BACT analysis, wet scrubbers are limited to inlet concentrations between 1 and 115 grams per cubic meter.[2] Typical dry kiln exhaust concentrations are on the order of 0.01 grams per cubic meter[3], which is below the scrubber's design constraint.

- **Volatile Organic Compounds (VOCs)**
  - Regenerative Thermal Oxidation (RTO) and Regenerative Catalytic Oxidation (RCO)
    - Weyerhaeuser previously determined either an RTO or an RCO as cost ineffective, according to annualized costs ($/scfm) provided in EPA Air Pollution Control Technology Fact Sheets and scaling them using Chemical Engineering Plant Cost Index (CEPCI) values. Further, there is no proper source of natural gas near the Raymond Facility, so operation of an RTO or RCO will require natural gas to be transported over 30 miles to the Facility. Due to the capital and installation costs for the natural gas pipeline, the RTO and RCO are both cost ineffective and vendor quotes are not provided.

ORCAA Comment 3 – Add-On Hoods and Fans

ORCAA: There is still discussion regarding adding hoods to the ends of the kilns to capture emissions escaping the ends of the CDK. As an addendum to the BACT cost analysis described in item 2, please include in the BACT analysis a comparison demonstrating the feasibility of incorporating add-on hoods with fans to vertically disperse emissions escaping the ends of the CDK as well as allow source testing of the CDK.

Response: As demonstrated in prior addendums to the NOC Application, it is neither feasible to incorporate add-on hoods with fans at the CDK ends, nor conduct source testing of the CDK. Below is a summary of the resources that Weyerhaeuser has provided before to support this determination:

Resources:

- National Council for Air and Stream Improvement's (NCASI) *Control Device and Stack Testing Feasibility Assessment*
  - Provided in Attachment B to the November 15, 2023 NOC Application Addendum and Attachment A to the February 26, 2023 Compiled BACT Analysis.
  - Describes the design constraints of CDKs and the infeasibility of add-on control devices and stack testing.
- Environmental Protection Agency's (EPA) proposed Plywood and Composite Wood Products (PCWP) Maximum Available Control Technology (MACT) rule amendments
  - Attached to this memo in Attachment D.

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[2] EPA (2003). "Air Pollution Control Technology Fact Sheet: Venturi Scrubber." https://www3.epa.gov/ttncatc1/dir1/fventuri.pdf

[3] The calculated exhaust PM concentration for the proposed CDK at the Raymond facility is 0.028 g/m^3.

- Explains the technical infeasibility for emission capture, control, and testing.

► Trinity Consultants' *CDK BACT Conditions Summary*
- Provided to ORCAA on March 8, 2024.
- Summarizes BACT permit conditions established in Prevention of Significant Deterioration (PSD) permits for existing Weyerhaeuser CDKs.

► Trinity Consultants' Compiled BACT Analysis
- Provided to ORCAA on February 24, 2024.
- The Reasonably Available Control Technology (RACT)/BACT/Lowest Achievable Emission Rate (LAER) Clearinghouse (RBLC) database results for the CDK BACT analysis.

With further research, Weyerhaeuser learned that Georgia EPD recognized the infeasibility of a full enclosure for a CDK in West Fraser Fitzgerald's Section 502(b)(10) Change to its Title V Operating Permit No. 2421-017-0008-V-05-1, which is attached to this memo in Attachment E. Further, Georgia EPD removed Condition 4.2.1, which had required Method 204 testing.

In addition to the above resources, visual comparisons of the exhaust exiting for setups with and without vapor extraction modules (VEMs) are provided in Figures 1 through 2. Figure 3 displays a CDK that has baffles on the ends, as well as VEMs. Please also view this "Deltech Continuous Kilns" video by BID Group for a video representation of CDK operation and exhaust:
https://www.youtube.com/watch?v=3DUIJ5kOY1M.

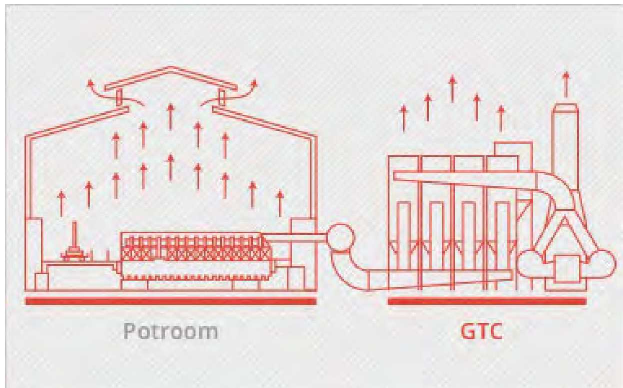
Figure 1. CDK Emissions with vs without VEMs

Figure 2. Side-by-Side Comparison of a CDK with its VEM On (Left) vs Off (Right)

Figure 3. CDK with a VEM and Baffles

Jennifer DeMay of ORCAA has shared with Trinity Consultants (Trinity) that EPA and ORCAA would like Weyerhaeuser to consider the feasibility of extending the ends of the CDK and installing a "pressure balancing system" that is currently demonstrated at aluminum smelters, which uses a negative pressure to capture any remaining fugitive emissions. To Trinity's knowledge, the aforementioned pressure balancing system is employed in smelter potrooms, which are long buildings that generate hot air exhaust, like a CDK. Potroom exhaust is primarily directed upward out of roof vents, but with the assistance of a pressure balancing system, most of the fugitive emissions can be captured and directed to an adjacent emission control system, also referred to as a Gas Treatment Center (GTC), which is displayed in Figure 4.

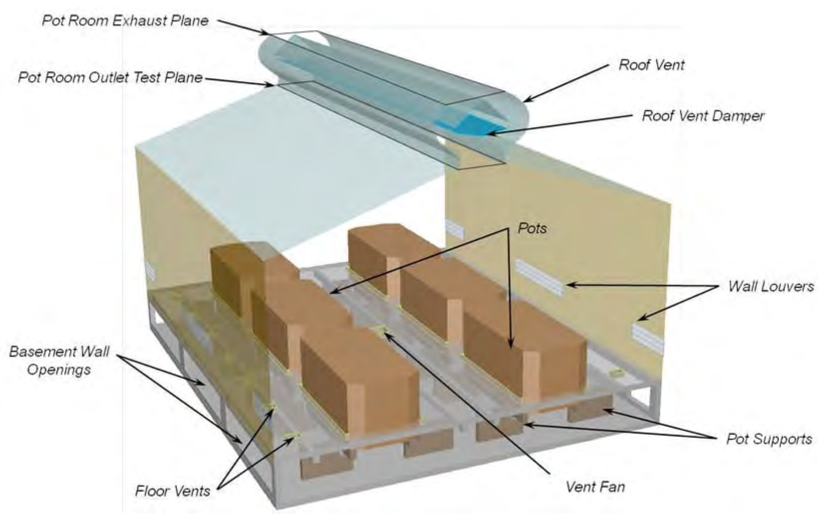
Figure 4. Potroom and GTC Design



Source: https://advancetex.net/ad-flow-system/aluminum/

However, there are several key differences between the CDKs and smelter potrooms. As shown in Figures 5 and 6, a smelter potroom is a significantly larger structure that does not require open doors for product to continuously travel in and out through. Also, potrooms are typically designed with roof vents along the length of the structure, where the majority of the exhaust is directed to, as well as open louvers on the building's walls. Therefore, the emission profile differs from that of a CDK. Even with a pressure balancing system, there still remains an amount of uncaptured fugitive emissions when using the pressure balancing system.

Figure 5. Smelter Potroom Design



Source: https://www.verdantas.com/experience/smelter-pot-room-roof-ventilation-system

Figure 6. Smelter Potroom Building Configuration

Source: https://www.genisim.com/website/cfd2001.htm

Installation of a pressure balancing system will obstruct a critical CDK's energy recovery function as explained in the NCASI document. In order to install a pressure balancing system, Weyerhaeuser would need to extend the kiln ends further out from the energy recover zones and use a negative pressure to pull in sufficient ambient air to capture the fugitive emissions and direct them up through a separate fan-powered stack. However, this process would require a significant amount of outside air to be pulled in and blown toward a stack that it would motivate exhaust coming out from the green/positive pressure side to pull toward the separate stack, while inhibiting the dry/negative pressure track from receiving enough outside air to properly re-direct exhaust and pre-treat the green lumber. Another constraint is the fact that while the kiln doors are relatively large, there is minimal surface area available between the kiln door edges (or baffles) and the wood stacks, which would likely render the additional fans as infeasible to draw sufficient outside air for capturing the remaining fugitive emissions. This space is even less when baffles are in place on the kiln ends, which is visualized in Figure 3.

Although the CDK has two counter-flow tracks, one track cannot be isolated and sealed off from the other track for the purposes of emission capture or testing, since that would obstruct the heat transfer between the green and dry lumber sides, require greater heat input, and thus, lead to higher combustion emissions.

ORCAA Comment 4 – BACT Limit Compliance

ORCAA: The proposed CDK BACT limits for PM, CO, NOx, and SO2 are in lb/MBF. It was asked how, until an approved testing method for CDK's is approved, the facility proposes to monitor/demonstrate compliance with the CDK BACT limits?

Response: Weyerhaeuser will comply with the PM, CO, NO_X, and SO_2 BACT limits as follows:

- **PM**: Compliance with the PM BACT emission limit shall be demonstrated through compliance with proper maintenance and operating practices. These practices will include the four work practice standards shared in the proposed PCWP MACT rule amendments, such as: [4]

[4] Ibid.

1. Operation and maintenance (O&M) plan
2. Burner tune-up
3. Over-drying prevention methods:
   a. Operate below a maximum temperature setpoint (220 °F);
   b. Conduct in-kiln moisture monitoring (via the in-kiln moisture management system); or,
   c. Follow a "site-specific plan (for temperature and lumber moisture monitoring)"
4. Set dried lumber minimum moisture content limits

- **CO**: Compliance with the CO BACT emission limit shall be demonstrated through compliance with proper maintenance and operating practices. These practices will include the four work practice standards shared previously from the proposed PCWP MACT rule amendments.

- **NO_X**: Per the vendor's guarantee, the green sawdust gasification burners will be designed with a "secondary gas burner system with [three] individual burner chambers," as well as flue gas recirculation, so compliance with the NO_X BACT emission limit shall be demonstrated through combustion modifications and compliance with proper maintenance and operating practices. These practices will include the four work practice standards shared previously from the proposed PCWP MACT rule amendments.

- **SO_2**: The CDK burner will use green sawdust (i.e., wood) as its primary fuel, which is essentially sulfur free, so compliance with the SO_2 BACT emission limit shall be demonstrated through low sulfur fuels and compliance with proper maintenance and operating practices. These practices will include the four work practice standards shared previously from the proposed PCWP MACT rule amendments.

Weyerhaeuser will also demonstrate compliance with the CDK BACT limits by monitoring and recording the kiln firing rate and dried lumber throughput.

Attachment A

Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions

GUIDELINE FOR AMBIENT IMPACT ASSESSMENT OF TOXIC AIR POLLUTANT EMISSIONS

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

AIR PROTECTION BRANCH

Revised May 2017

Table of Contents

List of Appendices

Historical Background and Scope

The previous Georgia Air Toxic Guideline document was approved by the Director of the Environmental Protection Division (EPD) on September 10, 1984 under the provisions 391-3-1.-02(2)(a)3.(ii) of the Georgia Rules for Air Quality Control. The 1984 guidelines were subsequently revised and approved for use on June 28, 1998. The 1998 guidelines have been further revised as presented in this document and have been approved for use under the above stated provisions in May 2017. This current version of the guidelines supersedes all previous versions.

The guidelines will be used in the review of air quality permit applications to construct/modify potential sources which emit any Toxic Air Pollutant (TAP) listed in Appendix A of this guideline document with emissions above the Minimum Emission Rate (MER) and in other cases at the Director's discretion. The Appendix A provides a list of TAPs, corresponding Acceptable Ambient Concentrations (AACs) and MERs. The list of TAPs in Appendix A will be updated periodically as new data becomes available. In addition, the guidelines may also be employed to estimate the environmental impact of TAP in any situation where approved ambient monitoring data is not available.

Section 1 Overview of Risk Assessment

1.0 Introduction

The purpose of this document is to provide a guide for facility owners to demonstrate to the Air Protection Branch of the Georgia Environmental Protection Division (EPD) that any toxic air pollutant (TAP) listed in Appendix A of this guideline document will comply with Georgia Rules for Air Quality Control 391-3-1.02(2)(a)1. and 391-3-1.02(2)(a)3. A TAP is defined as any substance which may have an adverse effect on public health, excluding any specific substance that is covered by a State or Federal ambient air quality standard.

1.1 Hazard Identification

In compiling the list of toxic air pollutants, EPD looked at the approach used by other states. EPD found that most of the states were regulating compounds listed on the EPA's list of 187 Hazardous Air Pollutants (HAPs). However, in addition to the 187 HAPs Georgia has historically regulated other TAPs based on IRIS, OSHA and NIOSH data. In this version, EPD is providing the regulated community with a definitive list of pollutants. In order to compile this list of TAPs, EPD considered the following resources:

- EPA list of Hazardous Air Pollutants (HAPs) which is available at https://www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications

- EPA Integrated Risk Information System (IRIS) database which is available at https://www.epa.gov/iris

- Occupational Safety and Health Administration (OSHA) Table Z1 thru Z3 which is available at https://www.osha.gov/dsg/annotated-pels/tablez-1.html

In developing the final list, EPD eliminated all the duplicates and also compounds listed in IRIS and OSHA/NIOSH database that had no inhalation toxicity data. The final list of toxic air pollutants is provided in Appendix A of this document.

1.2 Exposure Assessment

A considerable amount of time is spent by both EPD and the regulated community in establishing the Allowable Ambient Concentration (AAC) during the permit review process. This version provides AACs for all the TAPs listed in Appendix A. The procedures for establishing AAC are provided in Appendix D.

In addition to AAC, EPD has also provided in Appendix A of this guideline document, the Minimum Emission Rate (MER) for each TAP. The MER was established by using worst case dispersion scenarios based on EPD experience and SCREEN3 air dispersion model. SCREEN3 is considered a very conservative dispersion model and is available at https://www3.epa.gov/ttn/scram/dispersion_screening.htm#screen3.

In establishing MER, EPD considered both short term and long term exposure. The short term exposure was based on 15-min AAC while the long term exposure is based on continuous exposure to the TAP for 8760 hours per year for 70 years. The long term and short term AACs are combined with the SCREEN3 results to characterize the potential risk to receptors and establish MER for each TAP.

If the facility-wide emissions are below the MER then no further analysis is required for that pollutant. The basis for establishing MER is provided in Appendix C.

Note: MER does not apply when the major emissions are from volume and/or area sources.

Section 2 Determination of Toxic Air Pollutant Impact

2.1 Who is Required to Demonstrate Compliance with AAC?

The applicant is required to demonstrate compliance with AAC when the facility emits any one of TAPs listed in Appendix A of this document.

A demonstration is required for:

(a) All new facilities that require a State Implementation Plan (SIP) Permit.

(b) All existing facilities that are adding new equipment that require a SIP permit and emit toxic air pollutant listed in Appendix A.

(c) All existing facilities that are modifying existing equipment that increases the emission of toxic air pollutant listed in Appendix A.

(d) All existing facilities that are modifying existing equipment or making process changes that result in emission of toxic air pollutant listed in Appendix A not previously emitted from the facility.

(e) In some cases a demonstration may be required for sources that have never demonstrated compliance with the AAC.

(f) Case by case as determined by the Division.

2.2 Procedures for Demonstrating Compliance with AAC

The general procedure for determination of TAPs impact is a simple comparative method.

- For a pollutant that has a facility-wide emission rate below the MER established in the table in Appendix A, no further analysis is required.
- For pollutant that has a facility-wide emission rate above the MER established in the table in Appendix A, further analysis is required.

If facility-wide emissions are mainly emitted as volume or area sources, MER should not be used for screening out of the modeling analysis.

The maximum ground-level concentration (MGLC) found by dispersion analysis (Section 4) is compared to the AAC (Appendix A) for the pollutant. If the MGLC is less than the AAC, TAP impact is determined to be insignificant.

If the facility wide TAP emissions are greater than MER, follow the steps below:

STEP 1: Locate the long term and/or short term AAC for the toxic air pollutant emitted from the facility from the list in Appendix A.

STEP 2: Derive MGLC using SCREEN3 dispersion analysis. Adjust to the appropriate averaging time (24 hours, 15 minutes and annual).

STEP 3: Compare MGLC from SCREEN3 dispersion analysis with AAC

(i) If MGLC is less than AAC, proceed with application review, pollutant impact is determined to be insignificant.

(ii) If MGLC is greater than AAC, proceed to Step 4.

STEP 4: Perform AERMOD or ISCST3 analysis for MGLC per the procedures provided in Section 4 and 6.

STEP 5: Compare MGLC from AERMOD or ISCST3 with AAC

(i) If MGLC is less than AAC, proceed with application review, pollutant impact is indicated to be insignificant.

(ii) If MGLC is greater than AAC, it indicates potential adverse toxic air pollutant impact. Reduction in pollutant emission rate, additional controls, and/or increase in stack height may be considered. If these options fail to demonstrate compliance then a site specific risk analysis is required.

STEP 6: Perform a site specific risk analysis. The Division accepts the following approaches:

- Model the nearest (or worst case) receptor located in a residence area and compare with the annual AAC value;
- Model the nearest (or worst case) receptor located in a business area and compare with 8-hour AAC value (OSHA based);
- Model all other receptors in grids and compare with 15 minute short term AAC value (STEL or Ceiling based).

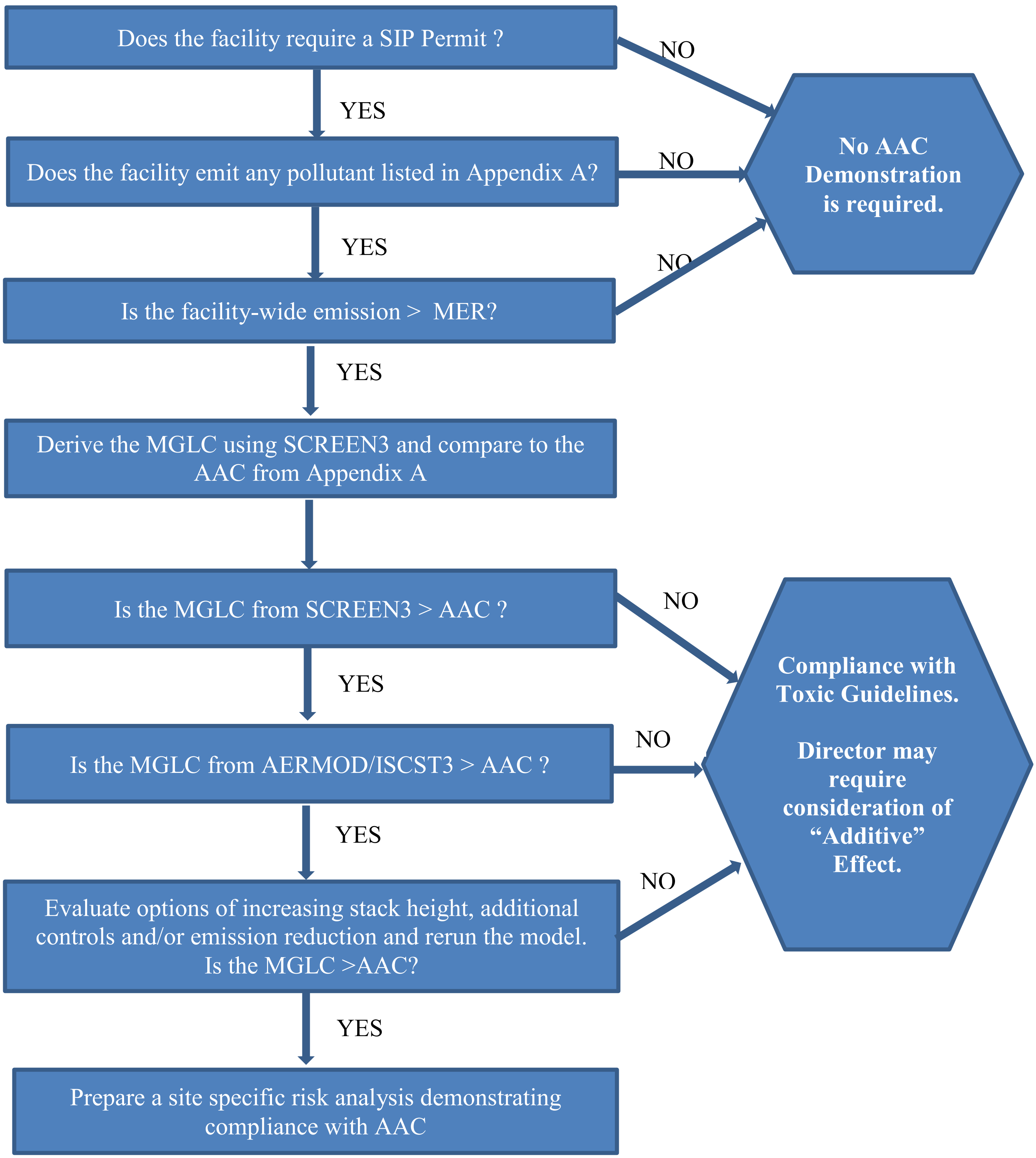
In addition to demonstrating compliance with AACs, the Division reserves the right to request the applicant to evaluate additive/synergistic effects from multiple pollutant exposure. In cases when two or more pollutants are known to have the same effect (e.g. reproductive effects, kidney toxicity, CNS stimulant, etc.) upon the same organ system of the body, the impacts of simultaneous exposure are considered “additive”. The following formula shall be used to evaluate additive effect:

$$\frac{\mathrm{MGLC1}}{\mathrm{AAC1}} + \frac{\mathrm{MGLC2}}{\mathrm{AAC2}} + \cdots\cdots + \frac{\mathrm{MGLCn}}{\mathrm{AACn}} > 1$$

Where,
MGLC 1, 2, …, n are the maximum ground level concentration of each pollutant
AAC 1, 2, …, n are the acceptable ambient concentration of each pollutant.

If the result is greater than one, then further risk assessment would be necessary. The applicant should be able to demonstrate that annual air emissions from the facility would result in a cumulative non-cancer hazard and excess lifetime cancer risks that fall within the acceptable USEPA risk range/limits of 1E-06 to 1E-04 and below the cumulative hazard risk index of 1.

After performing a site specific risk assessment, if it is infeasible for the applicant to comply with the AACs found in this guideline or the applicant is unable to demonstrate that the cumulative hazard risk index is below 1, the Director at his/her discretion may approve an application that includes the installation of New Source Maximum Available Control Technology (MACT). For the purpose of this guideline, “New Source MACT” is defined as the control technology which reflects the maximum degree of reduction in emissions of hazardous air pollutants that the Director determines is achievable by the source, provided that such control technology is no less effective than the level of emission control which is achieved in practice by the best controlled similar source.


Does the facility require a SIP Permit ?
NO
YES
Does the facility emit any pollutant listed in Appendix A?
NO
YES
NO
Is the facility-wide emission > MER?
No AAC Demonstration is required.
YES
Derive the MGLC using SCREEN3 and compare to the AAC from Appendix A
Is the MGLC from SCREEN3 > AAC ?
NO
YES
Is the MGLC from AERMOD/ISCST3 > AAC ?
NO
YES
Evaluate options of increasing stack height, additional controls and/or emission reduction and rerun the model. Is the MGLC >AAC?
NO
Compliance with Toxic Guidelines.
Director may require consideration of "Additive" Effect.
YES
Prepare a site specific risk analysis demonstrating compliance with AAC

Section 3 Required Data for Dispersion Analysis

The following information is needed to perform an impact assessment of toxic air pollutant:

3.1 Identification of Toxic Air Pollutants to be Emitted

The pollutants should be identified by the standard chemical nomenclature of the Chemical Abstract Service (CAS) with only a few substances that don't have a CAS number. Use of standard nomenclature provides information on elemental composition, and is the nomenclature most often used in reference materials on toxicity.

3.2 Emission Source Parameters

For required parameters for each dispersion model, please refer to Section 4, 5, and 6 for details.

3.3. Maximum Toxic Air Pollutant Emission Rate

This should be in the units of grams per second (g/s) for use in dispersion analysis (Some models allow lb/hr). This value should be the maximum emission rate expected under normal worse case conditions. This maximum emission rate is determined using the following methods:

A. When Performing 24-hour and 15-minute Evaluations:

(i) For processes whose emissions are relatively constant (continuous processes) - The maximum emission rate is the maximum 1-hr average emission rate during worse case conditions. If 1-hr average maximum emission rates are not available, use the shortest time period available.

(ii) For processes whose emissions vary significantly over time (batch processes)

a. 24-hour evaluations - The maximum emission rate is total emissions during the worst case batch divided by the length of the batch. The length of the batch does not include down time between batches.

b. 15-minute evaluations - The maximum emission rate is the emission rate during the highest emitting portion of the batch. For facilities which have multiple batch processes, the maximum emission rate should be based on the batch process which has the highest emission rate. Batch processes which routinely emit simultaneously should be considered together when determining the maximum emission rate to use in the evaluation. When a process emits more than one toxic pollutant, a maximum emission rate should be determined for each pollutant separately.

B. When Performing Annual Evaluations:

(i) For processes whose emissions are relatively constant (continuous processes) - the maximum emission rate is the total annual emission that would occur if the process is operating under worse case conditions for the entire year divided by 8760 hr/yr.

(ii) For processes whose emissions vary significantly over time (batch processes) - the maximum emission rate is the total emissions from the worst case batch times the maximum number of batches per year divided by 8760 hr/yr.

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Section 4 Air Dispersion Analysis

The Division accepts screening analysis using the SCREEN3 and refined modeling analysis using AERMOD and ISCST3. Use of models other than those referred to in this Guideline must be approved by the Division. In addition, if the source is located in an area with complex terrain, AERMOD must be used. The computer models may be obtained from the following website https://www.epa.gov/scram/air-quality-dispersion-modeling. The latest versions of these models should be used where possible. The Division also allows the use of third party modeling software from Trinity Consultants (BREEZE), Lakes Environmental (AERMOD view) and Oris-Solution (BEEST). The Division requires the model to be run with the regulatory default options. If any non-default options are proposed to be used in the modeling, those options should be thoroughly discussed in the application.

4.1 General Notes on Dispersion Modeling Analysis

All guidance discussed in this document adheres to EPA guidance (U.S. Environmental Protection Agency, Guidelines on Air Quality Models – Appendix W to Part 51, U.S. EPA, Research Triangle Park, NC, 2005, and Revised, 2017) for determining the impact of any pollutant. The guidelines presented in this document may change at any time as new guidance or new air quality modeling techniques become available.

A. Building Downwash

Due to safety factors built into this Guideline, the Division does not require the use of building downwash calculations if the ISCST3 model is used in the TAP ambient impact assessment, while the building downwash effect should be included when the AERMOD model is used. The Division reserves the right to require the inclusion of downwash calculations if they are warranted by specific conditions.

B. Capped and Horizontal Stacks

For capped and horizontal stacks that are NOT subject to building downwash influences, a simple screening approach can be applied, based on a procedure for ISCST3 that was approved by the Model Clearinghouse in July 1993. This approach is summarized below:

(i) Set the exit velocity to 0.001 m/s

(ii) Calculate an adjusted stack diameter (ds) that keeps the volume flow unchanged using the equation:

$$ds = 31.6\ d\ \sqrt{V}$$

Where,
ds = adjusted stack diameter (m)

d = original stack diameter (m)
V = original stack exit velocity (m/s)

(iii) To appropriately account for stack-tip downwash, the user should first apply the non-default option of no stack-tip downwash (i.e., the NOSTD option on the MODELOPT keyword). Then, for capped stacks, the stack release height should be reduced by three actual stack diameters to account for the maximum stack-tip downwash adjustment, while for horizontal releases no adjustment to release height should be made. More details can be found at https://www3.epa.gov/ttn/scram/7thconf/aermod/aermod_implmtn_guide_3August2015.pdf

C. Non-Circular Stacks

For noncircular stack, use equivalent dimensions to calculate the inner diameter (d) of the circular stack using the formula

$$A = (\pi /4)\ d^2$$

Where A = area of the noncircular stack

D. Industry Specific – Lumber Kilns

When modeling the continuous drying lumber kilns, the following procedures will be used:

- For continuous kilns with powered vents, the total air toxic emissions should be split assuming 80 percent exit through powered vents and 20 percent exit through doors.

- For continuous kilns without powered vent, assume all emissions exit through the doors.

- Model the powered vent as a stack.

- The emission via the kiln door can be modeled in two ways:

As a volume source: Release height is set at the midpoint of the door. Initial lateral and vertical dimension are calculated from the actual door size plus the initial plume spread/rise (usually 2 ft for spread and 5 ft for rise), and divided by 4.3 and 2.15 respectively.

As a point source: Release height is set at the midpoint of the door. Effective diameter is the equivalent diameter calculated based on the equal area. Exit velocity is set to 0.001 m/s, similar to horizontal discharge.

Note: In addition, the default option is with stack-tip downwash. Use non-default option (without the stack-tip downwash) only if all gases exit through the kiln door.

When modeling batch kilns, assume all the emissions are exiting through the doors and model such release as volume source or point source adhering to same criteria as continuous kiln.

Section 5 SCREEN3 Modeling Procedures

An initial simplified evaluation of air toxic impacts can be made with the SCREEN3 model. For merging multiple stacks in SCREEN3 see section below.

Recommendations for each SCREEN3 run are as follows:

- The maximum toxic pollution emission rate (expressed as a 1-hour average) for each pollutant should be used.

- The option for flagpole receptors should generally not be used.

- Choose the rural or urban dispersion option based on the procedure in EPA's "Guideline on Air Quality Models (2005 and Revised, 2017)" which is available at https://www3.epa.gov/ttn/scram/guidance_permit.htm. The rural option is appropriate for most locations in Georgia.

- Choose the default atmospheric temperature of 293K.

- For each release, exercise the automated distance array choosing as the minimum receptor distance the appropriate nearest fence line distance for that release. The maximum concentration for that release will then be chosen as the maximum calculated concentration at or beyond the nearest fence line distance.

- For each release, the maximum 1-hour concentration should be noted. The maximum ground-level concentrations produced from the Gaussian dispersion model by the SCREEN3 computer program are estimated to be valid for an averaging period of 1 hour. Factors for adjusting the 1-hour average concentrations to applicable averaging periods are listed below:

Averaging Time	Multiplying Factor
15 minutes	1.32
24 hours	0.40
Annual	0.08

  Further information on adjusting 1-hour concentrations to different averaging periods can be found in Appendix D of EPA-454/R-92-024, "Workbook of Screening Techniques for Assessing Impacts of Toxic Air Pollutants (Revised)".

- In the case where emissions occur less than 24 hours per day, an additional adjustment to the 24-hour concentration can be made by using the formula described below.

$$C_e = C_c(y/1440)(1440/y)^{0.2} = C_c\,(y)^{0.8}\,(2.97 \times 10^{-3})$$

Where,

C_e is emission adjusted 24-hour concentration,
C_c is calculated 24-hour concentration, and
y is minutes of emissions per 24 hours.

- Merged Sources

These procedures are generally used during the use of SCREEN3 to minimize model runs for a facility that may emit two or more pollutants simultaneously from a single emission point. There will also be cases where the facility under review contains two or more emission points, each emitting two or more pollutants. If necessary, each pollutant from each emission point may be assessed for toxic impact. Such a procedure will certainly be time consuming if the facility under review has many emission points emitting many different pollutants. The following abbreviated toxic impact review schemes are recommended to be employed as time saving measures.

A single representative stack may be used to represent several sources that are identified as “similar”. “Similar” stacks are those that are located less than 100 m apart, emit the same pollutants, and have stack heights and gas exit velocities differing by less than 20 percent. The procedure of merging sources identifies **one** worst case representative stack from which all of the emissions from the sources involved are modeled. The merged stack is typically located at the closest location, of all the stacks involved, to the property line. This location, if all other parameters were the same, would result in the maximum modeled off-site concentrations. Dissimilar stacks may also be merged, but the merged source technique will result in conservatively high off-site concentrations. Therefore, merging dissimilar stacks should be done with caution. To determine which stack should be used as the representative stack, compute the parameter, M, for each stack, using the following equation:

$$M = (Hs\ V\ Ts) / Q$$

Where,

M = parameter accounting for the relative influence of stack height, plume rise, and emission rate on concentrations;
Hs = stack height (m);
V = stack gas volume flow rate parameter;
Ts = stack gas exit temperature (K); and
Q = pollutant emission rate (g/s).

$$V = (\pi/4)\ v^2 d^2$$

Where,

d = stack exit diameter (m); and
v = stack gas exit velocity (m/s).

Note: Since it is possible for two stacks to have the same flow rate (V) and “M” value, while still having a large difference in momentum flux and predicted ambient concentrations, the stack exit velocity (v) is squared when calculating the stack flow rate (V). This is consistent with the algorithms used by the SCREEN3 model to calculate momentum flux and will ensure a conservative emission point is used as the representative stack.

The stack with the lowest "M" value is used as the representative stack. The sum of the emissions from all merged stacks is assumed to be emitted from the representative stack; i.e. the merged source is characterized by Hs_1, Vs_1, Ts_1, and Q, where subscript "1" indicates the representative stack and $Q = Q_1 + Q_2 + \ldots + Q_n$ (the combined emissions). The location of the representative stack is at the actual stack location closest to the property line.

To conservatively estimate ambient impacts using SCREEN3, the worst-case stack is determined using the lowest "M" factor calculated assuming a "Q" value of 1. The stack with the lowest "M" factor is then used as the representative stack. The sum of the facility-wide emissions and the parameters for the worst-case stack are then input into the model.

Section 6 Refined Modeling Procedures

If the screening modeling evaluation results in pollutant concentrations exceeding the AAC, the source emissions should be modeled using a refined dispersion model. The refined modeling analysis using either AERMOD or ISCST3 is acceptable. Use of other dispersion models needs to be approved on a case-by-case basis before application is submitted.

AERMOD is a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. ISCST3 is a steady-state Gaussian plume model which can be used to assess pollutant concentrations from a wide variety of sources associated with an industrial complex. Effective December 9, 2005, AERMOD is the preferred and recommended refined dispersion model by EPA. As of December 9, 2006, AERMOD is fully promulgated as a replacement to ISCST3. The applicant is encouraged to use the preferred AERMOD as the refined dispersion modeling tool, though application using ISCST3 is also acceptable. The user may wish to review the material in the individual refined model user's guide and the EPA Guideline on Air Quality Models - Supplement C.

Both AERMOD and ISCST3 may be obtained from the EPA website https://www3.epa.gov/scram001/dispersionindex.htm. The latest versions of these models shall be used with the regulatory default options. Any non-default option proposed to be used in the modeling need to be approved by Georgia EPD before application is submitted. The approved use of non-default options need to be documented in the application.

The following section listed the required input information and procedures for conducting refined modeling.

A. Plant layout information

Plant layout information for all facility buildings, emission sources and fence lines should be clearly provided within 2 meters of their actual locations.

B. Emission Source information

In general, industrial emission sources can be characterized in four different types:

1. Point sources

Examples include stacks, chimneys, exhaust fans, vents, and flares. The following input parameters are required:

Ptemis – point source emission rate in g/s,
Relhgt – release height above ground in meters,

Stktmp – stack gas exit temperature in degrees K,
Stkvel – stack gas exit velocity in m/s, and
Stkdia – stack inside diameter in meters.

2. Volume sources

Examples include open buildings, open storage tanks, building roof monitors, multiple vents, and conveyor belts. The following input parameters are required:

Vlemis – volume source emission rate in g/s,
Relhgt – release height (center of volume) above ground in meters,
Syinit – initial lateral dimension of the volume source in meters which is calculated by dividing the length of the side by 4.3, and
Szinit – initial vertical dimension of the volume source in meters which is calculated by dividing the vertical dimension by 2.15 for surface-based sources and elevated sources on or adjacent to a building. For elevated sources not on or adjacent to a building, the vertical dimension is divided by 4.3.

3. Area sources

Area sources refer to sources with low level or ground level releases with no plume rise such as storage piles, slag dumps, open pits, and lagoons. The following input parameters are required:

Aremis – area source emission rate in $g/s/m^2$,
Relhgt – release height above ground in meters,
Xinit – length of X side of the area source (in the east-west direction if Angle is 0 degrees) in meters,
Yinit – length of Y side of the area source (in the north-south direction if Angle is 0 degrees) in meters (optional),
Angle – orientation angle for the rectangular area in degrees from North, measured positive in the clockwise direction (optional), and
Szinit – initial vertical dimension of the area source plume in meters (optional).

4. Line sources

Examples include roadways and streets (motor vehicle sources) or lines of roof vents or stacks. In many cases, the line sources can be simulated using AERMOD as multiple point or volume sources. The applicant should contact the EPD before choosing this type of source.

C. Receptor Grids

1. Coordinate system

The Universal Transverse Mercator (UTM) system with NAD83 datum should be used for all coordinates in the refined modeling such as stack emission locations, fugitive emission locations, building locations, and receptors.

2. Receptor location and spacing

The applicant can use a combination of coarse and refined receptor grids to determine the maximum ground level concentration (MGLC) for each pollutant and averaging period evaluated. The receptors setup should provide sufficient resolution to identify the maximum pollutant impact. General guidelines are:

Receptors should be placed on the facility boundary and in the ambient area outside the facility provided that the general public does not have ready access to any portion of the property. Examples of areas with ready access to the public are: commonly used roads; rivers used by boaters or fishermen; areas with picnic tables or jogging trails, etc.

Refined receptor grid should be placed at the facility fence-line and extending out to 2km with 100 meter spacing.

Coarse receptor grid should be set with 200 meter or 250 meter spacing extending from 2km to 5km.

In designing the receptor grid, emphasis should be placed on resolution and location and not on the total number of receptors. The MGLC must be resolved on the 100 m resolution grid. In addition, the refined grid should be of sufficient size to ensure that the refined receptor indicating the MGLC has at least one receptor on all sides showing a lower concentration.

3. Terrain elevations

Terrain elevations for receptors should be processed from USGS National Elevation Dataset (NED) data by the AERMAP program. The 1 or 1/3 arc-second NED data can currently be retrieved from the Multi-Resolution Land Use Characteristics Consortium website at https://www.mrlc.gov/nlcd92_data.php.

If the source is located in an area with complex terrain, AERMOD must be used.

D. Meteorological data

For AERMOD modeling, the EPA guidelines recommend the use of meteorological data from the closest and most representative NWS station. The Division has prepared five years meteorological data for various combinations of ASOS surface and upper air station pairings. The data can be located at https://epd.georgia.gov/air/georgia-aermet-meteorological-data. Assignment of station pairings to each county was based on distance to the centroid of the county, climatological zone, data collection period, and data completeness criteria. The data online will be updated periodically. For ISCST3 modeling analysis, five years of meteorological data from the nearest NWS station should be used. The data was prepared by the Division and can be downloaded via link https://epd.georgia.gov/air/georgia-isc-meteorological-data. Due to the fact that ISCST3 is no longer a preferred model by EPA, the Division no longer provides updated meteorological data for this model.

E. Adjustment of Off-Property Maximum Pollutant Concentration to Correct Averaging Time

The model concentration outputs from ISCST3 and AERMOD are usually for averaging periods of 1-hour and longer. The 1-hour average concentrations should multiply by a factor of 1.32 when they are compared with a STEL or ceiling value for 15 minutes averaging period.

When the modeled concentration outputs are based on emissions which occur less than 24 hours per day, the modeled 24-hour concentration outputs are recommended to be adjusted using the following formula:

$$Ce = Cc(y/1440)\ (1440/y)^{0.2} = Cc\ (y)^{0.8}\ (2.97 \times 10^{-3})$$

Where;

Ce is the 24-hour concentration after adjustment,
Cc is the modeled 24-hour concentration outputs, and
y is minutes of emissions per 24 hours.

Reference Materials

U. S. Environmental Protection Agency, 1976. Estimation of Permissible Concentrations of Pollutants for Continuous Exposure. EPA-60/2-76-155. Research Triangle Park, N.C.

U. S. Environmental Protection Agency, 1983. Regional Workshops on Air Quality Modeling: A Summary Report - Addendum. EPA-450/4-82-015. Research Triangle Park, N.C.

U. S. Environmental Protection Agency, 1986. Guideline on Air Quality Models (Revised). EPA-450/2-78-027A. U.S. EPA Office of Air Quality Planning and Standards, Research Triangle Park, N.C. Supplement A, 1988, Supplement B, 1993, Supplement C, 1995.

