United States Environmental Protection Agency
Region 10, Air & Radiation Division
1200 Sixth Avenue, Suite 155, 15-H13
Seattle, Washington 98101

Permit Number: R10NT501001
Issued: July 1, 2021
Effective: August 1, 2021
AFS Plant I.D. Number: 16-009-00018

Technical Support Document

Non-Title V Air Quality Operating Permit
Revision No. 1

Permit Writer: Dan Meyer

Stimson Lumber Company

Coeur d'Alene Reservation
Plummer, Idaho

Purpose of Owner-Requested Non-Title V Operating Permit and Technical Support Document

Title 40 Code of Federal Regulations Section 49.139 establishes a permitting program to provide for the establishment of Federally-enforceable requirements for air pollution sources located within Indian reservations in Idaho, Oregon and Washington. The owner or operator of an air pollution source who wishes to obtain a Federally-enforceable limitation on the source's actual emissions or potential to emit must submit an application to the Regional Administrator requesting such limitation.

The United States Environmental Protection Agency (EPA) then develops the permit via a public process. The permit remains in effect until it is modified, revoked or terminated by EPA in writing.

This document, the Technical Support Document, fulfills the requirement of 40 CFR 49.139(c)(3) by describing the proposed limitation and its effect on the actual emissions and/or potential to emit of the air pollution source. Unlike the air quality operating permit, this document is not legally enforceable. The permittee is obligated to follow the terms of the permit. Any errors or omissions in the summaries provided here do not excuse the permittee from the requirements of the permit.

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Abbreviations and Acronyms

AF	Adjustment factor
ASTM	American Society for Testing and Materials
bf	Board feet
Btu	British thermal units
CAA	Clean Air Act [42 U.S.C. section 7401 et seq.]
CEMS	Continuous emission monitoring system
CERMS	Continuous emission rate monitoring systems
CFR	Code of Federal Regulations
dscf	Dry standard cubic feet
EF_X	Emission factor for HAP X
EI	Emissions inventory
EPA	United States Environmental Protection Agency (also U.S. EPA)
ESA	Endangered Species Act
ESLPAF	Lumber products consisting of the following species: Engelmann Spruce, Lodgepole Pine, Alpine Fir (and Western White Pine at Stimson)
EU ID	Emission unit identification
FC	Fuel content
F	Fahrenheit
F_d	Volume of combustion components per unit of heat content on a dry basis
FARR	Federal Air Rules for Reservations
FC	Fuel content
FHISOR	Fuel heat input to steam output ratio
FIP	Federal Implementation Plan
FL	Lumber product consisting of the following wood species: Douglas Fir, Western Larch
gal	Gallon
GWR	Green wood residue
HAP	Hazardous air pollutant
HCl	Hydrogen chloride
hr	Hour
IHFIR	Lumber product consisting of the following wood species: Western Hemlock and Western True Firs
lb	Pound (lbs = pounds)
m	Thousand
mbf	Thousand board feet
mlb	Thousand pounds
mm	Million
mmBtu	Million British thermal units
N/A	Not applicable
NCASI	National Council for Air and Stream Improvement
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
No.	Number
O&M	Operation and maintenance
odt	Oven dry ton

PERMS	Predictive emission rate monitoring system
PTE	Potential to emit
Region 10	U.S. EPA, Region 10
RF	Release factor
RM	Reference Method
SOB	Statement of Basis
Stimson	Stimson Lumber Company
TSD	Technical Support Document
WW	Lumber product consisting of any combination of western softwood species

1. EPA Authority to Issue Non-Title V Permits

On April 8, 2005 EPA adopted regulations (70 FR 18074) codified at 40 CFR Parts 9 and 49, establishing FIPs under the CAA for Indian reservations in Idaho, Oregon and Washington. The FIPs, commonly referred to as the FARR, put in place basic air quality regulations to protect health and welfare on Indian reservations located in the Pacific Northwest. 40 CFR 49.139 creates a permitting program for establishing Federally-enforceable requirements for air pollution sources on Indian reservations. This permit has been developed pursuant to 40 CFR 49.139.

2. Project Description

2.1. Background

This permit was originally issued pursuant to 40 CFR 49.139(b)(i) on September 28, 2007 (2007 non-Title V permit), to create synthetic minor HAP PTE limitations of 9 tons of any single HAP and 24 tons of all HAP combined so Stimson could avoid being considered a major source of HAP emissions. Using rounding conventions, the permit therefore allows the facility to emit up to 9.5/24.5 tpy of HAP.[1] This is just below the major source thresholds under Section 112 of the CAA of 10 tpy for any single HAP or 25 tpy of all HAP combined. See 42 U.S.C. 7412(a)(1); 40 CFR 63.2.

2.2. Basis for Revising the Permit

According to EPA's proposed 40 CFR part 63 rulemaking published July 26, 2019, entitled, "Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act" at 84 FR 36304," to be enforceable as a practical matter, HAP limits must specify:

- A technically accurate limitation that identifies the portions of the source subject to the limitation;
- The time period for the limitation (hourly, daily, monthly, and annual limits such as 12-month rolling limits); and
- The method to determine compliance, including appropriate monitoring, recordkeeping and reporting.

[1] See EPA Memorandum entitled "Performance Test Calculation Guidelines," dated June 6, 1990 available online at https://www3.epa.gov/ttnemc01/faqs/rounding.pdf.

EPA Region 10 is revising Stimson's 2007 non-Title V permit to ensure it satisfies these criteria. Examples of ways in which the 2007 non-Title V permit does not meet the above criteria include:

- The permit does not identify the boiler, kilns, pneumatic conveyance of wood residue and used oil heater as HAP-emitting activity.
- The permit does not prescribe to an adequate level of specificity the methodology for calculating emissions (neither operating parameters nor emission factors are specified).
- The permit does not require testing to derive source-specific EF and FHISOR for the boiler, which is important given the contribution of boiler HAP emissions to facility-wide HAP emissions, the uncertainty associated with boiler FHISOR and EF and the proximity of the facility's actual emissions to the 9/24 HAP emission limits.
- The permit does not include adequate provisions to generate information to calculate emissions and ensure that the EF used to calculate emissions are representative:
    - The permit does not include operating limits on the boiler or wet scrubber parameters.
    - The permit does not require the permittee to develop and follow QA/QC practices to assure the accuracy and representativeness of data generated by monitoring equipment.

As illustrated in Section 4 of the TSD, Stimson's potential emissions continue to exceed the HAP major source thresholds in the absence of synthetic minor limits. As explained in more detail below, EPA Region 10 estimates that in 2018 Simson's actual methanol and total HAP emissions were approximately 59 and 73% of the major source thresholds, respectively.

Ensuring Stimson's emissions remain below the 9/24 tpy HAP limits is necessary for the Stimson facility to continue avoid the applicability of the Plywood and Composite Wood Products Manufacture National Emissions Standards for Hazardous Air Pollutants (NESHAP), 40 CFR part 63, subpart DDDD (PCWP MACT), and the Industrial, Commercial, and Institutional Boilers and Process Heaters NESHAP for Major Sources, 40 CFR Part 63, Subpart DDDDD (Boiler MACT). The consequence of Stimson's actual HAP emissions exceeding the limits in the 2007 non-Title V permit and becoming subject to these MACT standards is significant. Based on the most recent October 2018 source test for PM at the facility, although less than the applicable PM limit in the FARR, Stimson's PM emissions are nearly three times the PM limit in the Boiler MACT.[2] The owner-requested limits therefore allow the facility to avoid the more stringent emission limits under the Boiler MACT and could apply in the future under the PCWP MACT. This illustrates the importance of ensuring that the 9/24 tpy HAP limits

[2] Under the Boiler MACT, boiler EU-1 would be subject to a RM5 PM limit of 0.037 lb/mmBtu, roughly equivalent to 0.019 gr/dscf @ 7% O2 and less than 10% of the FARR PM emission limit of 0.2 gr/dscf @ 7% O2 that is currently applicable to that emission unit. During the most recent October 2018 RM5 PM test, RM5 PM emissions from boiler EU-1, although less than the FARR PM limit, were 0.053 gr/dscf @ 7% O2, nearly three times the Boiler MACT PM limit.

Boiler MACT RM5 PM limit equivalency: $0.019\ \frac{gr}{dscf} @\ 7\%\ O2 = \left(\frac{0.037\ lb}{mmBtu}\right) \times \left(\frac{7{,}000\ gr}{lb}\right) \times \left(\frac{mmBtu}{9{,}240\ dscf}\right) \times \left(\frac{(21\%-7\%)}{(21\%-0\%)}\right)$

on the Stimson facility contain sufficient testing and monitoring to ensure compliance with the limits.

The following list identifies examples of how the permit is being revised to ensure it is enforceable as a practical matter:

- Specify the methodology to calculate 12-month rolling emissions for all emission units, including designation of operating parameters to track and associated EF;
- Specify the procedures to update boiler EU-1 EF (for certain HAP) and FHISOR based upon fuel sampling and analysis and source testing;
- Specify the procedure to establish permissible operating range for boiler EU-1 exhaust gas O2 and wet scrubber pressure drop, water flow and nozzle water pressure assure representativeness of EF;
- Specify the procedure to estimate the volume of lumber dried per month by species;
- Require permittee develop and implement a plan to assure continuous monitoring that produces data that is valid and representative.

Note that, since EPA first issued the 2007 non-Title V permit containing owner-requested limits on HAP, EPA has promulgated the Federal Minor New Source Review Program in Indian Country, 40 CFR 49.151 to 49.161 (Tribal Minor NSR Rule). The Tribal Minor NSR rule includes provisions for issuance of owner-requested limits (referred to in that rule as rule as "synthetic minor limits"), and new requests for synthetic minor limits are issued under 40 CFR 49.159 rather than 40 CFR 49.139(b)(i). See 40 CFR 49.158. Sources subject to non-Title V operating permits containing owner-requested synthetic minor limits issued under 40 CFR 49.139 before August 39, 2011, however, may continue to operate under such non-Title V operating permits unless the source is "modified" on or after August 30, 2011. See 40 CFR 49.139(c)(1). Because Stimson is not requesting new synthetic minor limits and is not undertaking a "modification" of the source, EPA is revising Stimson's 2007 non-Title V operating permit under the authority of 40 CFR 49.139(c)(1).

3. Facility Information

Stimson is located in Plummer, Idaho within the outer boundaries of the Coeur d'Alene Reservation.

The primary operation at the facility is the production of dimensional lumber from raw logs less than 11 inches in diameter. These logs are generally the tops of harvested trees discarded in the forest. Given the nature of the business, salvaged logs are not segregated by species. As log trucks arrive at the facility with their mixed species loads, Stimson pays for the logs by the ton and not by the species. A scaler inspects the logs in a load to identify the majority species. Based on the inspection, all logs in that mixed species load are deposited together into one of five decks: Douglas Fir – Western Larch, Grand Fir – Western Hemlock, Engelmann Spruce – Lodgepole Pine – Alpine Fir – Western White Pine, Ponderosa Pine and Western Red Cedar.

Stimson has debarkers and saws, kilns for drying lumber, a planer, a wood chipper, a bark hog, various storage bins and a hog fuel-fired boiler (to supply steam to the kilns). The site includes a log yard, shops, offices, and open and covered storage areas. There are no chemical wood preservative or gluing operations. Logs are received and stored in the log yard. The process of

cutting the logs into lumber includes debarking, sawing, chipping, kiln drying, planing, and packaging for shipping. Stimson's four broad kiln-dried lumber products are FL (Douglas Fir – Western Larch), IHFIR (Western True Firs (excluding Alpine Fir) – Western Hemlock), ESLPAF (Engelmann Spruce – Lodgepole Pine – Alpine Fir – Western White Pine) and WW (Western Wood consists of the species already mentioned plus Ponderosa Pine and Western Red Cedar). A portion of Stimson's Western Red Cedar lumber is sold without drying in the kilns. The byproducts of lumber manufacturing are sawdust, wood chips, planer shavings, and hog fuel. These byproducts may be burned in the hog fuel (wood-waste) boiler or stored in bins until the material is sold and transferred off-site. The hog fuel boiler is used to provide steam to generate electricity and for the drying of rough green lumber in the drying kilns. Prior to steam use in the kilns, the steam is used to produce electricity in a steam turbine-powered 5-megawatt capacity generator. (The mill does have the ability to by-pass the steam turbine and send the steam to the kilns after reducing the temperature and pressure of the steam in a desuperheater.) The electricity produced is primarily used on-site but is also sold to the regional power grid through Avista Utilities.

Fugitive and non-fugitive emissions count in determining whether a source is a HAP major source. The HAP-generating emission units (EU-1 through EU-4) and control devices that exist at the facility are listed in Table 3-1 below by emission unit identification number (EU ID #). The control devices that are required by this permit are so noted. Table 3-1 also lists activities either not suspected of emitting HAP or emitting HAP in relatively small amounts (EU-6 through EU-9). EU-5 is prohibited from operating.[3]

Table 3-1: Emission Units and Control Devices

EU #	Emission Unit Description	HAP Control Devices*
EU-1	Hogged Fuel-Fired Boiler: Riley R-X-1, Serial No. 2771, 70,000 lb/hr steam output capacity, 105 mmBtu/hr heat input capacity, moving grate spreader-stoker, pre-heated under-grate combustion air with two over-fire air ports, post-classifier fly ash carbon reinjection near lower of the two over-fire air ports, economizer upstream of multiclone, combustion air preheater downstream of multiclone, super-heated 400 psig steam provided to steam turbine to generate electricity, saturated steam supplied to kilns either through turbine or via desuperheater, fuel is hogged bark and wood residue, no back-up fuel, FD fan pushing combustion air through preheater shell, ID fan pulling boiler exhaust through air preheater tubes, SMARS controls (a) fuel feed rate (auger screw speed) and (b) under-grate air (forced draft FD fan flow rate) in order to achieve 400 psig set point. A programable logic controller	Joy Manufacturing multiclone with two hoppers (and associated air locks). Orifice-type Yanke Energy orifice type wet scrubber employing four overhead nozzles supplying fresh water (sprayed directly into exhaust exiting the scrubber) followed by a mist eliminator, installed July 2009.

[3] Stimson has not expressed an interest in operating this unit further. Rather than developing requirements to track its HAP emissions, EPA Region 10 is prohibiting the Permittee from operating the unit.

