# Statement of Basis

**Permit to Construct No. P-2009.0070**
**Project ID 61053**

**Stimson Lumber Company**
**St. Maries, Idaho**

**Facility ID 009-00004**

**Final**

**August 29, 2012**
**Ken Hanna**
**Permit Writer**

The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01.et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

## ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

| | |
|---|---|
| AAC | acceptable ambient concentrations |
| AACC | acceptable ambient concentrations for carcinogens |
| acfm | actual cubic feet per minute |
| ASTM | American Society for Testing and Materials |
| Btu | British thermal units |
| cfm | cubic feet per minute |
| CFR | Code of Federal Regulations |
| CO | carbon monoxide |
| $CO_2$ | carbon dioxide |
| $CO_2e$ | $CO_2$ equivalent emissions |
| COMS | continuous opacity monitoring systems |
| DEQ | Department of Environmental Quality |
| dscf | dry standard cubic feet |
| EL | screening emission levels |
| EPA | U.S. Environmental Protection Agency |
| gr | grains (1 lb = 7,000 grains) |
| HAP | hazardous air pollutants |
| IDAPA | a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act |
| lb/hr | pounds per hour |
| MACT | Maximum Achievable Control Technology |
| mg/dscm | milligrams per dry standard cubic meter |
| MMBtu | million British thermal units |
| NAAQS | National Ambient Air Quality Standard |
| NESHAP | National Emission Standards for Hazardous Air Pollutants |
| $NO_x$ | nitrogen oxides |
| NSPS | New Source Performance Standards |
| O&M | operation and maintenance |
| PM | particulate matter |
| $PM_{2.5}$ | particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers |
| $PM_{10}$ | particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers |
| PSD | Prevention of Significant Deterioration |
| PTC | permit to construct |
| PTE | potential to emit |
| *Rules* | *Rules for the Control of Air Pollution in Idaho* |
| scf | standard cubic feet |
| SCL | significant contribution limits |
| SM | synthetic minor |
| SM80 | synthetic minor facility with emissions greater than or equal to 80% of a major source threshold |
| $SO_2$ | sulfur dioxide |
| $SO_x$ | sulfur oxides |
| TAP | toxic air pollutants |
| VOC | volatile organic compounds |
| $\mu g/m^3$ | micrograms per cubic meter |

## FACILITY INFORMATION

### *Description*

Wood waste (bark and shavings) produced at this facility is hogged and used as fuel for the Wellons Boiler, which has an allowable steaming rate of 35,000 lb/hr. The steam is used as an energy source in the drying of lumber in the three kilns at the facility. An electrostatic precipitator has been added to control PM and PM10 emissions from the boiler.

The kilns have an allowable production rate of 101 MMBF/yr. The dried lumber is planed and trimmed to various sizes. Three cyclones are utilized at the facility for the pneumatic transfer of planer chips and shavings. A baghouse has been added to control PM and PM10 emissions associated with the cyclones.

Portions of the hog, chips, sawdust and shavings are trucked off site for sale.

### *Permitting History*

The following information was derived from a review of the permit files available to DEQ. Permit status is noted as active and in effect (A) or replaced (R).

| | |
|---|---|
| May 21, 2010 | P-2009.0070, Modification for the following: install boiler ESP; install baghouse to control emissions for planer shavings and waste wood transfer; and to transfer permit to new facility owner, (R). |
| June 19, 2002 | 009-00004, Revision to clarify language in Permit Condition 3.4 and 3.5 that allows facility to use a steaming rate of 27,000 lb/hr and requires a source test no later than August 31, 2004, (R). |
| April 12, 2002 | 009-00004, Drying kiln throughput increase from 75 MMBF to 93.45 MMBF, (R). |
| February 13, 1998 | 009-00004, Update boiler limits from hog fuel limits to steam rate limits, Removal of cyclone throughput limits, updating of kilns from 35 MMBF to 75 MMBF, (R). |
| April 10, 1996 | 009-00004, Replace Wilkes Boilers with Wellons, add four drying kilns, (R). |
| November 26, 1991 | 0120-0004, addition of Cleaver Boiler, Chipper cyclone and Planer shavings Cyclone, (R). |
| April 10, 1985 | 0120-0004, Initial Permit to add the Wilkes Boiler, (R). |

### *Application Scope*

This PTC is for a minor modification at an existing minor facility. The applicant has proposed the following:

- To increase the permitted kiln production rate to 101 million-board-feet per year (mmbf/year) by taking the following action:
  - As part of this project, and in order to increase the kiln production rate to 101 MMbf/yr, exhaust from the existing planer chipper cyclone (source ID S1) will be routed to the existing baghouse (source ID S2), controlling $PM_{2.5}/PM_{10}$ emissions by at least 99%.