U. S. Environmental Protection Agency, 1986. User's Manual for the Human Exposure Model (HEM). U.S. EPA Office of Air Quality Planning and Standards, Research Triangle Park, N.C.

U. S. Environmental Protection Agency, 1987. Analysis and Evaluation of Statistical Coastal Fumigation Models. EPA-450/4-87-002. Research Triangle Park, N.C.

U. S. Environmental Protection Agency, 1992a. A Tiered Modeling Approach For Assessing the Risks Due To Sources of Hazardous Air Pollutants. EPA-450/4-92-001. U. S. Office of Air Quality Planning and Standards, Research Triangle Park, N. C.

U. S. Environmental Protection Agency, 1992b. Workbook of Screening Techniques For Assessing Impacts of Toxic Air Pollutants (Revised). EPA-454/R-92-024. U.S. Office of Air Quality Planning and Standards, Research Triangle Park, N. C.

U. S. Environmental Protection Agency, 1995. User's Guide for the Industrial Source Complex (ISC3) Dispersion Models, EPA-454/B-95-003a. Research Triangle Park, NC

U. S. Environmental Protection Agency, 2004. User's Guide for the AMS/EPA Regulatory Model – AERMOD. EPA-454/B-03-001. Research Triangle Park, NC

U. S. Environmental Protection Agency, 2005. Guidelines on Air Quality Models – Appendix W to Part 51, U.S. EPA, Research Triangle Park, N.C, 2005.

U. S. Environmental Protection Agency, 2016. Integrated Risk Information System (IRIS), Washington, DC.

U. S. Environmental Protection Agency, 2017. Revisions to the Guidelines on Air Quality Models – Enhancements to the AERMOD Dispersion Modeling System and Incorporation of Approaches To Address Ozone and Fine Particulate Matter, Research Triangle Park, N.C.

Air Contaminants - Permissible Exposure Limits, 1995. U. S. Department of Labor, Occupational Safety and Health Administration (OSHA), 29 CFR 1910, subpart Z, as amended, 1995.

Documentation of Threshold Limit Values and Biological Exposure Limits, 7th ed., 2008. American Conference of Governmental and Industrial Hygienists (ACGIH).

Merck Index, 1983. An Encyclopedia of Chemicals and Drugs, 10th ed. Martha Windholz, ed. Rahway, New Jersey: Merck and Co., Inc.

NIOSH/OSHA Occupational Health Guidelines for Chemical Hazards, 2010. U.S. Dept. of Health and Human Services/Public Health Service/Center for Disease Control/National Institute for Occupational Safety and Health (NIOSH), U.S. Department of Labor/OSHA. DHHS(NIOSH) Publication No. 2005-149

Registry of Toxic Effects of Chemical Substances, 1997. U. S. Department of Health and Human Services, National Institute for Occupational Safety and Health (NIOSH). Washington, D.C. July 1997 DHHS (NIOSH) Publication Number 97-119

APPENDIX A

LIST OF TAP, AAC and MER

APPENDIX B

REFINED MODELING CHECKLIST

Refined Modeling Check List (including general information)

- **Description of New Source or Source / Process Modification**: provide a short description of the new or modified source(s) and a brief discussion of how this change affects facility production or process operation.
- **Source / Pollutant Identification**: provide a table of the affected pollutants, by source, which identifies the source type (point, area, or volume), maximum pollutant emission rates over the applicable averaging period(s), and, for point sources, indicate if the stack is capped or non-vertical (C/N).
- **Pollutant Emission Rate Calculations**: indicate how the pollutant emission rates were derived (e.g., AP-42, mass balance, etc.) and where applicable, provide the calculations.
- **Site / Facility Diagram**: provide a diagram or drawing showing the location of all existing and proposed emission sources, buildings or structures, public right-of-ways, and the facility property (toxics) / fence line boundaries. The diagram should also include a scale, true north indicator, and the UTM or latitude/longitude of at least one point.
- **Topographic Map**: A topographic map covering approximately 5km around the facility must be submitted. The facility boundaries should be annotated on the map as accurately as possible.
- **Model**: The latest version of AERMOD or ISCST3 should be used.
- **Source / Source Emission Parameters**: Provide a table listing the sources modeled and the applicable source emission parameters.
- **Terrain**: Use digital elevation data from the USGS NED database.
- **Coordinate System**: Specify the coordinate system used to identify the source, building, and receptor locations. A North American Datun of 1983 (NAD83) is recommended to use in AERMAP input file.
- **Receptors**: The receptor grid should be of sufficient size and resolution to identify the maximum pollutant impact.
- **Meteorology**: Indicate the Division pre-processed, 5-year dataset used in the modeling demonstration.
- **Modeling Results**: For each affected pollutant and averaging period, modeling results should be summarized and presented in tabular format indicating compliance status with the applicable AAC.
- **Modeling Files:** Submit input and output files for AERMOD, AERMAP or ISCST3. Also include the plot files and raw meteorological data.

APPENDIX C

BASIS OF MINIMUM EMISSION RATE

Basis for Minimum Emission Rate Determination

The minimum emission rate (MER) was developed using 50% of AAC and dilution factor (DF) based on SCREEN3 modeling. Use of the 50% of AAC indicated a violation occurred when modeled Maximum Ground Level Concentration (MGLC) was greater than 50% of AAC. This assumption can ensure extra safety margin for MER.

Calculation of Dilution Factor

The following criteria were used to perform a SCREEN3 modeling to calculate DF. These criteria provide poor dispersion and hence a worst case ground level concentration.

- Stack Height = 20 ft
- Stack Gas Velocity = 10 ft/sec
- Stack Gas Temperature = 77 degrees F
- Stack Inside Diameter = 1 ft
- No Downwash

The MGLC modeled by SCREEN3 with the above parameters and a 1 lb/hr emission rates is 225 $\mu g/m^3$. DF was calculated as the ratio of emission rate and MGLC adjusted with respective factors for different average periods in accordance with the SCREEN3 guidance.

DF 1hr = 1 lb/hr / 225 $\mu g/m^3$
DF 15-min = 1 lb/hr / (225 x 1.32) $\mu g/m^3$
DF 24-hr = 1 lb/hr / (225 x 0.40) $\mu g/m^3$
DF Annual = 1 lb/hr / (225 x 0.08) $\mu g/m^3$

Calculating the MER

The MER for each averaging period was calculated by multiplying 50% of the established AAC for each averaging period with their respective dilution factors.

Based on a 15-minute AAC
MER (lb/yr) = 50% x (15-min AAC) x (DF 15-min) x 8760 hr/yr
= (15-min AAC) x 14.75

Based on a 24-hour AAC
MER (lb/yr) = 50% x (24-hour AAC) x (DF 24-hr) x 8760 hr/yr
= (24-hour AAC) x 48.67

Based on an Annual AAC
MER (lb/yr) = 50% x (Annual AAC) x (DF Annual) x 8760 hr/yr
= (Annual AAC) x 243.33

The lowest of the MERs for different averaging periods was selected as the MER for a TAP. The MER was rounded to one significant digit.

APPENDIX D

PROCEDURES FOR ESTABLISHING AAC

The list of Toxic Air Pollutants in Appendix A will be updated periodically as new data becomes available.

An acceptable ambient concentration (AAC) must be developed for each toxic air pollutant added or revised. It is recommended that toxicity data should be used according to the following priority schedule. The reviewer should use the most recent version of each reference that is available at the time of the review.

STEP 1: Acquisition of Pollutant Toxicity Data

- IRIS – Inhalation Unit Risk (IUR) presented as the upper bound estimate of the probability of cancer formation per unit concentration of chemical, expressed in risk per microgram of TAP in a cubic meter of air (g/m^3)$^{-1}$ and/or reference concentration (RfC) that is not likely to cause deleterious health effects during a chronic exposure period, expressed in mg-TAP/m^3 air (mg/m^3). IUR estimates are used to calculate the RBAC that provides a cancer risk of 1 in 1,000,000 for pollutants with an IRIS weight-of-evidence classification of A, 1 in 100,000 for pollutants with an IRIS weight-of-evidence classification of B, and 1 in 10,000 for pollutants with an IRIS weight-of-evidence classification of C. The RBAC is calculated by dividing the cancer risk by the IUR. The results of this calculation are generally presented in IRIS. Both the RfC and RBAC are given an annual average. If both values exist, use the lower one.

- Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PEL) – PELs should be converted to units of mg/m^3. These are found in 29 CFR Part 1910 Subpart Z. Ceiling limits should be used for acute sensory irritant and toxic evaluations based on a 15-minute average. Eight-hour Time Weighted Average (TWA) are used for chronic effect evaluations based on a 24-hour average.

- American Conference of Governmental Industrial Hygienist (ACGIH) - Recommended Threshold Limit Values (TLV's) should be converted to units of mg/m^3. Use short term exposure limits (STEL) or ceiling limits (CL) for acute sensory irritant and toxic evaluations based on a 15-minute average. Eight-hour TWA are used for chronic effect evaluations based on a 24-hour average.

- National Institute of Occupational Safety and Health (NIOSH) - Recommended Standards (REL's) - The 8-hour TWAs should be converted to units of mg/m^3. Use STEL or CL for acute sensory irritant and toxic evaluations based on a 15-minute average. Some of the NIOSH TWAs are available in the NIOSH Pocket Guide to Chemical Hazards (NPG). EPD did not consider any LD50 data since we are setting the standards for Inhalation exposure. All of the NIOSH TWAs are available in the Registry of Toxic Effects of Chemical Substances (RTECS) Database.

- The recommended conversion formula to be used when the limit is given in units of parts per million (ppm) is:

  $$C\ (mg/m^3) = C\ (ppm) \times (MW) \div 24.45$$

Where:

C	=	Concentration of pollutant in air in units of mg/m^3 or ppm
MW	=	Molecular weight of the pollutant in units of gram/mole
24.45	=	Molar volume at 25°C and 760 mmHg

STEP 2: Adjustment of Toxicity Data for Potential Public Exposure in Excess of Occupational Exposure

The pollutant toxicity data acquired from RBAC and/or RfC has already been determined as an annual average pollutant exposure limit. For purposes of evaluating the pollutant impact using these estimates, the toxicity data acquired does not need to be converted.

The TWA data acquired from OSHA, NIOSH or ACGIH are usually based on a 40 hour per week pollutant exposure. Many sources operate more than 40 hours per week subjecting the public exposure to toxic pollutant emissions for more than 40 hours per week.

Therefore, it is required that this type of toxicity data be adjusted to account for emissions that occur more than 40 hours per week. The adjustment accounts for potential public pollutant exposure and uptake in excess of that exposure (40 hours per week) upon which the TWA's are based. The recommended adjustment formula is:

$$TA = TO\ (40/X)$$

Where:

X	=	Number of hours per week emissions occur. Use 168 for all initial analysis (24 hours per day x 7 days per week). Use actual hours when performing a site specific risk analysis.
TO	=	TWA data
TA	=	Toxicity data adjusted for exposure greater than 40 hours per week

The toxicity data should not be adjusted in cases where emissions occur less than 40 hours per week or when using a STEL or ceiling limit.

STEP 3: Applying Safety Factor to Establish AAC

A Safety factor is applied to account for pollutant exposure to members of the public who may be more sensitive to pollutant effects (persons with respiratory maladies, suppressed immune systems, and/or genetic susceptibilities, young children or the elderly) than the average citizen. No safety factors are applied to toxicity data acquired from IRIS (IUR and/or RfC) since RfC account for effects to the sensitive population over 70 year period; and in case of IUR safety factor is already accounted for. Therefore, the acceptable ambient concentration (AAC) is the same value as the RBAC or RfC.

The exposure adjusted toxicity data acquired from TWA as calculated in Step 2, is further adjusted by application of a safety factor. The recommended formula for application of the safety factor is:

AAC = TA / safety factor

Where,

AAC - acceptable ambient pollutant concentration
TA - exposure adjusted toxicity data from Step 2 of this Part.

The following safety factor are used

- For pollutants which are not known human carcinogen (From IRIS database) - 100.
- For known human carcinogens (From IRIS database) - 300.
- For acute sensory irritants (those pollutants with ceiling limits or STELs) -10.

The averaging period for the AAC using TWA will be 24 hours. The averaging period for the AAC is defined to be 15 minutes when using a STEL or ceiling limit value.

SUMMARY

An AAC is developed for each toxic air pollutant. Toxicity data is acquired from a priority list of references (Step 1). The toxicity data is adjusted for potential public exposure if the emissions are emitted in excess of 40 hours per week (Step 2) when using the pollutant toxicity data acquired from an 8-hour TWA. A further adjustment is made by application of a safety factor (Step 3.) when using the pollutant toxicity data acquired from TWA's, STEL's, and ceiling limits. This results in the AAC. A safety factor is not necessary when using pollutant toxicity data acquired from RBAC and/or RfC data since safety factors have already been incorporated (the AAC has the same value as the RBAC or RfC). The result of the Step 3 is the AAC.

APPENDIX E

LIST OF ACRONYMS

LIST OF ACRONYMS

AAC:	Acceptable Ambient Concentration
ACGIH:	American Conference of Governmental Industrial Hygienist
AERMOD:	AMS/EPA Regulatory Model
CAS:	Chemical Abstract Service
BACT:	Best Available Control Technology
CL:	Ceiling Limit
EPD:	Georgia Environmental Protection Division
HAP:	Hazardous Air Pollutant
ISC:	Industrial Source Complex
IRIS:	Integrated Risk Information System
MACT:	Maximum Available Control Technology
MGLC:	Maximum Ground Level concentration
MER:	Minimum Emission Rate
NED:	National Elevation Database
NIOSH:	National Institute for Occupational Safety and Health
NWS:	National Weather Service
OSHA:	Occupational Safety and Health Administration
PEL:	Permissible Exposure Limit
PSD:	Prevention of Significant Deterioration
RBAC:	Risk Based Air Concentration
RfC:	Reference Inhalation Concentration
STEL:	Short Term Exposure Limit
TAP:	Toxic Air Pollutant
TWA:	Time Weighted Average
USEPA:	United States Environmental Protection Agency

Attachment B

Wet ESP Vendor-based Cost Calculation

Parameter	Value	Unit	Notes
CDK Total Exhaust Flow Rate	100,000	acfm	Value obtained from KDS (50,000 ACFM/end).
Installation Cost	$17,000,000		Value obtained from the Weyerhaeuser Sutton WESP for 360,000 acfm (2023).
Rough Cost Estimate for 2 WESPs	$10,401,104		Applying a 6/10ths power cost scaling factor.
Expected Equipment Life	15	years	
Cost of Capital	$9,360,993		Assuming 12% per year.
Annual Maintenance and Operating Costs	$520,055	per yr	Assuming 5% per year.
Annual Electricity Cost	$201,600	per yr	Assuming 400 hp total motors, $0.08/kWhr, 8,400 hrs/yr operation.
Total Operating Costs Over Equipment Life Span	$10,824,828		
Total Annualized Cost	$2,039,128	per yr	Capital, Cost for Capital, Operating and Maintenance
CDK PM Emission Rate	24.82	tpy	
Removal Efficiency	90%		Assumed value.
PM Emissions Removed	22.3	tpy	
Total WESP Cost Effectiveness	$91,285	per ton PM removed	

Additional Notes:

Actual construction costs would likely be higher because the Raymond site has specific challenges due to being on a river and a swampy area.

Obtaining sufficient electricity will likely be an additional significant cost ($15MM).

Total CDK construction cost - $62MM.

February 6, 2023

Weyerhaeuser, Sutton Mill
Heaters, WV

Reference: P-223010 Rev 09

Attention: Mr. Bob Ferrel

Subject: Dryer Wet ESP Replacement Project

Mr. Ferrel,

LDX Solutions is pleased to submit our revised proposal for the supply of a Geoenergy® E-Tube® Wet ESP system to control emissions from the existing dryers at the Weyerhaeuser facility in the Sutton, WV.

This proposal revision reflects the changes that have been discussed in the site meeting and the latest erection pricing. We have also reviewed the differences in the SOW in this proposal and what was in the original estimate and included that in the clarifications section.

As we discussed, the Electrical Installation is the largest item where the engineering is not complete to the extent that we believe the pricing is as accurate as possible. If Weyerhaeuser wishes, LDX would be willing to do this scope for a Cost-Plus arrangement.

We look forward to working with you as the project moves forward. Thank you for this opportunity.

Sincerely,

Brian Kalata
LDX Solutions

Attachment C

Weyerhaeuser Sutton WESP Vendor Quote

P-223010, Rev. 09

February 6, 2023

PROPOSAL

Weyerhaeuser – Sutton Mill

Dryer Wet ESP System

Heaters, WV

Your contact:

Brian Kalata
404-387-5115
bkalata@ldxsolutions.com

Application Engineer:

Brook Eagleson

Table of Contents

PRICING

LDX Solutions offers to the following pricing per the described scope of work as described within:

Item No.	Description	Price
1 – 13, 16, 17	**Dryer Emission Control System:** Supply of engineering and fabrication of one (1) Wet ESP with ancillary systems as described. Includes commissioning, start-up, and training services.	$11,097,000
Deduct	Wetted materials of construction fabricated from 316L SS in lieu of 2205 duplex SS	**$(1,000,000)**
	Engineering Breakout	$280,000
Adder	Addition of 2nd centrifuge including ancillary equipment and installation	$390,000
Adder	Redundant recycle and flush pump/piping systems including installation	$167,000
Adder	Spare T/R set	$53,000
	Total Contracted to Date: Equipment supply and engineering	**$10,987,000**
Freight	**Estimated freight DDP site (pre pay and add)**	**$395,000**
	Additional Scope for Revision 6	
14	Mechanical Demolition of Existing Equipment	$520,000
15A	Mechanical Installation of New Equipment	$2,336,185
15B	Electrical Installation of New Equipment	$1,171,905
16	Foundation work for Stack and around enclosure	$135,070
17	Materials and Installation for Enclosure of work area and centrifuge	$315,195
18	Wet ESP lower enclosure room and ancillary equipment	w/ 17
19	Centrifuge enclosure room and ancillary equipment	w/ 17
20	Heat Tracing for external water lines	$23,500
21	LDX Erection Supervision	$59,200
	Total: Mechanical and electrical installation	**$4,561,055**

- The pricing is freight, DDP site, Pre pay and add
- Above pricing excludes all local, state, federal, VAT or other associated taxes. The Purchaser assumes liability for payment to the county/state/country of any Sales or Use tax if he uses or consumes the property herein purchased in such a way as to render the sale subject to tax.

In addition, the following are optional item to the project scope:

Item No.	Description	Price
OP-1	Dedicated Fire watch and Confined space during the mechanical Erection	$143,620
OP-2	Dedicated Fire Watch during the Demolition Stage	$100,875
OP-3	Supply of New Smart MCC (ethernet IP)	$136,925
OP-4	Add Man-safe Outlet damper to Biofilter	$42,000
OP-5	Not Used	
OP-6	Remove HMI and HMI programming from LDX scope	($15,000)

VALIDITY OF THE PROPOSAL

This proposal is presented for your consideration for a period of thirty (30) days from date of proposal, and thereafter will be subject to review of price and delivery.

ESCALATION

All quotations are made on the basis of the best current pricing available from our suppliers at the time of quoting. We will endeavor to hold our quoted prices and deliveries as firmly as possible. We must, however, reserve the right to renegotiate when we find ourselves subject to uncontrollable price and delivery situations.

TERMS OF PAYMENT

The terms of payment for the supply shall be:

- 10% With purchase order (Net 0 days)
- 15% With submittal of approval drawings: PFD, General Arrangement and Elevation Drawings (due net 30 days)
- 30% With delivery of material to fabrication shop (due net 30 days)
- 25% Upon readiness to ship equipment (due net 30 days)
- 15% Delivery (due net 30 days)
- 5% Upon satisfaction of performance guarantee, not to exceed six (6) months from first shipment (due net 30 days)

The terms of payment for the installation shall be:

- 15% Down payment for Install Material Purchase
- 10% At mobilization at site (due net 0)
- 65% Progress payments through installation period – billed monthly (net 30 days)
- 10% At completion of mill outage (net 30 days)

The terms of payment for the demolition shall be:

- 50% At mobilization at site (due net 30)
- 50% Upon completion of demolition (net 30 days)

DRYER SYSTEM – WET ESP PROCESS DESCRIPTION

Exhaust Quench System

The dryers will exhaust into the inlet quench ducts before reaching the inlet quench plenum at the bottom of the wet ESP unit. Here the gas stream will be sprayed with recycled water to:

1) Saturate the gas stream with water vapor.
2) Remove (scrub) large particulate and fiber from the gas stream.
3) Keep the internal duct areas clean (prevents organic buildup).
4) Provide a buffer between the dryer system and the abatement equipment in the case of a dryer fire.

Up-flow Design with Tube Cooling and Condensation

The gas stream leaving the quench ducts and entering the wet ESP collection sections is saturated with water vapor. This saturated gas stream has small water droplets entrained in it. In the up-flow mode, the wet ESP preferentially removes the water droplets prior to removing the smaller sub-micron particles. This occurs in the lower portion of the collecting tube. In order to wet the entire length of the collection tube, ambient air is pulled across the outside surface of the tube bundle in the manner of a shell and tube, air-to-air, heat exchanger.

Cooling the collection tube walls promotes condensation of water vapor from the saturated gas stream onto the internal surface of the tubes thus keeping the tubes wet. The "sticky" organic particulate that is collected is now collected on wetted tube walls. This wetting of the collection tube wall allows the collected material to be easily washed off with automatic flush sprays.

In addition to wetting the tube walls, the condensation mechanism enhances the particulate removal efficiency by creating a net flux of vapor in the direction of the collection tube surface. The forces of this flux will assist in moving fine particulate towards the tube wall and ultimate collection. This mechanism is referred to as diffusiophoresis.

The upflow design also provides the most efficient method of mist and droplet elimination available. No droplets will exit the collection section. Any mist or droplets that are entrained in the gas stream will be collected by the electrostatic forces in the collection tube section.

Finally, the upflow design has significantly less pressure drop than downflow designs.

Collection Tube Flushing

Each electrostatic collection section will be periodically and independently flushed with clean water to remove the collected particulate matter. A flush tank is fabricated as part of, and immersed within, the recycle tank for heat transfer purposes.

The flush water is sprayed onto the collection section through an overhead spray header and then cascades from the collection tubes to flush the inlet gas distribution devices. The spent flush water then gravity flows into the recirculation tank below. The flush system will be equipped with facilities to add sodium hydroxide to the flush water on a periodic basis to aid in cleaning. A de-foaming system is also offered to counteract periodic foaming incidents.

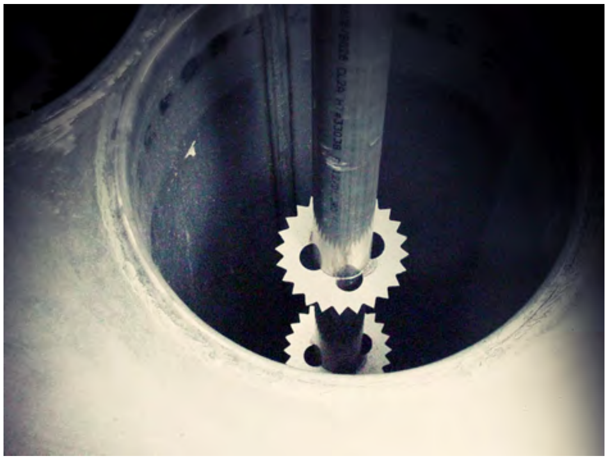
Star II Electrode

Extensive research culminated with the development of the Star II discharge electrode. The high performance discs increase the corona discharge to maximize the particle charging capacity. This ability to discharge more current at voltage results in less required collection surface or increased particulate collection. This greater discharging capacity is coupled with ability to deliver more power to the Star II discharge electrode.

The high voltage power supply, discussed further below, delivers significantly more power to the discharge electrodes.

Round Tubes

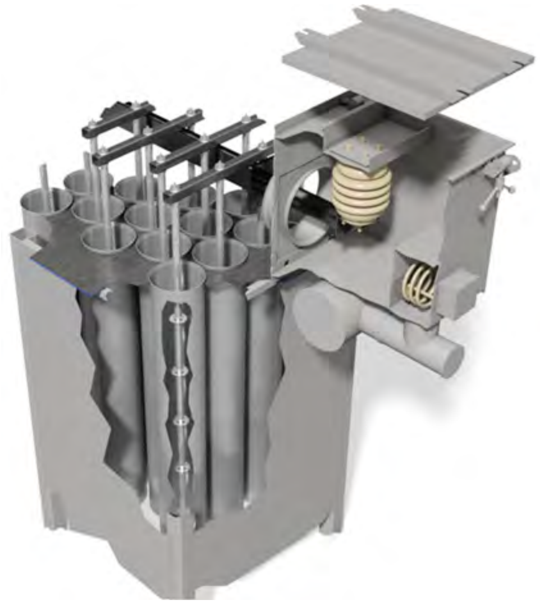
The collection electrodes are round tubes. The discrete, round-tube construction offers distinct advantages over a hex-tube or a square-tube arrangement.



First, the round tube has the most uniform and strongest electrical field of any wet or dry precipitator design currently available. This results in the highest efficiency.

Second, round tubes are easier to clean and not prone to build up in corners as are hex or square tube designs.

Energy-Saving Purge Air System

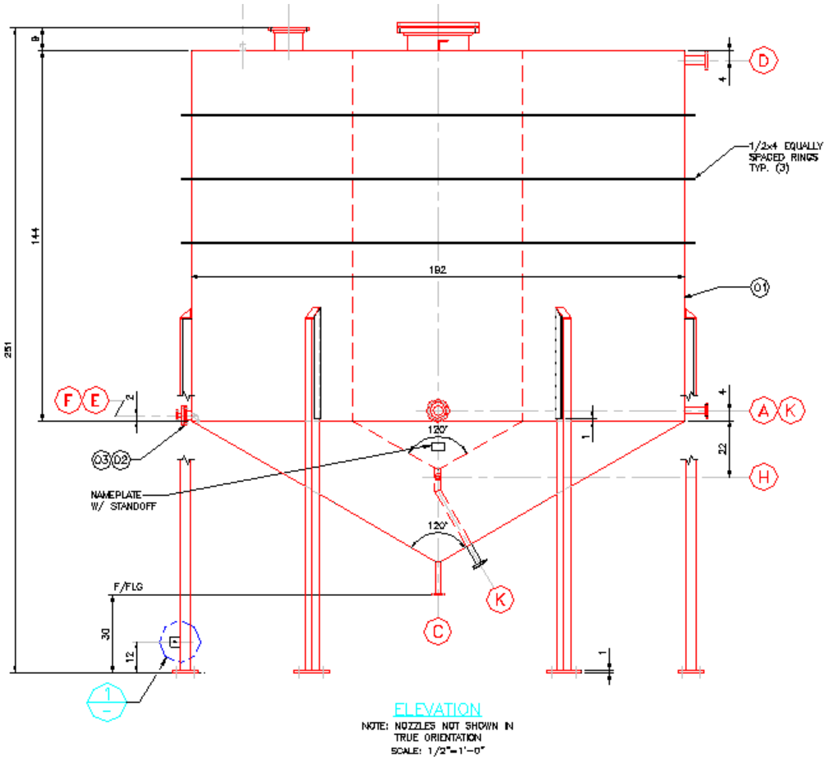


Heated purge air is provided to each of the insulators supporting the power grid. The heating of the purge air is required to maintain the dryness and cleanliness of the insulators. The purge air is heated by drawing ambient air through the outside of the wet ESP tube bundle. Auxiliary electric heaters are also included for start-up. After the system reaches temperature, the 1.5 kW auxiliary heaters are shut off.

We have significant experience with the design of the compartments holding the insulators. They are outboard of the wet ESP unit, designed to avoid any aspirating of dirty gas back into the compartment to provide long life on the insulators.

Water Recycle and Treatment System

The key features of this system are discussed below:



Recycle Tank

Each recycle tank is a cylindrical cone bottom tank with an integral flush tank that is heated by the surrounding recycle water.

The cone bottom design, tank agitation nozzles, and recycle pump suction location all work to prevent solids accumulation within the tank.

The recycle pump for The wet ESP will be used to supply water to the quench spray nozzles, centrifuge, and tank agitation nozzles.

Multi-Basket Strainer

Multi-basket strainers are included for final protection of the quench spray nozzles. The strainer baskets are located downstream of the recycle pump and housed in a large cylindrical vessel. The vessel features a quick opening lid that is attached to a davit arm.

In order to prevent spray nozzle plugging, the strainer baskets are sized to collect anything larger than 3/16” (0.1875”). The free passage of the quench spray nozzles is 3/8” or larger.

Sweco Decanter Centrifuge

A new Sweco centrifuge will be supplied for The wet ESP. The centrifuge unit will produce discharge solids with approximately 50% solids by weight. These solids can be burned in a grate burner or sent to landfill. The centrifuge centrate (cleaned recycle water) will gravity drain into the blowdown section of the recycle tank.

Shell and Tube Heat Exchanger

A cooling loop with an indirect water/water shell and tube heat exchanger will be provided for the in-feed of the centrifuge. The cooling loop is designed to cool the centrifuge in-feed to a temperature between 110°F and 140°F. The reduction in supply water temperature will improve the tar separation efficiencies of the centrifuge. The necessary cooling water will be used as pre-heated wet ESP system flush water and make-up quench water. Depending upon makeup water temperature and demand, an additional heat sink such as a cooling tower may be required (by others).

E-Tube® Wet ESP System

1. Up-flow configuration with tube cooling causes condensation that self-irrigates the collection tubes and improves particulate removal.
2. Up-flow configuration provides superior mist elimination in the collection tube bundle.
3. Up-flow design has less pressure drop.
4. Round tubes for the collection surface provide the best performance and cleanability.
5. The power supply provides the highest voltage to the system to maximize the efficiency.
6. The Star II discharge probes maximize the corona discharge and thus the particle charging capacity of the system.
7. Purged insulator compartments are specifically designed to avoid the entry of contaminated process gases and the fouling of the insulators.
8. Heating of the insulator compartment purge air with the thermal energy in the process gas stream saves energy.

DRYER SYSTEM – DESIGN BASE

The dryer system wet ESP is designed to operate within the design conditions specified in RFP documents from by Weyerhaeuser. The principal design parameters are summarized below.

QUENCH DUCT INLET STREAM CONDITIONS		
Flow Rate (design)	360,000	ACFM
	268,762	SCFM (wet)
Temperature	230	ºF
Moisture	0.251	lb H_2O/lb dry air

WET ESP INLET STREAM CONDITIONS		
Flow Rate (design)	331,172	ACFM
	276,492	SCFM (wet)
Temperature	157	ºF
Moisture	0.276	lb H_2O/lb dry air
PM Loading (maximum)	213.4	lb/hr (total)
	0.130	gr/dscf
	221.9	mg/Nm^3 (wet)

EXPECTED WET ESP OUTLET CONDITIONS		
Flow Rate (design)	335,780	ACFM
	280,338	SCFM (wet)
Temperature	157	ºF
Moisture	0.262	lb H_2O/lb dry air (saturated)
PM Loading	13.6	lb/hr*
	0.008	gr/dscf*
	19.7	mg/Nm^3 (dry)*

*Front half emissions as measured by US EPA Method 5

CENTRIFUGE SOLIDS COLLECTION		
Centrifuge Solids (maximum)	400 / 200	lb/hr (wet /dry basis)

DRYER SYSTEM – DESIGN BASE (CONTINUED)

SYSTEM REQUIREMENTS		
Evaporation Rate:	46.7	gpm
Blowdown Rate:	4.6	gpm; with centrifuge
Make-up Rate (Evap. + Blowdown):	18.8	gpm
Make-up Water Requirements		
Total Hardness:	< 50	mg/L
pH:	7.0	
Chlorides:	< 10	mg/L*
TSS and TDS:	< 200	mg/L
Estimated Electrical Consumption:	688	kW (Includes PA Heaters at Start-up)
	652	kW (Normal Operation)
Centrifuge Discharge water Temp In/Out:	157 / 130	°F at 50 gpm
Centrifuge Supply Temp In/Out:	70 / 112	°F at 35 gpm
NaOH Consumption:	124.6	gal/day of 50% solution**
Compressed Air Supply:	100	psig

DRYER SYSTEM – MOTOR/LOAD LIST

MOTOR/DEVICE	QTY	RATING	TYPE	VOLTS	RPM	PHASES
Recycle Pump	2	200 HP	TEFC / FVNR	480	1800	3
Flush Pump	2	40 HP	TEFC / FVNR	480	1800	3
Caustic Pump	1	1 HP	TEFC / FVNR	480	1800	3
Defoamer Pump	1	1 HP	TEFC / FVNR	480	1800	3
Tube Cooling Fans	6	25 HP	TEFC/FVNR	480	1800	3
Purge Air Fan	1	20 HP	TEFC / FVNR	480	1800	3
Purge Air Heaters	24	1.5 kVA/kW each	N/A	480	N/A	3
Caustic Tank Heater	1	5 kVA /5 KW	N/A	480	N/A	3
Transformer Rectifiers (TR Sets)	6	117.2 kVA/105 KW	N/A	480	N/A	3
Centrifuge Main Drive	2	50 HP	TEFC / FVNR	480	1800	3
Centrifuge Back Drive	2	15 HP	TEFC / FVNR	480	1800	3
Enclosure Heaters	2	30-50kw	N/A	480		3

DRYER SYSTEM – SCOPE OF SUPPLY

ITEM	QUANTITY	DESCRIPTION
1	One (1) lot	**System Engineering**
2	One (1) lot	**Wet ESP Quench Duct System**
3	One (1) lot	**E-Tube® Wet ESP, Model 1013-1584**
4	One (1) lot	**Wet ESP Water Recirculation System**
5	One (1) lot	**Wet ESP Solids Removal System**
6	One (1) lot	**Wet ESP Chemical Injection System**
7	Six (6) total	**Wet ESP High-Voltage Power Supplies**
8	One (1) lot	**Wet ESP Purge Air System**
9	One (1) lot	**Wet ESP Flush System**
10	One (1) lot	**Wet ESP Instrumentation**
11	One (1) lot	**Wet ESP PLC Controls**
12	One (1) lot	**Wet ESP Outlet Ductwork with Abort Stack**
13	One (1) lot	**Wet ESP Access and Structural Facilities**
14	One (1) lot	**Mechanical Demolition of Existing Equipment**
15	One (1) lot	**Mechanical and Electrical Installation of New Equipment**
16	One (1) lot	**Wet ESP On Site Services**
17	One (1) lot	**Wet ESP Training**

ENGINEERING SPECIFICATIONS

ITEM NO. 1:	SYSTEM ENGINEERING
The delivery of the following engineering submittals shall be made as part of this offer. The engineering supply is the same for both options.	
System Engineering	
Includes:	<u>Process/Project Engineering</u> • Project schedule • Process flow diagram • Piping and instrumentation diagram • General arrangement drawings • Equipment loads at the support locations (weights) • Ladder logic narrative/Functional description o Includes alarm list/trip set points • System I/O list • Equipment list/data sheets • Instrument index/list/data sheets • Instrument and control valve specifications • Valve list/data sheets • Motor list/data sheets • Spare parts list • Operation and maintenance manual <u>Electrical Detailed Design Engineering</u> • Electrical schematics (single line diagrams) • Preliminary major cable tray routing drawings (within wet ESP area only) • Cable schedules

ITEM NO. 2:	WET ESP QUENCH DUCT SYSTEM
Inlet quench ducting will be provided from the dryer to the wet ESP.	
Quantity:	One (1) lot
Material of Construction:	• 316L SS process wetted parts • 304L stainless steel external stiffening, saddle and supports are mild steel epoxy coated
Description:	• The quench ductwork supply includes 56"/92" ductwork with cleaning sprays to connect all exhaust gas sources to shared 118" diameter quench duct. Quench ductwork connections to the wet ESP inlet. • Spray bars, nozzles, and piping will be provided. • Access to the irrigating/quench nozzles is provided for approx. 86' of quench ductwork before the wet ESP inlet. All other spray lances and manways are to be accessed using temporary means provided by others. • See the general arrangement drawings issued with the proposal for preliminary routing.

EQUIPMENT SPECIFICATIONS – DRYER SYSTEM (CONTINUED)

ITEM NO. 3:	E-TUBE® WET ESP, MODEL 1013-1584
One (1) Model 1013-1584 E-Tube® Wet ESP units will be provided. The E-Tube® units offered will be complete with collecting electrodes, discharge electrodes, and a suspended power grid. Further specifications for the E-Tube® units are given below.	
Number Required:	One (1) lot
Design Pressure:	+15 in to -30 in w.c.
Collection Electrodes	
Type:	Cylindrical tubes
Materials:	316L SS; 14-gauge
Quantity:	1,584
Discharge Electrodes	
Type:	Rigid mast with discs
Materials:	316L SS; 16-gauge
Quantity:	1,584
Support:	Power grid suspended from outboard porcelain insulators
Collection Sections	
Quantity:	Six (6)
Materials of Construction:	• 316L SS tube sheets • 304L stainless steel supports and external stiffening • 304L stainless steel external skin
Features:	Fully seal-welded top and bottom tube sheets
Power Grid Housing	
Number Required:	One (1)
Materials of Construction:	• 316L SS • 304L stainless steel external stiffening
Features:	• Internal flush spray header with nozzles • Quick-opening doors for access to the electrodes • Segregated power grid house for isolated flushing
Purged Insulator Compartments	
Quantity:	Twenty-four (24)
Materials of Construction:	Type 304 stainless steel with 316L SS process wetted shroud
Features:	• Integrated purge air system • Suspension bracket for high-voltage insulator • Quick-opening access hatch for easy access to each insulator
Overall Wet ESP Features:	• Tube cooling system (6 tube cooling fans) • Includes six (6) pneumatic isolation dampers, allowing for field isolation during flushing. See General Arrangement drawing for more details

ITEM NO. 4:	WET ESP WATER RECIRCULATION SYSTEM
The wet ESP will have a water recirculation system that will be used to treat and store process water. A recirculation pump will provide process water to the quench duct spray nozzles. The recirculation water passes through an inline strainer to prevent nozzle plugging. The recirculation tank level is maintained with a level controller and make-up water.	
Number Required:	One (1) lot
Level Control	
Type:	Bubble tube
Recycle Tank	
Type:	Cone-bottom
Number Included:	One (1)
Volume:	21,000 gallons (preliminary)
Material:	• 316L SS • 304L stainless steel external stiffeners
Recycle Pump	
Number:	Two (2) (redundant option taken)
Type:	Centrifugal
Material of Construction:	316L wetted parts
Motor:	200 hp TEFC, 480 VAC / 3-phase / 60 Hz
Basket Strainer	
Number:	One (1)
Type:	Multi-basket strainer with quick release lid and davit arm.
Material of Construction:	316L SS wetted parts
Included:	All valves, piping, and fittings required for the recycle system. All process piping is 316L SS. Piping with a diameter of 2" or less is schedule 40; piping with a diameter of 2.5" or greater is schedule 10.

ITEM NO. 5:	WET ESP SOLIDS REMOVAL SYSTEM
A solids removal system to separate the collected solids from the recirculated water will be provided for the wet ESP. The system will include one (1) operating and one (1) standby decanter-style centrifuge unit. The centrifuge will produce discharge solids with approximately 50% solids by weight. The centrifuge centrate (cleaned recycle water) will gravity drain back to the recycle tank. Further information on the centrifuge system offered is given below.	
Number Required:	One (1) lot
Centrifuge[1)]	
Number Required:	Two (2)
Type:	Decanter
Capacity:	100 gpm
Material:	Type 304L stainless steel wetted parts
Motors	
Drive:	50 hp, TEFC, 480 VAC / 3-phase / 60 Hz
Back Drive:	15 hp, TEFC, 480 VAC / 3-phase / 60 Hz
Centrifuge Heat Exchanger*	
Number required	One (1)
Type:	Shell and tube
Hot Side Capacity:	35 gpm
Material:	316L SS stainless steel wetted parts

*Heat Exchanger is provided to install a future closed circuit cooling water loop if needed.