EU #	Emission Unit Description	HAP Control Devices*
	system was installed in 2020. Boiler manufactured 1951, installed 1983.	
EU-2	Lumber Drying Kilns: Four, batch-type, indirect steam-heated, dual-track, field-erected, Wellons multizoned computer controlled with continuous monitoring of air temperature and lumber moisture content, combined annual capacity of 130 million board feet (mmbf).	None
EU-3**	Sawmill: Includes log bucking and debarking, hog, bark conveying, log sawing, sawdust conveying, chipper, chip conveying and loading, unloading and storage of materials in sawdust and chip truck bins; annual capacity 109.2 mmbf of logs, or 393,000 dry tons of logs	None
EU-4**	Planer Mill; includes planer shavings cyclone and the planer chipper cyclone; annual capacity 130 mmbf	None
EU-5	Used Oil-Fired Heater: Clean Burn 4000, 280,000 Btu/hr.	None
EU-6	Piles and handling; bark fuel pile, sawdust pile, shavings pile, drop onto pile, wind erosion of piles.	None
EU-7	Tanks: diesel (15,000 gallon), gasoline (500 gallon) and used oil (2,120 gallon) fuel tanks, horizontal	None
EU-8	Plant Traffic: in log yard, on paved areas and in green lumber stacking area; involves front-end loaders and trucks	None
EU-9***	Miscellaneous activities that consist of the application of surface protection products that generate emissions	None

* Use of the listed control devices is required by this permit.
** The HAP-emitting activity pneumatic conveyance of green wood residue at the sawmill and planer mill is part of larger emission generating activities referred to by EPA as sawmill EU-3 and planer mill EU-4 in 40 CFR part 71 permitting actions.
*** This source has been designated an 'Insignificant Emission Unit' as its potential to emit regulated air pollutants, excluding HAPs, does not exceed 2 tpy.

4. Emission Inventory

4.1. Emission Inventory Basics

An emission inventory generally reflects either the "actual" or "potential" emissions from a source. Actual emissions generally represent a specific period of time and are based on actual operation and controls. Potential emissions, referred to as PTE, generally represent the maximum capacity of a source to emit a pollutant under its physical and operational design, taking into consideration regulatory restrictions, but only required control devices. PTE is often used to determine applicability to several EPA programs, including Title V, PSD and Section 112 (MACT). Emissions can be broken into two categories: point and fugitive. Fugitive emissions are those which could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening. Examples of fugitive emissions are roads, piles that are not normally enclosed, wind blown dust from open areas, and those activities that are normally performed outside buildings. Non-fugitive or point sources of emissions include any emissions that are not fugitive. The equation below represents the general technique for estimating emissions (in tpy) from each emission unit at the facility. Emissions are calculated by multiplying an EF by an operational parameter. To estimate actual emissions, the permittee will need to track the actual operational rates.

$$E = EF * OP * K$$

where:

E = pollutant emissions in tpy;
EF = emission factors (e.g., in units of lb/mmBtu, lb/mbf, lb/odt, lb/gal)
OP = operational rate (or capacity for PTE);
K = 1 ton/2000 lb for conversion from lb/yr to tpy

4.2. PTE Emissions Inventory

Without a permit limit on its potential to emit, Stimson's potential methanol and total HAP emissions would exceed the 10 and 25 tpy major source thresholds that apply to both fugitive and non-fugitive emissions. Table 4-1 illustrates that point.

Table 4-1: HAP Potential Emissions by Pollutant (not considering proposed limitations)

Rank	Hazardous Air Pollutant	EU-1 (Boiler)	EU-2 (Lumber Dry Kilns)[a]	EU-3 (Sawmill)	EU-4 (Planer Mill)	Total[a]
1	Methanol	0.4	24.9	0.07	0.01	25.3
2	Acetaldehyde	1.0	4.4	-	-	5.4
3	Benzene	3.2	-	-	-	3.2
4	Formaldehyde	1.3	0.7	-	-	2.0
5	Hydrogen chloride	1.4	-	-	-	1.4
6	Manganese Compounds	1.3	-	-	-	1.3
7	Styrene	1.2	-	-	-	1.0
8	Toluene	0.8	-	-	-	0.7
9	Acrolein	0.3	0.2			0.5
10	Lead Compounds	0.6	-	-	-	0.3
All other HAP		1.8	N/A	-	-	N/A

	Total	12.7	30.1	0.07	0.01	42.9

[a] Lumber dry kilns EU-2 individual (methanol, acetaldehyde, acrolein and formaldehyde) HAP potential emissions reflect highest-emitting species among several species the permittee is authorized to dry. Western true firs is the highest-emitting for methanol and formaldehyde while western hemlock is highest-emitting for acetaldehyde and acrolein. Overall, western true firs is highest-emitting. Because of the use of two different techniques to calculate kilns EU-2 potential emissions (individual vs total HAP), it is not possible to calculate a PTE value for "all other HAP" in Table 4-1. The acronym N/A has been placed in the appropriate fields.

The table lists, emission unit by emission unit, the facility's potential emissions for total HAP along with the ten highest-emitting individual HAP without accounting for the emission limits and requirements in Stimson's 2007 non-Title V operating permit. The table does, however, reflect the use of air pollution control devices employed to achieve compliance with requirements applicable independent of the permit. The one example of this at Stimson is boiler EU-1's trace metal HAP EF (e.g., for lead and manganese compounds) reflecting the use of multiclone and wet scrubber to comply with the FARR's 0.2 gr/dscf @ 7% O2 PM emission limit and 20% opacity limit. Without the use of these devices, trace metal HAP EF would be approximately an order of magnitude greater that the values listed in the table. The facility's part 71 permit issued on August 13, 2014 as amended on May 13, 2015 (2015 part 71 permit) requires the use of these controls. Appendix A to this Technical Support Document entitled, "EPA Estimation of Stimson Lumber Company Hazardous Air Pollutant Potential Emissions," presents the entire PTE inventory (with supporting calculations) for the 90 HAPs emitted across the four HAP-emitting units listed in Table 4-1. Boiler EU-1 and kilns EU-2 together account for nearly all the four units' potential HAP emissions. Former used oil-fired heater EU-5 is not listed in Table 4-1 as Stimson has stated that it will no longer operate this emission unit. Stimson has requested that Region 10 no longer list EU-5 as an emission unit in the non-Title V and part 71 operating permits.

The notable differences (aside from EF selection) between this PTE inventory and the one associated with Stimson's 2015 part 71 permit are:

- Kilns EU-2 lumber drying capacity increase from 109,200 mbf/yr to 130,000 mbf/yr based upon the statement in Stimson's February 11, 2019 part 71 renewal application (2019 part 71 renewal application).
- Addition of pneumatic conveyance of green (not kiln dried) wood residue as a HAP-emitting activity within the sawmill (EU-3) and planer mill (EU-4) based on EF documented in a January 1999 NCASI technical bulletin No. 773 entitled, "Volatile Organic Compound Emissions from Wood Products Manufacturing Facilities, Part VI - Hardboard and Fiberboard." Facility & Activity ID: 072-1LC1. EU-3 capacity to pneumatically convey wood residue is based upon values in the August 3, 2014 Statement of Basis (criteria pollutant PTE inventory) supporting the 2015 part 71 permit.

4.3. 2018 Actual Emissions Inventory

Table 4-2 reflects EPA Region 10's calculation of the facility's 2018 actual emissions (aside from the contribution of sawmill EU-3 and planer mill EU-4).

Table 4-2: 2018 Actual HAP Emissions

Rank	Hazardous Air Pollutant	EU-1 (Boiler)	EU-2 (Lumber Dry Kilns)	EU-3 (Sawmill)	EU-4 (Planer Mill)	EU-5 (Used Oil-Fired Heater)	Total
1	Methanol	0.3	5.6	a	a	-	5.9
2	Acetaldehyde	0.9	1.8	-	-	-	2.7
3	Benzene	2.7	-	-	-	-	2.7
4	Formaldehyde	1.1	0.1	-	-		1.2
5	Hydrogen chloride	1.2	-	-	-	0.002	1.2
6	Manganese Compounds	1.1	-	-	-	0.00004	1.1
7	Styrene	0.8	-	-	-	-	0.8
8	Toluene	0.6	-	-	-	-	0.6
9	Acrolein	0.3	0.03				0.3
10	Lead Compounds	0.3	-	-	-	-	0.3
All other HAP		1.5	0.01	-	-	0.0003	1.5
	Total	10.7	7.5	a	a	0.002	18.2

[a] As discussed below, Stimson's annual HAP emission reports under the 2007 non-Title V permit have not included information sufficient to estimate HAP emissions for these sources.

EPA Region 10's calculations employ boiler EU-1 steam generating rates, kilns EU-2 lumber production and heater EU-5 fuel consumption reported by Stimson in its 2018 annual HAP emissions report required by the 2007 non-Title V operating permit. Because the report did not specify the quantity of green (not kiln-dried) wood residue pneumatically conveyed in either the sawmill or planer mill, actual emissions for that emission generating activity could not be estimated. Similarly, Table 4-2 does not reflect boiler EU-1 emissions generated during startup and shutdown (fuel combustion with no steam generation) because Stimson's annual HAP emissions report did not include emissions estimates for this activity.[4] Appendix B to this TSD entitled, "EPA Estimation of Stimson Lumber Company Hazardous Air Pollutant 2018 Actual Emissions," presents 2018 actual emissions inventory (with supporting calculations) for the 90 HAPs emitted across three HAP-emitting units (boiler EU-1, kilns EU-2 and heater EU-5) listed in Table 4-2. Again, boiler EU-1 and kilns EU-2 together account for nearly all the five units' actual HAP emissions.

EPA Region 10 estimates that Stimson's 2018 methanol emissions were at least 5.9 tons and total HAP emissions were at least 18.2 tons. That's at least 59 and 73% of the major source thresholds, respectively. Stimson estimated its 2018 methanol and total HAP emissions to be 4.71 and 18.3 tpy, respectively, 47 and 73% of the major source thresholds. The reason for the differences in the 2018 actual emission estimates lies primarily in (1) the selection of the EF employed in the calculations, and (2) differences in estimates for the relative lumber volume of the different species dried in the kilns in the absence of the facility identifying and tracking individual species.

[4] This revised non-title V permit requires the calculation and reporting of HAP emissions from EU-3 and EU-4, as well as EU-1 startup and shutdown. These are some examples of how the 2007 non-title V permit was not adequate to ensure compliance with the 9/24 tpy HAP emission limits in the permit.

For boiler EU-1 EF (other than hydrogen chloride), Stimson used EF specified in AP-42 Section 1.6, September 2003, for wood-fired combustion in a boiler. In revising the permit, EPA Region 10 tailored the EF to better reflect Stimson's operations (combustion of bark/wet wood in a stoker boiler controlled by multiclones and a wet scrubber) using data from various underlying studies (and fuel sampling and analysis for HCl).

For kilns EU-2 EF, Stimson used April 2013 EPA Region 10 EF for lumber drying in an indirect steam-heated batch kiln. In the April 2013 EFs, formaldehyde and methanol EF are worst-case temperature dependent values with one set for entering air temperatures less than or equal to 200°F and another set for temperatures greater than 200°F. Acetaldehyde, propionaldehyde and acrolein EF are worst-case EF. In November 2019 and again in January 2021, EPA Region 10 updated its April 2013 EFs.. The updated EF incorporate new source test data, estimate HAP EF when no test data exists for that wood species, generate temperature-dependent EF equations when correlation between drying temperature and emissions is sufficient, calculate EF without a conservative adjustment to address lack of source-specific verification testing, and calculate EF with an adjustment to address high bias of source test data generated by Oregon State University.[5] EPA Region 10 used these updated EF to calculate Stimson's 2018 actual emissions.

In addition to the differences in the EF used for kilns EU-2, EPA Region 10 and Stimson's emissions calculations for kilns EU-2 also differ based on different estimates for species-specific lumber volumes dried in the kilns. Stimson currently tracks the volume of lumber dried by product (FL, IHFIR, ESLPAF and WW) and not by individual species. Because the EF for the different species of wood vary considerably, it is important to identify and track throughput by individual species. In performing its monthly lumber drying emissions calculations, Stimson has historically estimated volumes of individual species by tracking overall kiln throughput (mbf) and multiplying overall throughput by set fractions to estimate product throughput as follows for 2018: IHFIR – 0.48, FL – 0.26, WW – 0.21 and ESLP – 0.05. Species throughput, in turn, has historically been estimated by multiplying estimated product throughput by set fractions as presented in Table 4-3 as follows for 2018:

Table 4-3: Stimson Lumber Product/Wood Species Assumptions to Estimate 2018 Species Throughput in Kilns EU-2

Product by Percent of Monthly Production (%)	Species by Percent of Product (%)				
IHFIR 48	Western True Firs 83.33		Western Hemlock 16.67		
FL 26	Douglas Fir 100				
WW 21	Western True Firs 40	Douglas Fir 26	Western Hemlock 8	Lodgepole Pine 3	Engelman Spruce 2
ESLPAF 5	Lodgepole Pine 60		Engelmann Spruce 40		

Stimson referred EPA Region 10 to a University of Montana document entitled, "Idaho's Forest Products Industry and Timber Harvest, 2015" to support the assumptions it was employing to

[5] EPA Region 10 HAP and VOC Emission Factors for Lumber Drying, January 2021 available online at http…

calculate species throughputs. Stimson's assumptions, however, were not fully consistent with the information in the reference document, and Stimson did not provide an explanation for the differences. EPA Region 10 therefore estimated 2018 species throughputs based on the information presented in the reference document. Because the reference document did not differentiate Alpine Fir from the broader Western True Firs category, however, EPA Region 10 is relying upon on-site scaling data generated by Stimson between February and November 2020 to estimate the species make-up of ESLPAF. EPA Region 10 is relying on Stimson's assumed breakdown of uniform monthly product throughput in our emissions calculations.

Table 4-4: EPA Region 10 Wood Species Assumptions to Calculate 2018 Kilns EU-2 HAP Emissions

Product by Percent of Monthly Production (%)	Reference Document Species by Percent of Product (%)								
IHFIR 48	Western True Firs 87.54					Western Hemlock 12.46			
FL 26	Douglas Fir 81.08					Western Larch 18.92			
WW 21	WTF 37.13	DF 29.64	PP 8.80	WL 6.92	WRC 5.82	WH 5.28	LP 3.74	ES 1.84	WWP 0.83
ESLPAF 5	Lodgepole Pine 67		Alpine Fir 13.8			Western White Pine 10.1		Engelmann Spruce 9.1	

5. Testing, Monitoring and Recordkeeping Decision-making

5.1. Summary of Testing, Monitoring and Recordkeeping

As discussed above, the 2007 non-Title V permit does not include testing, monitoring, and recordkeeping to assure compliance with the 9/24 tpy HAP limit. A major purpose of this permit revision is to address these deficiencies.

Tables 5-1 and 5-2 summarize the revised permit's monitoring, recordkeeping and testing requirements that generate information necessary to calculate Stimson's emissions for comparison to the 9/24 tpy HAP emission limits in the permit.