    During the permit review process, it is noted that the permittee completed replacement of the pneumatic transfer system associated with the chip target box (source ID S8) with a tube conveyor. This action completely eliminated the chip target box as a point source of emissions. As a result, the ambient air quality assessment presented in the permit application is more conservative.

- In the permit application, a proposal was included for an additional production increase as part of this project to increase the permitted kiln production rate from 101 to 110 MMBF/year with multiple options for achieving this change. However, as this part of the project progressed, it was determined that additional time is needed to develop the design for this change, and on August 9, 2012 the facility requested that this option not be included in this permit modification. If this change is made it will be addressed in a later permit modification. The following options were proposed and are under further review:
  - Option 1 is to install paired exhaust stacks (of which only one would vent at a time) on each kiln to capture combined emissions from the kiln roof vents; or
  - Option 2 is to install individual stacks on each of the kilns' roof vents.

## Application Chronology

| | |
|---|---|
| May 11, 2012 | DEQ received an application and an application fee. |
| May 30, 2012 - June 14, 2012 | DEQ provided an opportunity to request a public comment period on the application and proposed permitting action. |
| June 13, 2012 | DEQ determined that the application was incomplete. |
| June 26, 2012 | DEQ received supplemental information from the applicant. |
| July 18, 2012 | DEQ received supplemental information from the applicant. |
| July 23, 2012 | DEQ received supplemental information from the applicant. |
| August 15, 2012 | DEQ determined that the application was complete. |
| August 21, 2012 | DEQ made available the draft permit and statement of basis for peer and regional office review. |
| August 21, 2012 | DEQ made available the draft permit and statement of basis for applicant review. |
| August 29, 2012 | DEQ received the permit processing fee. |

## TECHNICAL ANALYSIS

### *Emissions Units and Control Equipment*

**Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION**

| Source Description | Emissions Controls | Emissions Discharge Point ID No. and/or Description |
|---|---|---|
| **Name:** Boiler<br>**Manufacturer:** Wellons<br>**Manufacture Date:** 1987<br>**Max. capacity:** 40,000 lb/hr<br>**Max. production:** 2,381 BDT/mo<br>**Fuel:** hog fuel<br>**Fuel consumption:** 43,566 MMBtu/mo | **Name:** ESP<br>**Manufacturer:** PPC Industries<br>**Model:** 11R-1220-2612<br>**Type:** Dry<br>**Number of plates:** 24<br>**Plate Spacing:** 11.5 in.<br>**Number of electrodes:** 32<br>**Plate Cleaning:** Rapping<br>**Blower:** Forced, 60 hp<br>**$PM/PM_{10}$ Control eff:** 99.8% | **Exit height:** 47 ft<br>**Exit diameter:** 3.5 ft<br>**Exit flow rate:** 25.5k acfm<br>**Exit temperature:** 375 °F |
| **Name:** Planer<br>**Manufacturer:** Stimson Lumber<br>**Manufacture Date:** Prior to 1998<br>**Max. production:** 759.3 DBT/mo | **Name:** Baghouse<br>**Manufacturer:** Clarke Sheet Metal<br>**Model:** 6020<br>**Type:** Pneuair filter<br>**Number of bags:** 60<br>**Type of bag:** 16 oz polyester<br>**Size:** 20 @ 11.5 x 20'<br>20 @ 16 x 20'<br>20 @ 20 x 20'<br>**Air to cloth:** 4.17 to 1<br>**$PM/PM_{10}$ Control eff:** 99. 9% | **Exit height:** 28 ft<br>**Exit diameter:** unk ft<br>**Exit flow rate:** 4,500 acfm<br>**Exit temperature:** Ambient |
| **Name:** Drying kilns 3,4 ,5<br>**Manufacturer:** Stimson Lumber<br>**Max. production:** 93.45 MMBF | **None** | **Vents along ridgeline of roof** |

As part of this project, exhaust from the existing planer chipper cyclone (source ID S1) will be routed to the existing baghouse (source ID S2), controlling $PM_{10}$ emissions by at least 99%.

