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Hampton Lumber Mills, Inc. (dba Tillamook Lumber Company)
3111 3rd St.
Tillamook, OR 97141
S*ent electronically only*

Ryan Pettit,

Hampton Lumber Mills (dba Tillamook Lumber Company) (Hampton) in Tillamook, OR submitted a Cleaner Air Oregon (CAO) Emissions Inventory (Inventory) to DEQ on May 2, 2025. DEQ has completed an initial review, and in accordance with Oregon Administrative Rule (OAR) 340-245-0030(2) and OAR 340-245-0040(4), has determined that the following additional information, corrections, and updates are required by 60 days after the issuance date of this letter, or **January 13, 2026**:

Submit to DEQ a revised AQ520 Inventory Form, supporting calculations in Excel format, and supporting information including the following:

1. Include startup and shutdown emissions scenarios, including:
    a. Consideration of Toxic Air Contaminants (TACs) emitted from the boiler when operating without electrostatic precipitator (ESP) control during startup and shutdown, under worst-case potential to emit annual and daily scenarios;
    b. Description of current startup and shutdown procedures for the boiler, including time required to achieve the target temperature for energizing the ESP; and
    c. Additional AQ520 Forms as needed to represent additional modeled scenarios (a separate AQ520 Form for each scenario can facilitate ease of review).
2. Boilers (TEU BOIL):
    a. Update the Toxics Emission unit (TEU) ID to "B1" for consistency with the Emission Unit ID in Hampton's Air Contaminant Discharge Permit (ACDP);
    b. For the purposes of boiler activity reporting, provide either of the following and include justification, including example calculations, parameters used, and supporting information (such as Continuous Emission Monitoring System (CEMS) or source test data):
        i. A proposed ratio or method for converting steam output (in thousand pounds of steam) to heat input (in million British thermal units (MMBtu); or
        ii. A proposed method for tracking heat input in MMBtu (such as CEMS reports).
    c. Include chlorine (CASRN 7782-50-5) in the Inventory using an emission factor of 7.9×10^{-4} pounds per million British thermal units (lb/MMBtu) [Reference: AP-42 Section 1.6, Table 1.6-3 "Emission Factors for Speciated Organic Compounds, TOC, VOC, Nitrous Oxide, and Carbon Dioxide from Wood Residue Combustion", revised 9/03];
    d. Include di-n-octylphthalate (DEQ ID 518) in the Inventory using an emission factor of 1.1×10^{-7} lb/MMBtu [Reference: National Council for Air and Stream Improvement (NCASI) Technical Bulletin 1050: Compilation of Air Toxics Emissions Data for Pulp and Paper

Sources – Publication Accompanying the 2018 Air Toxics Emissions Database, Table 7.1 "Summary of Non-Metal Air Toxic Emissions from Wood Fired Boilers"];

e. Include polychlorinated biphenyls (PCBs) (CASRN 1336-36-3) in the Inventory using an emission factor of 7.86×10^{-9}. [Reference: calculated from individual PCB groups in NCASI Technical Bulletin 1050. Note that decachlorobiphenyl is included in this total PCB group and does not need to be listed separately];

f. On Worksheet 3, update the "Reference/Notes" column for the following TACs to indicate ESP control if the emission factors used are specific to boilers with an ESP: [Reference: NCASI Technical Bulletin 1050, Table 7.3 "Summary of Trace Element Emissions from Wood Fired Boilers: Electrostatic Precipitators"]
   i. Beryllium and compounds (CASRN 7440-41-7);
   ii. Lead and compounds (CASRN 7439-92-1); and
   iii. Zinc and compounds (CASRN 7440-66-6); and

g. Provide documentation, such as a screenshot of the database, for the dibenzo(a,h)anthracene (CASRN 53-70-3) and fluoranthene (CASRN 206-44-0) emission factors used. [Reference provided: NCASI Pulp and Paper Air Toxics Database (May 2019)]