Table 5-1: Summary of Monitoring and Recordkeeping Requirements

Emission Unit	Emission Calculation	EU Operating Rate Parameter (units of measure)	Parameters Needed to Calculate EF or Determine Whether Corrective Action Required to Maintain Representativeness of EF (units of measure)
Boiler EU-1 (when generating steam)	EU operating rate * FHISOR * EF [lb pollutant/EU operating rate]; where EF = FC * RF for halogens, hydrogen halides and	Mass steam generated (mlb/month)	<u>Halogens, hydrogen halides and trace metals; parameter needed to calculate EF</u>: • concentration of pollutants in fuel (lb/mmBtu) <u>Halogens, hydrogen halides and trace metals; range specified for parameter to reflect EF representativeness</u>: • scrubber Δp (inches H2O) • scrubber H2O flow (gal/min) • pressure in H2O supply header (inches H2O) <u>Trace metals; no range specified for parameter to reflect EF representativeness</u>: • multiclone Δp (inches H2O)

Emission Unit	Emission Calculation	EU Operating Rate Parameter (units of measure)	Parameters Needed to Calculate EF or Determine Whether Corrective Action Required to Maintain Representativeness of EF (units of measure)
	EF = FC * RF * AF for trace metals		Organics; range specified for parameter to reflect EF representativeness: • exhaust gas O2 concentration (% by volume, wet basis)
Kilns EU-2	EU operating rate * EF [lb pollutant/EU operating rate]	Lumber volume dried, by species (mbf/month) • product volume (mbf) • relative make-up of product by species (unitless)	Parameter needed to calculate EF: • species of wood • drying schedule's maximum set point temperature for air entering load of lumber (°F) ("entering air") No range specified for parameter to reflect EF representativeness: • moisture content of lumber (%, dry basis)
Sawmill EU-3		Mass green wood residue conveyed (bdt/month)	None
Planer Mill EU-4		Mass green wood residue conveyed (bdt/month)	None

Table 5-2: Summary of Testing Requirements

Emission Unit	Number of Tests	Values to be Determined to Enable Monthly Emission Calculations	Parameters to be Monitored to Enable Specification of Operating Range to Assure Representativeness of EF[a]
Boiler EU-1	Two; July – Sept. 2021, Dec. 2021 – March 2022	EF (lb/mmBtu): Cl2, HCl, HF, lead, manganese, phosphorus, acetaldehyde, acrolein, benzene, formaldehyde, hexane, methanol, methyl isobutyl ketone, methylene chloride, propionaldehyde, styrene and toluene FC (lb/mmBtu): chlorine, fluorine and three trace metals through fuel sampling and analysis RF (unitless): Cl, HCl, HF, lead, manganese and phosphorus by calculating "EF/FC"	Hydrogen halides and trace metals: • scrubber Δp (inches H2O) • scrubber H2O flow (gal/min) • pressure in H2O supply header (inches H2O) Organics: • exhaust gas O2 concentration (% by volume, wet basis)
Kilns EU-2	None	Not applicable	Not applicable
Sawmill EU-3			
Planer Mill EU-4			

[a] Monitoring/recording also required of parameters specified in the permit for which no range is being established.

In addition, Stimson is required to develop and implement a monitoring plan demonstrating that each monitoring system collects information at all times the EU is operating and generates representative and valid data. Stimson is required to revise this plan at any time if EPA determines the plan does not achieve its intended goal and specified the deficiencies.

In developing the testing, monitoring, and recordkeeping provisions, EPA Region 10 was guided by EPA's proposed 40 CFR part 63 rulemaking published July 26, 2019, entitled, "Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act" at 84 FR 36304, 36320:

> *In practice, monitoring for a surrogate (e.g., particulate matter (PM)) can adequately estimate or provide the actual emissions for a group of HAP at the unit, provided there exists a validated relationship between the surrogate and the HAP emissions (e.g., emissions of HAP metals may be controlled as PM by a baghouse and continuously monitored through bag leak detectors and pressure drop measurement; this requires a validated relationship between PM emissions and the HAP metals emissions as well as the relationship between the baghouse operating parameters and the PM emissions)…*
>
> *Depending on the situation, appropriate monitoring may consist of one or more of the following: collecting data on operational parameters that are used to monitor emissions; CEMS or CEMS-based methods; data collection and calculations for mass balance determinations; and continuous monitoring of operating parameters on a control device or process performance parameters correlated with actual emissions and used with calculations of emissions, including appropriate adjustments for control devices or process out-of-control periods. To determine whether a given set of monitoring requirements is appropriate, one should consider the following aspects of the monitoring: The parameter and its measurement approach; the operating range; and the representativeness of the data collected, an operational status check, quality assurance and control practices, frequency of data collection, data collection procedures, and averaging period.[32] It is important to identify and select these aspects of the monitoring to assure the emissions control measures employed are properly operated and maintained, and do not deteriorate to the point that the source's emissions fail to be in compliance with the applicable PTE limit… Selection of the parameter and the measurement approach, as well as the operating range, are all dependent directly upon site-specific criteria including the nature of the source, any control devices present, and other site-specific criteria.*
>
> *[32] See Table 1 of the Compliance Assurance Monitoring (CAM) Technical Guidance Document, available at https://www.epa.gov/sites/production/files/2016-05/documents/cam-tgd.pdf.*

The following sections of the TSD explain the basis for the testing, monitoring and recordkeeping requirements required in the revised permit and summarized in Tables 5-1 and 5-2 to ensure the 9/24 tpy HAP limits are enforceable as a practical matter.

5.2. Boiler EU-1

EPA Region 10 estimates that boiler EU-1 emits approximately 90 different HAP and contributes approximately 10.7 of 18.2 tons total HAP emitted from the facility in 2018. The permit prohibits Stimson from emitting more than 24 tpy total HAP. As discussed above, total HAP emissions from the Stimson facility are 76% of the 24 tpy emission limit as evidenced by 2018 emissions, and boiler EU-1 accounts for nearly 59% of those emissions. For methanol (HAP emitted in greatest quantity), the boiler generates approximately 0.3 tons of the 5.9-ton total. The second-highest emitted HAP is acetaldehyde at 2.7 tons, and boiler EU-1 is responsible for 32% of it. The third-highest emitted HAP is benzene at 2.7 tons, and boiler EU-1 is responsible for all of it. The permit prohibits Stimson from emitting more than 9 tpy of any individual HAP.

The EF that have been used to calculate boiler EU-1 HAP emissions to date are averages based on test data from a pool of generally similar boilers,[6] and thus may under or overestimate emissions from boiler EU-1. Emissions vary from boiler to boiler, even those from a common pool employing the same combustion technology, combusting the same type of fuel and employing the same PM control technology as illustrated in Appendices A and B to this TSD. For example, for the highest-emitted HAP benzene, the average EF is 5.85×10^{-3} lb/mmBtu with a standard deviation of 2.02×10^{-2} lb/mmBtu. There are thirteen boilers in the pool. Boiler EU-1's 2018 benzene emissions are estimated to be 2.7 tons using the average EF, 11 tons using the average EF plus one standard deviation, and 29 tons using the maximum EF.

Given the contribution of boiler EU-1 HAP emissions to facility-wide HAP emissions, the proximity of past actual (one year) facility-wide HAP emissions to the 9/24 tpy HAP limits, and given that the estimates use limited "average" similar-source EF rather than test results for this particular unit, EPA Region 10 has determined that targeted source testing to determine boiler EU-1 EF for a minority of pollutants emitted (but which contribute approximately 96% of the total HAP emitted) while simultaneously monitoring parameters that affect emissions is needed to provide an adequate assurance of compliance for this emission unit. The permit also requires monitoring of certain parameters between source tests. The facility-specific test-derived EF (RF or EF/FC for halogens, hydrogen halides and trace metals) would generally be expected to be representative of emissions for those time periods when the boiler, multiclone and scrubber continue to be operated in a manner such that designated boiler and scrubber parameters remain within the range of values observed during the source tests.

HAP Required to Be Measured During Testing

Table 4-2 lists the ten HAP emitted in greatest amount by the facility in 2018. Because boiler EU-1 emits each of them in a high amount relative to the other 90 HAP emitted by the boiler, the permit requires Stimson to determine EF for each of them through source testing. Table 5-3 lists in order the highest-emitted HAP for boiler EU-1 along with their EF. Because the cost of measuring additional trace metals beyond manganese and lead is incrementally small compared to the overall cost of conducting RM29 testing for manganese and lead, the permit also requires Stimson to measure phosphorus (12^{th} highest boiler EF) emissions. Similarly, because the cost of measuring additional halogen or hydrogen halides is incrementally small compared to the overall

[6] The one exception is the quarterly boiler EU-1 HCl EF (RF of 0.15 vs 0.085 for two similar EU), which is based on quarterly fuel chlorine sampling and analysis.

cost of conducting RM26A for HCl, the permit also requires Stimson to measure emissions for HF and Cl2 in addition to HCl. Although HF and Cl2 EF are nearly an order of magnitude less than HCl, their EF are the 13th and 18th highest boiler EF. Together, these 13 HAP account for 89.5% of boiler HAP emissions. The addition of the next four highest-emitted boiler EU-1 HAP (#11 methyl isobutyl ketone, #14 – 16's propionaldehyde, hexane and methylene chloride) brings the total number of HAP to be tested to 17, which together account for 95.1% of boiler EU-1 HAP emissions. See Table 5-4 for a summary presentation.

Table 5-3: Top 20 Boiler HAP EF

HAP	EF (lb/mmBtu)	HAP	EF (lb/mmBtu)
1. Benzene	5.85x10-3	11. Methyl isobutyl ketone	4.45x10-4
2. Hydrogen chloride	2.55x10-3	12. Phosphorus	4.05x10-4
3. Manganese compounds	2.47x10-3	13. Chlorine	3.69x10-4
4. Formaldehyde	2.33x10-3	14. Propionaldehyde	3.11x10-4
5. Acetaldehyde	1.89x10-3	15. Hexane	2.88x10-4
6. Styrene	1.86x10-3	16. Methylene chloride	2.87x10-4
7. Toluene	1.22x10-3	17. Naphthalene	1.39x10-4
8. Methanol	7.32x10-4	18. Hydrogen fluoride	1.27x10-4
9. Lead compounds	6.38x10-4	19. Carbon disulfide	1.25x10-4
10. Acrolein	5.66x10-4	20. Chromium compounds	1.14x10-4

Table 5-4: Fraction of HAP to be Tested by Count and by Emissions

Category of HAP	# of HAP	# HAP being tested[7]	% of HAP Being Tested	% of Total HAP EF
Trace Metals	12	3	25	15.0
Halogen and Hydrogen Halides	3	3	100	13.0
Organics	75	11	14.7	67.2
	90	17	**18.9%**	**95.1%**

Monitoring During and Between Source Tests

EPA Region 10 assumes that Stimson's orifice-type wet scrubber captures, to varying degrees, halogens, hydrogen halides and trace metals. EPA Region 10 expects that test-derived RF (EF/FC) will remain representative if the following three wet scrubber parameters remain relatively unchanged from levels observed during source testing: scrubber Δp (in H2O), scrubber H2O flow (gal/min) and pressure in H2O supply header (in H2O). Removal efficiency increases with increasing (1) exhaust gas Δp as greater pressure drop creates smaller liquid drops that are more efficient in collecting pollutants and (2) liquid to gas ratio. Thus, the permit requires monitoring scrubber Δp and H2O flow and establishes minimum operating thresholds to assure continued performance of the scrubber after source testing. Four spray nozzles are employed to atomize the water as it is distributed throughout the oncoming exhaust gas exiting the scrubber. The water (along with any captured pollutants) are deposited in the pool below. Plugging or corroding of the nozzles will diminish the effectiveness of the water spray. Plugging or corroding of a nozzle will result in an increase or decrease in the water pressure in that line (and a decrease

[7] The 18 HAP to be tested in boiler EU-1 exhaust are the top 18 emitted HAP.

in pollutant removal efficiency). Stimson indicates that corrosion or pluggage to a single nozzle can be detected by monitoring pressure in the upstream pipe supplying water to all four nozzles. Therefore, the permit requires monitoring water pressure in the common upstream supply header and establishes an operating range to assure continued scrubber performance after source testing.

For organics, test-derived EFs are expected to remain representative if exhaust gas O2 concentration (% by volume, wet basis) remains relatively unchanged from levels observed during source testing. Lower oxygen levels may indicate incomplete combustion. The detrimental effects of too much combustion air include: (1) reducing combustion temperatures and retarding the combustion rate, (2) reducing thermal efficiency (increasing FHISOR), thus requiring more fuel for a given steam output, and (3) increasing gas velocities in the furnace causing transport of fuel particles out of the furnace before complete combustion.[8] Both scenarios may be characterized by higher organic HAP emissions than those measured during source testing. The permit requires exhaust gas O2 monitoring and that a lower bound O2 operating threshold be established. No upper bound is necessary as the permittee is already sufficiently motivated to minimize combustion air in the interest of maintaining thermal efficiency (less fuel combusted per unit of steam production).

The permit requires Stimson to continue to continuously measure the mass of steam generated by boiler EU-1 to calculate emissions for all HAP, which are calculated prior to the completion of two rounds of source testing using default EF (lb/mmBtu). The permit also requires Stimson to continue to conduct quarterly fuel sampling and analysis to determine chlorine content FC (lb/mmBtu), which enables the calculation of a hydrogen chloride EF. For months beginning the month after the permit becomes effective, the chlorine FC is calculated by averaging the results of the previous eight quarterly sampling results. For the two years following permit issuance, Stimson will be using, in part, sampling results generated prior to the issuance of this permit revision. After submitting the results of the second source test, Stimson is required to begin calculating chlorine and hydrogen chloride monthly emissions (E = mlb steam/month * mmBtu/mlb steam * RF * lb pollutant/mmBtu) using two-test-average RF and eight-quarter-rolling-average FC. Stimson is required to similarly calculate hydrogen fluoride, lead, manganese and phosphorus emissions. Because fluorine and trace metal quarterly sampling and analysis is required beginning the month after the month the permit becomes effective (about four quarters prior to the second source test), Stimson will begin determining FC with only four quarterly sampling results and build to eight within a year of the second source test. Because halogen, hydrogen halide and trace metal emissions are dependent, in part, on the content of the pollutant in the fuel, it is necessary to multiply the multi-quarter average content of the pollutant in the fuel (lb/mmBtu) by test-derived RF ($\frac{(\frac{lb}{mmBtu})_{stack\ exit}}{(\frac{lb}{mmBtu})_{fuel}}$) to calculate emissions. For lead and manganese, it is necessary to also multiply the product by an additional factor that recognizes that trace metal compounds are likely emitted as oxides.

FHISOR is a critical boiler parameter that affects calculation of all HAP generated. The permit requires Stimson to initially use a FHISOR of 1.768 mmBtu/mlb steam to convert steam output

[8] Nonfossil Fuel Fired Industrial Boilers – Background Information, EPA-450/3-82-007, March 1982. Document available online from EPA's NSCEP at https://nepis.epa.gov/Exe/ZyNET.exe?ZyActionL=Register&User=anonymous&Password=anonymous&Client=EPA&Init=1

to heat input to enable calculation of emissions using EF in units of lb/mmBtu. The 1.768 mmBtu/mlb steam value is an average of three values derived from three tests conducted in October 2012 (4 runs with FHISOR of 1.667 and average fuel moisture content of 43%), October 2014 (3 runs with FHISOR of 1.6317 and average fuel moisture content of 33%) and October 2018 (3 runs with FHISOR of 2.005 and average fuel moisture content of 39%). See Appendices A and B to this TSD for the calculations. As additional source testing is conducted in the third quarter of 2021 and winter of 2021/2022, and thereafter to satisfy Title V periodic monitoring requirements for the FARR PM limit (currently RM5 PM testing between December 1 and March 31 at a frequency dictated by proximity to FARR PM limit), FHISOR is required to be updated by averaging existing test-derived values with new ones.