Additionally during the permit review process the facility replaced the pneumatic transfer system associated with the chip target box (source ID S8) with a tube conveyor, which completely eliminated this emission source. As a result of this change, the ambient air quality assessment presented in the modeling report is more conservative.

### *Emissions Inventories*

#### <u>Potential to Emit</u>

IDAPA 58.01.01 defines Potential to Emit as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is state or federally enforceable. Secondary emissions do not count in determining the potential to emit of a facility or stationary source.

Using this definition of Potential to Emit an emission inventory was developed for the proposed project. Potential emissions associated with planing and kiln drying are changed as a result of this project; potential emissions from the boilers are unchanged. Note that this emission inventory is based on an increase in kiln production to 110 MMbf/yr; however, the final permit is based on a limit of 101 MMbf/yr. Therefore, emission increases associated with this permit to allow kiln production up to 101 MMbf/yr are expected to be lower than what is shown below.

## Pre-Project Potential to Emit

Pre-project Potential to Emit is used to establish the change in emissions at a facility as a result of this project.

The following table presents the pre-project potential to emit for all criteria pollutants from the emission units being modified as submitted by the Applicant and verified by DEQ staff. Note that boiler potential boiler emissions are not changed by this permit project, therefore, boiler emissions are not included in the table below. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

**Table 2 PRE-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS**

| Source | $PM_{2.5}$ - T/yr[a, b] | $PM_{10}$ - T/yr[a, b] |
|---|---|---|
| Drying Kilns 3,4 and 5 | 1.92 | 1.92 |
| Planer Chipper Cyclone | 0.27 | 1.14 |
| Planer Shavings Cyclone[c] | 0.006 | 0.013 |
| Small Planer (Trimmer) Cyclone[c] | 0.0009 | 0.0021 |
| Chip Target Box | 0.755 | 3.17 |
| Shavings Target Box | 0.041 | 0.17 |
| Hog Fuel Target Box | 0.146 | 0.62 |
| Fuel Silo Target Box | 0.17 | 0.71 |
| Total, Point Sources | 3.31 | 7.75 |

a. Controlled average emission rate in tons per year is an annual average, based on existing annual kiln throughput limit of 93.45 MMbf/yr.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 or 10 micrometers, including condensable particulate as defined in IDAPA 58.01.01.006.81.
c. This assumes a 99% efficient baghouse for the planer shaving and Small Planer (Trimmer)

## Post Project Potential to Emit

Post project Potential to Emit is used to establish the change in emissions at a facility and to determine the facility's classification as a result of this project. Post project Potential to Emit includes all permit limits resulting from this project.

The following table presents the post project Potential to Emit for all criteria pollutants from the emission units being modified as determined by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

**Table 3 POST-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS**

| Source | $PM_{2.5}$ - T/yr[d, e] | $PM_{10}$ - T/yr[d, e] |
|---|---|---|
| Drying Kilns 3,4 and 5 | 2.26 | 2.26 |
| Planer Chipper Cyclone[f] | 0.0060 | 0.013 |
| Planer Shavings Cyclone[f] | 0.0069 | 0.015 |
| Small Planer (Trimmer) Cyclone[f] | 0.0011 | 0.0025 |
| Chip Target Box[g] | 0.009 | 0.37 |
| Shavings Target Box | 0.05 | 0.20 |
| Hog Fuel Target Box | 0.17 | 0.72 |
| Fuel Silo Target Box | 0.17 | 0.71 |
| Total, Point Sources | 2.67 | 4.29 |

d. Controlled average emission rate in tons per year is an annual average, based on existing annual kiln throughput limit of 101 MMbf/yr.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 or 10 micrometers, including condensable particulate as defined in IDAPA 58.01.01.006.81.
f. This assumes a 99% efficient baghouse for the planer shaving and Small Planer (Trimmer)
g. As part of this project, the application initially proposed that the chip target box would either be vented to a new baghouse achieving at least 99% control efficiency for $PM_{10}$ or its existing pneumatic transfer system would ge replaced by a fube conveyor, which would completely eliminated this point source of emissions. Prior to completing the permit the facility installed the tube conveyor, therefore emissions from the Chip Target Box will be zero instea d of the values listed in the table. Since the values listed in the table were used in the air dispersion model, those values are still listed in the table and the modeling results will be more conservative as a result.