3. Kilns (TEUs KILNS-Hem and KILNS-Mix):
   a. Update the Toxics Emission unit (TEU) IDs to "F6-KILNS-Hem" and "F6-KILNS-Mixed" to include the Emission Unit ID from the ACDP;
   b. DEQ's approved emission factors for kilns are based on emissions per batch of wood dried, and the emissions profile is not necessarily consistent over time for all TACs and species. To account for this, update the maximum daily emissions information as follows:
      i. Update the Max Daily Activity information in Worksheet 2 to reflect the maximum amount of lumber loaded into the kilns for drying in any 24-hour period;
      ii. For species with drying times longer than 24 hours, either:
         1. Maintain the annual emission factors for use in daily emissions calculations, so that all emissions from each batch are conservatively assumed to be emitted in a 24-hour period; or
         2. Propose correction factors to apply to the DEQ-approved emission factors to account for the maximum fraction of emissions that would be emitted over any 24-hour period. The correction factor should consider Hampton's minimum drying times and representative emissions information (some references have been provided as Attachment A to this letter). Submit to DEQ all calculations and any additional supporting justification used to prepare the proposed correction factors.

4. Ash Handling (TEU ASH):
   a. Include emissions from wind erosion of the ash pile in the Inventory:
      i. To estimate total particulate matter (PM) emissions, use the industrial wind erosion methodology provided in AP-42 chapter 13.2.5[1];
      ii. Calculate daily PM emissions using appropriate meteorological parameters for worst-case daily emissions, based on representative meteorological data; and
      iii. To speciate TACs, Hampton may assume PM_{10} is equal to 50 percent of total particulate matter and speciate PM_{10} as described in Items i and j below.
   b. Update the PM emission factors used for Transfer #1 (from the collection bin to a dump truck) and Transfer #3 (from the stockpile to a truck for shipment offsite) to use the AP-42

[1] EPA, AP-42 Section 13.2.5 "Industrial Wind Erosion" (revised 11/06). Available online: https://www.epa.gov/sites/default/files/2020-10/documents/13.2.5_industrial_wind_erosion.pdf [Accessed November 14, 2025]

"drop point" equation (AP-42 Section 13.2.4, Equation 1). The transfer point emission factor from AP-42 Section 11.19 is specific to rock crushing operations, while the drop point equation is intended to apply generally to batch drop operations;

c. Update the moisture content parameter used in the drop point equation to the moisture percent instead of the moisture fraction (for example, 4.8 instead of 0.048); [Reference: AP-42 Section 13.2.4, Equation 1]
d. Provide justification for the assumption that moisture content is at least 4.8 percent at all three drop points for all days of the year – if necessary, revise to a lower percentage for daily and/or annual worst-case emissions (a default conservative value of 0.25 percent can be used without additional justification);
e. Describe how fly ash is handled and disposed of, and include any potential handling and storage emissions in the Inventory;
f. Provide a reference for the annual and maximum daily wind speeds used in the drop point equation;
g. Provide the following information about the ash analytical data provided in Appendix C of the Inventory submittal:
    i. At what stage of the process, and from what location, were the samples taken?
    ii. Was it a composite sample of any kind (for example, taken from various areas of the storage pile, or at different times)?
    iii. Did the samples consist of bottom ash only?
    iv. Provide the sampling plan(s) used for data collection, if available;
h. Two of the three ash samples were taken on the same day (August 12, 2022) – instead of averaging the three samples individually, treat the two 2022 results as duplicate samples and average them together before averaging with the sample from June 6, 2012; and
i. Based on DEQ's review of expected trace metals in ash, include the following additional TACs in the ash analysis:[2]
    i. Aluminum (CASRN 7429-90-5);
    ii. Chromium VI (CASRN 18540-29-9); [3]
    iii. Cobalt (CASRN 7440-48-4);
    iv. Copper (CASRN 7440-50-8);
    v. Manganese (CASRN 7439-96-5);
    vi. Molybdenum trioxide (CASRN 1313-27-5);[4]
    vii. Phosphorus (DEQ ID 504);
    viii. Selenium (CASRN 7782-49-2);
    ix. Zinc (CASRN 7440-66-6); and

[2] See, for example: Someshwar, A.V. (1996), Wood and Combination Wood-Fired Boiler Ash Characterization. Journal of Environmental Quality, 25: 962-972. https://doi.org/10.2134/jeq1996.00472425002500050006x;

[3] Chromium VI may be conservatively assumed to be 56 percent of total chromium, based on the speciation used in the US EPA's National Air Toxics Assessment for wood-fired boiler combustion (See "An Overview of Methods for EPA's National-Scale Air Toxics Assessment, January 31, 2011, Appendix D, "Exhibit D-1. Chromium Speciation Table Used for the 2005 NATA", SCC code 10300902 for Wood/Bark-fired boiler combustion). Available online: https://www.epa.gov/sites/default/files/2015-10/documents/2005-nata-tmd.pdf [Accessed October 23, 2025]