1) Centrifuge system has two units ; one operating and one standby

ITEM NO. 6:	WET ESP CHEMICAL INJECTION SYSTEM
The wet ESP system will utilize a shared chemical injection system. The chemical injection system is designed to periodically inject sodium hydroxide (NaOH) directly into the flush pump suction to aid in the cleaning of the wet ESP collection tubes and defoamer directly into the recycle tank to control foam.	
Number Required:	One (1) lot
Caustic Tank:	
Number:	One (1) total
Type:	Round, flat bottom
Material of Construction:	LHDPE double wall
Capacity:	5,000 gal
Features:	Heat-traced, insulated, FRP ladder, 16" manway
NaOH Pump	
Number:	One (1) total
Type:	Gear pump
Material of Construction:	Ductile iron
Capacity:	3 – 5 gpm
Motor:	1 hp TEFC, 480 VAC / 3-phase / 60 Hz
Defoamer Pump	
Number:	One (1) total
Type:	Gear pump
Material of Construction:	Ductile iron
Capacity:	3 – 5 gpm
Motor:	1 hp TEFC, 480 VAC / 3-phase / 60 Hz

ITEM NO. 7:	**WET ESP HIGH-VOLTAGE POWER SUPPLIES**
Number Required:	Six (6)
Type:	Kraft, Conventional 3-phase
Output Rating:	70 kV, 1500 mA
Input Power:	117.2 kVA, 480 V / 3-phase / 60 Hz
Location:	• On wet ESP insulator platform • Selected for outdoor installation
HV Transmission:	Buss Duct to insulator
Features:	• Modbus communications, remote start/stop function, grounding switch, safety key interlock system. • Power supplies to be located on Wet ESP platform

ITEM NO. 8:	**WET ESP PURGE AIR SYSTEM**
A complete purge air system will be provided for the wet ESP system. The purge system will be designed to provide clean, warm purge air to all support insulators to prevent fouling and short-circuiting by process gas. The purge air system will also be equipped with a ducting network that uses the tube bundle for pre-heating the purge air after start-up.	
Number Required:	One (1) lot
Purge Air Fan	
Quantity:	One (1)
Type:	Centrifugal
Material of Construction:	Carbon steel
Fan Rating:	6,000 ACFM
Fan Motor Size:	20 hp, 480 VAC / 3-phase / 60 Hz
Purge Air Heaters:	(For start-up only)
Quantity:	Twenty-four (24)
Type:	Electric resistance 480 VAC / 3-phase / 60 Hz
Heater Rating:	1.5 kW each
Features:	Includes hot galvanized ducting network and dampers

ITEM NO. 9:	WET ESP FLUSH SYSTEM
Number Required:	One (1) lot
Flush Tank	
Number Included:	One (1)
Volume:	2,000 gal (preliminary)
Material:	316L SS
Configuration:	Located within the recycle tank.
Flush Pump	
Number Included:	Two (2) (one operating and one standby)
Type:	ANSI centrifugal
Material:	Cast Iron (wetted parts)
Capacity:	530 gpm
Motor:	40 hp TEFC, 480 VAC / 3-phase / 60 Hz
Seal:	Single mechanical seal (John Crane or equal)
Features:	All required nozzles and internal headers are provided. Includes all external automatic and manual valves, piping, fitting, and supports. External piping will be schedule 40 304L stainless steel; internal headers will be schedule 10 316L SS.

ITEM NO. 10:	WET ESP INSTRUMENTATION			
The following instrumentation will be provided for the wet ESP system. All field-mounted instrumentation necessary for effective system control will be included. Details of each instrument are shown below.				
Number Required	One (1) lot			
	Analog Input	**Analog Output**	**Discrete Input**	**Discrete Output**
Wet ESP				
Flush on/off control valve				3
Process gas temperature	3			
Process gas pressure	2			
Wet ESP sump level switch			1	
Quench on/off supply control valve				1
Area sump level switch			1	
Blowdown flow meter	1			
Blowdown flow control valve		1		
Caustic on/off control valve				1
Defoamer on/off control valve				1
Centrifuge				
Centrifuge supply on/off control valve				1
Centrifuge wash on/off control valve				1
Centrifuge vibration switch			1	
Centrifuge over torque switch			1	
Centrifuge supply flow meter	1			
Heat exchanger temperature (inlet/outlet)	2			
Tanks				
Flush tank level	1			
Flush tank make-up water on/off control valve				1
Recycle tank level	1			
Recycle tank make-up water on/off control valve				1
Caustic tank level	1			

Note: I/O count does not include redundant Centrifuge

ITEM NO. 11:	**WET ESP OUTLET DUCTWORK WITH ABORT STACK**
Inlet ductwork will be provided from the wet ESP discharge to the existing ductwork	
Number Required:	One (1) lot
Wet ESP Outlet Ductwork	
Size:	118" diameter ductwork from the wet ESP discharge to tie-in point on the existing ductwork
Material of Construction	
Exposed Parts:	316L SS
Wall Thickness:	3/16" minimum thick, adequately stiffened to withstand maximum internal pressures.
Description:	Includes six (6) butterfly style isolation dampers for field flushing.
Wet ESP Isolation Dampers	
Quantity:	Six (6)
Type:	Butterfly
Material of construction	
Exposed Parts:	316L SS
Size:	66" diameter
Actuator:	Pneumatic type by Rotork or equal.
Wet ESP Abort Stack (stand alone)	
Material of Construction	
Exposed Parts:	Carbon steel
Wall Thickness:	3/16" thick, adequately stiffened to withstand maximum internal pressures.
Description:	• Discharge height 125' above grade • Includes isolation damper and actuator • LDX to supply sample ports with test platform, to be accessed vie ladder or Manlift.

ITEM NO. 12:	WET ESP PLC CONTROLS
A complete control system will be provided. The control system will be capable of interfacing with the plant's control system. This system will consist of a PLC panel and a user interface system for the wet ESP. Field wiring will be routed from the PLC cabinet to the field devices. All I/O interface cards are included for the wet ESP system.	
Quantity:	One (1) lot
Basic Control System	
Processor:	Allen Bradley ControlLogix
Ladder Logic Program:	RS Logix 5000 (programming software not provided)
HMI:	By Weyerhaeuser
Control Panel Location:	Indoors within MCC room (by others)
Features:	The I/O rack will have 25% spare capacity, and a minimum of 10% spare I/O points will be provided. UL 508 listed. Cabinet will be NEMA 12 rated.

ITEM NO. 13:	WET ESP ACCESS AND STRUCTURAL FACILITIES
Complete access and structural facilities will be provided for the wet ESP, ductwork, and ancillary systems.	
Quantity:	One (1) lot
Access Description:	Wet ESP • Upper tubesheet platform for access to the T/Rs, PIC boxes, upper tubesheet manways • Purge air platform for access to the purge air fan • Centrifuge stand and inlet plenum for access to the centrifuge and inlet plenum manway • Damper platform for access to the outlet damper assembly Access to the upper tubesheet platform and centrifuge stand will be via stair tower and access to the purge air and damper platforms will be via ladder. Quench Ductwork • Platforming will be provided to access 118" ID ductwork, spray lance assemblies, and piping • Access to quench duct platforming will be via ladder
Material and Finish	
Structural Members, Handrails, Kickplates:	A-36 carbon steel, Galvanized
Handrail Type:	1.5" x 1.5" x 0.12" square tubing
Grating:	A-36 carbon steel, galvanized
Wet ESP Enclosure	Lower section of the wet ESP structure will be enclosed on the side walls and roof - Internal will be lighting and fan ventilation to function as a work space and parts storage

ITEM NO. 14:	MECHANICAL DEMOLITION OF EXISTING EQUIPMENT
Seller's proposal includes mechanical demolition of existing equipment after installation of the new wet ESP system. Details are described below:	
Description:	Seller will supply materials, manpower, lifting and hoisting equipment, welding and cutting equipment, travel and living expenses, and all consumables required to carry out the mechanical installation of the existing wet ESP system, including ductwork, quench chambers, structural steel, piping, and stacks. All demolished equipment will be cut to size and disposed in dumpsters. Dumpsters to be supplied by others and located adjacent to the demolition area.

ITEM NO. 15:	MECHANICAL AND ELECTRICAL INSTALLATION OF NEW EQUIPMENT
Seller's proposal includes mechanical and electrical installation of the wet ESP system as described above.	
Description of LDX Solutions provided mechanical installation services	Seller will supply materials, manpower, lifting and hoisting equipment, welding and cutting equipment, travel and living expenses, and all consumables required to carry out the mechanical installation of the wet ESP system, including structural steel, access facilities, recycle water system, flush system, inlet/outlet ductwork, and outlet isolation dampers. The mechanical installation begins at the tie-in points for the sources of exhaust gas and terminates at the tie-in point between the wet ESP outlet duct and existing biofilter ductwork. It is assumed that all utilities (gas, water, compressed air) will be brought to the boundaries of the concrete foundation.
Description of LDX Solutions provided electrical installation services	Seller will supply materials, manpower, lifting and hoisting equipment, welding and cutting equipment, travel and living expenses, and all consumables required to carry out the electrical installation of the wet ESP system as described. Electrical installation includes field wiring and termination of all required I/O to the control panel, instruments, and actuated items (dampers, valves, etc). Motor starters and VFDs are included as part of the MCC option to supply a new Smart MCC in the electric room to allow equipment to be tested before the shutdown.
Description of LDX Solutions provided safety attendant services	Seller will supply a dedicated safety person during the duration of installation as part of the base bid. If a dedicated hole and fire watch is required, that can be provided for the adder provided.

ITEM NO. 16:	**WET ESP ON-SITE SERVICES**
Seller's proposal includes the services of a qualified service technician to oversee the commissioning and start-up of the supplied wet ESP. This will include assuring electrode mechanical alignment and run-in checks of all equipment, including electrical and control function checks. After start-up, Seller's technician will verify operation and make final field adjustments as required for optimum performance.	
Quantity:	One (1) lot
Service Provided:	• Checkout and calibration of all equipment provided, supervision during initial start-up • Complete commissioning of the system • Start-up
On-site Time Included:	One (1) person for up to twenty (20) days; includes all travel and living expenses.

ITEM NO. 17:	**WET ESP TRAINING**
Seller's proposal includes the services of a qualified service technician to provide classroom and hands-on training for the plant personnel. This will include discussion of safety procedures, theory of operation, routine operating procedures recommended maintenance and troubleshooting. Also included will be a complete Operation and Maintenance Manual. Included in the manual will be a description of safety, operation and maintenance procedures and all drawings, catalogue cuts, control system ladder logic and electrical schematics necessary to operate the equipment.	
Quantity:	One (1) lot
Service Provided:	Two (2) days of classroom training Two (2) days of field training
Included Items:	One (1) hard copy and one (1) CD of a complete Operation and Maintenance Manual

Supply Delineation Table

In addition to the proposed supply by LDX Solutions detailed above in this proposal, the following items may be required and are to be designed and supplied by LDX Solutions or the purchaser as designated in the table below.

	Provided By		Comments
Item	LDX	Purchaser	
Equipment Supply:			
• Abatement equipment as described in the Equipment Specifications section above in this proposal	X		
• Ductwork expansion joints (beginning at quench duct inlet flange)	X		
• Continuous emissions monitoring system		X	If required
• Spare parts (pricing provide upon request)	X		List Only
Civil:			
• Geotechnical survey (soils report, underground survey, site elevation survey)		X	
• Site preparation & earthwork		X	
• Foundations	X	X	See clarifications
• Anchor bolts	X		Into existing foundation
• Concrete embedments (piping, conduit, etc.)			NA
Mechanical:			
• Receipt and safe storage of all material and equipment at the job site	X		
• Temporary utilities, secured on-site storage area within 100' of work area, unobstructed work area,		X	
• Mechanical installation, installation materials (hardware, gaskets, sealants, shims, first fill lubricants, etc.), and mobile equipment rentals	X		
• Dedicated Confined space and fire watch safety attendant services	X		Included option
• Touch up paint application	X		
• External insulation and cladding			NA
• Evaluation of and modification to existing structural members to verify load capacity	X		If required
• Modifications to any existing building/structures including opening/re-installing sections for installation, sealing around penetrations, etc.	X		
• Demolition of existing equipment as required to remove interferences with the new equipment	X		
Electrical:			
• Electrical detailed design/supply of the following: single-line diagram, cable schedules, electrical layout drawings (conduit/cable tray routing, electrical device locations), connection drawings for motors and instruments.	X		

Supply Delineation Table – Continued

• Electrical installation and installation materials	X		
• Confined space and fire watch safety attendant services	X		Included Option
• PLC control system	X		
• Uninterruptible power supply/emergency backup		X	
• Integration of controls with plant control system		X	
• Electrical room/controls building		X	
• Switch gear		X	If required
• Motor control centers	**X**		Included Option
• Variable frequency drives	**X**		Existing
• Motors	X		
• Cable trays	X		
• Cable tray supports	X		
• Field cabling and wiring	X		
• Local disconnects	X		
• Grounding of equipment and structures to grid	**X**		See Clarification
• Grounding grid		X	
• Area lighting and convenience receptacles	**X**		See Clarification
• Heat tracing and insulation for cold weather protection	**X**		If Required
Safety Systems:			
• Fire detection system			NA
• Fire suppression system			NA
• Explosion vents			NA
• Safety showers and eyewash stations			NA
• OSHA compliant safety guards	X		
• Noise attenuation		X	If Required
Miscellaneous:			
• Building permits, environmental permits, and professional engineer fees (other than structural PE stamps)		X	
• Performance testing and compliance testing		X	
• Taxes, duties, insurance, bonding		X	
• Disposal of existing equipment, construction debris, or other material		X	
• Handling of asbestos, lead, or contaminated soils		X	
• Utilities (compressed air, water, gas, etc. to boundary of equipment foundation)		X	
• Containment areas/pans		X	

Boundary Limits Table

The following form the major boundary limits of the proposed LDX Solutions equipment package:

Item	Start of LDX Supply	End of LDX Supply
Process Equipment	Inlet flange of the quench duct tie-ins to exhaust sources	Wet ESP outlet ductwork tie-in to existing biofilter ductwork
Support Steel	Top of foundation	N/A
Piping		
• Make-up Water	Perimeter of wet ESP equipment foundation	Make-up water flanges on LDX Solutions supplied recycle tank and flush tank
• Blowdown Water	N/A	Within 50' of wet ESP equipment foundation
• Caustic	Fill connection on caustic storage tank	Caustic injection location
• Defoamer	Defoamer tote discharge (tote by others)	Defoamer injection location
Compressed Air	Edge of equipment foundation	Supplied instruments, valves, dampers
Electrical		
• Motors/loads	Motor or load (see 'Motor/Load List')	Terminal box on each motor/load
• Instruments	Instrument (see 'Instrumentation List')	Terminal on each instrument
• Control cabinets	PLC (see 'PLC Control System')	Terminals in each control cabinet

CLARIFICATIONS

General

- The provided equipment will be fabricated per The LDX Solutions standard weld and fabrication procedures. Welding procedures to be provided that meet the intent of AWS D1.1 and ASME codes, however no UT or RT testing is to be required. Fabrication for this equipment includes internal and external seal welding (partial joint penetration) and Zyglo dye penetrant testing. No radiographic testing will be performed. LDX welding procedures are available for review.
- The equipment will be shop-fabricated to the maximum extent possible with consideration made to optimize freight costs.
- External carbon steel surfaces will be painted, per the following:
  - Surface preparation for most pieces per SSPC-SP3 power tool cleaning to remove rust and scale.
  - First coat is to be iron oxide primer.
  - Top finish coat is to be alkyd enamel.
  - Supports will receive a primer and topcoat only
- The noise levels of some components may exceed 85 dBA at a distance of 3'. We have not included any sound attenuation equipment.
- A compressor has not been included. It is assumed plant air is available as a local utility. Based on the specified availability of plant air at 100 psig at -40°F dew point.
- Mechanical installation pricing assumes that installation and demolition will occur right after one another and only one (1) initial contractor mobilization will be required.
- Foundation pricing is based on a shallow neat dug foundation for the stack and ductwork, and an 8" slab at grade around the workshop area. We have not allowed for any grading or backfilling, or the installation of a new footer around the building extension.
- Optional MCC will allow Weyerhaeuser to have the system operational before the shutdown.
- Grounding grid is by Others, however LDX will provide the bonding of the wet ESP structure and the stack to the pig tails provided
- Basic area lighting is included as part of the electrical scope of supply.
- Option 1 and 2 are for dedicated Fire and Confined space personnel. With Option 1, we have provided for 2 additional personnel to be dedicated to fire watch for the entire installation time, and 4 people during the shutdown. If less fire watch is acceptable this can be adjusted.
- LDX will allow for concrete removal utilizing a backhoe mounted breaker in the demo pricing provided that the concrete being removed is of a normal and customary design for this type of application. No finishing work is included.
- Weyerhaeuser will identify all existing electrical in the Demolition area to determine what must remain in place and what can be safely removed and render circuits safe for removal by LDX personnel.
- LDX will provide electrical demolition of existing WetESP electrical components, conduit and wiring back to the MCC panels where practical. Conduits/Cabling/Raceways/Cable Trays. This assumes there are no power circuits which will still be in use in these supports. If powered circuits are still being used in these supports, they will be exempt from demolition.
- All structural bolts shall be A325. Per Weyerhaeuser request, LDX will look to make all other bolted connections with grade 8 bolts

Wet ESP System

- The supplied piping will be provided in the form of fittings and random lengths. Piping will not be spooled.
- The proposed equipment has not been designed to meet ANSI/ASME Codes for B31.1 & 31.3 for piping. We have assumed standard LDX Solutions welding procedures will be followed.
- Warning, chloride concentrations in the make-up water exceeding 10 mg/L can cause severe corrosion of the stainless-steel components in the downstream equipment, including any downstream equipment such as a stack
- The cooling water source for the centrifuge heat exchanger is assumed to be provide by others. The recirculation pump, piping, all other associated piping accessories, insulation, etc. to/from this source are to be provided by others

Added Scope in this revision

- Add the install of the new MCC sections
- Added lighting and heating for the enclosures
- Added window disconnects at all motors with aux contact switch
- Added sidings, girts and roofing for the enclosures for the centrifuge and under the wet ESP.
- Provide option pricing for dedicated fire watch.
- Provide option to supply new MCC to allow advance testing of the system.
- Option price to remove the included HMI and associated programming from the control system.
- Added heat tracing to the external piping

TECHNICAL/PROJECT ENGINEER

Commissioning services are those provided for complex equipment and systems requiring a high degree of training and experience. These services include but are not limited to: overall system troubleshooting, system start-up and commissioning, retro-fit site surveys.

The additional services of a technical engineer for purposes of process consultation, system audits, start-up services, training, etc. can be made available at a rate of $1,800.00 per man day (man day being eight (8) hours) or portion thereof, plus expenses at cost. Charges after eight (8) hours will be billed at $250.00 per hour. Expenses are to include first-class food and lodging, economy travel to and from the project and the normal domicile of the engineer, and travel to and from the plant site and lodging.

There is no premium for working weekends; however, travel time to and from the plant site and the normal domicile of the engineer is billed at the daily rate.

FIELD SERVICE ENGINEER

Field services are provided by experienced engineers in performing equipment installation, installation supervision, acceptance testing, equipment maintenance and repair.

The services of a field service technician can be made available at a rate of $2,000.00 per man day (man day being ten (10) hours) or portion thereof, plus expenses at cost. Charges after ten (10) hours will be billed at $300.00 per hour. Expenses are to include first-class food and lodging, economy travel to and from the project and the normal domicile of the technician, and travel to and from the plant site and lodging.

There is no premium for working weekends; however, travel time to and from the plant site and the normal domicile of the technician is billed at the daily rate.

It should be emphasized that this is field service supervision and technical assistance, not field service labor. The LDX Solutions employee involved in field service will not be carrying tools to repair or correct any difficulty but will have the expertise to supervise the customer's labor force and to analyze technical difficulties.

For start-up service, arrangements should be made well in advance of required start-up with the Service Department. Assurances that equipment is ready to be started (all related equipment connected, proper electrical service provided, compressed air, etc.) are the customer's responsibility.

PERFORMANCE GUARANTEE

LDX Solutions will provide the equipment and process engineering as specified in this proposal for the air pollution control system described and guarantee the following items when the systems are operated in and supplied with the service conditions in accordance with the **DESIGN BASE** of this proposal.

- The emission control system is guaranteed to reduce the front half (filterable) particulate emissions in the exhaust gas stream to 0.008 gr/dscf or less using US EPA Method 5.

Acceptance tests must be performed within three (3) months after initial start-up of the equipment, not to exceed six (6) months of final shipment.

The guarantee shall be fully satisfied and LDX Solutions discharged therefrom upon the earlier of: (a) obtaining guaranteed performance by the testing described above, (b) the expiration of three (3) months from initial start-up with no testing being made, (c) the expiration of six (6) months from final shipment without a test being made.

If the guaranteed performance is not obtained, then LDX Solutions shall have the right, and if required by the Owners, the obligation, to visit the installation to determine the cause of such failure. It is a condition of this guarantee that the Owner will cooperate with LDX Solutions in the making of further tests and make available necessary personnel, feed and operating conditions to enable LDX Solutions to conduct such tests. The tests will be paid for by the Purchaser.

If failure to obtain guaranteed performance on the above is due to defect in LDX Solutions-supplied equipment, design, or engineering, then LDX Solutions will, at its expense, supply the equipment or process engineering it deems necessary until such performance is met, up to a limit of the contract price. Any remedy includes an equivalent scope of installation as outlined elsewhere in this proposal.

MATERIAL AND WORKMANSHIP

We guarantee every part of the apparatus delivered in accordance with this proposal will be of proper material and workmanship, and agree to replace any part or parts which may prove defective in material or workmanship within two (2) years from start-up, but not to exceed thirty months from shipping. It is agreed that such replacement is the full extent of our liability in this connection. Scope of supply of such replacement shall be identical to the scope of supply in the original project. Corrosion or wear from abrasion shall not be considered as defective materials unless it is the result of misapplication of material and/or service. The best engineering practice will always be followed, and materials used will be clearly specified. We shall not be held liable or responsible for work done or expense incurred in connection with repairs, replacements, alterations, or additions made, except on our written authority.

Confidentiality of Proposal Information

This document contains confidential information and remains the property of LDX Solutions and is conditionally loaned. The information contained herein is not to be shared with any party except those within the Buyer's company who are involved in its evaluation or outside consultants who are assisting the Buyer with this specific project. Specifically prohibited is the distribution of such information to any individual or business deemed to be a competitor by LDX Solutions.

Enclosures

Commercial Terms of Sale

General Arrangement Drawings

COMMERCIAL TERMS OF SALE

THESE TERMS OF SALE IS SUBJECT TO ALL PROVISIONS AND CONDITIONS ON THIS PAGE AND THE BACK PAGE OF THIS TERMS OF SALE, INCLUDING THOSE WHICH LIMIT WARRANTIES, ALL OF WHICH ARE INCORPORATED HEREIN BY THIS REFERENCE.

The conditions stated below shall constitute a part of the agreement resulting from the acceptance of an order unless expressly accepted in writing on our acknowledgement.

1. **Acceptance and Binding:** All purchase orders are subject to acceptance at our factory, and Seller shall have no liability until and unless they are so accepted. Sales representatives are not authorized to bind us. Clerical errors are subject to correction. The Seller shall not be bound by any representations which are not expressly set forth in writing.
2. **Prices and Taxes:** Unless otherwise acknowledged in writing: All prices and quotations are subject to change without notice. Goods will be billed at the prices in effect at the time of shipment. Prices are quoted F.O.B. factory. Taxes of any kind levied against the Seller with reference to this transaction, excepting only taxes imposed upon the net income of Seller, shall be the account of Purchaser and be added to the price quoted.
3. **Terms and Credit:** Terms of payment shall be as stated on our order acknowledgement. In the event payment is not made promptly when due, Buyer agrees to pay interest at the rate of 1½% per month, or as limited by individual state laws, from the due date. Partial shipments on quantity orders shall be deemed a separate and independent contract for billing and payment. Terms are subject to the continuing review of the Purchaser's credit by the Seller.
4. **Attorney's Fees:** Purchaser(s) agree(s) to pay to Seller the reasonable costs of collection of any past due amount, including but not limited to Seller's reasonable attorney's fees in the amount of fifteen percent (15%) of the past due amount, and any out of pocket filing and court charges.
5. **Returned Checks:** Purchaser(s) agree(s) to pay to Seller a handling fee of $20.00 on any returned check.
6. **Shipment:** Shipping dates are approximate and may be contingent upon the prompt receipt from the Purchaser of drawing and data approval, or written release for procurement and fabrication. Seller shall not be liable for any delay caused by strikes, accidents, delay in receipt of raw materials, or any other cause beyond the Seller's control. If the Seller is prepared to make shipment, and the Purchaser delays delivery, terms of payment shall apply as though delivery had been affected as of that date. All costs associated with handling, care and custody of the material shall be to the account of the Purchaser. The acceptance of the material by the Purchaser shall constitute a waiver of all claims for delay.
7. **Cancellation and Changes:** Orders shall not be subject to cancellation unless cancellation charges are borne by the Purchaser for all work done by the Seller, and for any other obligations incurred by the Seller in connection with the order. Acceptance of change orders is contingent upon price renegotiation. Scheduling changes requested by the Purchaser are subject to renegotiation of price and terms of payment.
8. **Save Harmless:** The Purchaser agrees to save the Seller, harmless from any and all liability, and to pay all costs and attorney fees for injury or damage to persons or property caused in any manner by said material while in possession of the Purchaser or the Purchaser's successor in interest.

9. **Corrosion, Allowance and Anti-Corrosive Materials:** The Seller shall have no responsibility for the determination of any corrosion allowance for anti-corrosive materials of construction in any equipment which it builds or quotes, with no exception. This decision is left to the good judgement, experience in operation and discretion of the Purchaser. Seller shall not be liable for loss or damage resulting from any failure to provide corrosion allowance or anti-corrosive materials.
10. **Installation, Initial Operation and Service**: All material shall be installed by and at the expense of the Purchaser. Should the Purchaser request the services of the Seller, such service shall be rendered and charged at the established rate at the time of performing said service, plus all other expenses including travel, hotel bills and living expenses.
    All such field services shall be considered advisory and Seller's personnel shall endeavor to guard against deficiencies in the work and erection techniques but Seller does not guarantee the performance of Purchaser's field labor and is not liable for quality or timeliness of performance or damages arising out of such performance or delays encountered.
11. **Warranty:** The equipment and/or services will be warranted against defects in materials and workmanship for a period of one year after delivery to Buyer in accordance with the following statement of warranty.

    Seller warrants that the equipment and/or services to be delivered will be of the kind and quality described in the agreement and will be free from defects in workmanship and material.

    If any failure to conform to this warranty appears within one year after the date of delivery, the Seller will upon notification thereof, if the equipment has been stored, installed, maintained, and operated in accordance with the Seller's recommendations and standard industry practice, correct such failure by suitable repair or replacement of materials, at its election, and the Purchaser shall incur costs for reinstallation. Seller shall not be responsible for damage caused by defective material nor for any corrective action initiated by the Purchaser without Seller's written authorization. Finish materials and accessories purchased from other manufacturers are warranted only to the extent of the original manufacturer's warranty.

    Seller does not make and shall not be responsible for any expressed or implied warranties and, as to Seller, Purchaser(s) purchase(s) the goods and equipment in its "as is" condition. No agent, employee, or representative of Seller has any authority to bind Seller to any affirmation, representation, or warranty concerning the goods and equipment sold under this written Terms of Sale and, unless as affirmation, representation, or warranty made by an agent, employee, or representative of Seller is specifically included within this written Terms of Sale, it shall not be relied upon, or enforceable, against Seller by Purchaser(s). It is agreed that NO WARRANTY OF MERCHANT-ABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS MADE BY SELLER, AND ANY SUCH WARRANTY HEREBY EXPRESSLY IS EXCLUDED BY THE PARTIES FROM THIS TERMS OF SALE.

    Except as otherwise agreed to by the Seller in writing, THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ANY WARRANTY OF MERCHANT-ABILITY FITNESS FOR PURPOSE OR OTHER WARRANTY OF QUALITY, WHETHER EXPRESSED OR IMPLIED.

12. **Limitation of Remedies**: In the event of any breach of warranty, the exclusive remedy of the Buyer shall be the correction of non-conformities in the manner and for the period of time as provided for in the "WARRANTY" section above.

13. **Limitation of Liability**: Except as otherwise agreed to by the Seller in writing:

    a) The liability of the Seller with respect to this agreement or anything done in connection herewith such as the performance of breach of this agreement, or in connection with the manufacture, sale, delivery, installation or technical direction of installation, repair or use of any equipment or services covered by or furnished under this agreement, whether such liability is based upon contract, tort, negligence, "strict liability", or other basis, shall not exceed the price of the equipment or part as to which such liability is asserted.

    b) The Seller shall not be liable for special, incidental, or consequential damages, such as (but not limited to damage or loss of other property or equipment, loss of profits or revenue, loss of use of other property or equipment, or claims of customers of the Buyer for interruptions in the Buyer's operations.

    c) Seller shall not be liable for damages resulting from any inadequacy in Purchaser's specifications relating to design conditions such as (but not limited to) air volume, temperature, gas chemistry, dust loading, and particle size, unless the Seller has agreed in writing to review such specifications and to approve them as being suitable for Purchaser's intended use, or fit for a particular purpose, as specified in such writing, and even where the Seller has made such an agreement, its liability under that agreement shall not exceed the price of the equipment or parts described in those specifications, unless the Seller has agreed otherwise in such writing.

    This limitation of liability is independent of any warranty provisions in the agreement and will apply regardless of what remedy or remedies the Buyer may be held entitled to pursue.

14. **Explosion Atmosphere and Pressure Relief Designs and Devices -** Limited Warranty: Explosions and other excess pressure conditions within equipment are not predictable as to timing, intensity, total energy capacity, location, rate or rise, and the like. In addition, they are frequently a function of a process or operation totally dependent upon the user. We affirm our best knowledge as being applied to any normal or any special requirement for safety venting protection of equipment to be supplied. Our designs and/or devices are totally subject to the approval and acceptance of the Purchaser. Therefore, we make NO GUARANTEE OR WARRANTY, EXPRESSED OR IMPLIED, as to the degree of protection such designs, and devices will provide. Our warranty, limitation of remedy and limitation of liability are set forth in paragraphs 9, 10, and 11 above.

15. **Explosion and/or Fire Hazard:** Explosion and/or fire hazard may be present with any type of dust. The potential of either is dependent on the type of dust, its concentration, method of dust storage, and the potential for an ignition source to be present. The determination of the need for and supply of auxiliary equipment for the venting of explosions or the sensing and suppression of fire are the total responsibility of the owner/user. LDX Solutions makes no guarantee, expressed or implied, that its equipment will not be subject to fire or explosion damage and accepts no liability for direct or indirect consequences of such events.

16. **Waiver:** Waiver of any provisions of this Terms of Sale by any party hereto shall constitute a waiver of that provision on that occasion only, and it shall not constitute a waiver of any other provisions herein with respect to any other occasion or party.

17. **Severability:** Should any provision of this Terms of Sale be declared to be invalid for any reason or have ceased to be binding upon the parties hereto, such provision shall be severed, and all other provisions shall continue to be effective and binding.

18. **Entire Agreement**: This Terms of Sale contains the entire agreement of the parties, and there are no representations, inducements, or provisions other than those expressed herein in writing. All changes, additions, or deletions hereto must be in writing signed by all of the parties. This Terms of Sale is the joint undertaking of the parties hereto and results from their common enterprise and negotiations.

19. **Conflict of Laws:** Law of the Agreement: Jurisdiction: The Purchase Order has been accepted by Seller, and this Terms of Sale is deemed to have been executed in, Kent County, Delaware, and shall be construed, interpreted, and enforced pursuant to and under the laws of the State of Delaware. Purchaser is a _____ corporation. This Terms of Sale has been accepted in the State of Delaware, and it will be governed by and construed in accordance with the laws of the State of Delaware. In light of the possible conflict of state laws which might apply to this Terms of Sale, the parties knowingly and intentionally intend to, and do, adopt the laws of the State of Delaware to govern the validity, construction, effectiveness, and performance of their obligations under this Terms of Sale, including the contractual rights and obligations of the parties hereunder, and all third parties in every respect. The parties request that full faith and credit be given to the law of the State of Delaware, in connection with any construction, interpretation, and enforcement of this Terms of Sale. Furthermore, the parties agree to accept service of process and to litigate any dispute between or among them arising out of or connected with this Terms of Sale, or Seller in any other respect, in the District or Superior Court Division of the General Court of Justice of the State of Delaware, in Kent County, Delaware, submitting to the jurisdiction of such court, and they waive any right to object to or contest service of process or such jurisdiction and to litigate elsewhere, as well as any right to a trial by jury.

20. **Drawings Limitation**: Subsequent use of LDX Solutions' design drawings and/or information for the purpose of building air pollution control equipment is expressly prohibited without the written authorization by, and payment to, LDX Solutions.

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 63

[EPA–HQ–OAR–2016–0243; FRL–5185.1–01–OAR]

RIN 2060–AV56

National Emission Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The U.S. Environmental Protection Agency (EPA) is proposing amendments to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Plywood and Composite Wood Products (PCWP), as required by the Clean Air Act (CAA). To ensure that all emissions of hazardous air pollutants (HAP) from sources in the source category are regulated, the EPA is proposing HAP standards for processes currently unregulated for total HAP (including acetaldehyde, acrolein, formaldehyde, methanol, phenol, propionaldehyde), non-mercury (non-Hg) HAP metals, mercury (Hg), hydrogen chloride (HCl), polycyclic aromatic hydrocarbons (PAH), dioxin/furan (D/F), and methylene diphenyl diisocyanate (MDI). The standards the EPA is proposing include emission limitations and work practices applicable for PCWP process units and lumber kilns located at facilities that are major sources of HAP emissions. This proposal responds to the 2007 partial remand and vacatur of portions of the 2004 PCWP NESHAP in which the EPA previously concluded maximum achievable control technology was represented by no control (*i.e.,* no emissions reduction). This proposal also responds to or requests comment on issues raised in a petition for reconsideration the EPA received regarding the technology review and other amendments to the PCWP NESHAP the EPA finalized on August 13, 2020.

DATES: Comments must be received on or before July 3, 2023. Under the Paperwork Reduction Act (PRA), comments on the information collection provisions are best assured of consideration if the Office of Management and Budget (OMB) receives a copy of your comments on or before June 20, 2023.

Public hearing: If anyone contacts us requesting a public hearing on or before May 23, 2023, we will hold a virtual public hearing. See **SUPPLEMENTARY INFORMATION** for information on requesting and registering for a public hearing.

ADDRESSES: You may send comments, identified by Docket ID No. EPA–HQ–OAR–2016–0243, by any of the following methods:

- *Federal eRulemaking Portal: https://www.regulations.gov/* (our preferred method). Follow the online instructions for submitting comments.
- *Email: a-and-r-docket@epa.gov.* Include Docket ID No. EPA–HQ–OAR–2016–0243 in the subject line of the message.
- *Fax:* (202) 566–9744. Attention Docket ID No. EPA–HQ–OAR–2016–0243.
- *Mail:* U.S. Environmental Protection Agency, EPA Docket Center, Docket ID No. EPA–HQ–OAR–0216–0243, Mail Code 28221T, 1200 Pennsylvania Avenue NW, Washington, DC 20460.
- *Hand/Courier Delivery:* EPA Docket Center, WJC West Building, Room 3334, 1301 Constitution Avenue NW, Washington, DC 20004. The Docket Center's hours of operation are 8:30 a.m.–4:30 p.m., Monday–Friday (except federal holidays).

Instructions: All submissions received must include the Docket ID No. for this rulemaking. Comments received may be posted without change to *https://www.regulations.gov/,* including any personal information provided. For detailed instructions on sending comments and additional information on the rulemaking process, see the **SUPPLEMENTARY INFORMATION** section of this document.

FOR FURTHER INFORMATION CONTACT: For questions about this proposed action, contact Ms. Katie Hanks, Sector Policies and Programs Division (E143–03), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; telephone number: (919) 541–2159; and email address: *hanks.katie@epa.gov.*

SUPPLEMENTARY INFORMATION:

Participation in virtual public hearing. To request a virtual public hearing, contact the public hearing team at (888) 372–8699 or by email at *SPPDpublichearing@epa.gov.* If requested, the hearing will be held via virtual platform on June 2, 2023. The hearing will convene at 10:00 a.m. Eastern Time (ET) and will conclude at 4:00 p.m. ET. The EPA may close a session 15 minutes after the last pre-registered speaker has testified if there are no additional speakers. The EPA will announce further details at *https://www.epa.gov/stationary-sources-air-pollution/plywood-and-composite-wood-products-manufacture-national-emission.*

If a public hearing is requested, the EPA will begin pre-registering speakers for the hearing no later than 1 business day after a request has been received. To register to speak at the virtual hearing, please use the online registration form available at *https://www.epa.gov/stationary-sources-air-pollution/plywood-and-composite-wood-products-manufacture-national-emission* or contact the public hearing team at (888) 372–8699 or by email at *SPPDpublichearing@epa.gov.* The last day to pre-register to speak at the hearing will be May 30, 2023. Prior to the hearing, the EPA will post a general agenda that will list pre-registered speakers in approximate order at: *https://www.epa.gov/stationary-sources-air-pollution/plywood-and-composite-wood-products-manufacture-national-emission.*

The EPA will make every effort to follow the schedule as closely as possible on the day of the hearing; however, please plan for the hearings to run either ahead of schedule or behind schedule.

Each commenter will have 4 minutes to provide oral testimony. The EPA encourages commenters to submit a copy of their oral testimony as written comments to the rulemaking docket.

The EPA may ask clarifying questions during the oral presentations but will not respond to the presentations at that time. Written statements and supporting information submitted during the comment period will be considered with the same weight as oral testimony and supporting information presented at the public hearing.

Please note that any updates made to any aspect of the hearing will be posted online at *https://www.epa.gov/stationary-sources-air-pollution/plywood-and-composite-wood-products-manufacture-national-emission.* While the EPA expects the hearing to go forward as set forth above, please monitor our website or contact the public hearing team at (888) 372–8699 or by email at *SPPDpublichearing@epa.gov* to determine if there are any updates. The EPA does not intend to publish a document in the **Federal Register** announcing updates.

If you require the services of a translator or special accommodation such as audio description, please pre-register for the hearing with the public hearing team and describe your needs by May 25, 2023. The EPA may not be able to arrange accommodations without advanced notice.

Attachment D

EPA Proposed PCWP MACT Rule Amendments

Docket. The EPA has established a docket for this rulemaking under Docket ID No. EPA–HQ–OAR–2016–0243. All documents in the docket are listed in *https://www.regulations.gov/.* Although listed, some information is not publicly available, *e.g.,* Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the internet and will be publicly available only in hard copy. With the exception of such material, publicly available docket materials are available electronically in *Regulations.gov*.

Instructions. Direct your comments to Docket ID No. EPA–HQ–OAR–2016–0243. The EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *https://www.regulations.gov/,* including any personal information provided, unless the comment includes information claimed to be CBI or other information whose disclosure is restricted by statute. Do not submit electronically to *https://www.regulations.gov/* any information that you consider to be CBI or other information whose disclosure is restricted by statute. This type of information should be submitted as discussed below.

The EPA may publish any comment received to its public docket. Multimedia submissions (audio, video, *etc.*) must be accompanied by a written comment. The written comment is considered the official comment and should include discussion of all points you wish to make. The EPA will generally not consider comments or comment contents located outside of the primary submission (*i.e.,* on the Web, cloud, or other file sharing system). For additional submission methods, the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit *https://www.epa.gov/dockets/commenting-epa-dockets.*

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Preamble acronyms and abbreviations. Throughout this document the use of "we," "us," or "our" is intended to refer to the EPA. We use multiple acronyms and terms in this preamble.