Rather than have one FHISOR apply at all times of the year under all load conditions, EPA Region 10 considered tying FHISOR to fuel moisture content or season of year. EPA has previously stated, "Higher fuel moisture contents reduce the fuel heating value, reduce overall boiler thermal efficiency, and retard combustion. This means that a higher fuel feed rate will be required for a given steam production." See page 3-21 of document referenced in Footnote 10 of this TSD. If FHISOR is indeed correlated with fuel moisture content, the 1.768 mmBtu/mlb steam FHISOR value may underestimate the annual average. The October testing to derive FHISOR is immediately preceded by the three hottest and driest months of the year, and the overall average fuel moisture content for the three October tests was 38%. See Appendix D to this TSD for the correlation between FHISOR and fuel moisture content for the three October tests. Bark moisture content typically ranges between 25 – 75%, coarse wood residue between 30 – 60%, and planer shavings between 16 – 40%, wet basis.[9] In the absence of facility-specific information beyond the October-based FHISOR, EPA has chosen at this time to require Stimson to apply a single FHISOR throughout the year independent of fuel moisture content. The average FHISOR value will be updated to incorporate new test results.

5.3. Kilns EU-2

The EF for lumber drying are based upon a correlation between full-scale and small-scale lumber dry kiln emissions and subsequent small-scale kiln testing while employing drying schedules used to dry lumber in large-scale kilns. Table 5-5 summarizes information about the underlying testing supporting the EF for the five species of wood dried in Stimson's lumber kilns.

Table 5-5: Information about Testing Data Supporting Lumber Dry Kiln EF (lb/mbf)

Species	% of Lumber Dried @ Stimson[1]	200°F Best-Fit-Curve EF / # tests / R2		Average EF / # tests / Std Dev or $\frac{Max}{Min}$		
		Methanol	Formaldehyde	Acetaldehyde	Propionaldehyde	Acrolein
Western True Firs	51	0.1964 / 4 / 0.98	0.0044 / 4 / 0.99	0.0550 / 1 / NA	no test data for species, substitution performed	no test data for species, substitution performed
Douglas Fir	33	0.0671 / 16 / 0.72	0.0018 / 16 / 0.71	0.0275 / 12 / 0.011	0.0003 / 10 / 0.002	0.0005 / 10 / 0.001
Western Hemlock	10	0.1005 / 17 / 0.65	0.0016 / 17 / 0.78	0.0677 / 5 / 0.018	0.0004 / 5 / 0.0002	0.0012 / 6 / 0.0005

[9] Boilers Fired with Wood and Bark Residues. Oregon State University Forest Research Laboratory Research Bulletin 17, November 1975. See Table 1 of document. https://ir.library.oregonstate.edu/downloads/wd375x437

Species	% of Lumber Dried @ Stimson[1]	200°F Best-Fit-Curve EF / # tests / R2		Average EF / # tests / Std Dev or $\frac{Max}{Min}$		
		Methanol	Formaldehyde	Acetaldehyde	Propionaldehyde	Acrolein
Lodgepole Pine @ 237°F [2]	4	0.0550 / 3 / $\frac{0.0510}{0.0570}$	0.0030 / 3 / $\frac{0.0030}{0.0029}$	no test data for species, substitution performed	no test data for species, substitution performed	no test data for species, substitution performed
Engelmann Spruce (Sub White Spruce)	2	0.0407 / 2 / NA	0.0019 / 2 / NA	0.0201 / 2 / $\frac{0.022}{0.019}$	0.0002 / 2 / $\frac{0.0002}{0.0001}$	0.05 / 2 / $\frac{0.0007}{0.0003}$
Ponderosa Pine	not reported	0.0842 / 5 / 0.89	0.0043 / 5 / 0.91	0.0340 / 3 / 0.038	0.0010 / 3 / 0.0009	0.0026 / 3 / 0.002
Western Larch	not reported	No test data for species, substitution performed				
Western Red Cedar	not reported	No test data for species, substitution performed				
Western White Pine	not reported	No test data for species, substitution performed				

[1] Values provided by Stimson but with no on-site data in support. True Firs = 40 + (40/79)(21) = 50.6. Douglas Fir = 26 + (26/79)(21) = 32.9. Western Hemlock = 8 + (8/79)(21) = 10.1. Lodgepole Pine = 3 + (3/79)(21) = 3.8. Engelmann Spruce = 2 + (2/79)(21) = 2.5.

[2] Lodgepole Pine values for methanol and formaldehyde cells reflect "average EF / # tests / $\frac{max}{min}$." Best-fit-curve could not be generated given similar (nearly identical) drying temperatures experienced during the three runs.

The schedules Stimson employs to dry its lumber, however, are similar to the ones employed during small-scale kiln testing. References to the emission studies/reports illustrating the schedules are located in EPA Region 10 HAP and VOC Emission Factors for Lumber Drying, January 2021 beginning on page 52.

As discussed above, the facility-wide limits are set below the major source threshold (effectively 9.5 and 24.5 tpy). Methanol is the HAP emitted in greatest amount from lumber drying and across the mill combined. Approximately 5.9 tons of methanol were emitted from the facility in 2018. Of that, 5.6 tons or 95% was emitted by kilns EU-2. Many factors influence the extent to which lumber generates HAP emissions while undergoing drying in a kiln. For methanol and formaldehyde, a batch will generate more emissions if dried at a higher temperature.

The methanol EF for the highest-throughput species, Western True Firs (0.1964 lb/mbf), is nearly twice that of the next highest species, Western Hemlock (0.1005 lb/mbf), but is based on less emissions data (4 runs versus 17 runs). The acetaldehyde EF for Western True Firs is around one-quarter that of methanol at maximum entering air drying temperature of 200°F, but this EF is based on only one test run. No test data has been generated for propionaldehyde and acrolein. Given the likelihood that drying Western True Fir lumber generates these two HAPs as shown through testing of other western softwoods, and in order to assure compliance with the 9/24 tpy limits, Region 10 has estimated propionaldehyde and acrolein EF based upon Western True Fir acetaldehyde EF and Western Hemlock EF for acetaldehyde, propionaldehyde and acrolein. See Appendices A and B of this TSD for the calculations. Of all the western softwoods for which EF

have been developed, Western Hemlock is most similar to True Firs as each is a non-resinous softwood species.

The most likely species for which to require EF confirmation testing would be Western True Firs given it has the highest throughput at the facility and the highest EF with the greatest uncertainty due to lack of testing as compared to other species. EPA Region 10 is not requiring Stimson to perform testing to verify EF for the kilns, however, due to uncertainty surrounding the availability of small-scale kilns and the cost of conducting full-scale kiln testing. NCASI demonstrated that full-scale kiln testing could be performed and produce valid results most recently in 2016 at a cost of around $100,000 for PM2.5, HAP (six total) and RM25A VOC for just one batch of lumber. EPA Region 10 decision-making on this issue may shift if relevant facts change over time. Such facts include, but are not limited to, the proximity of the facility's emissions to the 9/24 tpy limits, improved availability of small-scale kiln testing and improved affordability of full-scale kiln testing.

The permit requires Stimson to track and record the following about each charge (initiated during the month) in order to calculate the total monthly emissions generated: product(s) and species of wood present, lumber volume by product, drying schedule's maximum set point "entering air" temperature and record of all instantaneous kiln-wide average measured temperatures. Stimson is also required to scale a fraction of incoming logs daily to estimate the 6-month rolling composition of each lumber product by species. The permit also requires Stimson to track lumber moisture content and report to Region 10 if kiln-wide average content falls below 13% (dry basis). Most, if not all, small-scale kiln emissions data supporting Region 10 EF reflects drying lumber to approximately 15% (dry basis). Additional emissions (beyond levels predicted by EF) are generated as moisture content is driven below the level observed during testing.

5.4. Sawmill EU-3 and Planer Mill EU-4

The pneumatic conveyance of green wood residue generates methanol emissions. The permit specifies the 0.00122 lb/odt methanol EF to use to calculate emissions resulting from conveyance of green wood residue. The EF is based upon a test conducted by NCASI consisting of two runs during which exhaust gas was analyzed for 20 different HAP.[10] Only methanol was detected. The test sampled the exhaust of a cyclone receiving pneumatic stream of green aspen chips with moisture content of 40% (wet basis). Aspen is a hardwood, but Stimson processes only softwoods. The facility's methanol PTE resulting from this activity is 0.08 tpy (0.07 tpy from sawmill EU-3 and 0.01 tpy from planer mill EU-4) based upon the specified EF above and the sawmill and planer mill capacity noted in Stimson's 2019 part 71 renewal application. The permit does not require testing to develop a source-specific EF for this activity given its relatively small contribution to the mill's overall HAP emissions and the fact that the 9/24 tpy limits are set below the 10/25 tpy major source thresholds effectively by 0.5 tpy. EPA Region 10 is not aware of any information that would suggest that the Pacific Northwest softwood EF for this activity is approximately an order of magnitude greater than the hardwood aspen EF. As provided in Condition 8.6, however, the permit requires Stimson to submit to EPA for approval a plan for determining the volume of green wood residue conveyed from point of generation (or receipt from off-site) to pieces of equipment that either exhaust or vent to atmosphere.

[10] January 1999 NCASI technical bulletin No. 773 entitled, "Volatile Organic Compound Emissions from Wood Products Manufacturing Facilities, Part VI - Hardboard and Fiberboard." Facility & Activity ID: 072-1LC1.

5.5. Other Emission Units

In addition to EU-1 through EU-4, Table 3-1 lists activities at Stimson that may generate a relatively small amount of fugitive HAP emissions. For instance, the evaporation of organic HAP from hogged bark and wood residue (fuel for boiler EU-1) stored outside in piles may generate HAP emissions. Loading wood residue into trucks and railcars may also generate HAP emissions. EF have not been developed for these activities. Filling, dispensing and breathing losses from the 15,000-gallon diesel tank, 500-gallon horizontal tank and 2,120-gallon used oil tank generate a relatively small amount of HAP emissions. Rather than requiring the permittee to track these emissions by (a) conducting source testing of piles and wood residue loading to develop EF, and (b) monitoring throughput, EPA is requiring the permittee to limit emissions from Table 3-1 activities with EF assigned (EU-1 through EU-4) to levels slightly less than the HAP major source thresholds. EPA estimates that activities at the facility listed in Table 3-1 with no assigned HAP EF (EU-6 through EU-9) do not have the potential to emit more than 0.5 tons (1,000 lb) of HAP annually. Thus, EPA is limiting 12-month rolling total HAP emissions generated by EU-1 through EU-4 to no more than 24 tons and individual HAP emissions to no more than 9 tons. These are effectively 24.5 and 9.5 tpy limits due to rounding conventions.

Former used oil-fired heater EU-5 is not included in the revised permit as Stimson has stated that it will no longer operate this emission unit.

6. Additional Analysis

EPA Trust Responsibility. As part of Region 10's direct federal implementation and oversight responsibilities in Indian Country, Region 10 has a trust responsibility to the federally recognized Indian tribes within the Pacific Northwest and Alaska. The trust responsibility stems from various legal authorities including the U.S. Constitution, Treaties, statutes, executive orders, historical relations with Indian tribes and, in this case, the 1873 Executive Order and subsequent series of treaty agreements. In general terms, EPA is charged with considering the interest of tribes in planning and decision-making processes. Each office within EPA is mandated to establish procedures for regular and meaningful consultation and collaboration with Indian tribal governments in the development of EPA decisions that have tribal implications. Region 10's Air and Radiation Division has contacted the Tribe to invite consultation on this revision to the synthetic minor HAP permit and has maintained ongoing communications with Tribal environmental staff throughout the permitting process.

Endangered Species Act Impacts. EPA is obligated to consider the impact that a federal project may have on listed species or critical habitats. This permit revision does not increase emissions: the emission limits remain at 9/24 tpy HAP. Rather, it better assures compliance with the emission limits. Therefore, EPA concludes that the issuance of this permit will not affect a listed specie or critical habitat. EPA's no effect determination concludes EPA's obligations under Section 7 of the ESA. (See Endangered Species Consultation Handbook: Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act, Fish and Wildlife Service and National Marine Fisheries Service, March 1998, at Figure 1).

National Environmental Policy Act Review. Under Section 793(c) of the Energy Supply and Environmental Coordination Act of 1974, no action taken under the CAA shall be deemed a major Federal action significantly affecting the quality of the human environment within the

meaning of the National Environmental Policy Act of 1969. This permit is an action taken under regulations implementing the CAA and is therefore exempt from NEPA.

National Historic Preservation Act. This project involves establishing a limit on emissions. No part of the facility will be physically altered directly as a result of this permit. Consequently, no adverse effects are expected, and further review under NHPA is not indicated.

Environmental Justice (EJ) Policy - Under Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, signed on February 11, 1994, EPA is directed, to the greatest extent practicable and permitted by law, to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States. According to EPA's EJSCREEN Version 2019 environmental justice screening and mapping tool, minorities comprise 34% of the community within a one-mile radius of the facility, and 50% of the 1,145-resident population is characterized as low income. While the percentage of minorities in the community is lower than the national average (39%), the percentage of low-income residents is higher than the national average (33%).

This permit revision does not increase emissions: the emission limits remain at 9/24 tpy HAP. Rather, it better assures the 9/24 tpy HAP emission limits are enforceable as a practical matter. Therefore, EPA concludes that the issuance of this permit will not have disproportionately high and adverse impacts to a minority or low-income population.

7. Permit Content

Section 1 – Abbreviations and Acronyms

- Providing abbreviations and acronyms up front to enable their use without further explanation.

Section 2 – Description of Permit Revision

- The September 2007 is not consistent with the practicable enforceability criteria presented in the July 26, 2019 federal register notice. Chiefly, the 9/24 tpy HAP limits in the permit do not sufficiently identify the portions of the source subject to the limit and how to accurately calculate emissions to demonstrate compliance. The permit also does not contain sufficient monitoring and recordkeeping to generate information to verify the EF are representative and perform the emission calculations.

Section 3 – Source Information

- Table 3-1 lists the activities at Stimson for which the use of (a) throughput/operations monitoring and (b) an EF allows for the calculation of HAP emissions.
- Five of the eight emission units in the 2015 part 71 permit appear in the revised non-Title V permit. As discussed in Section 5.6 of this TSD, the revised non-Title V permit does not address the following emission units in Stimson's 2015 part 71 permit: (a) wood residue piles, (b) fuel storage tanks, and (c) plant traffic because EPA is not aware of a HAP EF for any of these activities and EPA expects a minimal contribution.

- Newly designated VOC-emitting activity EU-9 (application of surface protection products to lumber) does not appear in the revised non-Title V permit because Stimson indicates that there are no HAP emissions generated with this activity.
- The lumber drying and planing capacity of kilns EU-2 and planer mill EU-4 listed in Table 3-1 of the revised non-Title V permit differs from values presented in the previous part 71 permits. The increased value of 130 mmbf for each is presented in the Stimson's 2019 part 71 permit renewal application. Stimson indicates that the previous 109.2 mmbf capacities for EU-2 and EU-4 reflected sawmill EU-3 capacity. Stimson points out that it can receive rough green lumber from off-site and manufacture from it kiln-dried planed lumber. The updated 130 mmbf capacities for EU-2 and EU-4 reflects that reality.