[4] Assume 100 percent of elemental molybdenum oxidizes to molybdenum trioxide.

x. Polychlorinated dibenzo-p-dioxins (PCDDs) & dibenzofurans (PCDFs) TEQ (DEQ ID 646);[5] and

j. If additional site-specific samples are collected for ash speciation, a sampling plan must be approved by DEQ prior to sampling. Alternatively, Hampton may propose concentrations from the literature or from another site that are representative in terms of wood species, ash type (fly or bottom ash), and combustion characteristics for DEQ review and approval.

5. Unpaved Roads: Include fugitive dust from unpaved roads in ash handling areas as a TEU, using the methodology from AP-42 Section 13.2.2 ("Unpaved Roads"), and:
    a. Provide site-specific justification for the silt content and mean vehicle weight used in the equation; and
    b. If site-specific dust sampling analysis is used to speciate TACs, the dust sampling plan must be approved by DEQ prior to sampling. Alternatively, Hampton may conservatively assume that the road dust has the same TAC content as the stockpiled ash.
6. Welding (TEU WELD):
    a. Use the San Diego Air Pollution Control District's Welding Operations methodology to develop emissions estimates for welding activities –this methodology includes hexavalent chromium and potentially additional TACs based on the composition of welding materials used;[6]
    b. If molybdenum is present in any welding rods or electrodes, assume 100 percent of molybdenum is converted to molybdenum trioxide (CASRN 1313-27-5) to determine TAC emissions;
    c. Provide Safety Data Sheets for all welding rods or electrodes used; and
    d. Update the annual Requested PTE for FCAW E71T as needed for consistency – page 11 of the "CAO EI Supplemental" lists 38 pounds per year and the Inventory uses 36 pounds per year.
7. Plasma Cutting (TEUs PLASMAT and PLASMAH):
    a. Provide a Safety Data Sheet(s) or alloy specification(s) for the mild steel alloy(s) typically cut; and
    b. If TACs are present in the alloy(s) that aren't accounted for by Bromsen et al (1994), include them in the Inventory assuming fume percentage is equal to the alloy composition. DEQ will accept the percentages provided in Bromsen et al. for manganese and copper, unless the percentage in the alloy is higher.
8. Torch Cutting (TEU TORCH): Where the chemical composition of the alloy is provided as "≤", use the maximum percentage instead of the mid-point between the maximum percentage and zero to develop the emission factor.[7] This applies to:
    a. Copper and compounds (CASRN 7440-50-8) – use 0.5 percent;
    b. Nickel compounds, insoluble (DEQ ID 365) – use 0.2 percent; and
    c. Chromium VI, chromate and dichromate particulate (CASRN 18540-29-9) – use 0.05 percent for total chromium (chromium may be speciated assuming 5 percent is hexavalent).

[5] DEQ will accept assumed PCDD/PCDF TEQ concentrations of $1x10^{-6}$ mg/kg TEQ for bottom ash and $1.84x10^{-3}$ mg/kg TEQ for fly ash (Source: Arun V. Somshwar, 1996, "Wood and Combination Wood-Fired Boiler Ash Characterization", Figures 7 and 10).

[6] San Diego Air Pollution Control District, Welding Operations, Revised July 11, 2022. Available at: https://www.sdapcd.org/content/dam/sdapcd/documents/permits/emissions-calculation/welding/APCD-Welding-Operations.pdf [Accessed October 8, 2025).