While this list may not be exhaustive, to ease the reading of this preamble and for reference purposes, the EPA defines the following terms and acronyms here:

ACI activated carbon injection
APCD air pollution control device
BACT best available control technology
BDL below detection level
BF board feet
BTF beyond-the-floor
CAA Clean Air Act
CBI Confidential Business Information
CDK continuous dry kiln
CEMS continuous emission monitoring system
CFR Code of Federal Regulations
Cl_2 chlorine
CO_2e carbon dioxide equivalent
D/F dioxin/furan (*i.e.*, polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans)
DLL Detection Level Limited
dscm dry standard cubic meter
EJ environmental justice
EPA Environmental Protection Agency
ERT Electronic Reporting Tool
FR Federal Register
gr/dscf grains per dry standard cubic foot
HAP hazardous air pollutant(s)
HCl hydrogen chloride
HF hydrogen fluoride
Hg mercury
ICR information collection request
kPa kilopascals
lb/MSF ¾″ pounds of pollutant per thousand square feet of ¾-inch thick board
lb/MSF ⅜″ pounds of pollutant per thousand square feet of ⅜-inch thick board
lb/ODT pounds of pollutant per oven-dried ton of wood
LVL laminated veneer lumber
MACT maximum achievable control technology
MBF thousand board feet
MDF medium density fiberboard
MDI methylene diphenyl diisocyanate
MDL method detection limit
mg/dscm milligrams of pollutant per dry standard cubic meter of air
NAICS North American Industry Classification System
NESHAP national emission standards for hazardous air pollutants
NIST National Institute of Standards and Technology
Non-Hg non-mercury
NRDC Natural Resources Defense Council
NSPS new source performance standards
NTTAA National Technology Transfer and Advancement Act
O&M operation and maintenance
OAQPS Office of Air Quality Planning and Standards

OMB Office of Management and Budget
OSB oriented strandboard
PAH polycyclic aromatic hydrocarbons
PBCO production-based compliance option
PCWP plywood and composite wood products
PDF portable document format
PM particulate matter
PRA Paperwork Reduction Act
psia pounds per square inch absolute
RCO regenerative catalytic oxidizer
RDL representative detection limit
RFA Regulatory Flexibility Act
RMH resinated material handling
RTO regenerative thermal oxidizer
RTR residual risk and technology review
SBA Small Business Administration
SSM startup, shutdown, and malfunction
TEQ toxic equivalency
THC total hydrocarbon
tpy tons per year
ug/dscm micrograms of pollutant per dry standard cubic meter
UL upper limit
UMRA Unfunded Mandates Reform Act
UPL upper prediction limit
VCS voluntary consensus standards
WESP wet electrostatic precipitator

Organization of this document. The information in this preamble is organized as follows:

I. General Information

A. Does this action apply to me?

The source category that is the subject of this proposal is Plywood and Composite Wood Products regulated under 40 CFR part 63, subpart DDDD. The 2022 North American Industry Classification System (NAICS) codes for the Plywood and Composite Wood Products industry are 321113, 321211, 321212, 321215, 321219, and 321999. This list of categories and NAICS codes is not intended to be exhaustive but rather provides a guide for readers regarding the entities that this proposed action is likely to affect. The proposed standards, once promulgated, will be directly applicable to the affected sources. Federal, state, local, and tribal government entities would not be affected by this proposed action. As defined in the *Initial List of Categories of Sources Under Section 112(c)(1) of the Clean Air Act Amendments of 1990* (see 57 FR 31576, July 16, 1992) and *Documentation for Developing the Initial Source Category List, Final Report* (see EPA–450/3–91–030, July 1992), the Plywood and Particleboard source category is any facility engaged in the manufacturing of plywood and/or particle boards. This category includes, but is not limited to, manufacturing of chip waferboard, strandboard, waferboard, hardboard/cellulosic fiber board, oriented strandboard (OSB), hardboard plywood, medium density fiberboard (MDF), particleboard, softwood plywood, or other processes using wood and binder systems. The name of the source category was changed to Plywood and Composite Wood Products (PCWP) on November 18, 1999 (64 FR 63025), to more accurately reflect the types of manufacturing facilities covered by the source category. In addition, when the EPA proposed the PCWP rule on January 9, 2003 (68 FR 1276), the scope of the source category was broadened to include lumber kilns located at stand-alone kiln-dried lumber manufacturing facilities or at any other type of facility.

B. Where can I get a copy of this document and other related information?

In addition to being available in the docket, an electronic copy of this action is available on the internet. Following signature by the EPA Administrator, the EPA will post a copy of this proposed action at *https://www.epa.gov/plywood-and-composite-wood-products-manufacture-national-emission.* Following publication in the **Federal Register**, the EPA will post the **Federal Register** version of the proposal and key technical documents at this same website.

A redline/strikeout version of the rule showing the edits that would be necessary to incorporate the changes proposed in this action to 40 CFR part 63, subpart DDDD, is presented in the memorandum titled *Proposed Regulation Edits for 40 CFR part 63 Subpart DDDD National Emission Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products,* available in the docket for this action (Docket ID No. EPA–HQ–OAR–2016–0243).

II. Background

A. What is the statutory authority for this action?

The EPA originally promulgated the PCWP NESHAP (40 CFR part 63, subpart DDDD) on July 30, 2004. On August 13, 2020, the EPA took final action on the risk and technology review required by Clean Air Act (CAA) sections 112(d)(6) and (f)(2) for the PCWP residual risk and technology review (2020 RTR). The EPA is proposing in this action to amend the NESHAP to ensure that all emissions of HAP from sources in the source category are regulated.

In setting standards for major source categories under CAA section 112(d), the EPA has the obligation to address all HAP listed under CAA section 112(b) emitted by the source category. In the *Louisiana Environmental Action Network* v. *EPA (LEAN)* decision issued on April 21, 2020, the U.S. Court of Appeals for the District of Columbia Circuit (D.C. Circuit) held that the EPA has an obligation to address unregulated emissions from a major source category when the Agency conducts the 8-year technology review of a maximum achievable control technology (MACT) standard that previously left such HAP emissions unregulated.

In 2007, the D.C. Circuit remanded and vacated portions of the 2004 NESHAP promulgated by the EPA to establish MACT standards for the PCWP source category. *NRDC* v. *EPA,* 489 F.3d 1364 (D.C. Cir. 2007). In the 2004 NESHAP, the EPA had concluded that the MACT standards for several process units were represented by no emission reduction (or ''no control'' emission floors). The ''no control'' MACT conclusions were rejected because, as the court clarified in a related decision, the EPA must establish emission standards for listed HAP. 489 F.3d 1364, 1371, citing *Sierra Club* v. *EPA,* 479 F.3d 875 (D.C. Cir. 2007). The EPA acknowledged in the preamble to the proposed RTR (at 84 FR 47077–47078, September 6, 2019) that there are unregulated sources with ''no control'' MACT determinations in the PCWP source category, and we stated our plans to address those units in a separate action subsequent to the RTR.

This proposed rule responds to the partial remand and vacatur of the 2004 NESHAP, and to the petition for reconsideration of the 2020 technology review, and addresses currently unregulated emissions of HAP from process units in the PCWP source category, including lumber kilns. Six HAP compounds (acetaldehyde, acrolein, formaldehyde, methanol, phenol, propionaldehyde), defined as ''total HAP'' in the PCWP NESHAP, represent over 96 percent of the HAP emitted from the PCWP source category. In addition to total HAP, emissions estimates collected for the 2020 RTR indicated that unregulated HAP are present in the PCWP source category as a result of combustion in direct-fired dryers, including: non-mercury (non-Hg) HAP metals, mercury (Hg), hydrogen chloride (HCl), polycyclic aromatic hydrocarbons (PAH), dioxin/furan (D/F). There are also emissions of methylene diphenyl diisocyanate (MDI) from processes that use MDI resins and coatings. The EPA is proposing amendments establishing standards that reflect MACT for these pollutants emitted by process units that are part of the PCWP source category, pursuant to CAA sections 112(d)(2) and (3) and, where appropriate, CAA section 112(h).

B. What is this source category and how does the current NESHAP regulate its HAP emissions?

The PCWP industry consists of facilities engaged in the production of PCWP or kiln-dried lumber. Plywood and composite wood products are manufactured by bonding wood material (fibers, particles, strands, *etc.*) or agricultural fiber, generally with resin under heat and pressure, to form a structural panel or engineered wood product. Plywood and composite wood products manufacturing facilities also include facilities that manufacture dry veneer and lumber kilns located at any facility. Plywood and composite wood products include (but are not limited to) plywood, veneer, particleboard, OSB, hardboard, fiberboard, MDF, laminated strand lumber, laminated veneer lumber (LVL), wood I-joists, kiln-dried lumber, and glue-laminated beams. There are currently 223 major source facilities that are subject to the PCWP NESHAP, including 99 facilities manufacturing PCWP and 124 facilities producing kiln-dried lumber. A major source of HAP is a plant site that emits or has the potential to emit any single HAP at a rate of 9.07 megagrams (10 tons) or more, or any combination of HAP at a rate of 22.68 megagrams (25 tons) or more per year from all emission sources at the plant site.

The affected source under the PCWP NESHAP is the collection of dryers, refiners, blenders, formers, presses, board coolers, and other process units associated with the manufacturing of PCWP. The affected source includes, but is not limited to, green end operations, refining, drying operations (including any combustion unit exhaust stream routinely used to direct fire process unit(s)), resin preparation, blending and forming operations, pressing and board cooling operations, and miscellaneous finishing operations (such as sanding, sawing, patching, edge sealing, and other finishing operations not subject to other NESHAP). The affected source also includes onsite storage and preparation of raw materials used in the manufacture of PCWP, such as resins; onsite wastewater treatment operations specifically associated with PCWP manufacturing; and miscellaneous coating operations. The affected source includes lumber kilns at PCWP manufacturing facilities and at any other kind of facility.

The NESHAP contains several compliance options for process units subject to the standards: (1) installation and use of emissions control systems with an efficiency of at least 90 percent; (2) production-based limits that restrict HAP emissions per unit of product produced; and (3) emissions averaging that allows control of emissions from a group of sources collectively (at existing affected sources). These compliance options apply for the following process units: fiberboard mat dryer heated zones (at new affected sources); green rotary dryers; hardboard ovens; press predryers (at new affected sources); pressurized refiners; primary tube dryers; secondary tube dryers; reconstituted wood product board coolers (at new affected sources); reconstituted wood product presses; softwood veneer dryer heated zones; rotary strand dryers; and conveyor strand dryers (zone one at existing affected sources, and zones one and two at new affected sources). In addition, the PCWP NESHAP includes work practice standards for dry rotary dryers, hardwood veneer dryers, softwood veneer dryers, veneer redryers, and group 1 miscellaneous coating operations (defined in 40 CFR 63.2292).

The 2020 residual risk review found that the risk associated with air emissions from the PCWP manufacturing industry (including lumber kilns) are acceptable and that the current PCWP NESHAP provides an ample margin of safety to protect public health. In the 2020 technology review, the EPA concluded that there were no developments in practices, processes, or control technologies that would warrant revisions to the standards promulgated in 2004. In addition to conclusions with respect to the RTR, the 2020 action contained amendments to remove exemptions from the standards during periods of startup, shutdown, and malfunction (SSM). The 2020 amendments added work practices so there would be standards in place of the former startup and shutdown exemptions for 3 specific events that occur during PCWP production: safety-related shutdowns, pressurized refiner startup/shutdown, and softwood veneer dryer gas-burner relights. Lastly, the 2020 amendments included provisions requiring electronic reporting and repeat emissions testing. However, the 2020 technology review did not address the unregulated HAP emissions from PCWP facilities that the EPA is now addressing in response to the 2007 remand of the 2004 NESHAP.

C. What data collection activities were conducted to support this action?

On October 5, 2017, the EPA issued an Information Collection Request (ICR) to gather information from PCWP manufacturers to support conducting the PCWP NESHAP RTR. The ICR gathered detailed process data, emission release point characteristics, and HAP emissions data for PCWP process units located at major sources. The response rate for the 2017 ICR was over 99 percent. Following completion of the 2020 RTR, the EPA continued to track facility changes in the PCWP industry to stay abreast of the population of facilities subject to the PCWP NESHAP.

Using information from the 2017 ICR with more recent updates, as needed, the EPA assessed emissions test data needs to establish standards for unregulated HAPs. On February 28, 2022, the EPA requested emissions testing and other information in a CAA section 114 survey of 20 PCWP facilities operated by 9 companies. The purpose of the 2022 survey was to gather additional data to use along with the 2017 ICR data to establish emission standards for unregulated HAP. The EPA used information from both the 2017 ICR and 2022 survey to develop the standards proposed in this action. The data collected and used in this action are provided in the docket along with documentation of the analyses conducted.

III. Analytical Procedures and Decision Making

The MACT standards proposed in this action were developed pursuant to CAA section 112(d)(2) and (3) or, when appropriate, CAA section 112(h). When developing MACT standards, the ''MACT floor'' for existing sources is calculated based on the average performance of the best performing units in each category or subcategory and on a consideration of the variability of HAP emissions from these units. The MACT floor for new sources is based on the emissions levels that are achieved by the best performing similar source, with a similar consideration of variability. For existing sources, the MACT floor is based on the average emission limitation achieved by the best performing 12 percent of sources (for which the EPA has emissions information) for source categories or subcategories with 30 or more sources, or the average emission limitation achieved by the best performing 5 sources (for which the EPA has or could reasonably obtain emissions information) for categories or subcategories with fewer than 30 sources. To account for variability in PCWP manufacturing operations and resulting emissions, we calculated the MACT floors using the 99 percent Upper Prediction Limit (UPL) using available stack test data.[1] We note that the MACT floors for certain existing and new units are based on limited data sets.[2]

The UPL approach addresses variability of emissions data from the best performing source or sources in setting MACT standards. The UPL also accounts for uncertainty associated with emission values in a dataset, which can be influenced by components such as the number of samples available for developing MACT standards and the number of samples that will be collected to assess compliance with the emission limit. The UPL approach has been used in many environmental science applications. As explained in more detail in the UPL Memo,[3] the EPA uses the UPL approach to reasonably estimate the emissions performance of the best performing source or sources to establish MACT floor standards.

Once the UPL is calculated for a pollutant, the representative detection limit (RDL) for the pollutant measurement method is considered, if necessary. The RDL is representative of the laboratory instrument sensitivity and lowest industry-standard method detection limits (MDL) achieved when analyzing air pollutant samples. Consideration of the RDL is necessary when pollutants are measured near or below the detection limit of the analysis method, which was the case for some HAP measured in the 2022 survey. The EPA compares a value of 3 times the RDL (3xRDL)[4] of the test method to UPL values to ensure that the calculated MACT floors account for measurement variability. If the 3xRDL value exceeds the MACT floor UPL, the 3xRDL value is substituted as the MACT floor emission limit to ensure that the standard is set no lower than the minimum level at which emissions can reliably be measured. For the cases where we had low detection data, we reviewed the memorandum, *Data and procedure for handling below detection level data in analyzing various pollutant emissions databases for MACT and RTR emissions limits,* which describes the procedure for handling below detection level (BDL) data and developing RDL data when setting MACT emission limits.[5]

In addition, under CAA section 112(d)(2), the EPA must examine more stringent ''beyond-the-floor'' regulatory options to determine MACT. Unlike the floor minimum stringency requirements, the EPA must consider various impacts of the more stringent regulatory options in determining whether MACT standards are to reflect beyond-the-floor requirements. These impacts include the cost of achieving additional emissions reduction beyond that achieved by the MACT floor, any non-air quality health and environmental impacts that would result from imposing controls beyond the floor, and energy requirements of such beyond floor measures. If the EPA concludes that the more stringent regulatory options have unreasonable impacts, the EPA selects the MACT floor as MACT. However, if the EPA concludes that impacts associated with beyond-the-floor levels of control are reasonable in light of additional HAP emissions reductions achieved, the EPA selects those levels as MACT.

For some process types, it is not feasible to prescribe or enforce a numerical emission standard using the MACT floor and MACT determination approach described in CAA sections 112(d)(2) and (3). According to CAA section 112(h)(1), MACT standards may take the form of design, equipment, work practice, or operational standards if it is not feasible in the judgment of the Administrator to prescribe or enforce an emission standard. To support a determination that it is not feasible to prescribe or enforce an emission standard, CAA sections 112(h)(2)(A) and (B) require the EPA to determine that either: (A) a HAP or pollutants cannot be emitted through a conveyance designed and constructed to emit or capture such pollutant, or that any requirement for, or use of, such a conveyance would be inconsistent with any federal, state or local law, or (B) the application of measurement methodology to a particular class of

[1] For more information regarding the general use of the UPL and why it is appropriate for calculating MACT floors, see *Use of Upper Prediction Limit for Calculating MACT Floors* (UPL Memo), in the docket for this action.

[2] See the memorandum, *Approach for Applying the Upper Prediction Limit to Limited Datasets,* in the docket for this action.

[3] See *Use of Upper Prediction Limit for Calculating MACT Floors* (UPL Memo), in the docket for this action.

[4] The factor of 3 used in the 3xRDL calculation is based on a scientifically accepted definition of level of quantitation—simply stated, the level where a test method performs with acceptable precision. The level of quantitation has been defined as 10 times the standard deviation of 7 replicate analyses of a sample at a concentration level close to the MDL units of the emission standard. That level is then compared to the MACT floor value to ensure that the resulting emission limit is in a range that can be measured with reasonable precision. In other words, if the 3xRDL value were less than the calculated floor (*e.g.,* calculated from the UPL), we would conclude that measurement variability has been adequately addressed; if it were greater than the calculated floor, we would adjust the emissions limit to comport with the 3xRDL value to address measurement variability.

[5] Westlin/Merrill 2011. *Data and procedure for handling below detection level data in analyzing various pollutant emissions databases for MACT and RTR emissions limits.* December 13, 2011, in the docket for this action.

sources is not practicable due to technological and economic limitations.

IV. Analytical Results and Proposed Decisions

Section IV.A of this preamble discusses the standards the EPA is proposing for combustion-related HAP emissions (non-Hg metals, Hg, HCl, PAH, and D/F) from direct-fired PCWP dryers, including rotary strand dryers, green rotary dryers, dry rotary dryers, tube dryers, and softwood veneer dryers. Section IV.B discusses the standards we are proposing for all HAP from lumber kilns. Section IV.C discusses the total HAP standards we are proposing for various process units other than lumber kilns that also had ''no control'' MACT determinations in the 2004 NESHAP that were remanded and vacated. Section IV.D discusses the standards we are proposing for process units with MDI emissions, including reconstituted wood products presses, blow-line blend tube dryers, and miscellaneous coating operations.

A. What MACT standards are we proposing for direct-fired PCWP dryers?

1. Overview

Direct-fired dryer types. Direct-fired dryers are heated by the passing of combustion exhaust through the dryer such that the wood material being dried is contacted by the combustion exhaust. Direct-fired dryers emit combustion-related HAP because emissions from fuel burning pass through the dryer and the dryer's air pollution control system. There are different designs of PCWP dryers defined in 40 CFR 63.2292 of the PCWP NESHAP, including the following types of direct-fired dryers: rotary strand dryers, green rotary dryers, dry rotary dryers, tube dryers, softwood veneer dryers (heated zones), fiberboard mat dryers (heated zones), and hardboard ovens. Most PCWP direct-fired dryers are fired with wood residuals or natural gas (or some combination of the 2 fuels). Wood residual fuels include bark, resin-free residuals, residuals containing resin (*e.g.,* PCWP sander dust and trimmings) and mixtures of these wood fuels. Far less commonly for PCWP dryers, wood-derived syngas, propane, or fuel oil may be used.

In addition to the differences in fuel (*e.g.,* wood residuals and natural gas) there are differences in drying system configurations. For example, direct-fired PCWP dryers can be designed with an individual natural gas or wood-fired suspension burner dedicated to a single dryer. Other configurations include a combustion unit providing heat to multiple dryers. At some facilities, multiple combustion units are used to direct-fire one or more dryers. Based on a review of the design differences, 2 subcategories for setting MACT standards are being proposed for direct-fired PCWP dryers: (1) wood and other fuel-fired dryers; and (2) natural gas fuel-fired dryers. We are proposing these subcategories of PCWP dryers because combustion units firing wood residuals have different design and combustion-related HAP emissions profiles from those firing natural gas (or propane). Based on emission estimates collected with the 2017 ICR, emissions of non-Hg HAP metals, Hg, inorganic gaseous HAPs (HCl, hydrogen fluoride (HF), and chlorine (Cl_2)), D/F, and PAH in the PCWP source category are predominantly associated with wood residual combustion in direct wood-fired dryers. Subcategorization by fuel type is consistent with other NESHAPs, including the major source boiler NESHAP at 40 CFR part 63, subpart DDDDD (the Boiler MACT), where EPA subcategorized based on the primary fuel combusted in the process and the resulting differences in HAP emissions.[6] We are proposing to add the following definitions to the PCWP NESHAP to support subcategorization of direct-fired PCWP dryers:

PCWP dryer means each dry rotary dryer, green rotary dryer, tube dryer, rotary strand dryer, hardboard oven, or press predryer; or the heated zones from a softwood or hardwood veneer dryer, conveyor strand dryer, or fiberboard mat dryer.

Direct wood-fired PCWP dryer means a direct-fired PCWP dryer in which 10 percent or more of the direct-fired annual heat input results from combustion of wood-derived fuel such as bark, wood residuals, or wood-derived syngas or any other fuel except for natural gas (or propane).

Direct natural gas-fired PCWP dryer means a direct-fired PCWP dryer (including each dry rotary dryer, green rotary dryer, tube dryer, rotary strand dryer, hardboard oven, press predryer or heated zones from a softwood or hardwood veneer dryer, conveyor strand dryer, or fiberboard mat dryer) in which greater than 90 percent of the direct-fired annual heat input results from natural gas (or propane) combustion.

In addition, we are proposing the same definition of natural gas that is used in the Boiler MACT. Wood residuals are typically an onsite industrial byproduct instead of a purchased fuel. Further subcategorization based on the specific type of wood fuel used is not recommended because it is common for wood-residual mixtures to be used. Wood-derived syngas is considered part of the wood and other fuel subcategory although it is not currently used to direct-fire PCWP dryers (other than lumber kilns, which are discussed in section IV.B of this preamble). All other fuel types (fuel oil, *etc.*) are uncommon in PCWP direct-fired dryers but were included with the ''wood and other fuel'' subcategory to ensure that all fuels are covered under the standards in the absence of emissions data specific to other fuels. We are not proposing further subcategorization based on combustion unit design because of the large number of combustion unit and dryer combinations that exist, because there would be few units in each subcategory for which separate standards at both existing and new sources would need to be developed.

Format of emission limits (units of measure). Each emission limit is proposed in 2 formats: (1) concentration; and (2) mass per production. Concentration units include grains per dry standard cubic foot (gr/dscf) for PM and milligrams per dry standard cubic meter (mg/dscm) for non-PM pollutants. The concentration units of measure are neutral to the type of process and are relevant regardless of whether processes of multiple types are co-controlled with PCWP dryers. Mass per production units are pounds per thousand square feet (lb/MSF) for softwood veneer dryers and pounds per oven dried ton (lb/ODT) for all other dryer types. Mass per time (*e.g.,* pounds per hour) was not considered as an emission limit format because of the need to normalize emissions for the different process throughputs across facilities in the industry. Mass per production units such as lb/ODT or lb/MSF standardize mass emission rates, so they are applicable to dryers across multiple facilities and reflect MACT across a range of production rates. These units of measure are commonly used for PCWP emission factors.

Emission limits were developed in 2 formats to provide compliance options based on what is achieved by the best performing systems. The 2 formats proposed provide flexibility for the various process configurations subject to the limits and are also helpful because some dryers may not be readily equipped for oven-dried production rate measurements at the dryer.

Ranking dryer systems by performance level. Direct-fired PCWP dryers have numerous drying system configurations. The overall drying system includes the interconnected

[6] 75 FR 32017, June 4, 2010.

combustion unit(s), dryer(s), and air pollution control devices (APCDs). Within any drying system there can be 1 or more combustion units, 1 or more dryers, and 1 or more APCDs of different types in series or parallel. Given the different combinations of dryers and APCDs, we evaluated each set of interconnected combustion units, dryers, and APCDs venting to the same emission point(s) as a single drying system for purposes of evaluating and ranking performance level. For example, 5 dryers venting to one HAP APCD are part of 1 drying system with the HAP emission limitation achieved determined at the outlet of the HAP APCD. By ranking each system, the outlet emission level for the system is considered in the MACT ranking 1 time for the entire system, not 5 times for each dryer in the system. The systems approach was used to ensure that the various equipment combinations from the best performing facilities are accounted for in establishing the MACT limits.

To determine the performance level of a dryer system, we took the average of all available lb/production test runs at the APCD outlet. For dryer system control configurations with multiple APCD outlets, we summed the lb/production numbers from each outlet stack to arrive at the total emissions performance level for the dryer system. Once the lb/production performance level for each dryer system was determined, the dryer systems were ranked to identify the best performing systems (*i.e.,* those with the lowest emissions).

There are fewer than 30 of each type of wood-fired dryer system. When there are fewer than 30 sources, the MACT floor for existing sources is the average emission limitation achieved by the best performing 5 sources (for which the Administrator has or could reasonably obtain emissions information), and the MACT floor for new sources is the emission control achieved in practice by the best controlled similar source. When evaluating MACT floors for the PCWP dryers, if we had performance data for more than 5 dryer systems, we used the 5 systems with the lowest lb/production performance levels for calculating the existing source MACT floor. We used the single best performing system with the lowest lb/production performance level to calculate the new source MACT floor. The MACT floors in terms of emissions concentration were based on the same dryer system rankings.

2. PM and Non-Hg Metals

The EPA is proposing filterable particulate matter (PM) standards as a surrogate for non-Hg HAP metals from wood-fired PCWP dryers. Filterable PM is commonly used as a surrogate for HAP metals in particulate form including antimony, arsenic, beryllium, cadmium, chromium, cobalt, lead, manganese, nickel, and selenium. Air pollution control devices that reduce PM also reduce non-Hg HAP metals in particulate form. Emissions testing for speciated HAP metals and PM from wood-fired PCWP dryers was conducted using EPA Method 29 as part of the 2022 CAA section 114 survey. The speciated HAP metals were found to be present in the wood-fired PCWP dryer exhaust at levels above the detection limit. The 2022 test data, along with PM data from prior test reports collected by EPA in the 2017 and 2022 PCWP CAA section 114 surveys, were used to develop the MACT floors discussed in this section of the preamble.

Rotary strand dryers. There are 27 direct wood-fired rotary strand dryer systems in the U.S. including 1 dryer system at a synthetic area source. Emissions data for PM are available for 13 direct wood-fired rotary strand dryer systems. Because there are fewer than 30 direct wood-fired rotary strand dryer systems, the UPL MACT floor calculations for existing sources were based on the 5 best performing systems. The UPL MACT floor calculation for new sources was based on the best performing system. After comparing the UPL calculations to the corresponding 3xRDL limits, the PM MACT floor for existing sources, based on the UPL, is 9.9E–02 lb/ODT or 3.6E–03 gr/dscf and the PM MACT floor for new sources, based on 3xRDL, is 2.8E–02 lb/ODT or 7.0E–04 gr/dscf. The 3xRDL value was substituted for the lb/ODT UPL in the new source MACT floor to ensure that the standards are established at the minimum level at which emissions can be measured reliably.

Most of the direct wood-fired rotary strand dryer systems at major sources in the U.S. already operate with PM and HAP control technology (*e.g.,* wet electrostatic precipitator followed by a regenerative thermal oxidizer, WESP/RTO). The use of WESPs for PM control upstream of HAP controls on PCWP rotary strand dryers is prevalent because of the high moisture exhaust stream and nature of the particulate originating from dryers (*e.g.,* sticky, flammable). Other PM controls such as baghouses are not well-suited for controlling PM from these sources. No options more stringent than the MACT floor for existing or new sources were identified.

Some existing sources are expected to need to upgrade their WESP to meet the existing source MACT floor. One rotary strand dryer system with an ESP but no additional HAP control device was assumed to need to install a WESP to meet the PM MACT floor and an RTO to achieve the PAH MACT floor (discussed under rotary strand dryers in section IV.A.5 of this preamble). An estimated 0.32 tpy of non-Hg HAP metals would be reduced from existing sources.

Two new OSB facilities with direct wood-fired rotary stand dryer systems are projected to be constructed within the next 5 years. The PM MACT floor for new rotary strand dryer systems is achievable with a very well-performing WESP/RTO system. An estimated 0.073 tpy non-Hg HAP metals would be reduced from new sources.

Green rotary dryers. There are 7 direct wood-fired green rotary dryer systems in the PCWP source category. Emissions data for PM are available for 5 direct wood-fired green rotary dryer systems. Because there are fewer than 30 direct wood-fired green rotary dryer systems, the UPL MACT floor calculations for existing sources were based on all 5 systems. The UPL MACT floor calculation for new sources was based on the best performing system. The PM MACT floor for existing direct wood-fired green rotary dryer systems is 2.2E–01 lb/ODT or 1.2E–02 gr/dscf and the PM MACT floor for new sources is 2.5E–02 lb/ODT or 1.2E–03 gr/dscf. The wood-fired green rotary dryer systems in the PCWP source category already operate with PM and HAP control technology (*e.g.,* WESP/RTO or equivalent). No options more stringent than the MACT floor for existing or new sources were identified. Zero HAP reduction is estimated because all existing and new direct wood-fired green rotary dryers are expected to meet their floors with baseline control.

Dry rotary dryers. There are 9 direct wood-fired dry rotary dryer systems in the PCWP source category. Emissions data for PM are available for 7 dry rotary dryer systems. Because there are fewer than 30 direct wood-fired dry rotary dryer systems, the UPL MACT floor calculations for existing sources were based on the 5 best performing systems. The UPL MACT floor calculation for new sources was based on the best performing system. The PM MACT floor for existing direct wood-fired dry rotary dryer systems is 5.8E–01 lb/ODT or 3.4E–02 gr/dscf and the PM MACT floor for new sources is 2.9E–01 lb/ODT or 2.2E–02 gr/dscf. The MACT floor is based on the current level of PM control (*i.e.,* mechanical collection) in use for existing wood-fired dry rotary dryer systems. All of the existing wood-fired dry rotary dryer systems are expected to meet the PM MACT floor. Therefore, the HAP reduction for the existing PM MACT floor is zero. No new direct wood-fired dry rotary dryers are projected in the next 5 years.

We considered a beyond-the-floor option to achieve further PM reduction from existing or new direct wood-fired dry rotary dryers through the use of a WESP. A WESP could be used alone or as part of a WESP/RTO system (as discussed in section IV.A.5 of this preamble as a beyond-the-floor measure for PAH emissions) to enable the dry rotary dryers to meet the same PM limits as required for green rotary dryers. In considering this beyond-the-floor option, we also considered costs, non-air quality health and environmental impacts, and energy requirements of potentially imposing it as a MACT requirement. Nationwide costs of the beyond-the-floor option for existing direct wood-fired dry rotary dryers are estimated to be a one-time capital cost of $42 million, and annual costs of $10 million per year to install and operate a WESP. Nationwide emission reductions are estimated to be 56 tpy of PM and 0.17 tpy of non-Hg HAP metals, for a cost effectiveness of $181,000 per ton of PM reduced and $61 million/ton of non-Hg HAP metals reduced. Nationwide use of a WESP to control wood-fired dry rotary dryer non-Hg metals would consume an estimated 23,000 megawatt-hours per year (MWhr/yr) of electricity (with associated secondary air emissions), generate 21 million gallons of wastewater per year, and produce 4,000 tons of solid waste of per year. After considering the costs, environmental, and energy impacts of the beyond-the-floor option, the EPA is proposing that the MACT floor represents MACT for PM (non-Hg metals) from direct wood-fired dry rotary dryers due to the high costs and unfavorable cost effectiveness of the more stringent option.

Tube dryers. There are 11 direct wood-fired primary tube dryer systems in the PCWP source category. Emissions data for PM are available for 6 direct wood-fired primary tube dryer systems, 2 of which have emissions from a secondary tube dryer venting into the primary tube dryer. Because there are fewer than 30 direct wood-fired tube dryer systems, the UPL MACT floor calculations for existing sources were based on the 5 best performing systems. The UPL MACT floor calculation for new sources was based on the best performing system. The PM MACT floor for existing direct wood-fired tube dryer systems is 3.1E–01 lb/ODT or 3.1E–03 gr/dscf and the PM MACT floor for new sources is 2.0E–02 lb/ODT or 1.3E–03 gr/dscf. No options more stringent than the MACT floor for existing or new sources were identified because the primary tube dryer systems in the U.S. already operate with PM controls (WESP, baghouse, scrubber, *etc.*) and HAP control technology (RTO or biofilter). Zero HAP reduction is estimated because all existing and new direct wood-fired tube dryers are expected to meet their respective PM MACT floors with baseline control.

Softwood veneer dryer heated zones. There are 3 softwood veneer dryer systems with direct wood-fired heated zones in the PCWP source category. Emissions data for PM are available for one direct wood-fired softwood veneer dryer system. Since the UPL calculation for existing and new sources was based on data from one system, the UPL results for existing and new sources are the same. The PM MACT floor for existing and new direct wood-fired softwood veneer dryer systems is 7.2E–02 lb/MSF 3/8'' or 1.5E–02 gr/dscf. We did not identify any options more stringent than the MACT floor for existing or new softwood veneer dryer systems. All existing direct wood-fired softwood veneer dryers are expected to meet the existing floor using the control technology already installed; therefore, the HAP reduction for the existing floor is zero. Nationwide HAP reductions of the proposed PM MACT floor for new sources were not estimated because no new direct wood-fired dry softwood veneer dryers are projected in the next 5 years.

3. Mercury (Hg)

Emissions testing for Hg from wood-fired PCWP dryers was conducted using EPA Method 29 as part of the 2022 CAA section 114 survey. The data from this testing was used to develop the MACT floors described in this section of the preamble. Method 29 collects multiple sample fractions that are combined to determine Hg emissions. All of the Hg test runs for PCWP dryers were detection level limited (DLL), meaning 1 or more sample fractions from each run contained no detectable Hg. For the purpose of setting MACT standards, the EPA considers DLL test runs to contain detectable emissions. The EPA is proposing Hg emission limits for direct wood-fired PCWP dryers because all of the Method 29 test runs had at least 1 sample fraction in which Hg was detected.

The baseline level of Hg control for PCWP rotary strand, green rotary, tube, and softwood veneer dryers is typically a PM and HAP control device in series (*e.g.,* WESP/RTO or similar). For dry rotary dryers, the baseline level of control is a mechanical collector (*e.g.,* multiclone). Due to the low levels of Hg emissions from PCWP dryers, which were usually below 3xRDL of the measurement method, the minimum level at which emissions can reliably be measured, all PCWP dryers are expected to meet the Hg MACT floors for existing and new sources with the baseline level of control. No regulatory options more stringent than the Hg MACT floors for existing or new wood-fired PCWP dryers were identified.

Rotary strand dryers. Emissions data for Hg are available for 6 direct wood-fired rotary strand dryer systems. Because there are fewer than 30 direct wood-fired rotary strand dryer systems, the UPL MACT floor calculations for existing sources were based on the 5 best performing systems. The UPL MACT floor calculation for new sources was based on the best performing system. After comparing the UPL calculations to the corresponding 3xRDL limits, the Hg MACT floor for existing direct wood-fired rotary strand dryer systems is 1.6E–05 lb/ODT or 8.4E–04 mg/dscm, and the Hg MACT floor for new sources is 1.6E–05 lb/ODT or 8.4E–04 mg/dscm. The 3xRDL values were substituted for both UPLs in the existing and new source MACT floors to ensure the standards are established at the minimum level at which emissions can be measured reliably. No additional Hg reductions are estimated.

Green rotary dryers. Emissions data for Hg are available for 4 direct wood-fired green rotary dryer systems. Because there are fewer than 30 direct wood-fired green rotary dryer systems, the UPL MACT floor calculations for existing sources were based on all 4 systems. The UPL MACT floor calculation for new sources was based on the best performing system. After comparing the UPL calculations to the corresponding 3xRDL limits, the Hg MACT floor for existing direct wood-fired green rotary dryer systems, based on the UPL, is 1.3E–05 lb/ODT or 1.1E–03 mg/dscm, and the Hg MACT floor for new sources, based on 3xRDL, is 1.1E–05 lb/ODT or 8.4E–04 mg/dscm. The 3xRDL value was substituted for the UPL in the new source MACT floor to ensure that the standards are established at the minimum level at which emissions can be measured reliably. No additional Hg reductions are estimated.

Dry rotary dryers. Emissions data for Hg are available for 3 direct wood-fired dry rotary dryer systems. Because there are fewer than 30 direct wood-fired dry rotary dryer systems, the UPL MACT floor calculations for existing sources were based on all 3 systems. The UPL MACT floor calculation for new sources was based on the best performing system. After comparing the UPL calculations to the corresponding 3xRDL limits, the Hg MACT floor for existing and new direct wood-fired dry rotary dryer systems, based on 3xRDL, is 9.9E–06 lb/ODT or 8.4E–04 mg/dscm. The 3xRDL values were substituted for both UPLs in the existing and new source MACT floors to ensure that the standards are established at the minimum level at which emissions can be measured reliably. No additional Hg reductions are estimated.

Tube dryers. Emissions data for Hg are available for 5 direct wood-fired primary tube dryer systems, 1 of which has emissions from a secondary tube dryer venting into the primary tube dryer. Because there are fewer than 30 direct wood-fired tube dryer systems, the UPL MACT floor calculations for existing sources were based on all 5 systems. The UPL MACT floor calculation for new sources was based on the best performing system. After comparing the UPL calculations to the corresponding 3xRDL limits, the Hg MACT floor for existing direct wood-fired tube dryer systems is 2.7E–05 lb/ODT or 1.6E–03 mg/dscm, and the Hg MACT floor for new sources is 2.7E–05 lb/ODT or 8.4E–04 mg/dscm. The 3xRDL values were substituted for the lb/ODT UPLs in the existing and new source MACT floors and for the concentration UPL in the new source floor to ensure that the standards are established at the minimum level at which emissions can be measured reliably. No additional Hg reductions are estimated.

Softwood veneer dryers. Emissions data for Hg are available for 1 direct wood-fired softwood veneer dryer system. Because the UPL calculation for existing and new sources was based on data from one system, the UPL results for existing and new sources are the same. The Hg MACT floor for existing and new direct wood-fired softwood veneer dryer systems is 5.8E–05 lb/MSF 3/8'' or 4.1E–02 mg/dscm. No additional Hg reductions are estimated.

4. Acid Gases

Emissions testing for HCl, HF, and Cl_2 from wood-fired PCWP dryers was conducted using EPA Method 26A as part of the 2022 CAA section 114 survey. Emissions of HF were below detection limit (BDL) in 99 percent of the EPA Method 26A test runs. Chlorine emissions were BDL in 65 percent of the test runs. Emissions of HCl were detected in 71 percent of the EPA Method 26A test runs. No acid gas emissions were detected from the wood-fired softwood veneer dryer tested, and we are, therefore, not proposing acid gas standards for this subcategory. Based on the available data, we are proposing acid gas emission limits in terms of HCl emissions from direct wood-fired rotary strand dryers, green rotary dryers, dry rotary dryers, and tube dryers. The data from the 2022 emissions testing were used to develop the MACT floors discussed in this section of the preamble.

Rotary strand dryers. Emissions data for HCl are available for 6 direct wood-fired rotary strand dryer systems. Because there are fewer than 30 direct wood-fired rotary strand dryer systems, the UPL MACT floor calculations for existing sources were based on the 5 best performing systems. The UPL MACT floor calculation for new sources was based on the best performing system. After comparing the UPL calculations to the corresponding 3xRDL limits, the HCl MACT floor for existing direct wood-fired rotary strand dryer systems is 5.8E–03 lb/ODT or 1.5E–02 mg/dscm and the HCl MACT floor for new sources is 1.7E–03 lb/ODT or 1.0E–01 mg/dscm. The 3xRDL values were substituted for the UPLs in the new source MACT floor to ensure that the standards are established at the minimum level at which emissions can be measured reliably. No options more stringent than the MACT floor were identified for existing or new rotary strand dryers. Zero emissions reduction is estimated because all existing direct wood-fired dry rotary dryers are expected to meet the HCl MACT floor with current controls.

The HCl MACT floor for new wood-fired rotary strand dryers is about 10 percent lower than the average HCl emissions from rotary strand dryer systems included in the CAA section 114 tests. Although below the average performance level of dryers tested, the HCl MACT floor emission level (based on the UPL) has been achieved by 3 rotary strand dryers with WESP control and a rotary strand dryer with a multiclone. Thus, the new source MACT floor for rotary strand dryers is expected to be met with a well-performing WESP system. An example of a well-performing WESP is one that incorporates caustic addition (*e.g.,* 1 percent) into the WESP recirculation water and has increased blowdown. The incremental HCl emission reduction estimated for new wood-fired rotary strand dryers using an upgraded WESP is 0.072 tpy.