Section 4 – General Requirements

Conditions 4.1 and 4.2 are carried over from the 2007 non-Title V permit.

Condition 4.3 clarifies EPA Region 10's inherent authority to revise this non-Title V permit for cause.

Condition 4.4 reflects the credible evidence provisions in 40 CFR 49.123(d). See also Condition 2.6 from the 2015 part 71 permit.

Condition 4.5 provides authority to establish alternative testing, monitoring, recordkeeping and reporting requirements through our Title V monitoring authority through issuance, renewal, or significant modification of a part 71 permit.

Section 5 – Emission Limitations and Work Practice Requirements

Conditions 5.1 and 5.2 are the facility-wide HAP 9/24 tpy emission limits. Using rounding conventions, the permit therefore allows for emissions of up to 9.5/24.5 tpy. The limits (and the accompanying compliance demonstration) apply to emissions generated 12 months prior to and including the month after the permit becomes effective. For instance, assume the permit is issued June 15, 2021 after responding to public comment. Notice of the permit decision is given via email that same day along with an announcement that the permit becomes effective 30 days later on July 15, 2021.

The first 12-month period for which Stimson is required to demonstrate compliance with the 9/24 tpy limit in this permit is August 2020 to July 2021. The methodology for calculating the facility's emissions for that 12-month period is somewhat similar to the methodology Stimson has been employing based upon its annual HAP emissions reporting. One significant difference, however, is the methodology for estimating volumes of lumber by species dried in kilns EU-2. The permit no longer allows Stimson to estimate monthly the volume of each product (e.g., FL, IHFIR, ESLPAF, WW) dried in kilns EU-2. Those product-specific volumes must be measured and not estimated based upon the relative make-up of the forests from which logs are delivered to the mill. For 12 months (August 2020 through July 2021), the composition of each product, however, is estimated as directed in Appendix E of the permit based upon information presented in the University of Montana's "Idaho's Forest Products Industry and Timber Harvest, 2015" and on-site log scaling data between February and November 2020 for species Alpine Fir, Engelmann Spruce, Lodgepole Pine and Western White Pine. Beginning August 2021(and all months thereafter), the composition of each product is estimated based upon the most recent six months of on-site log scaling data. This means, for August 2021 emissions, product composition is based upon log scaling data for months March 2021 through August 2021. Another significant

difference is the application of the permit-specified FHISOR value of 1.768 mmBtu/mlb steam as opposed to 1.721 mmBtu/mlb steam to calculate boiler EU-1 emissions.[11] The change in FHISOR amounts to a 2.7% increase in estimation of boiler emissions. This increase is required to be used to calculate emissions for the period beginning 11 months prior to the month the permit becomes effective (beginning August 2020 if the permit becomes effective July 15, 2021). Beginning August 2021 (and all months thereafter), Stimson is required to calculate emissions using new EF for boiler EU-1 and kilns EU-2

Because dibenzofurans, naphthalene and 2,3,7,8-tetrachlorodibenzo-p-dioxin are both individual HAPs and contribute to the HAP POM (also subject to the 9 tpy limit), Condition 5.1 (24 tpy total HAP limit) specifies that the contribution of these three HAP shall not be double counted.

Condition 5.3 helps assure that default and test-derived factors do not underreport emissions. Stimson and EPA Region 10 are relying upon EF to be representative of emissions. Condition 5.3 assures that emission units and control devices are maintained so that effectiveness does not diminish from the levels achieved during boiler EU-1 source testing (when FHISOR, EF and RF are established).

Condition 5.4 provides the fundamental calculation to determine boiler EU-1's monthly emissions for an individual HAP based upon the mass of steam generated (mlb), the boiler's FHISOR (mmBtu/mlb steam) and an EF (lb/mmBtu).

Condition 5.5 specifies the calculation of boiler EU-1's emissions for the eleven months prior to the month the permit becomes effective plus the month in which the permit becomes effective. For these first twelve months, this permit specifies a methodology for calculating emissions that was not, in some instances, sufficiently specified in the 2015 part 71 permit. For instance, no EF were specified in the 2015 part 71 permit other than HCl for boiler based upon quarterly fuel sampling and analysis. The 2015 part 71 permit's SOB, however, did present a PTE EI as an appendix, and the EF used in that 2015 part 71 permit's PTE EI for boiler EU-1 are specified in Appendix A to this permit for use in calculating HAP emissions for the 11 months prior to the permit becoming effective and the month in which the permit becomes effective. Note that trace metal compound EF have not been adjusted to account for the fact that RM29 does not quantify the mass of the entire HAP compound because it is not reasonable to require the permittee to calculate emissions in this manner for periods prior to the effective date of this permit. The trace metal EF in Appendix B to this permit are adjusted, as appropriate, going forward beginning the month after the month the permit becomes effective.

Condition 5.5 specifies a FHISOR of 1.768 mmBtu/mlb steam based upon three source tests (and associated fuel sampling and analysis) conducted of boiler EU-1 in October 2012 (1.667), October 2014 (1.632) and October 2018 (2.004). The use of an average value is appropriate given EPA is not aware of a physical or operational change having taken place during or since that stretch of years that would be expected to increase or reduce boiler efficiency. As FHISOR increases, calculated emissions increase. If the test-derived FHISOR trend continues upward as

[11] The permit's 1.768 mmBtu/mlb steam is three-test average (October 2018, October 2014 and October 2012) value based upon methodology specified in Appendix C to the permit. See Appendix B to this TSD for more details. Stimson's 1.721 mmBtu/mlb steam = (1205.2 Btu/lb steam)*(mmBtu/1x10^6 Btu)*(1000 lb steam/mlb steam)*(1/0.7); where 1205.2 is heat input required to generate lb steam at the temperature and pressure generated by the boiler (no reference provided) and 0.7 is the efficiency of the boiler to convert heat input to steam output (no reference provided).

evidenced through new testing required by this permit and the associated part 71 permit, then EPA Region 10 may consider re-evaluating the strategy for using a multi-year average FHISOR for calculating emissions if the boiler is shown to be diminishing in efficiency.

Condition 5.5 refers to Appendix A for the boiler EU-1's EF's, except for HCl. Quarterly HCl EF's are based upon fuel sampling and analysis previously conducted pursuant to 2015 part 71 permit Condition 5.15 and calculations consistent with Appendix D of this permit and an assumed ratio of HCl EF to chlorine fuel content of 0.15. Steam, also used in the calculation of emissions, was required to be determined pursuant to 2015 part 71 permit Condition 5.9.1.

Condition 5.6 specifies how to calculate boiler EU-1's emissions beginning the month after the month the permit becomes effective. The methodology for calculating emissions for the months immediately preceding and proceeding the month in which the permit becomes effective is generally the same, including FHISOR. The methodology to calculate the HCl EF continues to be based upon quarterly fuel sampling results, but FC is calculated using the most recent eight quarterly sampling results (not just the most recent one). EF for all other HAP are new and presented in Appendix B to the permit. The EF are tailored to spreader stoker boilers combusting wet hog fuel and employing a multiclone and wet scrubber. But like the EF in Appendix A, the EF in Appendix B continue to be based upon average underlying similar source test values. The derivation of the EF in Appendix B to the permit are presented in Appendices A and B to the TSD.

Condition 5.7 specifies how to calculate emissions after EPA approves two rounds of testing (and fuel sampling and analysis) for boiler EU-1 to determine FHISOR, EF and RF (equal to EF/FC). Table 7-1 lists the HAP for which EF shall be determined.

Table 7-1: Identification of HAP for Which EF Shall Be Determined through Source Testing

<table>
<tr><th>Organic Compounds</th><th>Halogen and Hydrogen Halide Compounds</th><th>Trace Metal Compounds</th></tr>
<tr><td>1. Acetaldehyde</td><td>1. Chlorine</td><td>1. Lead compounds</td></tr>
<tr><td>2. Acrolein</td><td>2. Hydrogen chloride</td><td>2. Manganese compounds</td></tr>
<tr><td>3. Benzene</td><td>3. Hydrogen flouride</td><td>3. Phosphorus</td></tr>
<tr><td>4. Formaldehyde</td><td></td><td></td></tr>
<tr><td>5. Hexane</td><td colspan="2" rowspan="4">For halogen, hydrogen halide compounds and trace metals compounds listed in these two columns, RF shall also be determined through simultaneous fuel sampling and source testing.</td></tr>
<tr><td>6. Methanol</td></tr>
<tr><td>7. Methyl isobutyl ketone</td></tr>
<tr><td>8. Methylene chloride</td></tr>
<tr><td>9. Propionaldehyde</td><td></td><td></td></tr>
<tr><td>10. Styrene</td><td></td><td></td></tr>
<tr><td>11. Toluene</td><td></td><td></td></tr>
</table>

Upon submitting the second of the two source test reports, Stimson is required to use two-test average EF and RF values to calculate boiler EU-1 emissions calculations. For FHISOR, the permittee is required to average five values; three existing test-derived values from October 2012, 2014 and 2018 and two test-derived values from the two rounds of testing required by this

permit. See discussion of Condition 6.2 below for an explanation of the requirement for two source tests during different parts of the year.

For the organic HAP in Table 7-1 of the TSD (Table 6-1 of the permit), a test-derived EF (as opposed to Appendix B EF) is required to be used to calculate monthly emissions going forward. For halogen, hydrogen halide and trace metal HAP compounds in TSD Table 7-1, emissions are dependent upon the concentration of pollutant in the fuel along with a complex set of factors that result in only a fraction of the pollutants being exhausted to atmosphere. A portion of the pollutants are captured in the boiler's bottom ash, the multiclone's fly ash and in the wet scrubber's dirty water. The test-derived release factor or "RF" is required to be used to calculate monthly emissions going forward. As explained in Condition 6.2.5, "RF" is the ratio of post-control EF to FC measured during testing. With (1) test-derived knowledge of RF, and (2) quarterly sampling and analysis of halogens chlorine and fluorine along with trace metals over eight quarters, the permittee is required to calculate quarterly EF pursuant to Equations 5-3 and 5-4 of the permit. Note that for trace metals lead and manganese, an additional factor is used in the EF calculation. AF or "adjustment factor" is needed (except for phosphorus) to account for the fact that RM29 measures only the trace metal and the not the entire compound the trace metal is a part of. The HAP identified by Congress in Section 112 of the Clean Air Act is trace metal compounds, not just trace metals. The AF in Table 5-1 of the permit account for this shortcoming in testing capability.

Condition 5.8 requires the permittee, after completion of boiler EU-1 FHISOR testing required by a part 71 permit (but not the non-Title V permit), to use an updated FHISOR in boiler EU-1 emissions calculations. To update FHISOR, the permittee is required to average at least six values; three existing test-derived values from October 2012, 2014 and 2018, two test-derived values from the two rounds of testing required by this permit, and all subsequent test-derived values resulting from testing required to be conducted by Title V permits.

Condition 5.9 requires the permittee to calculate boiler EU-1's emissions while not generating steam by tracking the volume of fuel fired (wet) and converting that volume to heat input, which is then used with the EF listed in Appendix B to the permit to calculate emissions. The 0.227 mmBtu/ft3 conversion factor is calculated as follows:

mmBtu/ft3 fuel = fuel density [lb/ft3] * higher heating value [Btu/lb] * (mmBtu/1,000,000 Btu)			
mmBtu/ft3 fuel =	(48.7 lb/ft3) * (4655 Btu/lb) * (mmBtu/1,000,000 Btu)		
mmBtu/ft3 fuel =	0.227		
Fuel Density			
Species	Idaho 2015 Timber Harvest of Saw and Veneer Logs[a], (mbf)	Average Green Weight of Wood & Bark[b], (lb/ft3)	
True Fir (Grand Fir)	376,811	52	
Douglas Fir	300,871	47	
Western Red Cedar	59,110	31	
Ponderosa Pine	89,307	52	
Western Larch	70,197	53	
Western Hemlock	53,638	51	
Lodgepole Pine	37,942	42	
Engelmann Spruce	18,689	45	
Western White Pine	8,386	42	
	Weighted average:	48.7	
[a] University of Montana Bureau of Business and Economic Research document entitled, "Idaho's Forest Products Industrty and Timber Harvest, 2015." August 2, 2017. Table 5.			
[b] USDA Forest Service, Northern Research Statation, Research Note NRS-38 entitled, "Specific Gravity and Other Properties of Wood and Bark for 156 Tree Speces Found in North America." October 2009. Table 1B. https://www.nrs.fs.fed.us/pubs/rn/rn_nrs38.pdf			
Fuel Higher Heating Value			
Year of Fuel Sampling & Analysis at Stimson	Test/Sample Number	Higher Heating Value (as fired, ie. wet basis), (Btu/lb)	Average
2018	1	5183	5048
	2	5045	
	3	4917	
2014	1	4060	3847
	2	3800	
	3	3680	
2012	1	5640	5069
	2	4713	
	3	5273	
	4	4650	
		3-Test Average:	4655

Condition 5.10 restricts the permittee to firing resinated and non-resinated wood residue and wood products, logging residues and agricultural-derived biomass. It is Region 10's understanding that boiler EU-1 generally combusts only hogged bark and wood residue generated at a mill and that, on an annual basis, less than 1% of the fuel combusted in boiler EU-1 is something other than hogged bark and wood residue generated at a mill. The boiler EU-1 emission factors specified in the permit reflect emissions resulting from the combustion of bark

or wood.[12] If the amount of agricultural-derived biomass burned remains less than 1%, requiring testing while burning agricultural-derived biomass is not needed in the absence of other information. On an annual basis, these emissions factors are representative of boiler EU-1's annual emissions given our understanding that Stimson generally combusts only bark and wood residue.

Condition 5.11 limits the monthly amount of agricultural-derived biomass (i.e., crop residue) Stimson is allowed to combust in boiler EU-1 to assure the EF (lb/mmBtu) prescribed in the permit (based on the combustion of wood) remain representative of emissions. Region 10 is not aware of any EF having been developed for combustion of crop residue in a boiler. Wood and crop residues are forms of biomass. Region 10 anticipates that the emission factors for combustion in a boiler for the two categories of biomass will generally be similar. Wheat chaff, a crop residue Stimson has identified as a potential fuel, has a heat content similar to or higher than wood.[13] In other words, compared to wood, combustion of wheat chaff generates more heat per pound. All other factors being equal, the heat content factor suggests EF for combustion of wheat chaff would be lower than EF for combustion of wood.

Condition 5.12 is Condition 5.3 of the 2015 part 71 permit. The EFs for trace metal compounds reflect control through multiclone and wet scrubber (halogen and hydrogen halides to a degree as well). For the EF to remain representative, the permittee is required to employ these air pollution control devices at all times boiler EU-1 operates.

Condition 5.13 requires Stimson to develop and implement an O&M plan for boiler EU-1 and its air pollution control equipment to minimize emissions. The permittee is employing, in part, test-derived EF, RF and FHISOR to determine its emissions. For the test-derived EF and RF to remain representative, it is important that the boiler EU-1 and its air pollution control equipment be operated in the manner in which they were operated during testing. As stated in Condition 8.5.2, if EPA determines that the plan does not achieve the goal of good air pollution control and efficient operation, then EPA will notify the permittee of the specified deficiencies, and the permittee shall submit a revised plan to EPA within 30 days.