## Change in Potential to Emit

The change in facility-wide potential to emit is used to determine if a public comment period may be required and to determine the processing fee per IDAPA 58.01.01.225. The following table presents the facility-wide change in the potential to emit for criteria pollutants.

**Table 4 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS**

| Source | $PM_{2.5}$ - T/yr[a, b] | $PM_{10}$ - T/yr[a, b] |
|---|---|---|
| **Pre-Project Potential to Emit** | **3.31** | **7.75** |
| Post Project Potential to Emit | **2.67** | **4.29** |
| **Total, Point Sources** | **-0.64** | **-3.46** |

## TAP Emissions

A summary of the estimated PTE for emissions increase of toxic air pollutants (TAP) is provided in the following table. Estimates of the change of emissions for toxic air pollutants (TAP) from the emission units being modified were submitted by the Applicant and verified by DEQ staff. For most TAPS, it was shown that any estimated PTE increase would be less than the screening emission levels (EL) identified in IDAPA 58.01.01.585-586. For those TAP increases estimated to exceed an EL, a summary of the estimated PTE emissions increase is provided in the following table.

**Table 5 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR TOXIC AIR POLLUTANTS**

| Carcinogenic Toxic Air Pollutants | Pre-Project Annual Average Emissions Rates for Units at the Facility (lb/hr) | Post Project Annual Average Emissions Rates for Units at the Facility (lb/hr) | Change in Annual Average Emissions Rates for Units at the Facility (lb/hr) | Carcinogenic Screening Emission Level (lb/hr) | Exceeds Screening Level? (Y/N) |
|---|---|---|---|---|---|
| Acetaldehyde | 1.2E-00 | 1.4E-00 | 0.2000 | 0.0030 | Yes |
| Formaldehyde | 4.3E-02 | 5.0E-02 | 0.0070 | 0.00051 | Yes |

Some of the PTEs for TAP were exceeded as a result of this project. Therefore, modeling is required for acetaldehyde and formaldehyde because the annual average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded. Refer to the section below entitled "Ambient Air Quality Impact Analyses" for additional information.

## *Ambient Air Quality Impact Analyses*

As presented in the Modeling Memo in Appendix B, the estimated emission rates of $PM_{2.5}$, acetaldehyde and formaldehyde from this project exceeded applicable screening emission levels (EL) and published DEQ modeling thresholds established in IDAPA 58.01.01.585-586 and in the State of Idaho Air Quality Modeling Guideline[1]. Refer to the Emissions Inventories section for additional information concerning the emission inventories.

The applicant has demonstrated pre-construction compliance to DEQ's satisfaction that emissions from this facility will not cause or significantly contribute to a violation of any ambient air quality standard. The applicant has also demonstrated pre-construction compliance to DEQ's satisfaction that the emissions increase due to this permitting action will not exceed any acceptable ambient concentration for carcinogens (AACC) for toxic air pollutants (TAP). A summary of the Ambient Air Impact Analysis for TAP is provided in Appendix A.

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[1] Criteria pollutant thresholds in Table 1, State of Idaho Air Quality Modeling Guideline, Doc ID AQ-011, rev. 1, December 31, 2002.

An ambient air quality impact analyses document has been crafted by DEQ based on a review of the modeling analysis submitted in the application. That document is part of the final permit package for this permitting action (see Appendix B).

## REGULATORY ANALYSIS

### *Attainment Designation (40 CFR 81.313)*

The facility is located in Benewah County, which is designated as attainment or unclassifiable for $PM_{2.5}$, $PM_{10}$, $SO_2$, $NO_2$, CO, and Ozone. Refer to 40 CFR 81.313 for additional information.