Green rotary dryers. Emissions data for HCl are available for 4 direct wood-fired green rotary dryer systems. Because there are fewer than 30 direct wood-fired green rotary dryer systems, the UPL MACT floor calculations for existing sources were based on all 4 systems. The UPL MACT floor calculation for new sources was based on the best performing system. After comparing the UPL calculations to the corresponding 3xRDL limits, the HCl MACT floor for existing direct wood-fired green rotary dryer systems is 6.5E–03 lb/ODT or 9.7E–01 mg/dscm, and the HCl MACT floor for new sources is 2.9E–03 lb/ODT or 1.0E–01 mg/dscm. The 3xRDL value was substituted for the concentration UPL in the new source MACT floor to ensure that the standards are established at the minimum level at which emissions can be measured reliably. No options more stringent than the MACT floor were identified for existing or new green rotary dryers, which are already well-controlled. Zero emissions reduction is estimated because all existing and new direct wood-fired green rotary dryers are expected to meet their respective HCl MACT floors with baseline controls.

Dry rotary dryers. Emissions data for HCl are available for 3 direct wood-fired dry rotary dryer systems. Because there are fewer than 30 direct wood-fired dry rotary dryer systems, the UPL MACT floor calculations for existing sources were based on all 3 systems. The UPL MACT floor calculation for new sources was based on the best performing system. After comparing the UPL calculations to the corresponding 3xRDL limits, the HCl MACT floor for existing and new direct wood-fired dry rotary dryer systems is 1.10E–03 lb/ODT or 1.0E–01 mg/dscm. The 3xRDL values were substituted for both UPLs in the existing and new source MACT floors to ensure that the standards are established at the minimum level at which emissions can be measured reliably. No options more stringent than the MACT floor were identified for existing or new dry rotary dryers because the MACT floors are based on 3xRDL (*i.e.,* the minimum level at which emissions can reliably be measured). Zero emissions reduction is estimated because all existing direct wood-fired dry rotary dryers are expected to meet the existing HCl MACT floor. No new units are projected in the next 5 years.

Tube dryers. Emissions data for HCl are available for 5 direct wood-fired primary tube dryer systems, one of which has emissions from a secondary tube dryer venting into the primary tube dryer. Because there are fewer than 30 direct wood-fired tube dryer systems, the UPL MACT floor calculations for existing sources were based on all 5 systems. The UPL MACT floor calculation for new sources was based on the best performing system. After comparing the UPL calculations to the corresponding 3xRDL limits, the HCl MACT floor for existing direct wood-fired tube dryer systems is 6.4E–03 lb/ODT or 7.4E–01 mg/dscm, and the HCl MACT floor for new sources is 2.3E–03 lb/ODT or 1.0E–01 mg/dscm. The 3xRDL values were substituted for the UPLs in the new source MACT floor to ensure that the standards are established at the minimum level at which emissions can be measured reliably.

Existing and new wood-fired tube dryer systems are expected to meet the HCl MACT floors with the baseline controls, which typically incorporate a WESP or scrubber. No options more stringent than the existing and new source MACT floors were identified for primary tube dryers. All existing and new direct wood-fired tube dryers are expected to meet their HCl MACT floors; therefore, the HAP reduction for both floors is zero.

5. PAH

The EPA is proposing emission limits for PAH emissions that were detected in the exhaust from wood-fired rotary strand dryers, green rotary dryers, dry rotary dryers, and tube dryers. Emissions testing for PAH from wood-fired PCWP dryers was conducted using EPA Other Test Method 46 (OTM–46) as part of the 2022 CAA section 114 survey. EPA OTM–46 is nearly identical to the updated EPA Method 23, for which revisions were promulgated on March 20, 2023 (88 FR 16732). The data from the 2022 testing was used to develop the MACT floors discussed in this section of the preamble. The PAH MACT floors discussed here for wood-fired rotary strand dryers, green rotary dryers, dry rotary dryers, and tube dryers are greater than the corresponding 3xRDL values for PAH. For softwood veneer dryers, the 3xRDL value for PAH is proposed as MACT.

Rotary strand dryers. Emissions data for PAH are available for 6 direct wood-fired rotary strand dryer systems. Because there are fewer than 30 direct wood-fired rotary strand dryer systems, the UPL MACT floor calculations for existing sources were based on the 5 best performing systems. The UPL MACT floor calculation for new sources was based on the best performing system. The PAH MACT floor for existing direct wood-fired rotary strand dryer systems is 3.1E–04 lb/ODT or 2.7E–02 mg/dscm, and the PAH MACT floor for new sources is 3.9E–05 lb/ODT or 1.4E–03 mg/dscm. The PAH MACT floors are based on dryers that already have PM and HAP controls in series. Therefore, no options more stringent than the MACT floors were identified for existing or new sources.

Most existing wood-fired rotary strand dryer systems are expected to meet the PAH MACT floor with baseline PM and HAP controls in series. One rotary strand dryer system with an ESP but no additional HAP control device was assumed to need to add a WESP to meet the PM MACT floor and an RTO to achieve the PAH MACT floor. Nationwide emission reductions of the proposed MACT floor for PAH for existing direct wood-fired rotary strand dryers are estimated to be 0.043 tpy of PAH reduced and 130 tpy of VOC reduced.

New wood-fired rotary strand dryer systems are expected to be challenged to meet the stringent new source PAH MACT floor in spite of coming online with a WESP/RTO control system. While the new source MACT floor emission level based on the UPL has been achieved by rotary strand dryers with multiclone/RTO and WESP/RTO controls, the new source PAH MACT floor is 90 percent lower than the average PAH performance level achieved by the well-controlled rotary strand dryers in the CAA section 114 emission tests. The burner tune-up requirements required for all direct-fired PCWP dryers are expected to help with meeting the PAH MACT floor. Nationwide, 0.15 tpy of PAH reductions are estimated to be associated with the proposed PAH MACT floor.

Green rotary dryers. Emissions data for PAH are available for 4 direct wood-fired green rotary dryer systems. Because there are fewer than 30 direct wood-fired green rotary dryer systems, the UPL MACT floor calculations for existing sources were based on all 4 systems. The UPL MACT floor calculation for new sources was based on the best performing system. The PAH MACT floor for existing direct wood-fired green rotary dryer systems is 9.0E–03 lb/ODT or 4.1E–01 mg/dscm, and the PAH MACT floor for new sources is 2.6E–05 lb/ODT or 4.4E–03 mg/dscm. The PAH MACT floors are based on dryers that already have PM and organic HAP controls in series. Therefore, no options more stringent than the MACT floors were identified for existing or new sources. No reductions in PAH were estimated because existing wood-fired green rotary dryer systems are expected to meet the PAH MACT floor with baseline HAP controls. The burner tune-up requirements required for all direct-fired PCWP dryers are expected to help with meeting the PAH MACT floor. No options more stringent than the MACT floor were identified for new sources. No reductions in PAH are estimated because new direct wood-fired green rotary dryers are expected to meet the MACT floor with proper tuning.

Dry rotary dryers. Emissions data for PAH are available for 3 direct wood-fired dry rotary dryer systems. Because there are fewer than 30 direct wood-fired dry rotary dryer systems, the UPL MACT floor calculations for existing sources were based on all 3 systems. The UPL MACT floor calculation for new sources was based on the best performing system. The PAH MACT floor for existing direct wood-fired dry rotary dryer systems is 4.3E–04 lb/ODT or 3.9E–02 mg/dscm, and the PAH MACT floor for new sources is 2.5E–05 lb/ODT or 2.2E–03 mg/dscm.

All existing direct wood-fired dry rotary dryers are expected to meet the existing PAH MACT floor with the baseline controls (mechanical collection); therefore, the HAP reduction for the existing floor is zero. No new direct wood-fired dry rotary dryers are projected in the next 5 years. If a new wood-fired dry rotary dryer were to be installed, it is estimated that some facilities may need an RTO to meet the new source PAH MACT floor.

We considered a beyond-the-floor option for existing and new wood-fired dry rotary dryers to use a HAP control system that meets the limits in table 1B to subpart DDDD of 40 CFR part 63, which we anticipate would be based on use of a WESP/RTO system. The WESP would protect the RTO from particulate build up and is a beyond-the-floor option for PM for dry rotary dryers. The costs and other impacts of using a WESP on wood-fired dry rotary dryers were discussed in section IV.A.2 of this preamble. Nationwide costs of the beyond-the-floor option to reduce PAH from existing direct wood-fired dry rotary dryers using an RTO are estimated to be a one-time capital cost of $16 million and annual cost of $6.8 million per year. Nationwide HAP and VOC reductions for existing sources are estimated to be 18 tpy of organic HAP (including 0.016 tpy of PAH) and 282 tpy of VOC for a cost effectiveness of $383,000/ton of organic HAP reduced, $431 million/ton of PAH reduced, and $24,000/ton of VOC reduced. Nationwide energy impacts are estimated to be consumption of 23,000 MWhr/yr of electricity, with associated secondary air emissions, and 371,000 MMBtu/yr of natural gas. Nationwide wastewater (*e.g.,* for RTO washouts) and solid waste impacts are estimated to be 273,000 gallons of wastewater per year and 84 tons of solid waste of per year. Nationwide costs and impacts of the beyond-the-floor option for PAH for new direct wood-fired dry rotary dryers were not estimated as no new direct wood-fired dry rotary dryers are projected in the next 5 years.

After considering the costs, non-air quality environmental, and energy impacts of the beyond-the-floor option for PAH, we are proposing that MACT is represented by the PAH MACT floor. We rejected the more stringent beyond-the-floor option based on use of a WESP/RTO system because of its high costs, unfavorable cost effectiveness, energy usage, and non-air-quality environmental impacts.

Tube dryers. Emissions data for PAH are available for 5 direct wood-fired primary tube dryer systems, one of which has emissions from a secondary tube dryer venting into the primary tube dryer. Because there are fewer than 30 direct wood-fired tube dryer systems, the UPL MACT floor calculations for existing sources were based on all 5 systems. The UPL MACT floor calculation for new sources was based on the best performing system. The PAH MACT floor for existing direct wood-fired tube dryer systems is 3.0E–04 lb/ODT or 3.3E–03 mg/dscm, and the PAH MACT floor for new sources is 1.2E–05 lb/ODT or 6.3E–04 mg/dscm. The PAH MACT floors are based on tube dryer systems that already have PM and HAP controls in series. Therefore, no options more stringent than the MACT floors were identified for existing or new primary tube dryers. Because all existing and new direct wood-fired tube dryers are expected to meet their MACT floors for PAH with baseline HAP controls, zero HAP reduction is estimated.

Softwood veneer dryers. There are 3 softwood veneer dryer systems with direct wood-fired heated zones in the PCWP source category. Detectable PAH emissions are not expected from these dryers. Direct-wood fired softwood veneer dryers were not included in the CAA section 114 testing using EPA OTM–46 because veneer dryers operate at lower temperature with less mixing than rotary and tube dryers and, therefore, are not expected to have the same potential for formation of detectable PAH emissions as direct wood-fired rotary and tube dryers, which operate at higher temperatures under more turbulent conditions. However, given that PAH emissions were measured in the exhaust from other wood-fired PCWP dryers, absent PAH test data, we are proposing a PAH limit of 3.3E–05 mg/dscm based on 3xRDL for existing and new direct wood-fired softwood veneer dryers. We anticipate that this limit would be met through the same burner tune-up standards proposed to be required for all wood-fired dryers as well as using the incineration-based controls already in place on the softwood veneer dryers. Thus, no emission reductions are estimated, and no options more stringent than the 3xRDL value were identified for existing or new wood-fired softwood veneer dryers. The EPA requests submittal of available PAH emissions information for wood-fired softwood veneer dryers to help inform the final rule.

6. Burner Tune-Up Standards

The EPA is proposing burner tune-up standards to address dioxin/furan (D/F) from wood and other fuel fired dryers, any combustion-related HAP that may be emitted from natural-gas fired PCWP dryers, and any HAP from combustion unit bypass stacks. As discussed in section IV.B of this preamble, burner tune-ups are also being proposed as a standard for direct-fired lumber kilns to address combustion-related HAP from direct fuel firing and kiln combustion unit bypass stacks.

a. D/F From Wood-Fired PCWP Dryers

Emissions testing for D/F from wood-fired PCWP dryers was conducted using EPA OTM–46 as part of the 2022 CAA section 114 survey. The EPA conducted a detection limit evaluation on the D/F emissions test runs gathered from the 2022 CAA section 114 requests for wood-fired PCWP dryers. Over 70 percent of the D/F congener test runs were BDL. When considered on a toxic equivalency (TEQ) basis, 89 percent of test runs were below the 3xRDL value for TEQ. The EPA considers a work practice to be justified if a significant majority of emissions data available indicate that emissions are so low that they cannot be reliably measured (*e.g.,* more than 55 percent of test runs are non-detect).[7] Therefore, a work practice standard is being proposed for D/F from wood-fired PCWP dryers. The proposed work practice for existing and new PCWP dryers is an annual tune-up of the burners that provide direct heat to PCWP wood-fired dryers in order to ensure good combustion and, therefore, minimize emissions of organic HAP.

Nationwide HAP reductions of the proposed work practice for D/F for existing direct wood-fired PCWP dryers are estimated to be 5.9 tpy of all HAP reduced (including 2.43E–06 tpy of D/F). Nationwide HAP reductions of the proposed work practice for D/F for new and reconstructed direct wood-fired PCWP dryers are estimated to be 0.20 tpy of HAP reduced (including 1.34E–07 tpy of D/F).

[7] See the June 5, 2014, memorandum, *Determination of 'non-detect' from EPA Method 29 (multi-metals) and EPA Method 23 (dioxin/furan) test data when evaluating the setting of MACT floors versus establishing work practice standards,* in the docket for this action.

b. Natural-Gas Fired PCWP Dryers

Combustion-related HAP emissions from combustion units burning natural gas to directly fire PCWP dryers are similar to emissions from boilers and process heaters that burn natural gas. Under the Boiler MACT, ''units designed to burn gas 1 fuels'' (*i.e.,* units burning natural gas) were required to conduct periodic tune-ups as part of a work practice for non-Hg HAP metals, Hg, acid gases, D/F, and organic HAP. As explained at 76 FR 15637–38 (March 21, 2011), measured emissions of these pollutants from natural gas-fired boilers and process heaters were routinely found to be below the detection limits of EPA test methods, and, as such, the EPA found it technically and economically impracticable to reliably measure emissions from these units. The combustion unit tune-up work practice was identified as an effective HAP emissions standard for natural gas-fired PCWP dryers that combust the cleanest fuels available. Based on that conclusion, we are proposing a burner tune-up work practice standard for combustion-related HAP, including non-Hg metals, Hg, acid gases, D/F, and PAH, from existing and new direct natural gas-fired PCWP dryers. In addition to the proposed burner tune-up work practice standard for combustion-related HAP from direct gas-fired PCWP dryers, the current emission standards for PCWP dryers (40 CFR 63.2240(b)) already limit organic HAP emissions, including organic HAP emitted from natural gas combustion and organic HAP from the drying process. Nationwide combustion HAP reductions of the proposed tune-up work practice standard are estimated to be 0.10 tpy for existing sources and 0.0073 tpy for new sources.

c. Combustion Unit Bypass Stacks

Combustion-related HAP emissions can be emitted for brief periods of time from bypass stacks located between a combustion unit and PCWP dryer (or lumber kiln) direct-fired by the combustion unit when the dryer (or kiln) is unable to accept the hot exhaust from the direct-firing combustion unit. It is not feasible to prescribe numeric emission standards for combustion-related HAP emissions briefly emitted from bypass stacks between the combustion unit and dryer (or lumber kiln). Emissions measurement methodologies, including stack tests which require hours to complete, are not feasible for PCWP combustion unit bypasses that last minutes at a time. Use of a continuous emission monitoring system (CEMS) to capture these events is not feasible due to calibration issues and the need to perform relative accuracy test audits (RATA), which involve stack tests. Establishing parameter limits correlated with emissions also is not feasible because this would be done through stack testing. Therefore, we are proposing a work practice standard for existing and new combustion bypass stacks associated with direct-fired PCWP dryers or direct-fired lumber kilns regardless of fuel type. The work practice standard would require an annual tune-up of the burner associated with the bypass stack, along with monitoring and reporting bypass stack usage. Bypass stack usage time would be monitored using an indicator such as bypass damper position or temperature in the bypass stack. No feasible options more stringent than burner tune-ups coupled with bypass stack usage monitoring were identified for existing or new combustion bypass stacks. No HAP reductions were estimated in conjunction with bypass stack monitoring.

B. What MACT standards are we proposing for lumber kilns?

The EPA is proposing standards to limit emissions of all HAP from lumber kilns. All HAP emissions would be limited by the work practices the EPA is proposing that would limit over-drying of lumber. Combustion-related HAP emissions from direct-fired kilns would be further limited by the proposed burner tune-up standards. Additional information on our review of information pertaining to lumber kilns is available in the memorandum, *Development of National Emission Standards for Hazardous Air Pollutant Emission Standards for Lumber Drying Kilns,* in the docket for this action.

1. Lumber Kiln Overview

Lumber kilns can be characterized by wood type (softwood or hardwood), design (batch or continuous), and heating method (indirect- or direct-fired). Although few hardwood lumber kilns are located at major sources, we are proposing to include both hardwood and softwood lumber kilns in the PCWP NESHAP so HAP standards would apply to any lumber kiln located at a PCWP or lumber facility that is a major source of HAP emissions.

In batch kilns, lumber is loaded into the kiln where it remains stationary during the entire drying cycle. When drying is complete, the batch kiln is shut down to remove the lumber. The kiln is restarted again after it is loaded with a new batch of lumber. Batch kilns can be either track-loaded, where multiple packages [8] of lumber are pushed into the kiln on tracks at once, or smaller package loaded kilns, where lumber packages are loaded in the batch kiln with a forklift. The track loaded kilns tend to have higher annual throughput and are the type of batch kilns most commonly used at major source PCWP facilities.

Batch kilns typically have numerous roof vents positioned in rows down each side of the kiln's roof. The vents open and close throughout the drying cycle as the temperature and humidity in the kiln change. Internal fans under the kiln roof circulate air around the packages of lumber. The fans change direction every 2 to 3 hours to provide even drying of the lumber. Consequently, one bank of roof vents is normally exhausting hot, moist air while the other row of vents is allowing ambient air into the kiln. The direction of flow cycles between air intake and exhaust throughout the drying cycle. Batch kilns release fugitive air emissions from doors or cracks in the kiln exterior due to pressure differences between the interior of the kiln and ambient conditions outside the kiln.

Over the past decade, continuous dry kilns (CDKs) have become popular for drying southern pine lumber in the U.S. Southeast. Unlike batch kilns, CDKs do not have to be shut down for loading and unloading. In CDKs, lumber travels continuously through the kiln on tracks. Most CDKs in the U.S. have a ''counter-flow'' design where 2 sets of lumber travel in opposite directions to one another such that on one end of the kiln green lumber enters the kiln parallel to dry lumber exiting the kiln. This design allows heat from the dried lumber coming out of the kiln to preheat the incoming green lumber to conserve energy. There are no doors on CDKs, allowing the constant flow of lumber into and out of each end of the kiln. Thus, CDKs release exhaust containing steam and fugitive emissions from their open ends. Some CDKs have powered or unpowered hoods or stacks over their openings to direct a portion (*e.g.,* 40 to 80 percent of the volume) of exhaust upward while the remaining exhaust exits through the kiln ends.

In addition to batch or continuous design, another key design feature of lumber kilns is their heating method. Indirect-fired kilns are heated with steam from a boiler. The steam circulates through coils in the path of air circulation within the kiln. Direct-fired kilns use hot gases from fuel combustion to heat the kiln such that the kiln exhaust contains emissions from wood drying and fuel combustion. Combustion units used to direct-fire kilns may be a dedicated burner for each kiln or a combustion unit that direct-fires multiple kilns. Fuels used to direct-fire kilns include natural gas, wood, or wood-derived syngas generated in a gasifier. Wood is often used for direct-fired lumber kilns because it is a readily available byproduct of lumber manufacturing and is typically generated onsite. Gasifiers typically use green sawdust generated from cutting logs into boards. The green sawdust is first gasified under sub-stoichiometric conditions to produce a syngas that is then burned in a secondary combustion chamber to directly fire the kiln. Regardless of fuel, combustion gases are usually too hot for direct introduction into the kiln, so they are diluted with recirculated kiln exhaust and ambient air in a blend box prior to introduction to the kiln.

The EPA has identified 680 lumber kilns at major source PCWP facilities subject to 40 CFR part 63, subpart DDDD, including:

- 11 batch, indirect-fired, hardwood kilns.
- 203 batch, indirect-fired, southern yellow pine (SYP) kilns.
- 241 batch, indirect-fired, other (*e.g.,* western) softwood kilns.
- 103 batch, direct-fired, SYP kilns.
- 98 continuous, direct-fired, SYP kilns.
- 24 continuous, indirect-fired, SYP kilns.

None of the lumber kilns identified operate with any add-on air pollution controls. Emission factors that have been adopted by regulatory agencies and lumber producers for emission estimation purposes were mostly derived from small-scale kiln tests and a few (often research-level) tests of full-scale kilns. This information is useful for estimating emissions for inventory reporting purposes but is not suitable for developing or enforcing national emission standards due to the impracticality of capturing and measuring lumber kiln emissions (discussed in more detail later in this preamble). A significant challenge to measuring batch and continuous lumber kiln emissions is accurate determination of the total lumber kiln gas flow rate and the need to extrapolate concentrations from 1 or 2 sampling locations to

[8] Packages are stacks of boards layered with small strips of wood called ''stickers'' to allow for air to circulate around the boards while the boards are drying in the kiln.

estimate total kiln emissions from several emission points (including fugitives).

Because of the infeasibility of lumber kiln emissions collection and control, and because of measurement challenges, many facilities and permit authorities have established work practices for limiting organic emissions from lumber kilns. Good design and operating practices were determined to be the best available control technology (BACT) for several lumber kilns. A review of BACT determinations for new and modified kilns is relevant because a work practice can be found as BACT only after a permitting authority finds that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make use of a numerical emission standard infeasible.[9] This finding is similar to the requirements under CAA section 112(h) for concluding that MACT is represented by a work practice or operational standard.

2. Rationale for Work Practices

Given the impracticability of capturing and measuring emissions from lumber kilns, we have concluded that the criteria in CAA section 112(h) for establishing a design, equipment, work practice, or operational standard apply for lumber kilns. CAA section 112(h) states that if it is not feasible in the judgment of the Administrator to prescribe or enforce an emission standard for control of a HAP, the Administrator may, in lieu thereof, promulgate a design, equipment, work practice, or operational standard, or combination thereof, which in the Administrator's judgment is consistent with the provisions of CAA section 112(d). The phrase ''not feasible to prescribe or enforce an emission standard'' is further defined in CAA section 112(h)(2)(A) and (B) as any situation in which the Administrator determines that: (A) a hazardous air pollutant or pollutants cannot be emitted through a conveyance designed and constructed to emit or capture such pollutant, or (B) the application of measurement methodology to a particular class of sources is not practicable due to technological and economic limitations.

Relative to CAA section 112(h)(2)(A), the total volume of lumber kiln emissions cannot be emitted through a conveyance that is designed and constructed to emit or capture HAP emissions. For example, batch kilns have numerous vents that cycle between air intake and exhaust in addition to some fugitive emissions that can be emitted from the kiln doors or walls. Batch kilns do not and cannot have conveyances to capture emissions from the exhaust vents or eliminate the air intake, as such conveyances would disrupt the drying process by limiting air flow into the kiln. If constructed, flow exiting a conveyance would be intermittent (cyclical) just as it is from each kiln vent, meaning a conveyance would not help with measuring emissions as needed to prescribe or enforce a numeric emission standard. Similarly, CDKs have considerable amounts of fugitive emissions from their openings that cannot be eliminated while allowing for lumber to enter and exit the kiln. While some CDKs have passive hoods or stacks (which may be powered or unpowered) at their ends to direct a fraction of the kiln exhaust upward to improve dispersion, these devices do not and cannot eliminate the fugitive emissions from the CDK openings. If powered stacks were added to draw more air out of the CDK in an attempt to eliminate the fugitives to obtain a reliable emissions measurement, the energy-transfer function of the CDK, in which heat and steam from the exiting lumber are used to precondition incoming lumber, would be lost. Thus, it is not possible to capture emissions from the openings at each end or directly measure the total gas flow rate from a CDK as needed to prescribe or enforce an emission limit.

Relative to CAA section 112(h)(2)(B), there are technological and economic limitations to applying a measurement methodology for lumber kilns as needed to prescribe or enforce a numeric emission standard. For batch kilns, with numerous vents cycling between air intake and exhaust, and temperature and humidity changes throughout the batch cycle, there is not a consistent flow rate or concentration to measure using conventional stack test methods or continuous emission monitors. Direct measurement of flow rate from batch kilns is not technically feasible because of the numerous vents and changing flow direction. In addition to the need to test multiple vents, an economic limitation to testing batch kilns is the expense associated with testing over the long batch kiln cycle (*e.g.,* often 20 or more hours) in which the emission concentration and kiln parameters change throughout the cycle. For CDKs, direct measurement of total kiln exhaust flow is not technically feasible due to the significant volume of fugitive emissions from the kiln openings. In addition to being unable to measure total flow, many CDKs have no specific emission point (or conduit) in which to measure emissions concentration (*e.g.,* no outlet stack or hood, or in an indirect-fired kiln no kiln air return duct to a burner). This lack of a specific emission point for measurement of total kiln air flow and concentration is also an economic limitation, because even if outlet vents suitable for testing were present for a portion of exhaust, all such vents would need to be tested to ensure uniformity of concentration or to establish vent-specific concentrations, which would greatly increase source testing costs (while total flow would continue to remain uncertain, limiting usefulness of the data for prescribing or enforcing an emission standard).

3. Lumber Kiln Work Practice Standard

Work practices to reduce emissions from lumber kilns are often based on measures to minimize the amount of over-dried lumber produced. Lumber over-drying is of concern because HAP emissions have been shown to increase after the free water from the lumber is removed. As the free water evaporates, water bound within the cellular structure of the wood begins to be removed. Once the evaporative cooling of moisture on the surface of lumber ceases, the temperature of the lumber in the kiln increases and organic HAP emissions begin to increase. A work practice that minimizes over-drying limits organic HAP emissions from all types of kilns as well as combustion-related HAP emissions from direct-fired kilns since minimizing over-drying reduces fuel consumption, which results in less combustion-related HAP.

To develop a work practice standard for lumber kilns, we reviewed various permits and other information, including information received from ICR respondents regarding design, operation, and monitoring methods to minimize over-drying and limit HAP emissions. Several permits included ''good operating practices'' and kiln inspection and maintenance requirements to minimize over-drying. We also found that lumber manufacturers use a variety of practices to ensure that lumber is properly dried while balancing energy usage. For many manufacturers, the focus is on ensuring

[9] The regulatory definition of BACT in 40 CFR 52.21(b)(12) states, ''If the Administrator determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of best available control technology. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for compliance by means which achieve equivalent results.''

that the lumber meets grade classification, which can be accomplished using a variety of techniques. For example, to meet the moisture content grade ''KD19'' for southern pine lumber, manufacturers must dry lumber to a maximum of 19 percent moisture. There are moisture grades other than KD19, such as KD15 or lower, for lumber to be exported. Lumber or wooden poles that will later undergo treatment may be dried to higher moisture levels than KD19. To ensure that the maximum grade moisture is met by most boards in the kiln load, kiln operators need to dry to a target moisture a few percent below the maximum moisture grade. Methods used to determine dryness of lumber vary. Temperature parameters monitored in the kiln during drying (*e.g.,* wet or dry bulb temperature or temperature drop across the load) are used by kiln operators to determine when the drying cycle is complete. Temperature monitoring may be paired with hot checks in which sample boards are pulled from the kiln and checked for dryness near the end of the kiln cycle. In-kiln lumber moisture measurement during drying may be used, or lumber moisture may be checked with hand-held moisture meters after the drying cycle concludes. It is also common for lumber moisture measurement to be conducted downstream of the kiln (*e.g.,* hand-held moisture meter checks or in-line moisture monitoring at the planer before lumber is packaged for shipment). Of the methods available for determining lumber moisture, the in-line moisture meter at the planer typically produces the largest number of lumber moisture readings. Given different kiln designs and the wide variety of techniques used to determine lumber dryness, the work practice to limit over-drying in the kiln requires some flexibility for site-specific considerations.

Based on our review of methods for limiting lumber over-drying, in 40 CFR 63.2241(d) we are proposing a work practice standard with 4 elements: (1) operation and maintenance for all kilns, (2) burner tune-up for direct-fired kilns, (3) a work practice option in which all kilns limit over-drying by operating below a temperature set point, conducting in-kiln moisture monitoring, or following a site-specific plan (for temperature and lumber moisture monitoring), and (4) minimum kiln-dried lumber moisture content limits below which lumber is considered to be over-dried lumber for all kilns for purposes of the PCWP NESHAP.

Operation and maintenance (O&M) plan. For the first element of the work practice, we are proposing that facilities develop an O&M plan for all the lumber kilns located at the facility. Documentation of the O&M plan would be required to be retained onsite and to include procedures for maintaining the integrity of lumber kiln internal air flow and heat distribution components (*e.g.,* baffles, fans, vents, heating coils, and temperature sensors) to provide as uniform a temperature and air flow as reasonably possible. Maintaining the heat distribution components prevents hot spots that could lead to increased HAP emissions and also prevents cold spots in the kiln that could lengthen the drying cycle for the entire load, thereby avoiding higher HAP emissions. The O&M plan would be required to include charge optimization practices to promote uniformity in lumber charged into the kiln (*e.g.,* sizing, sorting, stickering, conditioning). Proper sorting results in less variation per kiln load that could lengthen the drying cycle and increase HAP emissions, and proper stickering ensures that air can flow through the lumber packages.[10] To demonstrate compliance with the O&M plan, the facility would be required to conduct an annual inspection of lumber kiln integrity and review the charge optimization practices used. Facilities would be required to implement corrective actions (as needed) and maintain records of inspections and corrective actions taken under the O&M plan. State authorities delegated responsibility for implementing 40 CFR part 63, subpart DDDD, (or ''delegated authorities'') may require modification of the O&M plan, as needed, upon review.

Kiln burner tune-up. For the second element of the work practice, we are proposing that facilities with batch and continuous direct-fired kilns conduct an annual burner tune-up to reduce the potential for combustion-related HAP emissions beyond the reduction in these emissions that results from minimizing lumber over-drying. Properly operating burners would reduce the potential for combustion-related HAP emissions from the kiln during routine operation and from any bypass stacks used temporarily during startup or shutdown of the kiln burner. We are proposing annual tune-ups for lumber kilns following the same procedures proposed for PCWP dryers.

Temperature, moisture, or site-specific plan limits. For the third element, we are proposing that facilities select from 1 of 3 work practice options for minimizing lumber over-drying for each kiln at the facility: (1) temperature set point, (2) in-kiln moisture monitoring, or (3) a site-specific plan (for temperature and lumber moisture monitoring). While the EPA could require a site-specific plan for all lumber kilns, we acknowledge that lumber kilns operating at moderate temperatures compared to kilns of similar design, or kilns equipped with in-kiln moisture monitoring, are already operating in a manner that minimizes rapid over-drying. Thus, we are proposing to provide two streamlined options (in lieu of requiring a site-specific plan) for lumber kilns operating at moderate temperatures or using in-kiln lumber moisture monitoring techniques that reduce the potential for over-drying. These options consider that over-drying can occur more rapidly in kilns operating at higher temperatures and/or without a direct in-kiln lumber moisture content measurement system that provides automatic feedback to the kiln operator. These options encompass kiln features likely to be included in a site-specific plan to minimize over-drying (if a plan were to be developed for the kiln). These compliance demonstration alternatives to a site-specific plan streamline compliance for kilns that have less potential for over-drying and reduce burden for the delegated authority reviewing the site-specific plan.

Under the temperature option, the lumber kiln would be operated with a maximum dry bulb temperature set point of no more than 210 °F for batch indirect-fired (IF) kilns, 235 degrees Fahrenheit (°F) for batch direct-fired kilns, or 245 °F for continuous indirect-fired or continuous direct-fired kilns. The proposed temperatures of 210 °F, 235 °F, and 245 °F represent both average and median dry bulb temperature used in lumber kilns in the source category that were within 5 °F of the proposed temperature. These temperatures are proposed because they represent temperatures below which approximately half of kilns operate while the remaining half of kilns operate at higher temperatures that could accelerate over-drying. Facilities would be required to continuously measure the dry bulb temperature during the kiln drying cycle, record the dry bulb temperature at least every 15 minutes, calculate the 3-hour block average temperature, and maintain the 3-hour block average below the temperature limit. See proposed 40 CFR 63.2269(a)–(b) and (m) and 40 CFR 63.2270(h) for more details on

[10] Additional information on lumber kiln O&M can be found in Simpson, William T., ed. 1991. *Dry Kiln Operator's Manual.* Agricultural Handbook AH–188. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory.

temperature monitoring under the PCWP NESHAP.

Under the in-kiln moisture measurement option, the lumber kiln would operate using a direct, in-kiln continuous lumber moisture monitoring technique that provides automated feedback from within the kiln to the kiln operator control panel during the drying cycle. Kiln owners and operators would be required to operate the kiln to dry to a semiannual average lumber moisture content above the minimum limit of moisture content proposed in paragraph 40 CFR 63.2241(e)(3)(ii) and table 11 to subpart DDDD of 40 CFR part 63, as discussed later in this preamble. We are proposing the in-kiln lumber moisture measurement option to promote direct measurement and use of lumber moisture content monitoring as a kiln control parameter during high-temperature drying (*i.e.,* in kilns operating above the dry bulb temperature set points under the work practice temperature option). An example of an in-kiln direct lumber moisture measurement technique is use of 2 steel plates inserted into packages of lumber spatially distributed throughout the kiln. The electrical resistance between the plates is measured and relayed to a moisture meter which supplies moisture measurements to the kiln control software. We are proposing that at least 1 lumber moisture reading per 20,000 board feet (BF) of lumber in the kiln load be taken and that the batch average lumber moisture content be determined at the end of the batch cycle (when the lumber has reached its lowest kiln-dried moisture content). The requirement for 1 lumber moisture reading per 20,000 BF (which is the same as 20 thousand board feet (20 MBF)) is proposed to ensure that there are multiple moisture measurements in different areas of the kiln, with the number of lumber moisture monitors being scaled to kiln capacity. For example, a lumber kiln drying 160 MBF per batch would require at least 8 lumber moisture monitors to be distributed throughout the kiln load. For CDKs, we are proposing that facilities measure the lumber moisture content at the completion of drying for each package of lumber (when the lumber has reached its lowest kiln-dried moisture content). Because different lumber grades can be produced in a given lumber kiln at different times, we are proposing that a ratio of measured lumber moisture divided by the minimum kiln-dried lumber moisture limit be developed for each batch kiln load and for each package of lumber dried in a CDK. If the semiannual average of all the ratios is greater than or equal to 1 for the kiln, then compliance would be demonstrated. The semiannual average ratio of measured moisture divided by the minimum kiln-dried lumber moisture limit would be reported in the semiannual report. A semiannual averaging time is proposed to correspond with the semiannual reporting frequency already required for reporting under the PCWP NESHAP, and because a semiannual average provides flexibility for the variability associated with drying lumber of different dimensions cut from logs with naturally occurring initial moisture variations (*e.g.,* seasonal or tree stand variations). See proposed 40 CFR 63.2241(e)(3)(ii) and 40 CFR 63.2270(i) for more details on the proposed methodology for calculating the semiannual average from kiln-dried lumber moisture measurements.

Under the site-specific plan option, facilities would develop and operate according to a site-specific plan to minimize lumber over-drying through temperature and lumber moisture monitoring. The site-specific plan would be required to be submitted to the delegated authority for approval. The site-specific limits from the plan would then have to be incorporated into the facility's operating permit when it is next reopened or renewed, as applicable.

The site-specific plan would be required to: identify one temperature parameter (such as wet or dry bulb temperature, wet bulb depression, or temperature drop across the load) to be continuously monitored during the kiln drying cycle; include a description of how the temperature parameter is measured and used to minimize over-drying of lumber; and include a site-specific limit for the temperature parameter that minimizes over-drying. Facilities would be required to continuously monitor the temperature parameter no less often than every 15 minutes and calculate the 3-hour block average for comparison to the site-specific temperature limit. See proposed 40 CFR 63.2269(a)–(b) and 40 CFR 63.2270(h) for more details on temperature monitoring under the PCWP NESHAP.

In addition, the site-specific plan would be required to: include a site-specific method for monitoring kiln-dried lumber moisture content (weight percent, dry basis); specify the location of such monitoring within the lumber manufacturing process (for example, at the kiln unloading track, in lumber storage, or at the planer); specify the minimum kiln-dried lumber moisture content limit based on the lumber moisture grades produced at the facility based on 40 CFR 63.2241(e)(3)(iii) and table 11 to subpart DDDD of 40 CFR part 63; and adhere to a minimum data requirement of one moisture measurement per 20,000 BF. Facilities would be required to calculate and record the monthly average kiln-dried lumber moisture content, compare the monthly average to the minimum kiln-dried lumber moisture content limit, and take corrective action if the monthly average lumber moisture content is below the minimum limit. Facilities would be required to maintain records of corrective actions taken and report corrective actions in the semiannual report. In addition, facilities would be required to calculate the semiannual average of batch or continuous kiln lumber moisture measurements and compare the semiannual average to the minimum kiln-dried lumber moisture content limit to determine compliance. The monthly averages with records of corrective action (when needed) are proposed to provide interim indications of compliance before the semiannual average is determined because facilities using a site-specific plan are likely to be measuring the moisture of kiln-dried lumber downstream of the kiln (*e.g.,* at the planer).

The site-specific plan containing limits for temperature and lumber moisture content would have to be developed and submitted to the delegated authority within 180 days after the effective date of the final rule. The written site-specific plan would have to be maintained onsite at the facility and would be enforceable upon the compliance date specified in the rule. Facilities would be required to report deviations from the site-specific plan following the compliance date. Once the site-specific plan is approved by the delegated authority, the plan requirements would be incorporated into the facility's title V operating permit when the permit is next reopened or renewed, as applicable.

Kiln-dried moisture minimum limit. In the fourth and final element of the work practice to minimize lumber over-drying, we are proposing minimum limits of kiln-dried lumber moisture content (weight percent on a dry basis) that are considered to be over-dried lumber for purposes of the PCWP NESHAP. In proposed 40 CFR 63.6241(e)(4) and proposed table 11 to subpart DDDD of 40 CFR part 63, the ''maximum lumber moisture grade'' means the upper limit of lumber moisture content (weight percent on a dry basis) that meets the relevant lumber grade standard for a lumber product. The proposed minimum limit of kiln-dried lumber moisture content varies according to the maximum lumber moisture grade as shown in proposed table 11 to subpart DDDD of 40 CFR part 63. The minimum limits of kiln-dried lumber moisture content proposed acknowledge the fact that different lumber moisture grades are produced and that enough margin is needed to encompass the target lumber moisture (which is a few percent below the grade moisture to ensure the lumber meets grade) and allow for variability that occurs around the target moisture. The minimum limits of lumber moisture proposed in table 11 to subpart DDDD of 40 CFR part 63 reflect the following moistures (all on a weight percent, dry basis):

- For lumber with maximum lumber moisture grade above 22 percent, the proposed minimum limit below which lumber is considered over-dried is 15 percent moisture. A minimum limit of 15 percent moisture was selected because a limit of 15 percent lumber moisture is included in at least 1 air permit for a lumber facility producing moisture grades higher than KD–19.
- For lumber with a maximum lumber moisture grade of 19 to 21 percent, the proposed minimum limit below which lumber is considered over-dried is 12 percent moisture. A minimum limit of 12 percent was selected because this limit is consistent with the limit indicated in several air permits for facilities producing KD–19, which is a grade produced in high volume.
- Consistent with the 7 percent difference between KD–19 and a 12 percent minimum limit, we are proposing the maximum grade moisture minus 7 percent as the minimum kiln-dried lumber moisture limit for grades with 18 down to 12 percent maximum moisture content (*e.g.,* 12 percent grade − 7 percent = 5 percent minimum kiln-dried lumber moisture limit).
- For lumber with maximum lumber moisture grade less than or equal to 10 percent, as required for some products to be exported, the proposed minimum limit below which lumber is considered over-dried is half the maximum lumber moisture grade. A 5 percent minimum kiln-dried lumber moisture limit is proposed for lumber with a maximum moisture grade of 11 percent, consistent with the minimum limit of 5 percent for grades of 10 and 12 percent moisture.

We estimate the HAP emission reduction achieved by the work practice to be 488 tpy for existing sources. We estimate that the work practice would also reduce 6,700 tpy of VOC emissions (as WPP1 [11]) from existing sources. For new sources, we estimate that the work practice would result in emission reductions of 77 tpy HAP and 1,000 tpy VOC (as WPP1).