Condition 5.14 requires kilns EU-2 emissions be determined monthly by calculating emissions attributable to drying lumber of each wood species and then calculating the sum across all wood species. Species-specific emissions are calculated by multiplying lumber throughput (mbf/month) by EF (lb/mbf).

Condition 5.15 specifies, for the twelve months prior to and including the calendar month in which the permit becomes effective, the methodology to determine species-specific lumber volumes and EF to be used in Condition 5.13's Equation 5-6. Stimson is required to have measured product-specific lumber volumes for all charges, and Appendix E provides the methodology for estimating monthly species-specific kilns EU-2 lumber throughput. The following calculations explain how the fractions of lumber product volumes by species were derived:

[12] In developing boiler EU-1 EF listed in Appendix B to the permit, EPA screened out emissions data resulting from combustion of resinated wood residue given Region 10's understanding that this type of fuel constitutes less than 1% of the fuel fired in Stimson's boiler.

[13] The Cost of Using Crop Residues in Direct Combustion Applications. Solar Energy Research Institute. SERI/TR-353-513. March 1980. https://www.nrel.gov/docs/legosti/old/513.pdf

Species	Idaho 2015 Timber Harvest of Saw & Veneer Logs (mbf)	Estimated Fraction of Product Volume by Species		
		WW	FL	IHFIR
Douglas Fir	300,871	0.296	0.811	
Engelmann Spruce	18,689	0.018		
Lodgepole Pine	37,942	0.037		
Ponderosa Pine	89,307	0.088		
Western Hemlock	53,638	0.053		0.125
Western Larch	70,197	0.069	0.189	
Western Red Cedar	59,110	0.058		
Western True Firs	376,811	0.371		0.875
• Alpine Fir (component of Western True Firs)	not specified			
Western White Pine	8,386	0.008		
Total	1,014,951	1	1	1
Estimated fraction of product volume by species is calculated by dividing 2015 Idaho harvest of the species by 2015 Idaho harvest of all species in the product.				
Example calculation: fraction of Douglas Fir in WW product is calculated as follows:				
0.296 = 300,871 / (300,871 + 18,689 + 37,942 + 89,307 + 53,638 + 70,197 + 59,110 + 376,811 + 8,386).				

For product ESLPAF containing species Englemann Spruce, Lodgepole Pine, Alpine Fir and Western White Pine, the estimated fraction of each could not be calculated using the University of Montana's document entitled, "Idaho's Forest Products Industry and Timber Harvest, 2015" because the document does not provide a timber harvest total for Alpine Fir (part of larger Western True Firs category). For ESLPAF, the species fractions in Appendix E to the permit were provided by Stimson and reflect on-site scaling data (species-specific # of logs received, not mbf by species) between February and November 2020. Beginning in February 2020, Stimson began scaling a fraction of incoming log trucks on a daily basis.

Species-specific EF for five HAP are specified in Appendix F to the permit. Appendix F is EPA Region 10's November 2012 EF. Stimson is required to have recorded the maximum set point "entering air" temperature for each charge and determine a species-specific monthly maximum to determine species-specific monthly formaldehyde and methanol EF via Appendix F. Appendix F reflects two sets of fixed EF for formaldehyde and methanol; one for maximum temperatures less than or equal to 200°F and the other for maximum temperatures greater than 200°F.

Condition 5.16 specifies, for time period beginning the month after the month the permit becomes effective, the methodology to determine species-specific lumber volumes and EF to be used in Condition 5.13's Equation 5-6. Stimson is required to have measured product-specific lumber volumes for all charges and scaled a portion of incoming truckloads for the preceding six-month period to estimate monthly species-specific kilns EU-2 lumber throughputs.

Species-specific EF for five HAP are specified in Appendix G to the permit. Appendix G is EPA Region 10's January 2021 EF. Stimson is required to have recorded for each charge (1) the maximum set point "entering air" temperature and (2) all measured/calculated kiln-wide average "entering air" temperatures. The recorded set point information (plus 4°F) is needed to determine a species-specific monthly maximum to determine species-specific monthly formaldehyde and methanol EF via Appendix G. Appendix G reflects best-fit linear equations for formaldehyde and methanol.

It is not uncommon for kiln-wide average instantaneous temperatures to spike above the maximum set point temperature. Because Stimson does not currently have an automated system in place to calculate kiln-wide 60-minute average "entering air" temperatures, Region 10 is

requiring Stimson to use drying schedule maximum temperatures plus 4°F to calculate methanol and formaldehyde EF. 4°F is approximately two times the 1.8°F maximum temperature differential (between set point and one-hour average kiln-wide "entering air" temperature) observed over seven May 2021 charges (information provided during public comment period) in which Stimson was isolating "entering air" temperature measurements and manually calculating one-hour average values.

Condition 5.17 prohibits permittee from drying lumber for a species of wood if the species is not a Pacific Northwest softwood. The Pacific Northwest refers to the states and territories of Washington, Oregon, Northern California, Idaho, Montana, Wyoming and British Columbia.

Condition 5.18 requires Stimson to develop and implement an O&M plan for kilns EU-2 to minimize emissions. The permit allows Stimson to employ best-fit-curve and average EF based upon small-scale kiln testing to determine kilns EU-2 emissions without follow-up source testing for the reasons explained in Section 5.3 of this TSD. Compliance with this condition assures that drying will be carried out uniformly across the kiln to discourage the creation of "hot spots" that unnecessarily generate greater emissions. Compliance with this condition helps assure that use of the prescribed EF does not underreport kilns EU-2 emissions.

Conditions 5.19 and 5.20 specify the methodology for calculating the sawmill EU-3 and planer mill EU-4 emissions resulting from the pneumatic conveyance of green wood residue. Green wood residue includes chips, shavings, hogged trim ends, sawdust, planer shavings, but not hogged bark. Pneumatic conveyance of kiln-dried wood residue likely generates some amount of HAP, but EPA is not aware of an EF for this emission generating activity. EPA is not requiring Stimson to conduct source testing to determine an EF for pneumatic conveyance for kiln-dried wood residue because this activity's emissions are expected to be relatively small. Its EF and throughput are expected to be a fraction of those of green wood residue.

Conditions 5.21 and 5.22 prohibit operation of heater EU-5 and require the unit be removed. Because the permittee expresses no intent to operate the unit, these conditions preempt requirements to track the unit's emissions.

Section 6 – Testing Requirements

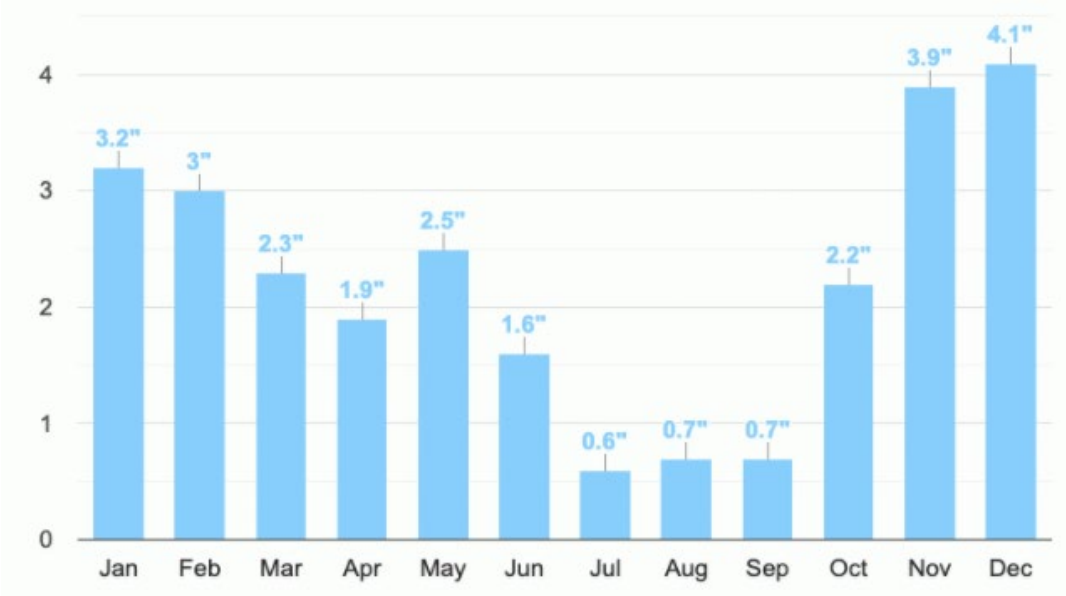
Condition 6.1 presents general testing requirements applicable to all emission units, not just boiler EU-1 (which this permit requires testing of). Conditions 6.1.1 through 6.1.4 appear as Conditions 3.25 through 3.28 in the 2015 part 71 permit. The requirement to submit a test plan prior to testing and a report after having conducted testing is in Section 8 of the permit.

Condition 6.2 requires Stimson to perform two rounds of source testing and concurrent fuel sampling/analysis to determine FHISOR, EF and RF in accordance with specified methods for boiler EU-1. The amount of moisture in the fuel may influence FHISOR and EF. Boiler EU-1's fuel moisture content varies by time of year because it is stored outside and only a fraction is protected from weather conditions. The company has suggested that the outside ambient temperature (which influences combustion air temperature) may also influence FHISOR.

To mitigate the possibility that FHISOR and HAP emissions may be influenced by seasonal environmental conditions (although not evidenced for FHISOR by the fuel moisture content data in Appendix D), EPA Region 10 is requiring testing be conducted twice; once during a typically cold and wet time of year (December through March) and then again during a typically warm

and dry time of year (July through September). See Figure 7-1 for monthly average rainfall totals for Plummer, Idaho.

Figure 7-1: Average Monthly Rainfall in Plummer, Idaho[14]



Condition 6.2.1 imposes different testing conditions as opposed to standard conditions. A constant demand for steam exists as the boiler serves a steam generator providing electricity for sale to Avista Utilities, and Stimson operates the boiler to provide as much steam/electricity as possible. For those periods when the fuel is relatively dry, the boiler operates at higher steaming rates. For those periods when the fuel is relatively wet, the boiler operates at lower steaming rates. This permit term assures that the steam generating rate at which testing is conducted is representative of rate normally generated during the time of year the testing is conducted.

Condition 6.2.2 establishes minimum sampling duration and volume of exhaust gas collected, generally consistent with other EPA regulatory requirements. According to EPA RM29A (Section 13.3.3.1), "a nominal one hour sampling run will collect a stack gas sampling volume of about 1.25 m3." At that sampling duration and volume, Region 10 expects the concentrations of lead, manganese and phosphorus to be more than three times the RM29A detection limit as illustrated in Appendix E to this TSD.

Condition 6.2.7 helps assure that each run's composite fuel sample (and subsequent analysis that shapes FC, FHISOR, EF and RF) is representative of the fuel combusted during the run. The sample is required to be taken at a location in the fuel delivery system subsequent to all upstream blending. Sampling must be conducted downstream of the location where the three independently controlled streams merge into one. See Appendix F to this TSD for illustration.

Condition 6.2.8 specifies what to do in the event fuel sampling and analysis or source testing generates a "non-detect" measurement of a pollutant. Each of the pollutants is expected to be present in the sample collected/analyzed based upon emissions information supporting the EF in Appendices A and B to the permit. If at least one run detects the pollutant, then it is reasonable to conservatively assume that the pollutant concentration is equal to the method detection limit

[14] https://www.weather-us.com/en/idaho-usa/plummer-climate#rainfall

(MDL) for non-detect runs. If no runs detect the pollutant, then it is reasonable to assume that the pollutant concentration is half-way between 0 and the MDL. With respect to source testing, the permittee can reduce the level of the MDL by extending the duration of the test run.

Condition 6.2.8 is more stringent than Appendix B (Procedures for Handling Test Data That are Below the Method Detection Limits) to EPA's Draft Final August 2013 "Recommended Procedures for Development of Emission Factors and Use of the WebFIRE Database," EPA-453/D-13-001.[15] The referenced document recommends (1) no EF be assigned when all measurements are below the MDL, and (2) measurements below the MDL be assigned a value of one-half the MDL when at least one other run measures the pollutant at a concentration above the MDL. Condition 6.2.8 is less stringent than EPA Boiler MACT regulations at 40 CFR 63.7520(f) which requires that all measurement results below the MDL be assumed equal to the MDL.

Condition 6.3.1 requires that monitoring be performed during source testing that the permittee is already required to perform at all times the boiler is operating pursuant to Condition 7.3.4 and 7.7.

Condition 6.3.2 requires that monitoring be performed to document the character of the fuel fired in boiler EU-1 during testing to determine EF, RF and FHISOR.

Section 7 – Monitoring and Recordkeeping Requirements

Condition 7.1 requires the permittee by the 10th of the month (beginning the month after the month the permit becomes effective) to calculate and record facility-wide 12-month rolling HAP emissions. For the month in which the permit becomes effective and the eleven preceding months, emissions generated by boiler EU-1 and kilns EU-2 are required to be quantified. Emissions from sawmill EU-3 and planer mill EU-4 must also be quantified but starting at a later date within six months after the month the permit becomes effective.

Condition 7.2 requires maintaining information relevant to HAP emission calculations. See Conditions 3.35 and 5.14 of the 2015 part 71 permit.

Condition 7.3 requires monitoring equipment required by this permit to meet certain performance, operational and maintenance criteria to assure the generated data is valid and representative.

Condition 7.4 requires the permittee to develop a monitoring plan that demonstrates that monitoring carried out by permittee satisfies Condition 7.3. For guidance in developing the plan, see Chapter 4 of EPA's August 1998 "Technical Guidance Document: Compliance Assurance Monitoring, Revised Draft."[16] The guidance provides reference materials for various types of sensors commonly used to measure process and/or air pollution control equipment operating parameters.

Condition 7.5 requires the permittee to develop and implement a plan to document the mass of fuel, by category, combusted in boiler EU-1 each month. The condition is needed to generate records documenting that no more than 1% of the fuel burned in boiler EU-1 is agricultural-derived biomass. Region 10 is uncertain as to the representativeness of the emission factors specified in the permit (or derived through testing specified in the permit) for combustion of

[15] https://www3.epa.gov/ttn/chief/efpac/procedures/procedures81213.pdf
[16] https://www.epa.gov/sites/production/files/2016-05/documents/cam-tgd.pdf

agricultural-derived biomass. The restriction on the amount of agricultural-derived biomass combusted in boiler EU-1 helps ensure the test-derived EF, RF and FHISOR continue to be representative of boiler EU-1 emissions. .

Condition 7.6 requires the permittee to determine monthly the percentage of fuel combusted in boiler EU-1 consisting of agricultural-derived biomass. This information provides a check on whether the test-derived EF, RF and FHISOR continue to be representative of boiler EU-1 emissions. Condition 7.6 also requires the permittee to collect information to enable the calculation of emissions when no steam is being generated.