[7] See https://www.oregon.gov/deq/aq/Documents/AQ104B-ToxicsATEI-MBGuide.pdf

9. Maintenance Shop Metalwork Activities (TEUs WELD, PLASMAT, PLASMAH, and TORCH): if these TEUs have multiple release points, update Worksheet 2 to include all release points in the "Stack or Fugitive ID" column:
    a. If emissions will be apportioned unevenly between release locations, include a separate row and TEU ID for each release location (for example, welding emissions for three shops can be designated as sub-TEUs WELD_1, WELD_2, and WELD_3); or
    b. If emissions will be split evenly between release locations or conservatively assumed to be emitted through the worst-case location, add this information to the "CAO EI Supplemental".
10. Include the chipper as a TEU with a methanol (CASRN 67-56-1) emission factor of 0.001 pounds per oven dried ton of green wood processed [Reference: AP-42 10.6.4-9, "Emission Factors for Hardboard And Fiberboard Miscellaneous Sources – Organics"] ,
11. Wood sealants, anti-stains, and anti-fungals: Include the following TACs in the Inventory:
    a. For End Shield™ Concentrate:
        i. Formaldehyde (CASRN 50-00-0), which is listed in Section 16 of the SDS; and
        ii. Chlorothalonil (CASRN 1897-45-6); and
    b. For Workhorse II:
        i. 1,4-dioxane (CASRN 123-91-1), which is listed in Section 15 of the SDS; and
        ii. nonylphenol ethoxylate, which should be reported as 4-Nonylphenol (and ethoxylates) (CASRN 104-40-5); and
        iii. Provide documentation that the proprietary ingredients listed in the SDS (alkyl amine, organic acid, and trialkyl nitrogen oxide compounds) do not contain TACs.
12. Exempt Miscellaneous Chemical Usage:
    a. Include the following TACs in the assessment:
        i. Tacoma Screw Light Grey Primer MRO Paint: Isopropyl Alcohol (CASRN 67-63-0);
        ii. Tacoma Screw Semi Gloss Black MRO Paint: methyl isobutyl ketone (CASRN 108-10-1); and
    b. Update the percent composition for methyl isobutyl ketone (CASRN 108-10-1) in Tacoma Screw Gloss Black MRO Paint to 7.5 (product composition is 5-10%);
    c. For the CRC Brakleen Brake Parts Cleaner product, remove methanol (CASRN 67-56-1) and toluene (CASRN 108-88-3) from the assessment, or provide documentation listing them as constituents;
    d. Include the Liquid Wrench Lubricating Oil in the assessment – it contains two TACs:
        i. Butoxydiglycol should be included as diethylene glycol monobutyl ether (CAS 112-34-5); and
        ii. PTFE, which should be included as part of the perfluorinated compounds (PFCs) group (DEQ ID 489)
    e. The following TACs should be included in the assessment for this TEU, but because they do not have risk-based concentrations (RBCs) in OAR 340-245-8010 Table 2, including them will not impact the outcome and DEQ is not requiring updates to the supporting calculations at this time: barium and compounds (CASRN 7440-39-3), talc containing asbestiform fibers (DEQ ID 358), and propylene glycol monomethyl ether acetate (CASRN 108-65-6).
13. Include the Aboveground Diesel Tank as an Exempt TEU on Worksheet 2, and provide the tank capacity and maximum annual throughput;
14. Include the following as Exempt TEUs on Worksheet 2 – these permitted units have some potential to emit TACs but amounts are expected to be low and emission factors are not currently available; therefore they are not expected to contribute materially to risk:
    a. Sawmill Material Handling (permitted EU ID F1);
    b. Hogged Fuel Material Handling (permitted EU ID F2);

c. Planer Mill Material Handling (permitted EU ID F3); and
d. Planer Mill Woodwaste System (permitted EU IDs PWS1 and PWS2);

15. In Worksheet 3, populate Column G ("Max Daily – Acute" emission factors) for all rows, even if the daily emission factor is the same as the annual emission factor.

DEQ requests that you submit additional information to complete your Emissions Inventory. If you think that any of that information is confidential, trade secret or otherwise exempt from disclosure, in whole or in part, you must comply with the requirements in OAR 340-214-0130 to identify this information. This includes clearly marking each page of the writing with a request for exemption from disclosure and stating the specific statutory provision under which you claim exemption. Emissions data is not exempt from disclosure.

DEQ remains available to discuss this information request and answer any questions you may have. Failure to provide additional information, corrections, or updates to DEQ by the deadlines in this letter may result in a violation of OAR 340-245-0030(2).

If you have any questions regarding this letter please contact me directly at 503-866-9643 or julia.degagne@deq.oregon.gov. I look forward to your continued assistance with this process.

Sincerely,

Julia DeGagné
Cleaner Air Oregon Project Engineer

Enc: Attachment A: Kiln Drying Emissions References

Cc: Yuki Puram, DEQ
J.R. Giska, DEQ
File