4. Consideration of Add-On Controls

The EPA has not identified any lumber kilns with add-on air pollution controls. The EPA, as well as state permitting authorities, have evaluated the possibility of capturing and controlling emissions from lumber kilns and in each case concluded that capture and control of lumber kiln emissions is not technically feasible or cost effective for VOC emissions from batch or continuous kilns. The technologies considered and rejected as technically infeasible in BACT determinations include oxidizers (RTO and RCO), carbon adsorption, condensation, biofilters, and wet scrubbers (also known as absorbers). In some BACT determinations, it was noted that if an RTO were to be attempted for use on a lumber kiln, duct heaters and a WESP would likely also be needed to prevent resin buildup in the ductwork (for safety) as well as to protect the thermal media in an RTO or catalytic media in an RCO. Technologies rejected based on technical infeasibility for control of VOC are also infeasible for control of HAP in the same exhaust stream. Therefore, we do not consider add-on controls for lumber kilns to be a viable option for reducing HAP emissions. No emission reduction measures more stringent than the proposed work practice were identified.

C. What MACT standards are we proposing for process units with organic HAP emissions?

The EPA is proposing MACT standards to resolve unregulated HAP emissions from process units that had ''no control'' MACT determinations in the 2004 NESHAP that were remanded and vacated. In addition to MACT standards for lumber kilns, the EPA is proposing MACT standards for various process units in the PCWP source category, including various RMH process units, atmospheric refiners, stand-alone digesters, fiber washers, fiberboard mat dryers at existing sources, hardboard press predryers at existing sources, and log vats. Some of these process units are already subject to new source HAP standards in the 2004 PCWP NESHAP, including fiberboard mat dryers, hardboard press predryers, and reconstituted wood products board coolers (which are a type of RMH unit) at new and reconstructed sources. Mixed PCWP process streams routed to HAP control devices subject to the current HAP emission limits in table 1B to subpart DDDD of 40 CFR part 63 are also already subject to the 2004 PCWP NESHAP. This section of the preamble describes the MACT standards we are proposing for emissions streams with unregulated HAP emissions. A detailed description of the process units being regulated and supporting information for the proposed standards are provided in the memorandum, *Development of Emission Standards for Remanded Process Units Under the Plywood and Composite Wood Products NESHAP,* in the docket for this action.

1. Resinated Material Handling (RMH) Process Units

The PCWP affected source is the collection of process units used to produce PCWP at a PCWP manufacturing facility, including various dryers and reconstituted wood products presses which are already subject to emission standards under the PCWP NESHAP and other process units for which prior ''no control'' MACT determinations were vacated and remanded to EPA. Many of the process units with the prior ''no control'' MACT determinations are RMH process units within the PCWP affected source, including resin tanks, softwood and hardwood plywood presses, engineered wood products presses and curing chambers, blenders, formers, finishing saws, finishing sanders, panel trim chippers, reconstituted wood products board coolers (at existing affected sources), hardboard humidifiers, and wastewater operations. These process units handle resin or resinated wood material downstream of the point in the PCWP process where resin is applied.

The RMH process units are not designed and constructed in a way that allows for HAP emissions capture or measurement. It is not feasible to prescribe or enforce an emission standard for control of HAP from RMH process units. The RMH process units are equipment within the PCWP production building (or outdoor wastewater operations) without any enclosure, conveyance, or distinct HAP emissions stream that can feasibly be emitted though a conveyance. For example, dry formers, saws, and sanders have pick-up points for removal of wood material as it is trimmed, but the

[11] VOC as WPP1 is based on the wood products protocol in which VOC emissions as propane are corrected for oxygenated compounds that have a low response to the flame ionization detector used to measure hydrocarbons, by adding formaldehyde and 35 percent of methanol emitted. WPP1 VOC was used in the assessment of lumber kiln emissions consistent with the approach used by permitting authorities.

entire process unit is not enclosed or isolated; engineered wood products presses are too large to enclose; plywood presses cannot be enclosed for operator safety reasons; and board coolers at existing sources cannot be enclosed for equipment functionality reasons. Emissions from RMH process units are fugitive in nature such that application of emissions measurement methodology is not technically feasible. Further, emissions capture and measurement from hundreds of individual RMH process units would not be economically feasible (*e.g.,* with testing costs estimated to exceed $20 million nationwide assuming that facilities could capture emissions). For these reasons, it is not feasible to prescribe or enforce an emission standard for RMH process units. Therefore, the EPA is proposing work practice standards under CAA section 112(h).

To develop work practice standards under CAA section 112(h), consistent with CAA section 112(d), measures used by the best performing sources to reduce or eliminate emissions of HAP through process changes or substitution of materials were considered. This approach is consistent with CAA section 112(d)(2)(A). The potential for HAP emissions from RMH process units relates to the material being processed (*i.e.,* resin and wood). Standards for RMH units pertaining to resin-related and wood-related emissions are discussed in the following subsections.

a. Resin-Related Emissions From RMH Process Units

Most PCWP resins are amino/phenolic resins such as phenol formaldehyde (PF), melamine urea formaldehyde (MUF), urea formaldehyde (UF) with urea scavenger, melamine formaldehyde (MF), or phenol resorcinol formaldehyde (PRF). Isocyanates such as MDI are also used. The HAP associated with use of amino/phenolic resins at PCWP facilities include formaldehyde (CAS 50–00–0), phenol (CAS 108–95–2) and methanol (CAS 67–56–1). The HAP associated with MDI resin is 4,4′-Methylenediphenyl Diisocyanate (CAS 101–68–8). Some PCWP products can only be made with specific types or formulations of resins. Other products are made with 1 or more types of resins (*e.g.,* OSB can be made with PF, MDI, or PF and MDI in the same board). The PCWP resins typically are a liquid with high solids content (*e.g.,* up to 70 percent solids) as received or may be delivered and applied in powdered form.

The potential for resin-related HAP emissions from RMH process units relates to the free HAP content and volatility of the resin system used. The PCWP resin systems used typically have very low free HAP content (weight percent) or low vapor pressure depending on the resin type and application. For example, most types of amino/phenolic resins are non-HAP resins which can be defined as a resin with HAP contents below 0.1 percent by mass for Occupational Safety and Health Administration-defined carcinogens as specified in section A.6.4 of appendix A to 29 CFR 1910.1200, and below 1.0 percent by mass for other HAP compounds.

However, some amino/phenolic resin formulations essential to manufacturing dry-process hardboard or I-joists have slightly higher weight percentages of some HAP than non-HAP resins but have low vapor pressure which reduces the potential for HAP emissions from RMH process units at facilities used to make those products. Similarly, MDI resins would not be considered non-HAP resins due to their percentage by weight MDI content, but MDI resins have very low vapor pressure as received and used in RMH process units. In developing work practice standards for RMH units, it is necessary to limit resin-related HAP emissions without precluding the types of PCWP products covered under the PCWP NESHAP from being produced. A work practice standard with enforceable options to use a non-HAP resin system or meet a vapor pressure limit adheres to the CAA while allowing the different types of PCWP products covered under the PCWP NESHAP to be produced.

Information on resin HAP content (HAP percent, by weight) and resin vapor pressure (in kilopascals [kPa] or pounds per square inch absolute [psia]) is often available in safety data sheets (SDS) or other technical documentation accompanying the resin when it is received from the resin supplier. Some PCWP manufacturers may dilute amino/phenolic resins when preparing them for use, which would reduce the mass fraction of free HAP content or corresponding vapor pressure of the free HAP in the resin. Therefore, resin supplier information for the ''as received'' resin, before the resin is diluted or mixed with wood, is the most consistently available source of information to use as the basis of the work practice standards pertaining to resin-related HAP.

When received, PCWP resins are stored in fixed roof resin tanks at the PCWP facility at ambient temperature. Resin tanks are the first type of RMH process units in which resins are used in the PCWP process. The average-size resin tank in the PCWP industry is 12,500 gallons while the maximum is 47,000 gallons. Limited vapor pressure data are currently available to the EPA for resins used at PCWP facilities. Therefore, vapor pressure criteria in the Amino/Phenolic Resin NESHAP (40 CFR part 63, subpart OOO) were reviewed in addition to information available from PCWP facilities. The maximum true vapor pressure limits for applying controls for storage vessels storing liquids containing HAP under the Amino/Phenolic Resin NESHAP are 13.1 kPa (1.9 psia) for tanks with 20,000 to 40,000 gallon capacity and 5.2 kPa (0.75 psia) for storage vessels with 40,000 to 90,000 gallon capacity. A maximum true vapor pressure limit of 5.2 kPa (0.75 psia) corresponding with the largest PCWP resin tanks is proposed as the vapor pressure work practice option for PCWP resin-related HAP emissions. This vapor pressure limit would apply for amino/phenolic resins that are not non-HAP resins as well as for MDI resins. For the PCWP NESHAP, the maximum true vapor pressure of the resin as received would be defined in 40 CFR 63.2292 as the equilibrium partial pressure exerted by HAP in the stored liquid at the temperature equal to the highest calendar-month average of the liquid storage temperature for liquids stored above or below the ambient temperature, or at the local maximum monthly average temperature as reported by the National Weather Service for liquids stored at the ambient temperature, as determined: (1) from safety data sheets or other technical information provided by the PCWP resin supplier; or (2) standard reference texts; or (3) by the ASTM Method D2879–18 (which is proposed to be incorporated by reference in § 63.14); or (4) any other method approved by the Administrator.

b. Wood-Related Emissions From RMH Process Units

The potential for wood-related organic HAP emissions from RMH process units is reduced when the wood is purchased pre-dried or is dried in a dryer upstream from the RMH process units. Organic HAP in wood is released during the drying process (*i.e.,* prior to the RMH process units) and dryers are controlled to meet the emission limits established in the 2004 PCWP NESHAP. Most RMH process units after the drying process are not heated, which further limits the potential for wood-related organic HAP emissions. Even if the RMH process unit is heated (such as plywood or engineered wood product presses), if the wood processed has been previously dried then the potential for wood-related HAP emissions is reduced because dryers operate at higher temperatures than presses. A standard that requires processing of dried wood will minimize wood-related organic HAP emissions from RMH process units in the affected source.

c. RMH Process Unit Proposed Standards

We are proposing work practice standards to require new and existing facilities with RMH process units to (i) use only a non-HAP resin (defined in 40 CFR 63.2292), or (ii) use a resin with a maximum true vapor pressure of less than or equal to 5.2 kPa (0.75 psia) as defined in 40 CFR 63.2292, or (iii) use a combination of resins meeting either (i) or (ii). Facilities with RMH process units would also be required to process wood material that was purchased pre-dried to a moisture content of no more than 30 percent (weight percent, dry basis) or that has been dried in a dryer located at the PCWP facility. This requirement to process dried wood would not apply for wet formers and wastewater operations.

No options more stringent than the RMH process unit work practices were identified for resin tanks, softwood and hardwood plywood presses, engineered wood products presses and curing chambers, blenders, formers, finishing saws, finishing sanders, panel trim chippers, or hardboard humidifiers at new or existing affected sources, or for reconstituted wood products board coolers at existing affected sources. Reconstituted wood products board coolers at new affected sources are already subject to standards under the PCWP NESHAP. For wastewater operations, the EPA is proposing a work practice in addition to the RMH process unit standards to further limit the potential for HAP emissions. Facilities with wastewater operations would be required to implement one of the following measures:

- Follow the plan required in 40 CFR 63.2268 for wet control devices used as the sole means of reducing HAP emissions from PCWP process units; or
- Reduce the volume of wastewater to be processed by reusing or recirculating wastewater in the PCWP process or air pollution control system; or
- Store wastewater in a closed system; or
- Treat the wastewater by using an onsite biological treatment system, or by routing the wastewater to an offsite POTW or industrial wastewater treatment facility.

The applicability of these work practices for wastewater operations depends on the type of PCWP produced and specific equipment generating wastewater. Requiring one of the above work practices in addition to the RMH standards was identified as a more stringent option.

The emissions reductions associated with the work practices for RMH units are estimated to be 6.7 tpy of HAP from existing sources. No HAP reduction is estimated for new sources projected in the next 5 years because all facilities are expected meet the standards upon startup. No quantifiable HAP reductions are expected from the additional work practice for wastewater operations.

2. Atmospheric Refiners

Atmospheric refiners operate with continuous infeed and outfeed of wood material and under atmospheric pressure for refining (rubbing, grinding, or milling) wood material into fibers or particles used in particleboard or dry formed hardboard production. Atmospheric refiners are further characterized based on their placement before or after dryers in the PCWP production process. We are proposing the following definitions for inclusion in the PCWP NESHAP to distinguish between the 2 types of atmospheric refiners.

Dried wood atmospheric refiner means an atmospheric refiner used to process wood that has been dried onsite in a dryer at the PCWP affected facility for use in PCWP in which no more than 10 percent (by weight) of the atmospheric refiner annual throughput has not been previously dried onsite.

Green wood atmospheric refiner means an atmospheric refiner used to process wood for use in PCWP before it has been dried onsite in a dryer at the PCWP affected facility. Green wood atmospheric refiners include atmospheric refiners that process mixtures of wood not previously dried onsite (*e.g.,* green wood) and wood previously dried onsite (*e.g.,* board trim) in which wood not previously dried onsite comprises more than 10 percent (by weight) of the atmospheric refiner annual throughput.

The above definitions include a 10 percent (by weight) criteria to provide clarity for atmospheric refiners that process material recycled from various points in the PCWP process. An atmospheric refiner ''system'' may comprise 1 or more atmospheric refiners with the same emission point (*e.g.,* 2 particleboard refiners venting to the same baghouse).

a. Dried Wood Atmospheric Refiners

Based on available information from the 2017 ICR and more recent updates, there are 6 dried wood atmospheric refiner systems following PCWP dryers. Each of the 6 dried wood atmospheric refiner systems is controlled by a baghouse for dust collection. Emissions data for total HAP are available from the 2022 CAA section 114 survey testing for 2 of the dried wood atmospheric refiner systems. Because there are fewer than 30 systems, the MACT floor for existing sources is based on the average of the top 5 systems, or in this case the 2 systems with available total HAP emissions data. The MACT floor for new sources is based on the single best performing system. The MACT floor UPLs for existing and new systems were calculated according to the methodology referenced in section III.B of this preamble. Based on these calculations, the total HAP MACT floor for existing dried wood atmospheric refiners following dryers is 4.1E–03 lb/ODT. The total HAP MACT floor for new sources is 3.3E–03 lb/ODT.

Based on the average performance level for dried wood atmospheric refiners, we anticipate that the existing and new source total HAP MACT floors could be met without the use of add-on HAP controls. No HAP reduction is estimated for existing sources. No new dried wood atmospheric refiners are projected to be constructed or reconstructed in the next 5 years.

The EPA considered an option more stringent than the MACT floor to require dried wood atmospheric refiners to meet the emission limits in table 1B to subpart DDDD of 40 CFR part 63 based on add-on HAP control. With this beyond-the-floor option, nationwide emissions reductions for existing sources were estimated to be 0.9 tpy of HAP reduced and 28 tpy of VOC reduced. The nationwide capital and annual costs of this beyond-the-floor option are $19 million and $7.8 million per year, with a cost effectiveness of $8.4 million per ton of HAP reduced and $284,000 per ton of VOC reduced. Energy impacts associated with the beyond-the-floor option for existing sources include 24,000 MW-hr/year electricity use (with associated secondary air emission impacts) and 475,000 MMBtu/yr in natural gas usage. In addition, an estimated 192,000 gal/year of wastewater (for RTO washouts) and 113 tons/year of solid waste are estimated to be generated.

After considering the regulatory options for dried wood atmospheric refiners, the EPA is proposing MACT standards based on the MACT floor for existing and new dried wood atmospheric refiners. The more stringent beyond-the-floor option was rejected due to the high costs relative to the emission reductions that would be achieved, energy usage, and other non-air quality environmental impacts. Although the more stringent beyond-the-floor option is not being proposed, we are proposing to include a provision in 40 CFR 63.2240(d)(6) to give facilities the option of complying with the more stringent limits in table 1B to subpart DDDD of 40 CFR part 63 in place of the proposed limits in table 1C to subpart DDDD of 40 CFR part 63 if they choose to meet the more stringent option.

b. Green Wood Atmospheric Refiners

Existing sources. Based on available information, there are 28 green wood atmospheric refiner systems that precede dryers in the PCWP process. Controls used on green wood atmospheric refiners include cyclones, baghouses, and oxidizers used to control or co-control dryers. Total HAP emissions data are available from the 2022 CAA section 114 survey testing for 5 green wood atmospheric refiner systems, including 3 systems with oxidizers [12] and 2 systems with baghouses. The 3 systems with oxidizers are co-controlled with other PCWP process units (*e.g.,* dryers, presses) but had measurable emission streams at the inlet to the HAP control device containing only emissions from the green wood atmospheric refiners. Because the green wood atmospheric refiner emissions could be determined at the control device inlet, the green wood atmospheric refiner emissions at the control device outlet could be estimated. (Estimation of the outlet HAP emission rate attributable to the green wood atmospheric refiners was necessary because the measured HAP emission rate at the control device outlet exceeded the atmospheric refiner inlet emissions, due to the greater contribution to the total emissions from co-controlled dryers and/or presses.) Based on the emission reduction required for green rotary dryers in table 1B to subpart DDDD of 40 CFR part 63, we estimated that the green wood atmospheric refiner emissions at the HAP control outlet would be 90 percent below the inlet for each run for purposes of obtaining run values for use in the MACT floor UPL calculation. Using the outlet test run data for the 5 systems, the total HAP MACT floor UPL for existing source green wood atmospheric refiners is 1.2E–01 lb/ODT.

Based on the average performance level for green wood atmospheric refiners, we expect that existing sources would meet the total HAP MACT floor. An option more stringent than the MACT floor would be to require existing green wood atmospheric refiners to meet the emission limits in table 1B to subpart DDDD of 40 CFR part 63. This alternative could be considered as a beyond-the-floor regulatory option for all green wood atmospheric refiners and allowed as an option for those units already co-controlled with dryers meeting the table 1B limits.

Nationwide costs of the more stringent beyond-the-floor option for existing green wood atmospheric refiners (*e.g.,* RTO control) were estimated to be $56 million capital and $23 million per year, with nationwide reductions of 59 tpy HAP and 834 tpy VOC, and cost effectiveness of $388,000/ton HAP reduction and $27,000/ton VOC reduced. Energy impacts associated with the beyond-the-floor option for existing sources include 64,000 MW-hr/year electricity use (with associated secondary air emission impacts) and 1,100 billion Btu/yr in natural gas usage. In addition, an estimated 768,000 gal/year of wastewater and 300 tons/year of solid waste are estimated be generated.

The EPA is proposing that MACT for existing source green wood atmospheric refiners be based on the MACT floor. The EPA is proposing to reject the more stringent beyond-the-floor option (table 1B limits) due to high costs compared to the emissions reductions that could be achieved, energy usage, and other non-air quality environmental impacts. Although the more-stringent beyond the floor option is not being proposed, we are proposing to include a provision in 40 CFR 63.2240(d)(6) to give facilities the option of complying with the more stringent limits in table 1B to subpart DDDD of 40 CFR part 63 in place of the proposed limits in table 1C to subpart DDDD of 40 CFR part 63 if they choose to meet the more-stringent option.

New sources. The total HAP MACT floor for green wood atmospheric refiners at new sources, based on the UPL of the data set for the single best performing system, is 2.4E–03 lb/ODT. We note that this UPL calculation is based on a limited data set.[13] Comparing the MACT floor to the average performance level achieved by all of the green wood atmospheric refiners suggests that add-on HAP control (*e.g.,* oxidizer) would be needed by most systems to meet the MACT floor for new sources. The same level of HAP control (*e.g.,* oxidizer) would be achieved by new source green wood atmospheric refiners that are co-controlled with process units required to meet the emission limits in table 1B to subpart DDDD of 40 CFR part 63. Therefore, we are proposing to provide the option in 40 CFR 63.2240(d)(6) that would allow green wood atmospheric refiners to meet either the new source MACT floor UPL specific to green wood atmospheric refiners or the current table 1B limits, because either limit would result in the same level of HAP control (*e.g.,* that achieved by use of an oxidizer). Emission reductions were estimated to be 4.9 tpy organic HAP and 77 tpy VOC. No options more stringent than the MACT floor were identified. Therefore, we are proposing standards for new source green wood atmospheric refiners based on the MACT floor.

3. Stand-Alone Digesters and Fiber Washers

One wet/dry process hardboard facility operates a batch stand-alone digester and a fiber washer that have unregulated HAP emissions. Stand-alone digesters are used to steam or water soak wood chips so that they may be easily rubbed apart or ground into fibers in atmospheric refiners that follow the digesters. Stand-alone digesters have batch operating cycles that differ from pressurized refiner pre-steaming vessels (sometimes called ‘‘digesters’’) used to preheat wood chips prior to refining. Pressurized refiner pre-steaming vessels have continuous infeed and outfeed without pressure release between the pre-steamer and pressurized refiner. We are proposing to add the following definition of ‘‘stand-alone digester’’ to the PCWP NESHAP to clearly distinguish this type of unit from pressurized refiners, which are already subject to the PCWP NESHAP.

Stand-alone digester means a pressure vessel used to heat and soften wood chips (usually by steaming) before the chips are sent to a separate process unit for refining into fiber. Stand-alone digesters operate in batch cycles that include filling with wood chips, pressurization, cooking of wood chips under pressure, pressure release (purge) venting, and chip discharge (blow) from the pressure vessel. Venting of emissions from stand-alone digesters is separate from any downstream refining process. A stand-alone digester is a process unit.

Pressurized refiners are already subject to emission standards from the 2004 PCWP NESHAP. We are proposing to

[12] A fourth green wood refiner system with RCO does not have isolatable inlet or outlet emissions because it vents straight into dryer(s) controlled by the RCO.

[13] See the memorandum, *Approach for Applying the Upper Prediction Limit to Limited Datasets,* in the docket for this action for details on our review of the data sets and conclusions regarding appropriateness of the proposed MACT floors.

amend the current definition of pressurized refiner in the PCWP NESHAP to state that: ''Pressurized refiners include pre-steaming vessels that operate under pressure to continuously feed and vent through the pressurized refiner.'' The amended definition would distinguish between pre-steaming vessels that are part of pressurized refiner systems and stand-alone digesters.

One batch stand-alone digester system at a wet/dry hardboard process was identified. Measuring emissions from the stand-alone digester vents is not feasible because the flow rate from the vents is inconsistent and varies widely with the intermittent ''purge'' and ''blow'' cycles. In addition, entrained water droplets in the high moisture stream (composed primarily of steam) can interfere with emissions samples. Considering the inability to accurately measure emissions and the over 60-year age of the 1 remaining stand-alone digester in the PCWP industry where hardboard production has severely declined due to economic constraints,[14] we have concluded that application of emissions measurement methodology is not practicable due to technological and economic limitations and that a work practice is the appropriate format of standard according to CAA section 112(h)(2)(B). The potential for HAP emissions from stand-alone digesters is reduced when: (1) clean steam from the boiler is used for the digestion process (as opposed to steam potentially contaminated with HAP being reused from another process); and (2) HAP-containing or wood pulping chemicals [15] are not added to the digestion process. Thus, we are proposing a work practice requiring clean steam to be used in the digesters and prohibiting addition of HAP-containing or wood pulping chemicals to the digestion process. Initial and continuous compliance with the stand-alone digester work practice is proposed to be demonstrated through recordkeeping. No regulatory options more stringent than the work practice were identified for further consideration for existing or new stand-alone digesters. No new fiberboard or hardboard mills are projected; therefore, no new PCWP affected sources are expected to use stand-alone digesters.

Fiber washers are units in which water-soluble components of wood (hemicellulose and sugars) that have been produced during digesting and refining are removed from the wood fiber before the fiber is used in fiberboard or hardboard production. In a fiber washer, wet fiber leaving a refiner is further diluted with water and then passed over a filter, leaving the cleaned fiber on the surface. With the decline in the number of wet process fiberboard and hardboard facilities since the 2004 NESHAP was promulgated, only 1 fiber washer remains in operation in the PCWP industry. This vacuum drum-type washer is over 60 years old (due to economic constraints), is uncontrolled, and is not configured with an enclosure to capture emissions for measurement. Because there are technological and economic limitations to measuring emissions from this washer, this unit meets the criteria under CAA section 112(h)(2)(B) for establishing a work practice standard. The potential for HAP emissions from the fiber washer is already reduced because the facility uses fresh water to perform washing (as opposed to reusing process water) and does not use any wood pulping chemicals to dissolve lignin or HAP-containing chemicals (such as resins) in the manufacturing process. The lignin that remains in the fiber helps bind the wood fibers together to form the hardboard product. We are proposing a work practice for PCWP fiber washers to use fresh water for washing and processing fiber without addition of wood pulping or HAP-containing chemicals. Initial and continuous compliance with the fiber washer work practice is proposed to be demonstrated through recordkeeping. No regulatory options more stringent than the work practice were identified for further consideration for existing or new fiber washers. No new fiberboard or hardboard mills are projected; therefore, no new PCWP affected sources are expected to use fiber washers. No HAP emission reductions are expected to result from the work practices standards because they are already in use.

4. Fiberboard Mat Dryers and Press Predryers at Existing Sources

Fiberboard mat dryers are conveyor-type dryers used to dry wet-formed fiber mats. Press predryers are used in the wet/dry hardboard process to remove additional moisture from the hardboard mat after it exits the fiberboard mat dryer before the mat enters the hardboard press.

The PCWP NESHAP contains HAP emission standards for fiberboard mat dryers (heated zones) and hardboard press predryers at new sources (*i.e.,* the add-on control device compliance options in table 1B to subpart DDDD of 40 CFR part 63 or the production-based compliance option in table 1A to subpart DDDD of 40 CFR part 63). In this action, the EPA is proposing standards for the heated zones of an existing fiberboard mat dryer and hardboard press predryer that are unregulated for HAP at a wet/dry process hardboard facility. Both of these existing dryers are uncontrolled.

According to CAA section 112(d)(3)(B), because there are fewer than 30 sources, the MACT floor for existing sources must be based on the ''average emission limitation achieved by the best performing 5 sources'' or in this case the one fiberboard mat dryer and one predryer with unregulated HAP emissions. The average emission limitation achieved for purposes of setting the MACT floor emission level is based on the upper limit (UL) of the test data when there is only 1 source (where prediction is not required). The UL for each dryer was calculated using HAP test data collected in 2022 through a CAA section 114 survey.

For the fiberboard mat dryer (heated zones), the MACT floor based on the UL of the test data is 4.9E–02 lb total HAP per MSF on a ⅛″ thickness basis. The MACT floor based on the UL of the test data for the press predryer is 8.0E–02 lb total HAP per MSF on a ⅛″ thickness basis. We note that the MACT floor calculations were based on limited data sets.[16] No organic HAP emission reductions are associated with the MACT floor options.

We considered beyond-the-floor regulatory options for the existing fiberboard mat dryer and press predryer, which would be to route the dryers to incineration-based control, such as an RTO, in order to meet the emission limits of table 1B to subpart DDDD of 40 CFR part 63 as required in the NESHAP for new sources. Both dryers were considered together because using 1 RTO to treat emission streams from both dryers would be more cost-effective than 2 separate HAP control devices. In addition to RTO installation and operating costs, compliance costs would include emissions testing, RTO temperature monitoring, reporting, and recordkeeping. Total capital and annual costs associated with the beyond-the-

[14] Eighteen facilities manufacturing hardboard were in operation when the PCWP NESHAP was promulgated in 2004. Four hardboard manufacturing facilities remain in operation today.

[15] Wood pulping chemicals added to dissolve lignin in wood include sodium sulfide (Na_2S) in combination with sodium hydroxide (NaOH), sulfurous acid (H_2SO_3) compounds, or sodium sulfite (Na_2SO_3) in combination with sodium carbonate (Na_2CO_3). Lignin removal is not necessary in the hardboard industry where natural lignin helps bind wood fibers in processes where synthetic resins are not used.

[16] See the memorandum, *Approach for Applying the Upper Prediction Limit to Limited Datasets,* in the docket for this action for details on our review of the data sets and conclusions regarding appropriateness of the proposed MACT floors.

floor option are estimated to be $2.2 million and 1.0 million per year, respectively. Reductions in HAP and VOC associated with the beyond-the-floor option for both dryers are estimated to be 8.1 tpy organic HAP and 16 tpy VOC, for a cost effectiveness of $117,000/ton of organic HAP reduced and $61,000/ton of VOC reduced. Energy impacts associated with the beyond-the-floor option for existing sources include 3,000 MW-hr/year electricity use (with associated secondary air emission impacts) and 50,000 MMBtu/yr in natural gas usage. In addition, an estimated 21,000 gal/year of wastewater and 8.2 tons/year of solid waste are estimated to be generated from oxidizer media washouts and replacements, respectively.

After reviewing the regulatory options for the existing fiberboard mat dyer heated zones and press predryer, the EPA is proposing to set the HAP emission standards at the MACT floor. The more stringent beyond-the-floor options for each dryer were rejected because of the high costs relative to the HAP emission reduction that could be achieved, energy usage, and other non-air quality environmental impacts. Although the more stringent beyond-the-floor options are not being proposed, we are proposing to include a provision in 40 CFR 63.2240(d)(6) to allow for compliance with the more stringent limits in table 1B to subpart DDDD of 40 CFR part 63 in place of the proposed limits in table 1C to subpart DDDD of 40 CFR part 63.

5. Log Vats

Log vats are used to condition logs before they are cut into veneer or wood strands. Hot water vats in which logs are immersed are often open to the atmosphere. In log steaming or ''chest'' vats, logs are placed in the vat in batches, the door is closed, and steam (which condenses in the vat) along with hot water sprays are used to condition the logs for a specified time before the logs are removed for veneer production. Both types of vats heat logs to within the same temperature range (up to 230 °F based on ICR responses).

The recent ICR identified 81 log vats used at PCWP facilities, including 51 hot water vats and 30 chest vats. None of the log vats are controlled for HAP, have a conveyance for collection of emissions, or have a stack for emissions measurement. Because the log vats have neither the proper emissions capture and conveyance ductwork nor stacks where emissions testing could be conducted, based on CAA section 112(h)(2)(A) and (B), we are proposing a work practice standard for log vats at existing or new sources. Although the HAP emissions data are not available to correlate with log temperature, it is reasonable to expect that overheating logs could increase the potential for HAP emissions from log vats. The proposed work practice standard would require facilities to: (a) operate each vat using a site-specific target log temperature that does not exceed 212 °F, measured in the water used to soak the logs or in the wood cut at the lathe or standers; and (b) operate each vat to reduce the potential for fugitive emissions by either: (1) covering at least 80 percent of the vat hot water surface area for soaking vats in which logs are submerged; or (2) keeping doors closed while steam or hot water showers are being applied inside log steaming vats.

Initial and continuous compliance with the log vat work practice could be demonstrated through monitoring, recordkeeping, and reporting that reflects adherence to the work practice conditions. No regulatory options more stringent than the work practice were identified for further consideration for log vats. Nationwide organic HAP reductions are estimated to be 0.7 tpy for existing sources and 0.17 tpy for new sources.

6. Mixed PCWP Process Streams Regulated at Existing Sources

Some PCWP facilities route emission streams from multiple process units of the same or different types into 1 shared HAP control system such as an RTO, RCO, biofilter, or process incineration system to meet the compliance options in table 1B to subpart DDDD of 40 CFR part 63. In a few mixed process arrangements, an emissions stream from a remanded unit is mixed at the inlet to a HAP control device and co-controlled with other process units listed in table 1B such that the combined emission stream became subject to the table 1B limits when the control system was initially installed to meet the 2004 NESHAP or as part of the PCWP plant design. Due to commingling, emissions from each individual type of process unit contributing to a mixed PCWP process stream cannot be distinguished at the inlet or outlet of the control device. For this reason, we are proposing that mixed PCWP process streams from remanded units meeting the compliance options in table 1B be considered a separate type of emission stream that remains subject to the table 1B limits. Mixed PCWP process streams are proposed to be defined in 40 CFR 63.2292 as an emission stream from a process unit subject to the final amendments that was commingled with emissions stream(s) from process unit(s) subject to the compliance options in table 1B to subpart DDDD of 40 CFR part 63 before the effective date of the final amendments at an affected source that commenced construction (or reconstruction) on or before the date of this proposal. The recommended definition of ''mixed PCWP process stream'' refers specifically to a ''stream'' as opposed to a whole process unit because there can be uncaptured or uncontrolled emissions from a remanded process unit in addition to the captured emission stream from the remanded unit that is routed to the HAP control device as part of a mixed PCWP process stream.

D. What MACT standards are we proposing for process units with MDI emissions?

The EPA is proposing standards to regulate MDI emissions from reconstituted wood products presses, tube dryers that blow-line blend MDI resin, and miscellaneous coating operations. The proposed standards for tube dryers that blow-line blend MDI resin would apply for commingled MDI emissions from tube dryers and reconstituted wood products presses using MDI. Supporting information for the proposed standards is provided in the memorandum, *Regulatory Options for MDI Emissions from Plywood and Composite Wood Products Reconstituted Wood Products Presses, Tube Dryers, and Miscellaneous Coating Operations,* in the docket for this action.

1. Reconstituted Wood Products Presses

The EPA is proposing standards for MDI emissions from reconstituted wood products presses that use MDI resin at any time during the year in any portion of the board (*e.g.,* whole board, core, or face). Emissions data for MDI are available from EPA Method 326 testing conducted in 2022 (in response to a CAA section 114 request) on presses using MDI throughout the whole board.

The EPA is proposing to distinguish reconstituted wood products presses that produce OSB from those producing particleboard or MDF (PB/MDF) for purposes of establishing MDI standards because product differences appear to affect MDI emissions. With the HAP control level being the same, product differences are expected to be the reason for the difference in MDI emissions. Particleboard and MDF are similar to one another in that they are used for the same interior product markets (*e.g.,* cabinets, shelving, furniture) while OSB is used for exterior applications (*e.g.,* siding, roofing). OSB furnish is made of flat wood strands (*e.g.,* several inches in length) as opposed to the small wood fibers used to manufacture MDF. The smaller wood fibers (or particles) used in MDF/PB presses have greater overall surface area than the much larger OSB wood strands per volume of board produced. The difference in wood furnish surface area that is coated with MDI resin can result in different potential for MDI emissions from PB/MDF presses compared to OSB presses. Different pressing temperatures are also used. Therefore, we are proposing to group the presses by product type to adequately address the variability in MDI emissions associated with different products.

There are 26 OSB presses that use MDI resin. The EPA has MDI emissions data for 2 of these presses using the type of control system considered to be best performing for reducing organic HAP emissions, including MDI. As noted previously, when there are fewer than 30 sources, the MACT floor is based on the best performing 5 sources. However, in this case emissions data are only available for 2 sources for determining the MACT floor. Using the MDI emissions data from 2 OSB presses, the MACT floor for existing sources was calculated and compared to the 3xRDL MDI concentration and OSB press emission rate values of 27 micrograms per dry standard cubic meter (ug/dscm) of air or 2.5E–04 lb/MSF ¾″ (1.3E–04 lb/MSF ⅜″). The 3xRDL values exceeded the MACT floor concentration and emission rate for existing sources and are therefore being proposed in place of the existing source MACT floor for OSB presses using MDI to ensure that the standards are established at the minimum level at which emissions can be measured reliably. The MDI MACT floor for new source OSB presses was calculated using the MDI emissions data for the best performing OSB press and compared to the 3xRDL MDI concentration. The 3xRDL values exceeded the MACT floor concentration and emission rate for new sources and are therefore being proposed in place of the new source MACT floor for OSB presses using MDI.

There are 10 PB/MDF presses that use MDI resin. The EPA has MDI emissions data for 2 of the PB/MDF presses with the type of control system considered to be best performing for reducing organic HAP emissions, including MDI. Using the MDI emissions data from the 2 PB/MDF presses, the MACT floor for existing sources was determined to be 8.4E–04 lb/MSF ¾″ or 200 ug/dscm, which is higher than the corresponding 3xRDL value. The MACT floor for new source PB/MDF presses was calculated based on the single best performing press and compared to the 3xRDL MDI concentration and PB/MDF press emission rate values of 27 ug/dscm and 2.3E–04 lb/MSF ¾″, respectively. The 3xRDL values exceeded the MACT floor concentration and emission rate and are therefore being proposed in place of the MACT floor for new source PB/MDF presses using MDI to ensure that the standards are established at the minimum level at which emissions can be measured reliably.

Estimated annual emissions of MDI from the reconstituted wood products presses tested were less than 0.1 ton/year. This low level of emissions is likely because MDI polymerizes into a solid rapidly and irreversibly in the reconstituted wood products press, and the presses tested are equipped with the types of organic HAP controls found on the best performing sources in the PCWP industry. Also, less than one hundredth of a percent (<0.01%) of the MDI applied was measured at the inlet or outlet of the control device. Considering the low levels of MDI emitted and that reconstituted wood products presses already meet HAP limits from the 2004 PCWP NESHAP using robust HAP controls, no regulatory options more stringent than the existing or new source MACT floors for MDI were identified for OSB or PB/MDF reconstituted wood products presses. Accordingly, we are proposing that the MDI MACT floors for existing and new OSB and PB/MDF reconstituted wood products presses is MACT for these process units.

Reconstituted wood products presses operating HAP controls are expected to meet the MACT floor for existing and new sources. However, it is currently unknown whether presses at 2 particleboard facilities that meet the PCWP production-based compliance option (PBCO) [17] using pollution prevention measures would meet the MDI MACT floor. An MDI emission reduction of 0.077 tpy with corresponding VOC reduction of up to 63 tpy is estimated for existing sources. For new sources, no MDI or VOC emission reductions are estimated because new presses are expected to meet the new source limit.

2. Tube Dryers

Primary tube dryers often incorporate blow-line blending in which resin is added to wood fibers as they enter the primary tube dryer. The resin and wood fibers mix with the turbulent conditions in the primary tube dryer as the wood fiber is dried. Within the PCWP industry, 5 primary tube dryer systems incorporate blow-line blending using MDI resin to produce MDF. In addition, 3 secondary tube dryer systems follow primary tube dryers that blow-line blend MDI resin. All of the primary and secondary tube dryer systems have air pollution controls to reduce organic HAP emissions to comply with the 2004 PCWP NESHAP standards.

Primary and secondary tube dryers are often co-controlled. In some systems, air flow from the secondary tube dryers vents through the primary tube dryers (for energy conservation), while in other systems the secondary tube dryers vent directly to the same air pollution control system as the primary tube dryers. All of the secondary tube dryers that follow primary tube dryers in which MDI is injected with a blow-line have emissions that exit from the same emission point as primary tube dryers. Therefore, the MDI emission limits developed for the primary tube dryers apply for secondary tube dryers as well.

Primary tube dryers may also be co-controlled with a reconstituted wood products press. Emissions data for MDI are available from the 2022 CAA section 114 survey testing for 1 MDI primary tube dryer system that blow-line blends MDI and is co-controlled with a press. Emissions from the dryer (including press emissions routed through the dryer) are controlled by an RTO. The inlet and outlet of the RTO were tested for MDI, in which an average MDI reduction of 87 percent was achieved. The inlet MDI concentration for the blow-line blend tube dryer (with press) system was higher than MDI emissions from reconstituted wood products presses alone, which suggests that most of the MDI emissions in a combined system are associated with the blow-line blend tube dryer. Therefore, we are proposing that the same MDI standard (in terms of lb/ODT) established for blow-line blend tube dryers alone would also apply for blow-line blend tube dryer and press combinations.

Because there are fewer than 30 primary tube dryers that blow-line blend MDI, according to CAA section 112(d), the MACT floor for existing sources is based on the best performing 5 systems for which the Administrator has emissions information and the MACT floor for new sources is based on the single best performing system. In this case, because emissions data are available for only 1 system, data for this 1 system was used to establish the MACT floor for both existing and new sources. Using the emission test run data for the tested dryer system (7 runs), the MACT floor for new and existing sources is 1.7E–02 lb/ODT or 0.68 mg/

[17] Table 1A to subpart DDDD of 40 CFR part 63 contains the PBCO total HAP limits.

dscm. No regulatory options more stringent than the MACT floor were identified for tube dryers that blow-line blend MDI.

Because all of the tube dryer systems that blow-line blend MDI resin have HAP emission controls, we anticipate that they would all meet the MDI MACT floor based on the average MDI emissions from the comparable unit tested. No MDI emission reductions are estimated as all existing and new sources are expected to meet the MACT floor.