Condition 7.7 is monitoring required of boiler EU-1, multiclone and scrubber. See Section 5.2 of this TSD for explanation of the parameters required to be monitored. A 90% minimum monthly data capture (recording) requirement applies to five parameters (steam, O2, scrubber Δp, scrubber H2O flow and scrubber H2O pressure) needed to calculate emissions (tracking steam) or assure representativeness of the EF (tracking O2, scrubber Δp, scrubber H2O flow and scrubber H2O pressure). This requirement is in addition to the requirement in Condition 7.3.4 to operate the monitoring equipment at all times the boiler is operating except during specified periods. The 90% minimum monthly data capture (recording) requirement means that the number of "absent" recordings (excused or not) cannot exceed 10% of the total recordings required of the monitor for the month.

Condition 7.7.1 requires Stimson to use a totalizer to track steam production. The mill operates a steam totalizer, and an employee records manually once an hour the instantaneous steam production rate (lb/hr) appearing on the totalizer's display positioned on the wall of the boiler control room. When calculating monthly emissions using these hourly recordings, the mill assumes each instantaneous recording is an accurate reflection of that hour's steam production. Condition 7.7.1 requires Stimson to direct a totalizer (the one currently in use or another) to consider all of the mass flow measurements performed over an hour in calculating the amount of steam produced during that hour. Stimson must begin determining hourly steam production in this manner the day the permit becomes effective.

Condition 7.7.1.1 requires the use of a missing data procedure to generate an artificial steam production rate for those periods when the totalizer fails to record a steam production rate for a one-hour period (or longer). Measuring or substituting for steam production is necessary to calculate the emissions generated during an hour.

Condition 7.7.2 requires an hourly average exhaust gas %O2 wet be calculated and recorded based on measurements performed at least every 15 minutes. This provision provides for a more representative measure/recording of O2 concentration than the 2015 part 71 permit which required an instantaneous O2 measurement be recorded once per day. Exhaust gas O2 provides an indication of boiler performance because much lower oxygen levels may lead to incomplete combustion and much higher oxygen levels could cause the combustion chamber to be too cool. A description for the location of the monitoring equipment is provided for clarity.

Condition 7.7.3 requires recording of multiclone Δp once per day. The 2015 part 71 permit required recording of this parameter once per month. Pressure drop across the multiclone is generally related to control device performance (plugging or corrosion).

Conditions 7.7.4 and 7.7.5 requires an hourly average scrubber Δp and water flow to the scrubber be calculated and recorded based on measurements performed at least every 15 minutes.

This provision provides for a more representative measure/recording of scrubber Δp and water flow than the 2015 part 71 permit which required an instantaneous Δp and water flow measurement be recorded once per day. Scrubber pressure drop and water flow are real-time indicators of scrubber performance.

Conditions 7.7.6 requires an hourly average H2O pressure in the dedicated water supply distribution lines be calculated and recorded based on measurements performed at least every 15 minutes. The 2015 part 71 permit did not require monitoring of this parameter. The deadline to purchase, install, calibrate and to begin operating the monitoring equipment by the first boiler EU-1 source test provides the permittee time necessary to achieve compliance. Pressure in the dedicated scrubber water supply line (supplying the water to spray through four nozzles into the exhaust exiting the scrubber) is a real-time indicator of scrubber performance. The integrity of the nozzles is key to achieving the spray of water into the scrubber exhaust, and it is technically sound to assume a portion of boiler EU-1 HAP (halogen-based and trace metals) is reduced by spraying the water into the scrubber exhaust rather than simply pouring or pumping water into the scrubber tank. In meetings with Region 10 during the fall and winter of 2020, Stimson stated that corrosion or pluggage to a single nozzle can be detected by monitoring pressure in the upstream pipe supplying water to all four nozzles.

Condition 7.8 requires Stimson, upon discovery of an indicator out of range, to expeditiously restore operation of boiler EU-1 and wet scrubber such that the indicator is no longer outside the range established in Condition 7.8.1. While failing to expeditiously restore boiler EU-1 or scrubber operations to normal or usual manner of operation (characterized by indicators operating within the acceptable range) is a permit deviation, an indicator out-of-range is not a permit deviation. Stimson is required to report each indicator out-of-range occurrence and its resolution in the semi-annual monitoring report required pursuant to Condition 8.4.2. Operating out of range indicates that EF (used to calculate emissions) may not have been representative of emissions generated for the period.

Conditions 7.9.1 requires quarterly fuel sampling and analysis to determine FC for chlorine, fluorine and three trace metals. Because the permit establishes a default HCl EF methodology largely consistent with 2015 part 71 permit based upon chlorine content in the fuel and default RF, quarterly sampling and analysis for chlorine is required to continue upon the permit becoming effective. Although the default EF for Cl2, HF and three trace metal HAP are constants (not variable EF based upon pollutant concentration in the fuel) in the absence of a default RF, fuel sampling and analysis is required of fluorine and trace metals beginning the quarter the permit becomes effective in order to begin building an inventory of FC values contributing to eight-quarter rolling averages used in the emission calculations.

Condition 7.9.2. See explanation for Condition 6.2.7 regarding the need to collect a representative composite sample.

Condition 7.10 is Condition 4.28 of the 2015 part 71 permit and reflects certain NESHAP Subpart 63, Subpart JJJJJJ requirements related to recording of boiler EU-1 (and control device) malfunctions and associated actions to return operation to normal. This requirement serves as monitoring to assure compliance with Condition 5.3.

Condition 7.11 requires the permittee to track various parameters for each batch of lumber dried in kilns EU-2. Table 7-2 summarizes the information to be recorded and what the information is used for:

Table 7-2 – Kilns EU-2 Recording of Operations and Associated Emission Limitation

Monitoring Provision		Emission Limitation Provision	
Permit Condition…	Summary of Information Recorded about a Batch	Permit Conditions…	Summary of Emission Limitation
7.11.1	Identity of products and associated wood species present	5.1 and 5.2	9/24 tpy facility-wide HAP limit. Identity and volume of product is needed to calculate monthly volume of lumber dried by product. (Additional information outside the scope of Condition 7.11 monitoring needed to determine monthly volume of lumber dried by species.)
7.11.2	Volume of lumber by product	5.1 and 5.2	
7.11.3	Drying schedule's maximum set point "entering air" temperature (°F)	5.1 and 5.2	9/24 tpy facility-wide HAP limit. Maximum set point temperature (across all charges containing, in whole or in part, a particular species) is needed to calculate monthly methanol and formaldehyde EF for the species.
7.11.4	At least every 15 minutes, the kiln-wide average dry bulb temperature of heated air that enters a load of lumber	5.1. and 5.2	9/24 tpy facility-wide HAP limit. Measurements/records are needed to check proposition that kiln-wide average temperatures do not exceed 4°F above the charge's set point.
7.11.5	At least every 15 minutes, the kiln-wide average moisture content of lumber	5.1. and 5.2	9/24 tpy facility-wide HAP limit. See Section 5.3 of TSD for justification.

Each of the four kilns houses two side-by-side track systems. The track system is used for moving carts carrying stacks of lumber into and out of the kiln between batch drying cycles. The lumber carried by the carts on a single track inside the kiln is considered one load, so there are two loads (one on each track system) in each batch (i.e., charge) of lumber dried. A batch drying cycle duration can range from about one day to several days depending upon several factors. Kilns 1 and 2 are designed with four heating zones wherein the drying process can be separately controlled. The length of the kiln is segmented into two cross-sectional areas. The top of each is one zone, and the bottom another. Kilns 3 and 4 are designed with six heating zones with the length of the kiln segmented into three cross-sectional areas. Again, the top of each is one zone, and the bottom another. For all kilns, a minimum of four thermocouples are employed per zone, and at any one time at least two thermocouples are measuring the temperature of the air entering the loads (at least one thermocouple per load) and at least two more are measuring the temperature of the air exiting the loads (at least one thermocouple per load).

Conditions 7.12 requires Stimson to review monthly the information required to be monitored in Condition 7.11, and (a) record the species-specific maximum "entering air" set point temperatures, and (2) calculate and record the product-specific volume of lumber dried.

Condition 7.13 requires Stimson to conduct daily monitoring to determine monthly and 6-month rolling totals of the number of logs received by species for a subset of all the logs received on-site. This information will be used to estimate the relative species make-up of each lumber product dried in kilns EU-2. Stimson has proposed to estimate the relative volume of each species based on the 6-month rolling relative number of logs received by species. In other words, if the most recent 6-month rolling ratio of logs received by species (determined by scaling a small subset of logs received on-site) between Western True Fir and Western Hemlock is 85/15, then this month's volume (mbf) of IHFIR product is 85% Western True Fir and 15% Western Hemlock. Based on currently available information and given the facility's past actual HAP emissions in comparison to the limits in the permit, EPA Region 10 concludes that Stimson's proposed method of estimating the relative species make-up of each lumber product dried in kilns EU-2 provides an adequate assurance of compliance. Tracking the relative 6-month rolling volume of logs received (rather than number of logs received), a more time-consuming and costly process, may become necessary should the margin of compliance be reduced or other information become available indicating that Stimson's proposed estimation method does not accurately reflect the relative species make-up of each lumber product dried in kilns EU-2.

Condition 7.14 is the calculation to determine monthly lumber volume dried by species beginning the month after the month the permit becomes effective. Monthly product volume and relative break-down by species (estimated using ratio of relative number of logs received for subset of logs scaled) must be known to perform the calculation.

Condition 7.15 requires Stimson to develop and implement a plan to estimate (in a manner that produces a representative result) the six-month rolling relative fraction of logs received at the facility, by species. The estimate is used to calculate kilns EU-2 emissions.

Conditions 7.16 and 7.17 require the permittee to develop a plan to determine monthly the mass of green wood residue pneumatically conveyed on an equipment-specific basis.

Section 8 – Reporting Requirements

Conditions 8.1 and 8.2 requires a test plan be submitted before testing and a test report submitted after testing is completed. Monthly average steaming rate (for the month in which testing is to be performed) is required to be submitted by Condition 8.1.3 so that Region 10 can review and approve the conditions under which testing is to be conducted.

Condition 8.3 requires prompt reporting of deviations. An initial notification by phone and follow-up written notification is required of certain deviations. The permit defines "promptly" consistent with EPA Region 10-issued part 71 permits.

Condition 8.4 requires that monitoring reports be submitted semi-annually. Reporting of kiln charges with lumber moisture content less than 13% must be included in the report along with boiler EU-1 and scrubber indicators out of range.

Condition 8.5 requires that the specified plans be submitted by certain deadlines, reviewed annually and updated as needed or required by EPA.

Condition 8.6 requires that a plan to determine sawmill EU-3 and planer mill EU-4's GWR_{EQP} be submitted to EPA for approval by the end of the sixth calendar month after the month in which the permit becomes effective.

Condition 8.7 requires electronic submittal of reports to EPA and that a hardcopy be sent to the Tribal environmental office.

Condition 8.8 requires the permittee to annually report HAP emissions.

8. Public Participation

8.1. Public Notice and Comment

As required under 40 CFR 49.139(c), all draft owner-requested operating permits must be publicly noticed and made available for public comment. For the draft permit, the public comment period began on April 21, 2021 and ended on May 21, 2021.

For this permit action, the requirements of 40 CFR 49.139(c)(5) are satisfied as follows:

1. Make available for public inspection, in at least one location in the area affected by the air pollution source, a copy of the draft operating permit prepared by EPA, the technical support document for the draft permit, the application, and all supporting materials (see 40 CFR 49.139(c)(5)(i));
2. Publish public notice for this draft permit, by prominent advertisement in a newspaper of general circulation in the area affected by this source, of the availability of the draft permit to operate and supporting materials and of the opportunity to comment. Where possible, notices will also be made in the Tribal newspaper (see 40 CFR 49.139(c)(5)(ii));
3. Provide copies of the notice to the owner or operator of the air pollution source, the Tribal governing body, and the Tribal, State and local air pollution authorities having jurisdiction in areas outside of the Indian reservation potentially impacted by the air pollution source (see 40 CFR 49.139(c)(5)(iii)); and
4. Provide for a 30-day period for submittal of public comments, starting upon the date of publication of the notice. If requested, the Regional Administrator may hold a public hearing and/or extend the public comment period for up to an additional 30 days (see 40 CFR 49.139(c)(5)(iv)).

Notice of the draft permit action and opportunities to comment and request a hearing were posted on Region 10's website at https://www.epa.gov/publicnotices/notices-search/location/Idaho from April 20, 2021 through May 21, 2021. Notice was also published in the *St. Maries Gazette Record* on April 21, 2021 and in the May 2021 edition of the Coeur d'Alene Tribe's *Council Fires*. Public notices were physically posted on notice boards throughout the cities of Plummer, St. Maries and Worley in city halls, libraries, post offices and tribal headquarters. Region 10 also distributed the public notices to the necessary parties via e-mail.

Region 10 announced an opportunity for a public hearing on the draft permit contingent upon request. Because no requests were received for a public hearing, none was held. Due to COVID-19, the administrative record was available to review online at https://www.epa.gov/publicnotices/notices-search/location/Idaho. In the notice described above, Region 10 announced that the public could receive a copy of the administrative record or of individual documents in the record by contacting Region 10 via email or phone. Region 10 received no requests for documents.

8.2. Response to Public Comments and Permit Issuance

During the public comment period, Region 10 received comments from the Benewah County Board of Commissioners and Stimson. Region 10 considered all comments received during the public comment period. See Region 10's separate Response to Comments document for a summary of the comments and our responses. As required in 40 CFR 49.139(c)(7), Region 10 will send (via email) the final permit, TSD and Response to Comments document to the Permittee and the Benewah County Board of Commissioners. Region 10 will also provide public notice of the final permit decision and make the aforementioned documents available online for a period of 30 days at https://www.epa.gov/publicnotices/notices-search/location/Idaho upon issuance of the permit. The non-Title V permit becomes effective on August 1, 2021. This date was selected to align with the effective date of the Title V permit renewal that is being processed in parallel with the non-Title V permit revision. A Title V permit becomes effective at least 30 days after service of notice of the final permit decision.

Appendix A: HAP PTE Emissions Inventory

Save file “tsd-app-a.xlsx” attached to adobe acrobat document. Open using Microsoft Excel.

Appendix B: HAP 2018 Actual Emissions Inventory

Save file “tsd-app-b.xlsx” attached to adobe acrobat document. Open using Microsoft Excel.

Appendix C: Illustrations of Orice Type Wet Scrubbers

Figures C-1 through C-3 generally reflect the design of the Yankee Energy orifice type scrubber used to reduce PM emissions generated by boiler EU-1. Boiler EU-1's scrubber may be most similar to Figure C-3. However, a notable difference is that boiler EU-1's scrubber employs four overhead nozzles that spray water directly into the exhaust exiting (not entering) the scrubber. The exhaust then continues to travel up through the center duct to a mist eliminator. Boiler EU-1 exhaust travel through the scrubber/mist eliminator produces cyclonic flow in the downstream stack.