### *Facility Classification*

"Synthetic Minor" classification for criteria pollutants is defined as the uncontrolled Potential to Emit for criteria pollutants are above the applicable major source thresholds and the Potential to Emit for criteria pollutants fall below the applicable major source thresholds. "Synthetic Minor" classification for HAP pollutants is defined as the uncontrolled Potential to Emit for HAP pollutants are above the applicable major source thresholds and the Potential to Emit for HAP pollutants fall below the applicable major source thresholds.

As demonstrated in the Statements of Basis for permits previously issued for this facility, this facility is classified as a synthetic minor facility.

### *Permit to Construct (IDAPA 58.01.01.201)*

IDAPA 58.01.01.201 ..........................................Permit to Construct Required

The permittee has requested that a PTC be issued to the facility for the proposed change in operations of the lumber drying kilns. Therefore, a permit to construct is required to be issued in accordance with IDAPA 58.01.01.220. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.200-228.

### *Tier II Operating Permit (IDAPA 58.01.01.401)*

IDAPA 58.01.01.401 ..........................................Tier II Operating Permit

The application was submitted for a permit to construct (refer to the Permit to Construct section), and an optional Tier II operating permit has not been requested. Therefore, the procedures of IDAPA 58.01.01.400–410 were not applicable to this permitting action.

### *Visible Emissions (IDAPA 58.01.01.625)*

**IDAPA 58.01.01.625..........................................Visible Emissions**

The sources of $PM_{10}$ emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is already included in the existing permit.

### *Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)*

IDAPA 58.01.01.301 ..........................................Requirement to Obtain Tier I Operating Permit

Post project facility-wide emissions from this facility do not have a potential to emit greater than 100 tons per year for $PM_{10}$, $SO_2$, $NO_x$, CO and VOC or 10 tons per year for any one HAP or 25 tons per year for all HAP combined as demonstrated previously for this facility. Therefore, the facility is not a Tier I source in accordance with IDAPA 58.01.01.006 and the requirements of IDAPA 58.01.01.301 do not apply.

## PSD Classification (40 CFR 52.21)

40 CFR 52.21 ....................................................Prevention of Significant Deterioration of Air Quality

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change at a stationary source not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source, that would constitute a major stationary source by itself as defined in 40 CFR 52. Therefore in accordance with 40 CFR 52.21(a)(2), PSD requirements are not applicable to this permitting action. The facility is not a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a), and does not have facility-wide emissions of any criteria pollutant that exceed 250 T/yr.

## NSPS Applicability (40 CFR 60)

As described in the Statement of Basis for PTC No. P-2009.0070 issued on May 21, 2010, the facility is not subject to any NSPS requirements 40 CFR Part 60. In particular, the Wellons boiler is not subject to 40 CFR 60 Subpart Dc.

## NESHAP Applicability (40 CFR 61)

The facility is not subject to any NESHAP requirements in 40 CFR 61.

## MACT Applicability (40 CFR 63)

The facility is not subject to any MACT standards in 40 CFR Part 63.

## Permit Conditions Review

This section describes the permit conditions for this initial permit or only those permit conditions that have been added, revised, modified or deleted as a result of this permitting action.

Revised Permit Condition 23

The purpose of this permit change was to increase the kiln production rate. In the permit application, compliance with all applicable requirements, including compliance with EPA's new $PM_{2.5}$ NAAQS, was demonstrated based on a production rate of 101 MMbf/yr. Therefore, the kiln production rate limit in the permit was increased to reflect this amount.

Revised Permit Condition 26

The permit condition has been revised to add the Planer Chipper Cyclone and to indicate that the exhaust from the existing planer chipper cyclone will be routed to the existing baghouse that controls emissions from the other wood residuals cyclones.

Revised Permit Condition 27

The existing baghouse emissions limit was changed to indicate that it now also includes emissions from the planer chipper cyclone. The existing limit is now based on $PM_{2.5}$ instead of $PM_{10}$ because compliance with the $PM_{2.5}$ NAAQS was found to be the limiting factor for this facility modification instead of the $PM_{10}$ NAAQS. The existing PM limit was not carried forward since the PTE for PM emissions will be inherently limited by the emission limit for $PM_{2.5}$.