3. Miscellaneous Coatings Operations

The EPA is proposing to regulate MDI emissions from miscellaneous coating operations in which MDI moisture sealants are applied to engineered wood products such as parallel strand lumber or LVL. One MDI moisture sealant spray booth at an engineered wood products facility was identified and tested as part of the 2022 CAA section 114 survey. Using the test data from this facility, the proposed MACT floor limit for existing and new sources is 1.9E–03 lb MDI emitted/lb sealant applied, or 1.4E–05 lb MDI/ft^2 surface area coated based on coating HAP content. No reduction in MDI emissions is estimated as a result of the MDI MACT floor. No options more stringent than the MACT floor emission level were identified for further analysis.

E. What performance testing, monitoring, and recordkeeping and reporting are we proposing?

1. Performance Testing

For the new and existing source emission limits being added to the PCWP NESHAP, we are proposing that new sources demonstrate initial compliance within 180 days after the effective date of the final rule or after startup, whichever is later, and that existing sources demonstrate initial compliance within 3 years after promulgation of the final rule. Additionally, we are proposing that subsequent performance testing would be required every 5 years (60 months), using the methods identified in table 4 to subpart DDDD of 40 CFR part 63.

The proposed emissions test methods for total HAP include EPA Method 320 (40 CFR part 63, appendix A), NCASI Method IM/CAN/WP–99.02 (IBR in 40 CFR 63.14), NCASI Method ISS/FP–A105.0 (IBR in 40 CFR 63.14); or ASTM D6348–12e1 (IBR in 40 CFR 63.14) with the conditions discussed in section VIII.I of this preamble. EPA Method 326 (40 CFR part 63, appendix A) is proposed for MDI emissions measurement, in which a minimum sample of 1 dry standard cubic meter (dscm) must be collected. For PM as a surrogate to HAP metals, either EPA Method 5 (40 CFR part 60, appendix A–3) or EPA Method 29 (40 CFR part 60, appendix A–8) is proposed with a minimum sample volume of 2 dscm. For Hg, EPA Method 29 or EPA Method 30B (40 CFR part 60, appendix A–8) are proposed, with a minimum sample volume of 2 dscm. The EPA Method 26A (40 CFR part 60, appendix A–8) is proposed for HCl emissions measurement with a minimum sample volume of 2 dscm. The recently updated EPA Method 23 (40 CFR part 60, appendix A–8) is proposed for PAH emission measurement with a minimum sample volume of 3 dscm. Consistent with the treatment of non-detect data used to establish the emission standards, we are proposing that non-detect data be treated as the MDL in test averages used to demonstrate compliance with the standards proposed in tables 1C, 1D, or 1E to subpart DDDD of 40 CFR part 63.

2. Parameter Monitoring

Under this proposal, continuous compliance with the standards proposed in tables 1C, 1D, or 1E to subpart DDDD of 40 CFR part 63 would be demonstrated through control device parameter monitoring coupled with periodic emissions testing described earlier in this preamble. The parametric monitoring already required in table 2 to subpart DDDD of 40 CFR part 63 for thermal oxidizers, catalytic oxidizers, or biofilters to demonstrate continuous compliance with the compliance options in table 1B to subpart DDDD of 40 CFR part 63 would also be required to demonstrate ongoing compliance with the standards in tables 1C, 1D, or 1E to subpart DDDD of 40 CFR part 63. In addition to the parametric monitoring currently specified for thermal oxidizers, catalytic oxidizers, or biofilters, we are proposing to add to table 2 to subpart DDDD of 40 CFR part 63 the following parameter monitoring requirements for the types of APCDs that we expect would be used to comply with the standards proposed in tables 1D or 1E to subpart DDDD of 40 CFR part 63:

- For WESP, monitor and record the secondary electric power input and liquid flow rate;
- For dry ESP, monitor and record the secondary electric power input or opacity;
- For wet PM scrubbers, monitor and record the liquid flow rate and pressure drop;
- For wet acid gas scrubbers, monitor and record the liquid flow rate and effluent pH;
- For electrified filter beds, monitor and record the ionizer voltage or current and pressure drop; and
- For mechanical collectors (*e.g.,* cyclone or multiclone) or other dry control devices, monitor and record opacity.

The operating limits for these parameters are proposed to be set consistent with the existing provisions of 40 CFR 63.2262, as the average of the 3 test run averages during the performance test. Continuous compliance with the parameters for WESP, dry ESP, wet scrubbers, and EFB would be determined by comparing the 3-hour block average parameter average to the limit established during the performance test.

Consistent with existing provisions in table 2 to subpart DDDD of 40 CFR part 63, a source owner choosing to rely on a control device other than a thermal oxidizer, catalytic oxidizer, or biofilter used to meet a compliance option in table 1C to subpart DDDD of 40 CFR part 63 would be required to petition the Administrator for site-specific operating parameters to be monitored or would have to maintain the 3-hour block average THC concentration within the limits established during the performance test. The source owner of process units that meet a compliance option in table 1C, 1D, or 1E to subpart DDDD of 40 CFR part 63 without using a control device would be required to maintain on a daily basis the process unit controlling operating parameter(s) within the ranges established during the performance test or maintain the 3-hour block average THC concentration within the limits established during the performance test.

For control devices where opacity is used as an operating parameter, we are proposing that a continuous opacity monitoring system (COMS) would be used and that the 24-hour block average opacity must not exceed 10 percent (or the highest hourly average measured during the performance test). We are proposing updates to table 10 to subpart DDDD of 40 CFR part 63 to indicate provisions pertaining to opacity and COMS that apply for subpart DDDD. We are proposing to change the following provisions from ''No'' or ''NA'' to ''Yes'' in table 10: 40 CFR 63.8(c)(5), 63.8(e), 63.9(f), and 63.10(e)(4). We are also proposing to note in table 10 that the requirements for opacity standards in 40 CFR 63.6(h)(2) through (9) do not apply because the opacity is being proposed as an operating limit and not as an emission standard.

Continuous monitoring requirements associated with the work practices proposed in table 3 to subpart DDDD of 40 CFR part 63 include combustion unit bypass stack usage monitoring (*e.g.,* temperature or bypass damper position), lumber kiln dry bulb temperature monitoring (for comparison of the 3-hour block average to the dry bulb set point), in-kiln lumber moisture monitoring (for comparison of the semiannual average kiln-dried lumber moisture content), or monitoring of lumber kiln temperature (with 3-hour block averaging) and lumber moisture (with semiannual averaging) for comparison to limits in an approved site-specific plan.

We are also proposing continuous monitoring and recording of process unit bypass stack usage at all times while the process units are operating, including times when the process unit is undergoing startup or shutdown, and during the operating conditions specified in 40 CFR 63.2250(f)(2) through (4). This requirement is being proposed to ensure that reliable data are available to evaluate continuous compliance with the PCWP NESHAP requirements.

Consistent with NESHAP general provisions, a source owner would be required to operate and maintain the source, its air pollution control equipment, and its monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, to include operating and maintaining equipment in accordance with the manufacturer's recommendations. Owners would be required to prepare and keep records of calibration and accuracy checks of the continuous monitoring system (CMS) to document proper operation and maintenance of the monitoring system.

3. Recordkeeping and Reporting

Under this proposal, and consistent with existing requirements in the PCWP NESHAP, a source owner would be required to submit semi-annual compliance summary reports which document both compliance with the requirements of the PCWP NESHAP and any deviations from compliance with any of those requirements. Owners and operators would be required to maintain the records specified by 40 CFR 63.10 and, in addition, would be required to maintain records of all monitoring data, in accordance with the PCWP NESHAP (40 CFR 63.2282).

F. What other actions are we proposing, and what is the rationale for those actions?

In addition to proposing the new standards and monitoring, recordkeeping and reporting requirements discussed above, we are proposing to revise the PCWP NESHAP to remove obsolete rule language including the emissions averaging compliance option, dates, and startup/shutdown provisions that are no longer in effect. Removing the outdated language from the PCWP NESHAP would streamline the rule and make it easier to read. We are also proposing updates and clarifications of the electronic reporting requirements. The proposed revisions and rationale are presented below.

1. Emissions Averaging

Emissions averaging was included in the 2004 rule as a compliance option for use at existing affected sources. To date, the EPA is only aware of one facility that used the emissions averaging compliance option, but that facility has ceased PCWP production. We are proposing to remove the emissions averaging compliance option because no existing facilities are using it, and emissions averaging is not an option for new affected facilities. Also, the proposed new emission standards discussed in section IV of this preamble further diminish opportunities for emissions averaging. Our proposal to remove the emissions averaging option would simplify the rule language.

2. Obsolete Dates and Provisions

On August 13, 2020, the EPA published several amendments to the PCWP NESHAP that were effective on August 13, 2020. The amendments included removal of references to the SSM exemption in 40 CFR 63.6(f)(1) and (h)(1) and changes to certain recordkeeping and reporting provisions. The compliance dates for the August 13, 2020, amendments were August 13, 2020, for affected sources that commenced construction or reconstruction after September 19, 2019, or August 31, 2021, for all other affected sources. Those compliance dates have passed.

The amendments now being proposed would become effective on the date of publication of the final rule and would have multiple associated compliance dates as discussed in section IV.G of this preamble. To reduce confusion as we add future compliance dates to the PCWP NESHAP, we are proposing to remove the obsolete dates and provisions that are no longer in effect, including:

- In 40 CFR 63.2233(1) through (3), cross-references to specific paragraphs needed to implement the August 13, 2020, amendments are proposed to be removed and replaced with a reference to the proposed 40 CFR 63.2233(e), which provides compliance dates for the rule requirements proposed in this action.
- Paragraphs 40 CFR 63.2250(a) through (c) are proposed to be removed and reserved because their requirements no longer apply.
- Date language is proposed to be removed in paragraphs 40 CFR 63.2250(f) and (g), which are paragraphs that replaced the obsolete paragraphs 40 CFR 63.2250(a) through (c) in the August 13, 2020, amendments.
- Paragraphs 40 CFR 63.2280(b) and (d) contained dates for when electronic submittal of initial notifications and performance test results became effective. 40 CFR 63.2281(b)(6) contained dates for when electronic submittal of semiannual reports became effective. These dates have passed, and the electronic reporting requirements are in full effect, so we are proposing to remove dates to make the rule easier to read.
- The first part of paragraph 40 CFR 63.2281(c)(4) contains dates for language that was phased out as well as dates for when electronic reporting requirements were phased in. Similarly, 40 CFR 63.2282(a)(2) contains obsolete dates and language intended to phase out some records and phase in other records. Because the dates have now passed, we are proposing to remove the obsolete language to simplify the rule.
- Row 2 in table 9 to subpart DDDD of 40 CFR part 63 is proposed to be removed and reserved because the requirement for an SSM report is no longer in effect.
- The August 13, 2020, final rule added a column to table 10 to subpart DDDD of 40 CFR part 63 to clarify which general provisions in subpart A of 40 CFR part 63 applied before and after August 13, 2021, for existing sources. The now obsolete column pertaining to requirements before August 13, 2021, is proposed to be removed.

Those amendments pertain to SSM provisions that have been removed and to reporting provisions that were added on August 13, 2020. For clarity, we are retaining date language from the August 13, 2020, final rule that specified compliance dates for standards and electronic reporting provisions added with that rulemaking. We have also taken care to insert compliance date language for the new standards proposed in this action (in 40 CFR 63.2240(d) and (e), tables 1C, 1D, 1E to subpart DDDD of 40 CFR part 63, 40 CFR 63.2241(d) through (h), and table 3 to subpart DDDD of 40 CFR part 63) as discussed further in section IV.G of this preamble.

3. Electronic Reporting Updates and Clarifications

On November 19, 2020, the EPA published a final rule incorporating standard electronic reporting language into the general provisions at 40 CFR 63.9(k). In this action, we are proposing to update the electronic reporting language in 40 CFR part 63, subpart DDDD, to refer to the provisions in 40 CFR 63.9(k) in addition to other revisions. The proposed revisions are as follows:

- We are proposing to require that initial notifications and notifications of compliance status be submitted in a user-specified format such as portable document format (PDF) in 40 CFR 63.2280(b) and (d) instead of 40 CFR 63.2281(h).
- General provisions pertaining to submittal of CBI are proposed to be removed from 40 CFR 63.2281(h), (i)(3), and (j)(3).
- In 40 CFR 63.2281(k), we are proposing to replace language pertaining to CEDRI outages (which is now in 40 CFR 63.9(k)) with additional detailed procedures for submitting CBI in electronic format. The update provides an email address that source owners and operators can use to electronically mail CBI to the OAQPS CBI Office when submitting compliance reports.
- In 40 CFR 63.2281(l), we are proposing to remove the provisions related to force majeure claims which are now in 40 CFR 63.9(k).
- We are proposing to remove the provision in 40 CFR 63.2283(d) that states that records submitted to CEDRI may be maintained in electronic format, because 40 CFR 63.10(b)(1) already allows the retention of all records electronically.
- In table 10 to subpart DDDD of 40 CFR part 63, we are proposing to indicate that all of the provisions in 40 CFR 63.9(k) apply to 40 CFR part 63, subpart DDDD.

In addition, we are proposing to amend 40 CFR 63.2281(c)(4) to clarify the compliance reporting requirements for the work practices in table 3 to subpart DDDD of 40 CFR part 63 (rows 6, 7, or 8). We are proposing to clarify that the requirement to report the date, time, and duration of every instance in which one of the work practices is used applies only if that individual work practice is used for more than 100 hours during the reporting period. The EPA's original intent was for the 100-hour reporting threshold to be compared to the semiannual usage of each of the 3 work practices individually, not for the total usage of all 3 work practices combined. As stated in 40 CFR 63.2281(c)(4), when one of the work practices is used for less than 100 hours per semiannual reporting period, a summary of the number of instances and total amount of time that work practice was used is required to be reported. As noted previously, we are also proposing to require continuous monitoring and recording of process unit bypass stack usage at all times including during the operating conditions specified in 40 CFR 63.2250(f)(2) through (4) and table 3 to subpart DDDD of 40 CFR part 63 (rows 6, 7, or 8) to ensure that reliable data are available to evaluate continuous compliance with the PCWP NESHAP requirements.

Finally, we are placing in the docket a revised draft version of the PCWP semiannual reporting template with updates to reflect the proposed changes to 40 CFR part 63, subpart DDDD, described throughout this preamble.

4. Definitions and Other Amendments

We are proposing to add several definitions to the PCWP NESHAP to define process units with new standards being added to the rule. We are also proposing to amend selected existing definitions to ensure that the products and process units covered by the PCWP NESHAP are adequately described.

5. Issues Raised by Petitioners Following the RTR

Following publication of the final RTR (85 FR 49434, August 13, 2020), the EPA received a petition for reconsideration (Petition) from Earthjustice on behalf of Greater Birmingham Alliance to Stop Pollution, Louisiana Environmental Action Network, and Sierra Club (Petitioners). The Petitioners asked the EPA to reconsider certain aspects of the August 13, 2020, final technology review and other amendments under the authority of CAA section 307(d)(7)(B), arguing that the EPA's rationale for four decisions all appeared for the first time in the 2020 final rule and response to comments (RTC) document accompanying the final rule.[18] The EPA is proposing changes to the PCWP NESHAP to address some of the Petitioners' concerns and is inviting public comment on some of the issues raised by the Petitioners in their letter to the EPA, which is available in the docket for this action.[19] The four issues are discussed below.

In the first issue raised, the Petitioners alleged that the EPA failed to set limits for unregulated HAPs. Although we do not agree that the Petitioners have met their burden under CAA section 307(d)(7)(B) to show that it was impracticable to raise this objection during the public comment period for the proposed 2020 technology review, and thereby compel reconsideration of this issue, this action contains proposed standards for unregulated HAP in order to respond to the 2007 partial remand and vacatur of the 2004 NESHAP and to comport with the 2020 *LEAN* ruling, such that the Petitioners' concern regarding this issue will be resolved once this action is finalized.

In the second and third issues raised by the Petitioners, they disagreed with two work practices the EPA finalized on the August 13, 2020, for safety-related shutdowns and pressurized refiner startup and shutdown and objected to what they perceived to be the EPA's changed or new rationale for these work practices, claiming that they did not have an opportunity to raise their objections during the public comment period. The Petitioners disagreed with the EPA's use of CAA section 112(h) to develop work practice standards for safety-related shutdowns and pressurized refiner startup and shutdown events. For safety-related shutdowns, the Petitioners took issue with the EPA's rationale that facilities cannot capture and convey HAP emissions *to a control device* during these periods for safety reasons (RTC at 89, emphasis added), saying that whether emissions can be conveyed *to a control device* is irrelevant under CAA section 112(h)(2)(A). In response to this critique, and to ensure that there is a full opportunity for all stakeholders to comment on the EPA's rationale for these work practices, the EPA requests comment on the relevance of the ability of facilities to capture and convey emissions to a control device to CAA

[18] *National Emission Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products (40 CFR part 63, subpart DDDD) Residual Risk and Technology Review, Final Amendments, Responses to Public Comments on September 6, 2019, Proposal.* Document ID No. EPA–HQ–OAR–2016–0243–0244 in the docket for this action.

[19] Letter from J. Pew, Earthjustice, to A. Wheeler, EPA. Petition for reconsideration of the final action taken at 85 FR 49434 (August 13, 2020), titled ''*National Emission Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products Residual Risk and Technology Review submitted on behalf of Greater Birmingham Alliance to Stop Pollution, Louisiana Environmental Action Network, and Sierra Club.*'' October 13, 2020.

section 112(h)(2)(A), given that CAA section 112(h)(2)(A) explicates CAA section 112(h)(1) which explicitly refers to the EPA's judgment as to when it is not feasible to prescribe or enforce an emission standard *for control of* a HAP (emphasis added).

Regarding the EPA's rationale under CAA section 112(h)(2)(B) for the safety-related shutdown and pressurized refiner startup and shutdown work practices, the Petitioners expressed discontent with the EPA's conclusion that stack tests (which typically take 1 to 3 hours) cannot be conducted for events lasting only minutes. The Petitioners asserted that EPA should have considered the practicability of other measurement methodologies including CEMS or continuous parameter monitoring. In response to the Petitioners' concerns, we maintain that stack testing is not feasible for safety-related shutdown events lasting only minutes or for pressurized refiner startup/shutdown events lasting less than 15 minutes. We request comment on how the EPA could feasibly prescribe or enforce a numeric emission limit for such short-term events without the ability to conduct stack testing. Further, continuous operation of CEMS on bypass stacks that are unused for the majority of process operating time is not practicable from an economic standpoint or technically (*e.g.,* because of the calibration drift likely to occur while the CEMS goes unused). The source testing required for conducting a RATA of CEMS would not be possible without requiring the use of the bypass during the RATA. Obtaining emissions data to correlate with parameters to establish continuously monitored parameter limits also necessitates stack testing. Although CEMS or specific continuously monitored parameter limits are not an appropriate measurement methodology for safety-related shutdowns and pressurized refiner startups and shutdowns themselves because of technical and economic limitations, we are proposing additional continuous parameter monitoring of bypass stack usage in addition to the work practices for safety-related shutdowns and pressurized refiner startup/shutdown events to address the Petitioners' concern. As discussed in section IV.A.6 of this preamble, we are proposing to require continuous monitoring of combustion unit bypass stacks in addition to proposing standards for annual tune-ups of combustion units used to direct-fire dryers. As discussed in section IV.E.2 of this preamble, we are also proposing continuous monitoring of process unit bypass stack usage at all times while the process units are operating, including times when the process unit is undergoing startup or shutdown, and during safety-related shutdowns and pressurized refiner startup/shutdown events to ensure that reliable data are available to evaluate continuous compliance with the PCWP NESHAP requirements.

The Petitioners also took issue with inclusion of measures that facilities have developed to protect workers and equipment in the safety-related shutdown work practice. The Petitioners argued that the steps an operator takes to protect workers and equipment are not necessarily the steps needed to prevent excess emissions or to remove raw materials and the heat source from the process as expeditiously as possible. We disagree with the Petitioners that the phrase ''to protect workers and equipment'' detracts from the safety-related shutdown work practice requirements to ensure that the flow of raw materials (such as furnish or resin) and fuel or process heat (as applicable) ceases and that material is removed from the process unit(s) as expeditiously as possible given the system design to reduce air emissions. However, we request comment on inclusion of measures facilities developed to protect workers and equipment from the safety-related shutdown provision. We also request comment on all aspects of the work practice provisions (which appear in table 3 to subpart DDDD of 40 CFR part 63, rows 6 and 7) based on operational experience now that these narrowly defined provisions have been implemented in place of the broader SSM exemptions that were removed from the PCWP NESHAP.

In their fourth issue raised, the Petitioners disagreed with the EPA's statement that use of low-HAP resins is a development under CAA section 112(d)(6), claiming that the EPA must revise standards for any development identified to require the maximum degree of reduction that is achievable through its application. In the 2020 technology review, when noting that low-HAP resins were a development, the EPA also explained that the EPA did not identify information to suggest that the resin system changes have significantly altered the type of process units or HAP pollution control technologies used in the PCWP industry to date or have led to processes or practices that have not been accounted for in the promulgated PCWP NESHAP compliance options. The Petitioners dismissed as irrelevant the EPA's explanation that there are many types of resin systems used in the manufacture of the various PCWP and that the resin-system solution for one facility's product may not be applicable for another product produced at a different facility. The Petitioners also argued that it is irrelevant that the EPA noted in 2020 plans for additional action for the PCWP NESHAP source category with respect to remanded PCWP process units in which the EPA would further consider the effects of resin system changes.

Given the Petitioners' objections, we are rearticulating our conclusion from the August 13, 2020, final technology review. Specifically, we are retracting our characterization of low-HAP resins as a ''development'' under CAA section 112(d)(6) with respect to the standards established for the PCWP source category in 2004. As noted in 2020, the EPA did not identify information suggesting that the resin system changes have significantly altered the type of process units or HAP pollution control technologies used in the PCWP industry or have led to processes or practices that were not accounted for in the 2004 promulgated PCWP NESHAP compliance options. Therefore, we agree with the Petitioners that it may have been inappropriate to describe resin changes as a ''development'' under CAA section 112(d)(6) since the 2004 promulgated standards. Moreover, we disagree with the Petitioners' claim that if resin changes were in fact such a ''development,'' the EPA would be required to establish MACT standards under CAA section 112(d)(2) and (3) as a consequence of that development. CAA section 112(d)(6) does not require the EPA to reconduct MACT determinations, as the D.C. Circuit made clear in *NRDC* v. *EPA*, 529 F.3d 1077 (D.C. Cir. 2008). Instead, CAA section 112(d)(6) provides that the EPA is to exercise its judgment to determine what revisions to preexisting standards are necessary, after considering such developments. In any event, as discussed in section IV.C.1 of this preamble, in this action—in order to address previously unregulated HAP emissions, respond to the 2007 partial remand and vacatur of the 2004 NESHAP, and comport with the *LEAN* ruling—we are under CAA section 112(h) setting standards for RMH process units for which no emission standards are currently in place, based on the use of non-HAP resins or resins with low vapor pressure (and therefore low potential for HAP emissions) including resin types which were available at the time of the 2004 rule.

G. What compliance dates are we proposing, and what is the rationale for the proposed compliance dates?

Amendments to the PCWP NESHAP proposed in this rulemaking for adoption under CAA section 112(d)(2) and (3) are subject to the compliance deadlines outlined in the CAA under CAA section 112(i). For existing sources, CAA section 112(i)(3) provides that there shall be compliance ''as expeditiously as practicable, but in no event later than 3 years after the effective date of such standard'' subject to certain exemptions further detailed in the statute.[20] In determining what compliance period is as ''expeditious as practicable,'' we consider the amount of time needed to plan and construct projects and change operating procedures. As provided in CAA section 112(i), all new affected sources would comply with these provisions by the effective date of the final amendments to the PCWP NESHAP or upon startup, whichever is later.

The EPA projects that many existing sources would need to make changes (*e.g.,* review operations, assemble documentation, install add-on controls and monitoring equipment) to comply with the proposed limits for various process units in their facility. These sources would require time to develop plans, construct, conduct performance testing, and implement monitoring to comply with the revised provisions. Therefore, we are proposing to allow 3 years for existing sources to become compliant with the new emission standards.

All affected facilities would have to continue to meet the current provisions of 40 CFR part 63, subpart DDDD, until the applicable compliance date of the amended rule.

For all affected sources that commence construction or reconstruction on or before May 18, 2023, we are proposing that it is necessary to provide 3 years after the effective date of the final rule for owners and operators to comply with the provisions of this action. For all affected sources that commenced construction or reconstruction after May 18, 2023, we are proposing that owners and operators comply with the provisions by the effective date of the final rule (or upon startup, whichever is later). The effective date is the date of publication of the final amendments in the **Federal Register**.

As noted previously, the affected source is the collection of process units at a PCWP facility. Examples of new affected sources are new greenfield PCWP or lumber facilities, existing facilities constructing new PCWP manufacturing process lines in addition to (or as a replacement for) existing process lines, and existing lumber facilities adding (or replacing) lumber kilns in projects that meet the definition of reconstruction.

We solicit comment on these proposed compliance periods, and we specifically request submission of information from sources in this source category regarding specific actions that would need to be undertaken to comply with the proposed amended provisions and the time needed to make the adjustments for compliance with any of the revised provisions. We note that information provided may result in changes to the proposed compliance dates.

V. Summary of Cost, Environmental, and Economic Impacts

A. What are the affected sources?

There are currently 223 major-source facilities subject to the PCWP NESHAP. We estimate that 6 new PCWP facilities will be constructed and become subject to the NESHAP in the next 5 years.

B. What are the air quality impacts?

This proposed action is expected to reduce HAP and VOC emissions from the PCWP source category. In comparison to baseline emissions of 7,474 tpy HAP and 55,349 tpy VOC,[21] the EPA estimates HAP and VOC emission reductions of approximately 591 tpy and 8,051 tpy, respectively. We also estimate that the proposed action would result in additional reductions of 231 tpy of PM, 164 tpy of $PM_{2.5}$, 132 tpy of NO_X, 718 tpy of CO, 12 tpy of SO_2, 129,741 tpy of CO_2, 11 tpy of methane (CH_4), and 4.7 tpy of nitrous oxide (N_2O). The reduction in CO_2, CH_4, and N_2O combined is also equal to 130,455 carbon dioxide equivalent (CO_2e).

Secondary air impacts associated with the proposed action are estimated to result in emissions increases of 5.4 tpy of PM, 2.0 tpy of $PM_{2.5}$, 22 tpy of CO, 2.7E–04 tpy of Hg, 14 tpy of NO_X, 14 tpy of SO_2, 23,227 tpy CO_2, 1.8 tpy of CH_4, and 0.26 tpy of N_2O. The increase in the CO_2, CH_4, and N_2O is also equal to 23,350 CO_2e. More information about the estimated emission reductions and secondary impacts of this proposed action can be found in the document *Cost, Environmental, and Energy Impacts of Subpart DDDD Regulatory Options* in EPA Docket ID No. EPA–HQ–OAR–2016–0243.

C. What are the cost impacts?

The EPA estimates that this proposed action would cost approximately $126 million in total capital costs (distributed across multiple years) and $51 million per year (in 2021 dollars) in total annualized costs. More information about the estimated cost of this proposed action can be found in the document *Cost, Environmental, and Energy Impacts of Subpart DDDD Regulatory Options* contained in the docket for this action.

D. What are the economic impacts?

For the proposed rule, the EPA estimated the cost of compliance with the proposed emission limits. This includes the capital costs of installation, and subsequent maintenance and operation of the controls as well as other one-time and annual costs. To assess the potential economic impacts, the expected annual cost was compared to the total sales revenue for the ultimate owners of affected facilities. For this rule, the expected annual cost is $228,700 (on average) for each facility, with an estimated nationwide annual cost of $51,000,000. The 223 affected facilities are owned by 65 parent companies, and the total costs associated with the proposed amendments are expected to be on average about 0.2 percent of annual sales revenue per ultimate owner.

Information on our cost and economic impact estimates for the PCWP manufacturing source category is available in the docket for this proposed rule (Docket ID No EPA–HQ–OAR–2016–0243).

E. What are the benefits?

Implementing the proposed amendments is expected to reduce emissions of HAP and non-HAP pollutants, such as VOC. In this section, we provide a qualitative discussion of the benefits of this proposed rule and HAP health effects.

[20] *Association of Battery Recyclers* v. *EPA,* 716 F.3d 667, 672 (D.C. Cir. 2013) (''Section 112(i)(3)'s 3-year maximum compliance period applies generally to any emission standard . . . promulgated under [section 112]'' (brackets in original)).

[21] Baseline emissions are from uncontrolled process units; *i.e.,* they do not include emissions from process units regulated by the NESHAP.

We estimate that the proposed amendments would reduce HAP emissions from the source category by approximately 591 tpy. The amendments would regulate emissions of acetaldehyde, acrolein, formaldehyde, methanol, phenol, propionaldehyde, non-Hg HAP metals, Hg, HCl, PAH, D/F and MDI. Information regarding the health effects of these compounds can be found in *Health Effects Notebook for Hazardous Air Pollutants* (at *https://www.epa.gov/haps/health-effects-notebook-hazardous-air-pollutants*) and in the EPA Integrated Risk Information System (IRIS) database (at *https://iris.epa.gov/AtoZ/?list_type=alpha*).

The proposed amendments would reduce emissions of VOC which, in conjunction with NO_X and in the presence of sunlight, form ground-level ozone (O_3). There are health benefits of reducing VOC emissions in terms of the number and value of avoided ozone-attributable deaths and illnesses. The *Integrated Science Assessment for Ozone* (Ozone ISA) [22] as summarized in the TSD for the Final Revised Cross State Air Pollution Rule Update [23] synthesizes the toxicological, clinical, and epidemiological evidence to determine whether each pollutant is causally related to an array of adverse human health outcomes associated with either acute (*i.e.,* hours or days-long) or chronic (*i.e.,* years-long) exposure. For each outcome, the ISA reports this relationship to be causal, likely to be causal, suggestive of a causal relationship, inadequate to infer a causal relationship, or not likely to be a causal relationship.

In brief, the Ozone ISA found short-term (less than 1 month) exposures to ozone to be causally related to respiratory effects, a ''likely to be causal'' relationship with metabolic effects and a ''suggestive of, but not sufficient to infer, a causal relationship'' for central nervous system effects, cardiovascular effects, and total mortality. The ISA reported that long-term exposures (1 month or longer) to ozone are ''likely to be causal'' for respiratory effects including respiratory mortality, and a ''suggestive of, but not sufficient to infer, a causal relationship'' for cardiovascular effects, reproductive effects, central nervous system effects, metabolic effects, and total mortality.

F. What analysis of environmental justice did we conduct?

Following the directives set forth in multiple Executive orders, the Agency has evaluated the impacts of this action on communities with EJ concerns. Executive Order 12898 directs the EPA to identify the populations of concern who are most likely to experience unequal burdens from environmental harms—specifically, minority populations (*i.e.,* people of color and/or Indigenous peoples) and low-income populations (59 FR 7629; February 16, 1994). Additionally, Executive Order 13985 is intended to advance racial equity and support underserved communities through Federal Government actions (86 FR 7009; January 25, 2021).

The EPA defines EJ as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.[24] The EPA further defines fair treatment to mean that no group of people should bear a disproportionate burden of environmental harms and risks, including those resulting from the negative environmental consequences of industrial, governmental, and commercial operations or programs and policies. In recognizing that people of color and low-income populations often bear an unequal burden of environmental harms and risks, the EPA continues to consider ways of protecting them from adverse public health and environmental effects of air pollution.

To examine the potential for any EJ issues that might be associated with PCWP manufacturing facilities, we performed a demographic analysis, which is an assessment of individual demographic groups of the populations living within 5 kilometers (km) and 50 km of the facilities. The EPA then compared the data from this analysis to the national average for each of the demographic groups.

The results of the demographic analysis (see table 1 of this preamble) indicate that the population percentages for certain demographic groups within 5 km of the 223 facilities are greater than the corresponding nationwide percentages. The demographic percentage for populations residing within 5 km of facility operations is 9 percentage points greater than its corresponding nationwide percentage for the African American population (21 percent within 5 km of the facilities compared to 12 percent nationwide), 7 percentage points greater than its corresponding nationwide percentage for the population living below the poverty level (20 percent within 5 km of the facilities compared to 13 percent nationwide), and 2 percentage points greater than its corresponding nationwide percentage for the population 25 years old and older without a high school diploma (14 percent within 5 km of the facilities compared to 12 percent nationwide). The remaining demographic groups within 5 km of facility operations are less than, or within one percentage point of, the corresponding nationwide percentages. It should be noted that, the average percent of the population that is Native American living within 5 km of the 223 facilities is 1.1 percent, which is over 1.5 times the national average. This is largely driven by populations living within 5 km of 16 facilities where the percent Native American population is over 5 times the national average. These facilities are located in Washington (3 facilities), Oklahoma (4 facilities), Texas, Louisiana, South Dakota, Wisconsin, Minnesota, Oregon, Maine, Florida, and South Carolina.

In addition, the proximity results presented in table 1 of this preamble indicate that the population percentages for certain demographic groups within 50 km of the 223 facilities are greater than the corresponding nationwide percentages. The demographic percentage for populations residing within 50 km of the facility operations is 7 percentage points greater than its corresponding nationwide percentage for the African American population (19 percent within 50 km to the facilities compared to 12 percent nationwide), and 3 percentage points greater than its corresponding nationwide percentage for the population living below the poverty level (16 percent within 50 km of the facilities compared to 13 percent nationwide). The remaining demographic percentages within 50 km of the facilities are less than, or within one percentage point of, the corresponding nationwide percentages.

A summary of the proximity demographic assessment performed for the major source PCWP manufacturing facilities is included as table 1 of this preamble. The methodology and the results of the demographic analysis are presented in a technical report, *Analysis of Demographic Factors for Populations Living Near PCWP Manufacturing Facilities,* available in this docket for

[22] U.S. EPA. 2020. *Integrated Science Assessment for Ozone and Related Photochemical Oxidants.* U.S. Environmental Protection Agency. Washington, DC. Office of Research and Development. EPA/600/R–20/012. Available at: *https://www.epa.gov/isa/integrated-science-assessment-isa-ozone-and-related-photochemical-oxidants.*

[23] U.S. EPA. 2021. *Regulatory Impact Analysis Final Revised Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS.* Available at *https://www.epa.gov/sites/default/files/2021-03/documents/revised_csapr_update_ria_final.pdf.*

[24] *https://www.epa.gov/environmentaljustice.*

this action (Docket ID EPA–HQ–OAR–2016–0243).

TABLE 1—PROXIMITY DEMOGRAPHIC ASSESSMENT RESULTS FOR MAJOR SOURCE PCWP MANUFACTURING FACILITIES

Demographic group	Nationwide	Population within 50 km of 223 facilities	Population within 5 km of 223 facilities
Total Population	328,016,242	34,271,452	1,554,465
	Race and Ethnicity by Percent		
White	60	66	65
African American	12	19	21
Native American	0.7	0.7	1.1
Hispanic or Latino (includes white and nonwhite)	19	8	9
Other and Multiracial	8	6	4
	Income by Percent		
Below Poverty Level	13	16	20
Above Poverty Level	87	84	80
	Education by Percent		
Over 25 and Without a High School Diploma	12	13	14
Over 25 and With a High School Diploma	88	87	86
	Linguistically Isolated by Percent		
Linguistically Isolated	5	2	2

Notes:

• The nationwide population count and all demographic percentages are based on the U.S. Census Bureau's 2015–2019 American Community Survey 5-year block group averages and include Puerto Rico. Demographic percentages based on different averages may differ. The total population counts within 5 km and 50 km of all facilities are based on the 2010 Decennial Census block populations.

• Minority population is the total population minus the white population.

• To avoid double counting, the "Hispanic or Latino" category is treated as a distinct demographic category for these analyses. A person is identified as 1 of 5 racial/ethnic categories: White, African American, Native American, Other and Multiracial, or Hispanic/Latino. A person who identifies as Hispanic or Latino is counted as Hispanic/Latino for this analysis, regardless of what race this person may have also identified as in the Census.

The human health risk estimated for this source category for the August 13, 2020, RTR (85 FR 49434) was determined to be acceptable, and the standards were determined to provide an ample margin of safety to protect public health. Specifically, the maximum individual cancer risk was 30-in-1 million for actual and allowable emissions and the noncancer hazard indices for chronic exposure were below 1 (*i.e.,* 0.8 for actual and allowable emissions). The maximum noncancer hazard quotient for acute exposure was 4. These health risk estimates were based on HAP emissions from the source category after addition of air pollution controls used to meet the MACT standards promulgated in 2004, as well as the baseline HAP emissions from process units for which standards are being proposed in this action. While the August 13, 2020, amendments to 40 CFR part 63, subpart DDDD, reduced emissions by an unquantified amount by removing the startup, shutdown, and malfunction exemption and adding repeat testing requirements, the proposed changes to 40 CFR part 63, subpart DDDD, in this action would reduce emissions by an additional 591 tons of HAP per year and therefore would further improve human health exposures for populations in all demographic groups. The proposed changes would have beneficial effects on air quality and public health for populations exposed to emissions from PCWP manufacturing facilities.

VI. Request for Comments

We solicit comments on this proposed action. In addition to general comments on this proposed action, we are also interested in additional data that may improve the analyses. If additional HAP performance test results are submitted, such data should include supporting documentation in sufficient detail to allow characterization of the quality and representativeness of the data or information.

For lumber kilns, we request comment on our proposed conclusions with respect to feasibility of capturing and measuring emissions from lumber kilns and our conclusions with respect to applicability of add-on controls for lumber kilns. We request comments on the proposed standards, including the proposed O&M plan with its requirement for annual inspections in 40 CFR 63.2241(e)(1), proposed requirement for annual lumber kiln burner tune-ups in 40 CFR 63.2241(e)(2), and the proposed minimum kiln-dried lumber moisture content limits below which lumber is considered over-dried lumber for purposes of the PCWP NESHAP in 40 CFR 63.2241(e)(4). With respect to the work practice proposed in 40 CFR 63.2241(e)(3), we request comment on the utility and provisions for each of the 3 options (temperature set point, in-kiln lumber moisture monitoring, or site-specific plan).

For RMH units, we request comments on the work practices proposed for RMH process units, including comments pertaining to the procedures for demonstrating compliance with the requirement to use non-HAP resin or resin meeting the proposed maximum true vapor pressure limit and the requirement to process dried wood. We also request comment on other potential approaches for establishing standards for RMH process units considering that the RMH process units are not designed and constructed in a way that allows for HAP emissions capture or measurement.

VII. Submitting Data Corrections

The site-specific emissions data used in setting MACT standards for PM (non-Hg HAP metals), Hg, acid gases, and PAH, as emitted from the PCWP source category, are provided in the docket (Docket ID No. EPA–HQ–OAR–2016–0243). If you believe that the data are not representative or are inaccurate, please identify the data in question, provide your reason for concern, and provide any ''improved'' data that you have, if available. When you submit data, we request that you provide documentation of the basis for the revised values to support your suggested changes. For information on how to submit comments, including the submittal of data corrections, refer to the instructions provided in the introduction of this preamble.

VIII. Statutory and Executive Order Reviews

Additional information about these statutes and Executive Orders can be found at *https://www.epa.gov/laws-regulations/laws-and-executive-orders.*

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action is not a significant regulatory action and was therefore not submitted to the Office of Management and Budget (OMB) for review.

B. Paperwork Reduction Act (PRA)

The information collection activities in this proposed rule have been submitted for approval to OMB under the PRA. The ICR document that the EPA prepared has been assigned EPA ICR number 1984.11. You can find a copy of the ICR in the docket for this rule, and it is briefly summarized here.

We are proposing changes to the reporting and recordkeeping requirements for the PCWP NESHAP by incorporating the reporting and recordkeeping requirements associated with the MACT standards being added to the rule for multiple HAP from new and existing process units.

Respondents/affected entities: Owners or operators of PCWP or kiln-dried lumber manufacturing plants that are major sources, or that are located at, or are part of, major sources of HAP emissions.

Respondent's obligation to respond: Mandatory (40 CFR part 63, subpart DDDD).

Estimated number of respondents: On average over the next 3 years, approximately 223 existing major sources would be subject to these standards. It is also estimated that 6 additional respondents would become subject to the emission standards over the 3-year period.

Frequency of response: The frequency of responses varies depending on the burden item (*e.g.,* one-time, semiannual, annual, every 5 years).