Figure C-1: Orifice Type Scrubber[17]

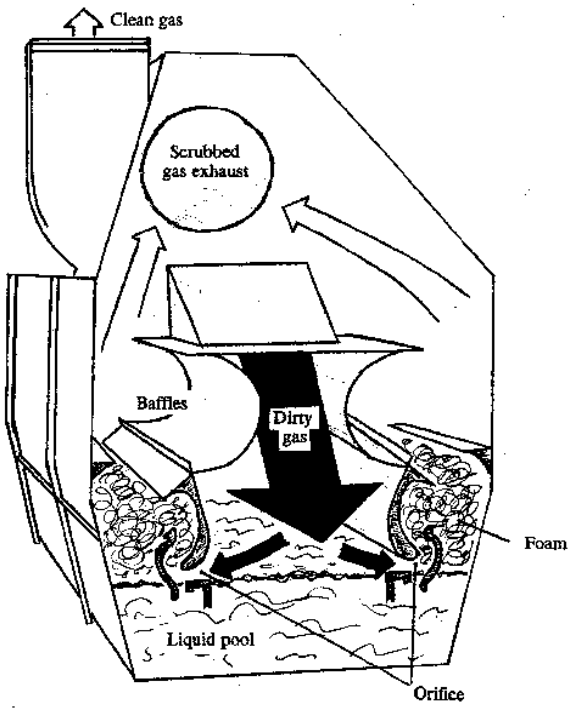
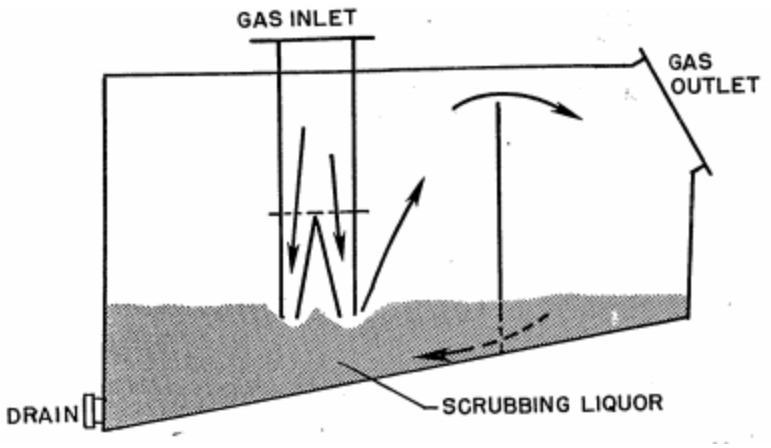


Figure C-2: Orifice Type Scrubber[18]

[17] Page 203 of document at https://www3.epa.gov/ttn/catc/dir1/finepmtech.pdf entitled, "Stationary Source Control Techniques Document for Fine Particulate Matter," October 1998, prepared for EPA by EC/R Incorporated, Chapel Hill, NC. EPA-452/R-97-001.

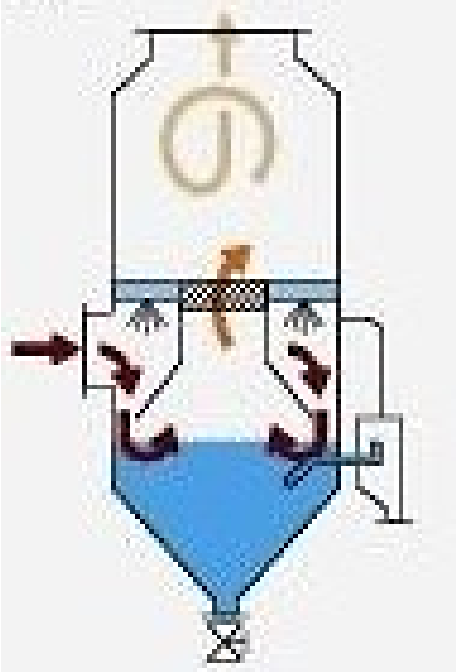
[18] Page 4-30 of document at https://nepis.epa.gov/Exe/ZyPDF.cgi/50000KBR.PDF?Dockey=50000KBR.PDF entitled, "Wet Scrubber Inspection and Evaluation Manual," September 1983, prepared for EPA by EC/R Incorporated, Chapel Hill, NC. EPA 340/1-83-022.

Appendix C: Illustrations of Orice Type Wet Scrubbers



Appendix C: Illustrations of Orice Type Wet Scrubbers

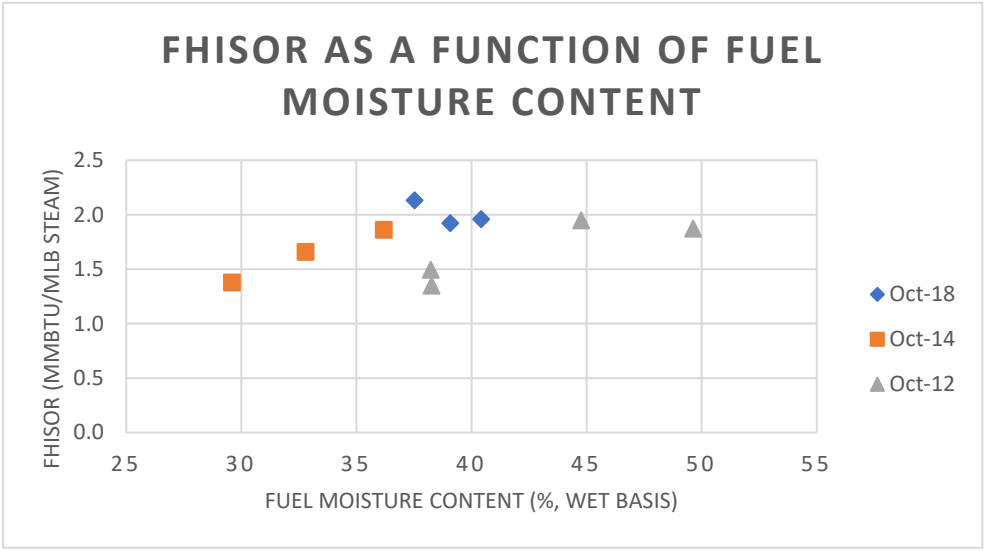
Figure C-3: Orifice Type Scrubber[19]

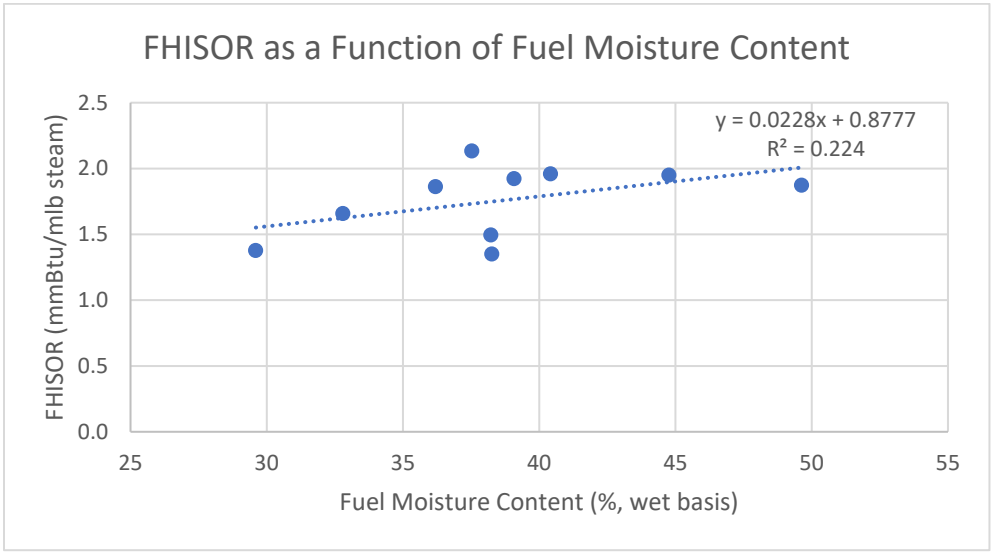


[19] Babcock & Wilcox Power Generation Group, Inc. Type D Turbulaire

Appendix D: Boiler EU-1 FHISOR as a Function of Fuel Moisture Content

Figure D-1: FHISOR as a Function of Fuel Moisture Content for Three Source Tests





Appendix E: Calculations to Estimate Whether Boiler EU-1 Trace Metals Emissions Are Detectable Using EPA RM29A for a Given Sampling Duration

Sample time per run = 1 hr

Hazardous Air Pollutant	Detection Limits for Different Analytical: ICP-MS Analytical Detection Limit[1] (µg/ml)	CVAAS Analytical Detection Limit[2] (µg/ml)	Front Half Liquid Volume Digested Sample Prior to Aliquotting[3] (ml)	Back Half Liquid Volume Digested Sample Prior to Aliquotting[3] (ml)	Stack Sample Gas Volume (dsm3)	Front Half Estimate of In-Stack Detection Limit (µg/m3)	Back Half Estimate of In-Stack Detection Limit (µg/m3)	Combined Estimate of In-Stack Detection Limit (µg/m3)	3x Combined Estimate of In-Stack Detection Limit (µg/m3)	EPA Region 10 Emission Factor (lb/mmBtu)	Expected Concentration (µg/m3)	NCASI TB 1050 Emission Factor (lb/mmBtu)	Expected Concentration (µg/m3)
Antimony Compounds	0.0032	N/A	300	150	1.25	0.77	0.38	1.15	3.46	4.00E-04	238.58	2.00E-06	1.19
Arsenic Compounds (including arsine)	0.0053	N/A				1.27	0.64	1.91	5.72	4.48E-05	26.69	1.11E-05	6.62
Beryllium Compounds	0.0001	N/A				0.02	0.01	0.04	0.11	6.38E-06	3.80	6.90E-08	0.04
Cadmium Compounds	0.0004	N/A				0.10	0.05	0.14	0.43	2.20E-05	13.11	3.20E-06	1.91
Chromium Compounds (including hexavalent)	0.0007	N/A				0.17	0.08	0.25	0.76	7.80E-05	46.53	9.75E-06	5.82
Cobalt Compounds	0.0007	N/A				0.17	0.08	0.25	0.76	5.64E-07	0.34	1.95E-06	1.16
Lead Compounds (not elemental lead)	0.0042	N/A				1.01	0.50	1.51	4.54	5.92E-04	353.22	3.00E-05	17.89
Manganese Compounds	0.0002	N/A				0.05	0.02	0.07	0.22	1.91E-03	1140.08	2.50E-04	149.11
Mercury Compounds	N/A	0.00002				0.005	0.002	0.01	0.02	1.33E-06	0.79	9.61E-07	0.57
Nickel Compounds	0.0015	N/A				0.36	0.18	0.54	1.62	6.44E-05	38.39	7.34E-06	4.38
Phosphorus	0.0075	N/A				1.80	0.90	2.70	8.10	4.05E-04	241.66	9.85E-05	58.75
Selenium Compounds	0.0075	N/A				1.80	0.90	2.70	8.10	2.73E-05	16.29	1.71E-06	1.02

1 SW-846, Method 6020. RM29 Section 13.2.1 — Compounds for which one hour sampling duration may not be sufficient to collect enough sample to be three times detection limit.

2 RM29 Section 13.2.3, range is from 0.00002 to 0.0002 ug/ml depending upon the type of CVAAS analytical instrument used. For this analysis, analytical detection limit is assumed to be on the low end of range.

3 RM29 Section 13.3.1

Compare expected concentration to detection limits. Need expected concentration to be three times the detection limit.

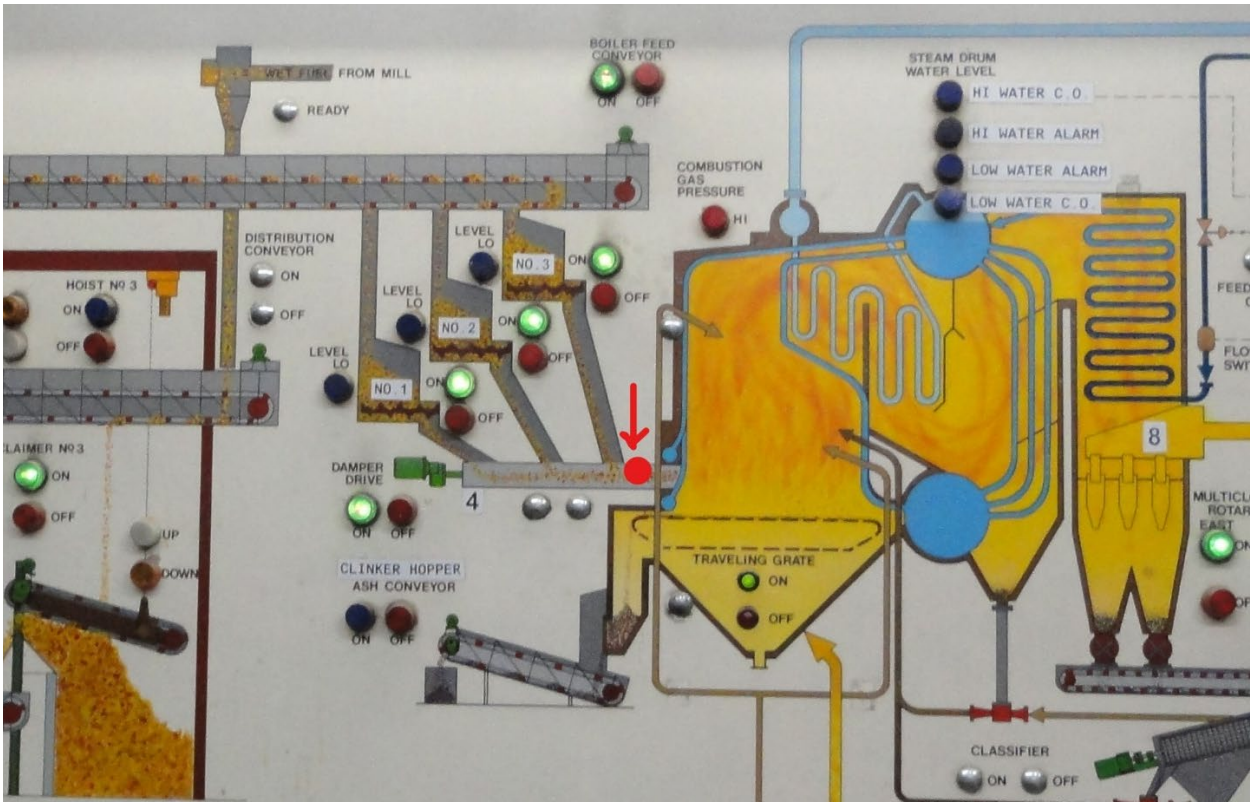
Expected exhaust gas concentration = EF [lb/mmBtu] * heat input [mmBtu/hr] * (1/stack flow rate) [min/dscf] * (35.3147 ft3/m3) * (hr/60 min) * (453600000 ug/lb)

Heat input = 105 mmBtu/hr

Stack flow rate = 47,000 dscf/min

Appendix F: Illustration of Boiler EU-1 Fuel Sampling Location

Figure F-1: Illustration of Boiler EU-1 Fuel Sampling Location



Photograph taken by EPA Region 10 on January 7, 2020 inside Stimson's boiler EU-1 control room. Inserted red arrow and dot illustrate location on the process flow diagram where fuel sampling is required to be performed.