Revised Permit Condition 28

This permit condition has been revised to specify exactly which emission sources it applies to and to add the Planer Chipper Cyclone. As part of this permit modification, the permittee indicated that the exhaust from the existing planer chipper cyclone (source ID S1) will be routed to this existing baghouse (source ID2) controlling $PM_{10}$ emissions by at least 99%.

Revised Permit Condition 29

The baghouse permit condition was changed to simply indicate the manual shall be maintained now and to remove the rrequirements for submittal "within 60 days" of issuance of the permit since the initial submittal of a plan was completed following issuance of the former permit. The Planer Chipper Cyclone was added to the list of equipment which the procedures document must address. A requirement to submit a revised plan was included if needed to include new requirements associated with connecting the Planer Chipper Cyclone to the baghouse.

## PUBLIC REVIEW

### *Public Comment Opportunity*

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c or IDAPA 58.01.01.404.01.c. During this time, there were no comments on the application and there was not a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

# APPENDIX A – EMISSIONS INVENTORIES

**Table A-1**
**Drying Kilns Emission Factors**
**Stimson Lumber Company, St. Maries, Idaho**

| Pollutant | | Cedar | Fir | | | Hemlock | Pine | | | | | Redwood | Annual Average | Max Short Term |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Units | Western | Douglas | Alpine/Larch | White | Hemlock | Lodgepole | Ponderosa | Southern | Sugar | White | Redwood | Emission Factor [1] | Emission Factor [2] |
| **Stimson Distibution [3]** | % | | **20.0** | **5.0** | | **70.0** | **5.0** | | | | | | 100 | |
| Kiln Temp | F | | < 200 | < 200 | < 200 | < 200 | < 200 | | < 200 | | | | | |
| | | | | | | | | | | | | | | |
| $PM_{10}$ | lb/1000 BF | | 0.02 | 0.02 | | 0.05 | 0.02 | | | | | | **0.041** | **0.050** |
| VOC (as propane) | lb/1000 BF | 0.15 | 0.56 | 0.65 | 0.65 | 0.29 | 1.32 | 1.98 | 3.93 | 2.53 | 2.76 | 0.15 | **0.42** | **1.318** |
| Acetaldehyde | lb/1000 BF | | 0.057 | 0.113 | 0.113 | 0.113 | 0.012 | 0.113 | 0.045 | | | | **0.097** | **0.113** |
| Acetone | lb/1000 BF | | | | | | | | 0.058 | | | | -- | -- |
| Acrolein | lb/1000 BF | | 0.00065 | 0.0016 | 0.0016 | 0.0016 | 0.0016 | 0.0016 | 0.006 | | | | **0.001** | **0.002** |
| Formaldehyde | lb/1000 BF | | 0.001 | 0.0028 | 0.0028 | 0.00124 | 0.0040 | 0.0029 | 0.0595 | | | | **0.001** | **0.004** |
| Methanol | lb/1000 BF | | 0.038 | 0.122 | 0.122 | 0.072 | 0.055 | 0.065 | 0.183 | | | | **0.067** | **0.122** |
| Methyl Isobutyl Ketone | lb/1000 BF | | | | | | | | 0.001 | | | | -- | -- |
| Propionaldehyde | lb/1000 BF | | 0.00055 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | | | | **0.001** | **0.001** |
| Toluene | lb/1000 BF | | | | | | | | 0.0001 | | | | -- | -- |
| Xylenes (total) | lb/1000 BF | | | | | | | | 0.0002 | | | | -- | -- |

**Notes:**
(1) Factors are weighted according to log species distribution. Speciated VOC factors were obtained from an Oregon DEQ study of May 8, 2007 titled "Title III Implications of Drying Kiln Source Test Resuls". VOC factors were obtained from NCASI values as summarized by Z. Hedgpeth of Ecology. $PM_{10}$ factors were obtained from the Oregon DEQ AQ-EF02 document, Emission Factors, Wood Products.
(2) Max short term emission factor based on highest emitting species processed at mill.
(3) Assumed worst case distribution based on normal species processed at mill.