Total estimated burden: The average annual burden to industry over the next 3 years from the proposed recordkeeping and reporting requirements is estimated to be 46,900 hours per year. Burden is defined at 5 CFR 1320.3(b).

Total estimated cost: The total annual recordkeeping and reporting cost for all facilities to comply with all of the requirements in the NESHAP, including the requirements in this proposed rule, is estimated to be $9,720,000 per year including $4,020,000 in annualized capital and O&M costs.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for the EPA's regulations in 40 CFR are listed in 40 CFR part 9.

Submit your comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden to the EPA using the docket identified at the beginning of this rule. The EPA will respond to any ICR-related comments in the final rule. You may also send your ICR-related comments to OMB's Office of Information and Regulatory Affairs using the interface at *https://www.reginfo.gov/public/do/PRAMain.* Find this particular information collection by selecting ''Currently under Review—Open for Public Comments'' or by using the search function. OMB must receive comments no later than July 17, 2023.

C. Regulatory Flexibility Act (RFA)

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA. The small entities subject to the requirements of this action are small businesses, including one small business owned by a tribal government, as defined by the U.S. Small Business Administration (SBA). The EPA prepared a small business screening analysis to determine if any of the identified affected entities are small entities, as defined by the SBA. This analysis is available in the Docket for this action (Docket ID No. EPA–HQ–OAR–2016–0243). The Agency has determined that 21 small ultimate PCWP manufacturing parent companies out of 65 may experience an impact from less than 0.01 percent to 1.94 percent of annual sales, with only 2 out of these 21 ultimate parent companies experiencing an impact of more than 1 percent of annual sales. Because the total annualized costs associated with the proposed amendments are expected to be more than 1 percent of annual sales revenue for only 2 small business ultimate parent owners in the PCWP manufacturing source category, there are, therefore, no significant economic impacts from these proposed amendments on the 27 affected facilities that are owned by 21 affected small ultimate parent entities.

Details of this analysis are presented in *Economic Impact and Small Business Screening Assessments for Proposed Amendments to the National Emission Standards for Hazardous Air Pollutants for Plywood and Composite Wood Products Manufacturing Facilities,* located in the docket for this action (Docket ID No. EPA–HQ–OAR–2016–0243).

D. Unfunded Mandates Reform Act (UMRA)

This action does not contain an unfunded mandate of $100 million or more as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments. While this action creates an enforceable duty on the private sector and one facility owned by a tribal government, the cost does not exceed $100 million or more.

E. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the National Government and the states, or on the distribution of power and responsibilities among the various levels of government.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications as specified in Executive Order 13175. Thus, Executive Order 13175 does not apply to this action. However, consistent with the EPA policy on coordination and consultation with Indian tribes, the EPA will offer government-to-government consultation with tribes as requested.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

This action is not subject to Executive Order 13045 because the EPA does not believe the environmental health or safety risks addressed by this action present a disproportionate risk to children. This action proposes emission standards for previously unregulated pollutants; therefore, the rule should result in health benefits to children by reducing the level of HAP emissions from the PCWP manufacturing process.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This action is not a ''significant energy action'' because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. In this proposed action, the EPA is setting emission standards for previously unregulated pollutants. This does not impact energy supply, distribution, or use.

I. National Technology Transfer and Advancement Act (NTTAA) and 1 CFR Part 51

This action involves technical standards. Therefore, the EPA conducted searches for the PCWP NESHAP through the Enhanced National Standards Systems Network (NSSN) Database managed by the American National Standards Institute (ANSI). We also conducted a review of voluntary consensus standards (VCS) organizations and accessed and searched their databases. We conducted searches for EPA Methods 1, 1A, 2, 2A, 2C, 2D, 2F, 2G, 3, 3A, 3B, 4, 5, 10, 18, 25A, 26A, 29 of 40 CFR part 60, appendix A; 204, 204A, 204B, 204C, 204D, 204E, 204F, 205 of 40 CFR part 51, appendix M; 308, 316, 320, 326 of 40 CFR part 63; OTM–46, and 0011 (SW–846). During the EPA's VCS search, if the title or abstract (if provided) of the VCS described technical sampling and analytical procedures that are similar to the EPA's referenced method, the EPA ordered a copy of the standard and reviewed it as a potential equivalent method. We reviewed all potential standards to determine the practicality of the VCS for this rule. This review requires significant method validation data that meet the requirements of EPA Method 301 for accepting alternative methods or scientific, engineering, and policy equivalence to procedures in the EPA referenced methods. The EPA may reconsider determinations of impracticality when additional information is available for any particular VCS.

Detailed information on the VCS search and determination can be found in the memorandum, *Voluntary Consensus Standard Results for NEHSAP: Plywood and Composite Wood Products,* which is available in the docket for this action (Docket ID No. EPA–HQ–OAR–2016–0243). Two VCS were identified as acceptable alternatives to the EPA test methods for this proposed rule.

The VCS ANSI/ASME PTC 19.10–1981 Part 10 (2010), ''Flue and Exhaust Gas Analyses,'' is an acceptable alternative to EPA Method 3B manual portions only and not the instrumental portion. This method determines quantitatively the gaseous constituents of exhausts resulting from stationary combustion sources. The manual procedures (but not instrumental procedures) of ASME/ANSI PTC 19.10–1981 Part 10 may be used as an alternative to EPA Method 3B for measuring the oxygen or carbon dioxide content of the exhaust gas. The gases covered in ASME/ANSI PTC 19.10–1981 are oxygen, carbon dioxide, carbon monoxide, nitrogen, sulfur dioxide, sulfur trioxide, nitric oxide, nitrogen dioxide, hydrogen sulfide, and hydrocarbons. However, the use in this rule is only applicable to oxygen and carbon dioxide. This VCS may be obtained from American Society of Mechanical Engineers (ASME), Three Park Avenue, New York, NY 10016–5990, telephone (800) 843–2763, *https://www.asme.org.* The EPA is proposing to incorporate by reference the VCS ANSI/ASME PTC 19.10–1981 Part 10 (2010), ''Flue and Exhaust Gas Analyses,'' as an acceptable alternative to EPA Method 3B manual portions only and not the instrumental portion.

The VCS ASTM D6348–12e1, ''Determination of Gaseous Compounds by Extractive Direct Interface Fourier Transform (FTIR) Spectroscopy,'' is an acceptable alternative to EPA Method 320 with certain conditions. The VCS ASTM D6348–12e1 employs an extractive sampling system to direct stationary source effluent to an FTIR spectrometer for the identification and quantification of gaseous compounds. Concentration results are provided. This test method is potentially applicable for the determination of compounds that (1) have sufficient vapor pressure to be transported to the FTIR spectrometer and (2) absorb a sufficient amount of infrared radiation to be detected. The VCS ASTM D6348–12e1 may be obtained from *https://www.astm.org* or from the ASTM Headquarters at 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, Pennsylvania, 19428–2959. The EPA is proposing to incorporate by reference the VCS ASTM D6348–12e1, ''Determination of Gaseous Compounds by Extractive Direct Interface Fourier Transform (FTIR) Spectroscopy,'' as an acceptable alternative to EPA Method 320 in place of ASTM D6348–03. ASTM D6348–03(2010) was determined to be equivalent to EPA Method 320 with caveats. ASTM D6348–12e1 is a revised version of ASTM D6348–03(2010) and includes a new section on accepting the results from the direct measurement of a certified spike gas cylinder but lacks the caveats placed on the ASTM D6348–03(2010) version. ASTM D6348–12e1 is an extractive FTIR field test method used to quantify gas phase concentrations of multiple analytes from stationary source effluent and is an acceptable alternative to EPA Method 320 at this time with caveats requiring inclusion of selected annexes to the standard as mandatory. When using ASTM D6348–12e1, the following conditions must be met:

- The test plan preparation and implementation in the Annexes to ASTM D6348–03, sections A1 through A8 are mandatory; and
- In ASTM D6348–03, Annex A5 (Analyte Spiking Technique), the percent (%) R must be determined for each target analyte (Equation A5.5).

In order for the test data to be acceptable for a compound, percent R must be 70 percent $\geq$ R $\leq$ 130 percent. If the percent R value does not meet this criterion for a target compound, the test data is not acceptable for that compound and the test must be repeated for that analyte (*i.e.,* the sampling and/or analytical procedure should be adjusted before a retest). The percent R value for each compound must be reported in the test report, and all field measurements must be corrected with the calculated percent R value for that compound by using the following equation:

Reported Results = ((Measured Concentration in Stack))/(percent R) $\times$ 100.

In addition to the VCS mentioned earlier in this preamble, we are proposing to incorporate by reference ASTM D1835–05, ''Standard Specification for Liquefied Petroleum (LP) Gases,'' for use in the proposed definition of natural gas in 40 CFR 63.2292, and ASTM D2879–18, ''Standard Test Method for Vapor Pressure-Temperature Relationship and Initial Decomposition Temperature of Liquids by Isoteniscope'' for use in the proposed definition of maximum true vapor pressure in 40 CFR 63.2292. The VCS ASTM D–1835–05 covers those products commonly referred to as liquefied petroleum gases, consisting of propane, propene (propylene), butane, and mixtures of these materials. With ASTM D2879–18, the vapor pressure of a substance as determined by isoteniscope reflects a property of the sample as received including most volatile components but excluding dissolved fixed gases such as air. The isoteniscope method is designed to minimize composition changes which may occur during the course of measurement. These VCS ASTM may be obtained from *https://www.astm.org* or from the ASTM Headquarters at 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, Pennsylvania, 19428–2959.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 (59 FR 7629, February 16, 1994) directs Federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations (people of color and/or Indigenous peoples) and low-income populations.

The EPA believes that the human health or environmental conditions that exist prior to this action result in or have the potential to result in disproportionate and adverse human health or environmental effects on people of color, low-income populations, and/or Indigenous peoples. The assessment of populations in close proximity of PCWP manufacturing facilities shows that the percentage of African Americans, Native Americans, people below poverty level, and people over 25 without a high school diploma are higher than the national average (see section V.F of the preamble). The higher percentages are driven by 19 of the 223 facilities in the source category.

The EPA believes that this action is likely to reduce existing disproportionate and adverse effects on people of color, low-income populations, and/or Indigenous peoples. The EPA is proposing MACT standards for total HAP, MDI, PM as a surrogate for non-Hg metals, Hg, HCl, PAH, and D/F. The EPA expects all 223 PCWP facilities to implement changes to comply with the MACT standards (*e.g.,* control measures, work practices, emissions testing, monitoring, reporting, and recordkeeping for the process units used) and expects that HAP exposures for the people of color and low-income individuals living near these facilities would decrease.

The information supporting this Executive Order review is contained in section V.F of this preamble.

List of Subjects in 40 CFR Part 63

Environmental protection, Air pollution control, Hazardous substances, Incorporation by reference, Reporting and recordkeeping requirements.

Michael S. Regan,

Administrator.

[FR Doc. 2023–10067 Filed 5–17–23; 8:45 am]

BILLING CODE 6560–50–P

Attachment E

West Fraser Fitzgerald's Section 502(b)(10) Change to its Title V Operating Permit No. 2421-017-0008-V-05-1

West Fraser, Inc.
Fitzgerald GA Lumber Division
173 Peachtree Road
Fitzgerald, Georgia 31750
(229) 796-0600
www.westfraser.com

December 18, 2019

Mr. Kirk Drucker
Program Manager, VOC Permitting Unit
Stationary Source Permitting Program
Air Protection Branch
4244 International Parkway, Suite 120
Atlanta, Georgia 30354

Subject: West Fraser, Inc.
Fitzgerald GA Lumber Division
Title V Operating Permit No. 2421-017-0008-V-05-1
Section 502(b)(10) Change

Mr. Drucker,

West Fraser Fitzgerald plans to make changes at the facility pursuant to Georgia Air Quality Control Rule 391-3-1-.03(10)(b)5.

1) Background: On January 10, 2019, the facility was issued Permit No. 2421-017-0008-V-05-1 authorizing construction and operation of two direct fired continuous kilns (ID Nos. CDK1 and CDK2) to replace existing Kilns KL01, KL02, and KL03 and incorporate the off-permit-change that was approved on April 10, 2018, for replacing the planer mill (ID No. PL) and its cyclone (ID No. PLCY) with a new planer mill (ID No. PL) and a new cyclone (ID No. PLCY2). The permit authorizes production up to 240 MMBf of kiln dried lumber per year. The permit indicated full enclosure of the CDKs. It was recognized that full enclosure of kilns is not feasible thus the mill submitted a minor modification in November 2019 to more accurately present the CDK configuration and proposed emissions. The modification included an assessment of the potential impacts of toxic air pollutants to demonstrate acceptable concentrations. This update to the kiln configuration requires language changes within Permit No. 2421-017-0008-V-05-1. Additionally, the current permit does not reflect the two fuel silos that are required as part of the continuous dry kiln project nor does it reflect removing the hammer mill and associated cyclone. Per discussions between Forrest Denney and Eric Cornwell, it is understood that these changes can be accomplished as a 502(b)(10) change along with a SIP/construction application.

2) Description of the change: As indicated in the SIP/construction application, the facility requests authorization to construct two fuel silos that are required as part of the continuous dry kiln project that is authorized by Permit No. 2421-017-0008-V-05-1. The green sawdust burners on CDK1 and CDK2 will each be fed by an associated fuel silo. Each silo will have a high efficiency cyclone attached (Proposed ID No. FSCY1 and FSCY2) for the conveyance of green sawdust to the silos. Another high efficiency cyclone will be installed for routing sawdust to a truck bin (Proposed ID No. SDCY), if needed, in lieu of routing to the fuel silos. This cyclone is a replacement of an existing low efficiency unit on site.

The hammer mill and associated cyclone (ID No. HM and HMCY) will be removed from operation with the installation of the CDKs. Planer shavings are not needed as fuel and thus will not be processed through the hammer mill but will be shipped off site as a byproduct via the new planer mill cyclone (ID No. PLCY2).

3) Planned date of the change: The fuel silos will be installed in conjunction with the kilns as part of the CDK project. This project will proceed in phases. The first kiln (ID No. CDK1) and associated silo are expected to begin construction after the first of the year and be operational by the third or fourth quarter 2020. The second CDK will commence construction some months after that and finally the planer mill rebuild will occur.

4) Change in emissions: The following table from SIP Form 100 identifies the change in emissions. There are no permit emission limits within the permit that require update.

Existing Facility Emissions Summary

Criteria Pollutant	Current Facility		After Modification	
	Potential (tpy)	Actual (tpy)	Potential (tpy)	Actual (tpy)
Carbon monoxide (CO)	87.6	49.6	87.6	87.6
Nitrogen oxides (NOx)	33.6	19.0	33.6	33.6
Particulate Matter (PM) (filterable only)	22.5	17.2	25.4	25.4
PM <10 microns (PM10)	17.9	13.6	20.7	20.7
PM <2.5 microns (PM2.5)	16.4	10.6	18.8	18.8
Sulfur dioxide (SO_2)	7.0	4.0	7.7	7.7
Volatile Organic Compounds (VOC)	480.0	271.6	480.0	480.0
Greenhouse Gases (GHGs) (in CO2e)	58,544	33,127	64,110	64,110
Total Hazardous Air Pollutants (HAPs)	29.4	16.6	29.4	29.4
Individual HAPs Listed Below:				
Methanol	19.3	10.9	19.3	19.3
Formaldehyde	4.6	2.6	4.6	4.6
Acetaldehyde	5.4	3.1	5.4	5.4

5) Permit terms or conditions that are no longer applicable as a result of the change: The requested changes are identified in the attached permit with red line strikeout and italicized additions.

This change does not constitute a Title I modification and does not exceed the allowable emission rate for particulate matter (PM, PM_{10}, or $PM_{2.5}$) within the permit. This change does not violate applicable requirements or contravene federally enforceable permit terms and conditions that are monitoring, record keeping, reporting or compliance certification requirements.

Based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

If you have any questions, please contact WF's Environmental Consultant, Forrest Denney via email at forrest.denney@westfraser.com or by phone at (404) 889-4718.

Sincerely,

Jerone Nails
General Manager
Fitzgerald Lumber Division

cc: U.S. EPA Region 4
Operating Source Section
Air and Radiation Technology Branch
61 Forsyth Street
Atlanta, Georgia 30303

PERMIT AMENDMENT NO. 2421-017-0008-V-05-1
ISSUANCE DATE:

GEORGIA
DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENTAL PROTECTION DIVISION

Air Quality - Part 70 Operating Permit Amendment

Facility Name:	**West Fraser – Fitzgerald Lumber Mill**
Facility Address:	**173 Peachtree Road** **Fitzgerald, Georgia 31750 Ben Hill County**
Mailing Address:	**P.O. Box 310** **Fitzgerald, Georgia 31750**
Parent/Holding Company:	**West Fraser, Inc.**
Facility AIRS Number:	**04-13- 017-00008**

In accordance with the provisions of the Georgia Air Quality Act, O.C.G.A. Section 12-9-1, et seq and the Georgia Rules for Air Quality Control, Chapter 391-3-1, adopted pursuant to and in effect under the Act, the Permittee described above is issued an amendment to the Part 70 Operating Permit for:

The construction and operation of two continuous direct-fired kilns and a new planer mill.

This Permit Amendment is conditioned upon compliance with all provisions of The Georgia Air Quality Act, O.C.G.A. Section 12-9-1, et seq, the Rules, Chapter 391-3-1, adopted and in effect under that Act, or any other condition of this Amendment and Permit No. 2421-017-0008-V-05-0. Unless modified or revoked, this Amendment expires upon issuance of the next Part 70 Permit for this source. This Amendment may be subject to revocation, suspension, modification or amendment by the Director for cause including evidence of noncompliance with any of the above; or for any misrepresentation made in App No. TV-234867 dated **April 18, 2018**; any other applications upon which this Amendment or Permit No. 2421-017-0008-V-05-0 are based; supporting data entered therein or attached thereto; or any subsequent submittal or supporting data; or for any alterations affecting the emissions from this source.

This Amendment is further subject to and conditioned upon the terms, conditions, limitations, standards, or schedules contained in or specified on the attached 11 pages.

Richard E. Dunn, Director
Environmental Protection Division

Table of Contents

PART 1.0 FACILITY DESCRIPTION

1.3 Process Description of Modification

West Fraser – Fitzgerald Lumber Mill (hereinafter "facility") submitted a Title V permit amendment application dated April 18, 2018, which was logged in as Application No. TV-234867, for the authorization to construct and operate two direct natural gas-fired continuous kilns (ID Nos. CDK1 and CDK2) that will replace existing Kilns KL01, KL02, and KL03. The facility also requested to incorporate the off-permit-change that was approved on April 10, 2018, for replacing the planer mill (ID No. PL) and its cyclone (PLCY) with a new planer mill (ID No. PL) and a new cyclone (ID No. PLCY2), into the permit amendment.

Describe next permit action here

PART 3.0 REQUIREMENTS FOR EMISSION UNITS

Note: Except where an applicable requirement specifically states otherwise, the averaging times of any of the Emissions Limitations or Standards included in this permit are tied to or based on the run time(s) specified for the applicable reference test method(s) or procedures required for demonstrating compliance.

3.1.1 Updated Emission Units

Emission Units		Specific Limitations/Requirements		Air Pollution Control Devices	
ID No.	**Description**	**Applicable Requirements/Standards**	**Corresponding Permit Conditions**	**ID No.**	**Description**
KL01	Drying Kiln No. 1 Direct-fired / Batch Fuel Type = Wood Capacity = 60 MMbf/yr	40 CFR 63 Subpart A 40 CFR 63 Subpart DDDD 391-3-1-02(2)(b)1 391-3-1-02(2)(e)1 391-3-1-02(2)(g)2 391-3-1-02(2)(n)	**3.2.3, 3.4.1, 3.4.2, 3.4.3,** 3 4 4, 3 4 5, **6.2.1**	N/A	None
KL02	Drying Kiln No 2 Direct-fired / Batch Fuel Type = Wood Capacity = 60 MMbf/yr	40 CFR 63 Subpart A 40 CFR 63 Subpart DDDD 391-3-1-02(2)(b)1 391-3-1-02(2)(e)1 391-3-1-02(2)(g)2 391-3-1-02(2)(n)	**3.2.3, 3.4.1, 3.4.2, 3.4.3,** 3 4 4, 3 4 5, **6.2.1**	N/A	None
KL03	Drying Kiln No 3 Direct-fired / Batch Fuel Type = Wood Capacity = 60 MMbf/yr	40 CFR 63 Subpart A 40 CFR 63 Subpart DDDD 391-3-1-02(2)(b)1 391-3-1-02(2)(e)1 391-3-1-02(2)(g)2 391-3-1-02(2)(n)	**3.2.3, 3.4.1, 3.4.2, 3.4.3,** 3 4 4, 3 4 5, **6.2.1**	N/A	None
CDK1	**Drying Kiln No. 4** **Direct-fired / Continuous** **Fuel Type = Wood** **Capacity = 120 MMbf/yr**	40 CFR 63 Subpart A 40 CFR 63 Subpart DDDD 391-3-1-02(2)(b)1 391-3-1-02(2)(e)1 391-3-1-02(2)(g)2 391-3-1-02(2)(n)	**3.2.1, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.3.1,** 3 4 4, 3 4 5, **3.4.6, 3.4.7, 4.2.1, 5.2.2, 6.1.7, 6.2.1, 6.2.2, 6.2.3**	N/A	None
CDK2	**Drying Kiln No. 5** **Direct-fired / Continuous** **Fuel Type = Wood** **Capacity = 120 MMbf/yr**	40 CFR 63 Subpart A 40 CFR 63 Subpart DDDD 391-3-1-02(2)(b)1 391-3-1-02(2)(e)1 391-3-1-02(2)(g)2 391-3-1-02(2)(n)	**3.2.1, 3.2.2, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.3.1,** 3 4 4, 3 4 5, **3.4.6, 3.4.7, 4.2.1, 5.2.2, 6.1.7, 6.2.1, 6.2.2, 6.2.3**	N/A	None
FS1	**Fuel Silo No. 1**			FSCY1	Fuel Silo No. 1 Sawdust Transfer Cyclone
FS2	**Fuel Silo No. 2**			FSCY2	Fuel Silo No. 1 Sawdust Transfer Cyclone
STB1	**Sawdust Truck Bin**			SDCY	Sawdust Truck Bin Transfer Cyclone
PL	Planer Mill	391-3-1-02(2)(b)1 391-3-1-02(2)(e)1 391-3-1-02(2)(n)	**3.4.1, 3.4.2,** 3 4 4, 3 4 5, **3.4.6, 3.4.7, 5.2.1,** 6 1 7	**PLCY2**	**Planer Mill Shavings Cyclone 2**
~~HM~~	~~Hammer Mill~~	~~391-3-1-02(2)(b)1~~ ~~391-3-1-02(2)(e)1~~ ~~391-3-1-02(2)(n)~~	~~3.4.1, 3.4.2, 3 4 4, 3 4 5, 3.4.6, 3.4.7, 5.2.1, 6 1 7~~	~~HMCY~~	~~Hammer Mill Cyclone~~

* Generally applicable requirements contained in this permit may also apply to emission units listed above. The lists of applicable requirements/standards and corresponding permit conditions are intended as a compliance tool and may not be definitive

** New emission unit is in bold.

*** New and modified conditions are in bold

**** PLCY2 was authorized to be constructed per an OPC approval letter dated April 10, 2018 to replace existing Cyclone PLCY as part of the planer mill replacement modification.

3.2 Equipment Emission Caps and Operating Limits

New Conditions

3.2.1 The Permittee shall construct and operate the drying kilns (ID Nos. CDK1 and CDK2) and associated equipment in accordance with the application submitted. If the Permittee constructs or operates a source or modification not in accordance with the application submitted pursuant to that rule or with the terms of any approval to construct, the Permittee shall be subject to appropriate enforcement action.
[391-3-1-.02(7)(b)15. and 40 CFR 52.21(r)(1)]

3.2.2 Approval to construct the drying kilns (ID Nos. CDK1 and CDK2) shall become invalid if construction is not commenced within 18 months after receipt of such approval, if construction is discontinued for a period of 18 months or more, of if construction is not completed within a reasonable time. The Director may extend the 18-month period upon a satisfactory showing that an extension is justified. This provision does not apply to the time period between construction of the approved phases of a phased construction project; each phase must commence construction within 18 months of the projected and approved commencement date. For purposes of this Permit, the definition of "commence" is given in 40 CFR 52.21(b)(9).
[391-3-1-.02(7)(b)15. and 40 CFR 52.21(r)(2)]

3.2.3 Within 30 days after the initial startup of both the drying kilns (ID Nos. CDK1 and CDK2), the Permittee shall shut down and remove from operation the existing drying kilns (ID Nos. KL01, KL02, and KL03).
[Georgia Air Toxic Guidelines]

3.2.4 During the operation of the drying kilns (ID Nos. CDK1 and CDK2), the Permittee shall:
[Georgia Air Toxic Guidelines]

a. Operate the associated power vents at all time; and

b. Maintain and operate CDK1 and CDK2 in a manner to minimize non-point emissions from the doors and bodies of the kiln. It is recognized that fugitive or non-point emissions are inherent to the operation of the CDKs and that full enclosure is not feasible. ~~Operate the power vents so that no air/exhaust in the kiln would exit through any natural draft opening (NDO), as defined in Condition 4.2.1. The differential pressure (vacuum) across each kiln's NDO shall be maintained at or above the minimum differential pressure established in accordance with Condition 4.2.1. The Permittee may elect to operate the power vents at the minimum flowrate recorded during the performance tests that would create the minimum differential pressure across each NDO.~~

3.2.5 The Permittee shall not process more than 240 million board feet (MMbf) of lumber in CDK1 and CDK2, combined, during any twelve consecutive months.
[40 CFR 52.21]

3.2.6 The Permittee shall fire only wood in the continuous drying kilns (ID Nos. CDK1 and CDK2).
[391-3-1-.03(2)(c) and 391-3-1-.02(2)(g)2. (subsumed)]

3.2.7 Within 180 days of the startup of the direct-fired continuous kilns (CDK1 and CDK2) the Permittee shall develop and implement a Work Practice and Preventive Maintenance Program (PMP) for the continuous drying kilns (CDK1 and CDK2) to assure that the provisions of Condition ? are met. The program shall be subject to review and modification by the Division. At a minimum, the following operational and maintenance checks shall be made, and a record of the findings and corrective actions taken, shall be kept in electronic or manual maintenance logs:
[391-3-1-.02(6)(b)1, 40 CFR 52.21, and 40 CFR 70.6(a)(3)(i)]

a. General Work Practice Standards for Wood-Drying Kiln Operation:

i. The lumber kiln drying operation target final moisture content will be 12% or greater based on a 12-month rolling average. Moisture content will be measured with a moisture meter exiting the planer machine.

ii. The lumber kiln shall be operated following a wet bulb temperature set-point-drying schedule of 240°F or lower for steam batch kiln 203.

iii. Operate the lumber drying kilns (CDK1 and CDK2) per the Preventive Maintenance Program (PMP) developed for the drying kilns and maintain records documenting compliance with this maintenance plan. With future equipment changes or modifications these preventative maintenance activities can be modified pending approval from EPD.

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~~The Permittee shall develop and implement a Work Practice and Preventive Maintenance Program for the drying kilns (ID Nos. CDK1 and CDK2). The program shall be subject to review and modification by the Division. At a minimum, the following operational and maintenance checks shall be made, and a record of the findings and corrective actions taken, shall be kept in electronic or manual maintenance logs:~~
~~[391-3-1-.02(6)(b)1, 40 CFR 52.21(j), and 40 CFR 70.6(a)(3)(i)]~~

~~a. General Work Practice Standards for Continuous Drying Kiln Operation:~~

~~i. The lumber kiln drying operation target final moisture content will be 9% or greater.~~

~~ii. The lumber kiln shall be operated following a Dry Bulb temperature set point drying schedule of 235°F or lower, with a Wet Bulb temperature of 170°F or lower.~~

~~iii. Routines for periodic preventative maintenance are detailed in Paragraphs b, c, d, e, and f of this condition, and are based on manufacturer's recommendations.~~

~~b. Routine During Kiln Operation:~~

~~i. Inspect wet-bulb socks and replace as needed. Replace a sock daily if it has a tendency to become hard. Check water flow to the wet bulb.~~

~~ii. Ensure that all Resistance Temperature Detectors (RTDs) are in the airflow.~~

~~iii. Check all baffles for damage, record problems and repairs done, when kiln is down for repairs.~~

~~iv. Make certain all fans are running. If one "trips out" frequently, investigate to determine the reason and then document the solution.~~

~~v. Ensure that the kiln computer controller is functioning property.~~

~~vi. Check to verify that the heating system is operating properly.~~

~~vii. Grease lumber truck wheels.~~

~~c. Weekly Routine:~~

~~i. Replace wet bulb socks on as needed basis.~~

~~ii. Drain oil or water from transducer air supplies.~~

d. Monthly Routine:

i. Inspect temperature sensor mounts for damage, when kiln is down for repairs.

ii. Ensure control room's air conditioner/heater is working properly for maintaining correct temperature for electrical components.

iii. Clean tracks through kilns, to remove accumulated dust, when kiln is down for repairs.

e. Semi-Annually:

i. Check connection on all RTDs.

f. Annually:

i. Check tracks for damage.

ii. Inspect area at base of kiln door for damage.

g. The Permittee shall correct any adverse condition, discovered by an inspection done in accordance with this condition, in the most expedient manner possible and note the corrective action taken. If not immediately correctable, the Permittee shall implement a corrective action plan within 24 hours after an adverse condition has been discovered during inspections per Paragraphs b. through f. A record of the adverse condition and the corrective action(s) taken shall be kept.

The Permittee shall also record any exceedances of the work practice standards and preventive maintenance program and corrective action taken to prevent any future exceedances.

3.2.8 The Permittee shall submit a revised toxic impact assessment to demonstrate compliance with the Georgia Air Toxic Guidelines for the entire facility, if test results from the performance testing required in Condition 4.2.1 fail to prove that each of the drying kilns (ID Nos. CDK1 and CDK2) meets the requirements of a permanent total enclosure
[Georgia Air Toxic Guidelines]

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3.3 Equipment Federal Rule Standards

New Condition

3.3.1 Upon the initial startup of the drying kilns (ID Nos. CDK1 and CDK2), the Permittee shall comply with all applicable provisions of the National Emission Standards for Hazardous Air Pollutants (NESHAP) as found in 40 CFR 63 Subpart A – "General Provisions," and Subpart DDDD – "National Emission Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products" for operation of Drying Kilns CDK1 and CDK2.
[40 CFR 63 Subpart A and Subpart DDDD]

3.4 Equipment SIP Rule Standards

Modified Conditions

3.4.1 The Permittee shall not cause, let, suffer, permit or allow emissions from the direct-fired lumber drying kilns with ID Nos. KL01, KL02, and KL03, the planer mill with ID No. PL, and the hammer mill with ID No. HM, the opacity of which is equal to or greater than forty (40) percent.
[391-3-1-.02(2)(b)1.]

This Condition shall become null and void upon the shutdown of the existing drying kilns (ID Nos. KL01, KL02, and KL03).

3.4.2 The Permittee shall not cause, let, suffer, permit, or allow the emission from the direct-fired lumber drying kilns with ID Nos. KL01, KL02, and KL03, the planer mill with ID No. PL, and the hammer mill with ID No. HM, each, particulate matter (PM) in total quantities equal to or exceeding the allowable rate as calculated using the applicable equation below, unless otherwise specified in this Permit.
[391-3-1-.02(2)(e)1.(i)]

a. $E = 4.1 * P^{0.67}$; for process input weight rate up to and including 30 tons per hour.

b. $E = 55 * P^{0.11} - 40$; for process input weight rate above 30 tons per hour.

Where: E = allowable emission rate in pounds per hour;
P = process input weight rate in tons per hour.

This Condition shall become null and void upon the shutdown of the existing drying kilns (ID Nos. KL01, KL02, and KL03).

3.4.3 The Permittee shall not burn fuel containing more than 2.5 percent sulfur, by weight, in the wood flour fired kiln burners.
[391-3-1-.02(2)(g)2.]

This Condition shall become null and void upon the shutdown of the existing drying kilns (ID Nos. KL01, KL02, and KL03).

New Conditions

3.4.6 The Permittee shall not cause, let, suffer, permit or allow emissions from the drying kilns (ID Nos. CDK1 and CDK2), the planer mill (ID No. PL), and ~~the hammer mill (ID No. HM),~~ the opacity of which is equal to or greater than forty (40) percent.
[391-3-1-.02(2)(b)1.]

3.4.7 The Permittee shall not cause, let, suffer, permit, or allow the emission from the drying kilns (ID Nos. CDK1 and CDK2), the planer mill (ID No. PL), ~~and the hammer mill (ID No. HM)~~, each, particulate matter (PM) in total quantities equal to or exceeding the allowable rate as calculated using the applicable equation below, unless otherwise specified in this Permit. [391-3-1-.02(2)(e)1.(i)]

a. $E = 4.1 * P^{0.67}$; for process input weight rate up to and including 30 tons per hour.

b. $E = 55 * P^{0.11} - 40$; for process input weight rate above 30 tons per hour.

Where: E = allowable emission rate in pounds per hour;
P = process input weight rate in tons per hour.

PART 4.0 REQUIREMENTS FOR TESTING

4.1 General Testing Requirements

4.1.3 If required, pPerformance and compliance tests shall be conducted and data reduced in accordance with applicable procedures and methods specified in the Division's Procedures for Testing and Monitoring Sources of Air Pollutants. The methods for the determination of compliance with emission limits listed under Sections 3.2, 3.3, 3.4 and 3.5 which pertain to the emission units listed in Section 3.1 are as follows:

a. Method 1 shall be used for the determination of sample point locations.

b. Method 2 shall be used for the determination of stack gas flow rate.

c. Method 3 or 3A shall be used for the determination of stack gas molecular weight.

d. Method 3B shall be used for the determination of the emission rate correction factor or excess air (Method 3A may be used as an alternative to Method 3B);

e. Method 4 shall be used for the determination of stack gas moisture.

f. Method 5 shall be used for the determination of the particulate matter concentration.

g. Method 9 and the procedures contained in Section 1.3 of the above referenced document shall be used for the determination of opacity.

h. Method 204 shall be used for the determination of the capture efficiency of a permanent total enclosures.

Minor changes in methodology may be specified or approved by the Director or his designee when necessitated by process variables, changes in facility design, or improvement or corrections that, in his opinion, render those methods or procedures, or portions thereof, more reliable.
[391-3-1-.02(3)(a)]

4.2 Specific Testing Requirements

4.2.1 Within 180 days after the initial startup of the new continuous drying kilns (ID Nos. CDK1 and CDK2), the Permittee shall conduct performance tests to demonstrate that each kiln is a permanent total enclosure as defined in Method 204, in which all air/exhaust in the kiln exits the kiln through the power vent and no air/exhaust in the kiln exits the kiln through any NDO. A kiln's NDO includes but are not limited to doors and any vents other than the power vents. Using the results of the performance tests, the Permittee shall record and establish a minimum differential pressure, in inches of water column, across each kiln's NDO that demonstrates the kiln as being a permanent total enclosure.
[391-3-1-.02(6)(b)]

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PART 5.0 REQUIREMENTS FOR MONITORING (Related to Data Collection)

5.1 General Monitoring Requirements

5.1.1 Any continuous monitoring system required by the Division and installed by the Permittee shall be in continuous operation and data recorded during all periods of operation of the affected facility except for continuous monitoring system breakdowns and repairs. Monitoring system response, relating only to calibration checks and zero and span adjustments, shall be measured and recorded during such periods. Maintenance or repair shall be conducted in the most expedient manner to minimize the period during which the system is out of service.
[391-3-1-.02(6)(b)1]

5.2 Specific Monitoring Requirements

Modified Condition

5.2.1 The Permittee shall, for each week or portion of each week of operation of the units controlled by Cyclones PLCY2, FSCY1, FSCY2 and SDCY ~~HMCY~~, inspect the exterior of the cyclones for holes in the body or evidence of malfunction in the interior of the cyclone. Any adverse condition discovered by this inspection shall be corrected in the most expedient manner as possible. The Permittee shall record the incident as an excursion and note the corrective action taken.
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

New Conditions

5.2.2 The Permittee shall install, calibrate, maintain, and operate monitoring devices for the measurement of the indicated parameters on the following equipment. Data shall be recorded at the frequency specified below. Where such performance specification(s) exist, each system shall meet the applicable performance specification(s) of the Division's monitoring requirements.
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

a. A device to measure and record the moisture content of the dried lumber out of each drying kiln (ID Nos. CDK1 and CDK2). Data shall be recorded daily.

b. A device to measure and record the dry bulb temperature inside each drying kiln (ID Nos. CDK1 and CDK2). Data shall be recorded daily.

c. ~~A device to measure and record the wet bulb temperature inside each drying kiln (ID Nos. CDK1 and CDK2). Data shall be recorded daily.~~

PART 6.0 OTHER RECORD KEEPING AND REPORTING REQUIREMENTS

6.1 General Record Keeping and Reporting Requirements

Modified Condition

6.1.7 For the purpose of reporting excess emissions, exceedances or excursions in the report required in Condition 6.1.4, the following excess emissions, exceedances, and excursions shall be reported:
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

a. Excess emissions: (means for the purpose of this Condition and Condition 6.1.4, any condition that is detected by monitoring or record keeping which is specifically defined, or stated to be, excess emissions by an applicable requirement)

None required to be reported in accordance with Condition 6.1.4.

b. Exceedances: (means for the purpose of this Condition and Condition 6.1.4, any condition that is detected by monitoring or record keeping that provides data in terms of an emission limitation or standard and that indicates that emissions (or opacity) do not meet the applicable emission limitation or standard consistent with the averaging period specified for averaging the results of the monitoring)

i. Any twelve consecutive month period for which the total amount of lumber dried in drying kilns (ID Nos. CDK1 and CDK2), combined, exceeds 240 million board feet.

ii. Any time that the fuel burned in the drying kilns (ID Nos. CDK1 and CDK2) does not meet the requirements specified in Condition 3.2.6.

c. Excursions: (means for the purpose of this Condition and Condition 6.1.4, any departure from an indicator range or value established for monitoring consistent with any averaging period specified for averaging the results of the monitoring)

i. Any adverse condition revealed by the cyclone inspection required by Condition 5.2.1.

ii. Any time Drying Kilns CDK1's and CDK2's power vents are not operated when the associate kiln is in operation.

iii. Any daily measurement of dried lumber moisture content, measured in accordance with Condition 5.2.2a., less than ~~9%.~~12%

iv. Any daily measurement of dry bulb temperature inside each drying kiln (ID Nos. CDK1 and CDK2), measured in accordance with Condition 5.2.2b., is above 245~~35~~°F.

v. ~~Any daily measurement of wet bulb temperature inside each drying kiln (ID Nos. CDK1 and CDK2), measured in accordance with Condition 5.2.2c., is above 170°F.~~

6.2 Specific Record Keeping and Reporting Requirements

6.2.1 The Permittee shall furnish the Division written notification as follows:
[40 CFR 70.6(a)(3)(i) and 391-3-1-.02(6)(b)1.]

a. The actual dates of initial startup of the drying kilns (ID Nos. CDK1 and CDK2), within 15 days after such dates.

b. Certification that a final inspection has shown that construction has been completed in accordance with the application, plans, specifications, and supporting documents submitted in support of the Permit within 60 days after the initial startup.

c. The actual date when the existing drying kilns (ID Nos. KL01, KL02, and KL03) permanently cease operation within 30 days after such date.

6.2.2 The Permittee shall maintain monthly records of the amount of the dried lumber processed through the drying kilns (ID Nos. CDK1 and CDK2), combined, necessary to confirm compliance with the production limit in Condition 3.2.5. The records shall be retained in a permanent form suitable and available for inspection or submittal to the Division upon request. These records shall be retained for at least five years following the day of record. The Permittee shall notify the Division in writing if the combined production through Drying Kilns CDK1 and CDK2 exceeds 20.0 million board feet during any calendar month. This notification shall be postmarked by the fifteenth day of the following month and shall include an explanation of how the Permittee intends to maintain compliance with the production limit in Condition 3.2.5.
[391-3-1-.02(6)(b)1(i) and 40 CFR 70.6(a)(3)(ii)(B)]

6.2.3 The Permittee shall, each month, calculate and record the twelve-month rolling total of the board feet of lumber dried in the drying kilns (ID Nos. CDK1 and CDK2), combined, using the monthly records required in Condition No. 6.2.2. A twelve- month rolling total shall be defined as the sum of the current month's total plus the totals for the previous eleven consecutive months.
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]