**Table A-2**
**PTE Emissions Before Project**
**Stimson Lumber Company, St. Maries, Idaho**

| PTE Parameter | Parameter Value | Notes |
|---|---|---|
| Maximum annual boiler fuel input (MMBtu/yr): | 527,878 | (from steaming rate; assumes 1205.2 Btu/lb steam and 70% efficiency) |
| Maximum annual boiler steam output (Mlb steam/yr): | 306,600 | (35 Mlb steam/hr x 8,760 hrs/yr) |
| Maximum annual kiln throughput (MBF/yr): | 93,450 | (from 5/17/2010 SOB) |
| Planer Chipper Cyclone throughput (BDT/yr): | 9,111 | (from 5/17/2010 SOB) |
| Planer Shavings Cyclone throughput (BDT/yr): | 10,513 | (from 5/17/2010 SOB; controlled 99% by baghouse) |
| Small Planer (Trimmer) Cyclone throughput (BDT/yr): | 1,682 | (from 5/17/2010 SOB; controlled 99% by baghouse) |
| Chip Target Box throughput (BDT/yr): | 126,932 | (from 5/17/2010 SOB) |
| Shavings Target Box throughput (BDT/yr): | 6,920 | (from 5/17/2010 SOB) |
| Hog Fuel Target Box throughput (BDT/yr): | 24,616 | (from 5/17/2010 SOB) |
| Fuel Silo Target Box throughput (BDT/yr): | 28,558 | (from 5/17/2010 SOB) |

| Pollutant | Wellons Wood Boiler | | Kilns | | | | Cyclones | Target Boxes | Total |
|---|---|---|---|---|---|---|---|---|---|
| | ($lb/10^3$ lb steam) | (ton/yr) (4) | (Max Hourly - lb/MBF) | (Annual - lb/MBF) | (lb/hr) (4) | (ton/yr) (4) | (ton/yr) | (ton/yr) | (ton/yr) |
| $PM_{10}$ | 0.01171 (1) | 1.80 | 0.05 (2) | 0.041 (2) | 0.53 | 1.92 | 1.15 (3) | 4.68 (6) | 9.54 |
| $PM_{2.5}$ | 0.01171 (7) | 1.80 | 0.05 (7) | 0.041 (7) | 0.53 | 1.92 | 0.28 (3) | 1.11 (6) | 5.10 |
| $NO_X$ | 0.36 (1) | 55.19 | | | | | | | 55.19 |
| CO | 0.566 (1) | 86.77 | | | | | | | 86.77 |
| $SO_2$ | 0.0144 (1) | 2.21 | | | | | | | 2.21 |
| VOC | 0.13 (1) | 19.93 | 1.32 (2) | 0.42 (2) | 14.06 | 19.44 | | | 39.37 |

| TAP | CAS | HAP (Y/N) | Wellons Wood Boiler | | Kilns | | | | Cyclones | Target Boxes | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (lb/MMBTU) | (ton/yr) (4) | (Max Hourly - lb/MBF) | (Annual - lb/MBF) | (lb/hr) (4) | (ton/yr) (4) | (ton/yr) | (ton/yr) | (ton/yr) |
| Acetaldehyde | 75-07-0 | Y | 8.3E-04 (8) | 2.2E-01 | 1.1E-01 (2) | 9.7E-02 (2) | 1.2E+00 | 4.5E+00 | | | 4.7E+00 |
| Acetophenone | 98-86-2 | Y | 3.2E-09 (8) | 8.4E-07 | | | | | | | 8.4E-07 |
| Acrolein | 107-02-8 | Y | 4.0E-03 (8) | 1.1E+00 | 1.6E-03 (2) | 1.4E-03 (2) | 1.7E-02 | 6.6E-02 | | | 1.1E+00 |
| Benzene | 71-43-2 | Y | 4.2E-03 (8) | 1.1E+00 | | | | | | | 1.1E+00 |
| bis(2-Ethylhexyl)phthalate (DEHP) | 117-81-7 | Y | 4.7E-08 (8) | 1.2E-05 | | | | | | | 1.2E-05 |
| Bromomethane (methyl bromide) | 74-83-9 | Y | 1.5E-05 (8) | 4.0E-03 | | | | | | | 4.0E-03 |
| 2-Butanone (MEK) | 78-93-3 | N | 5.4E-06 (8) | 1.4E-03 | | | | | | | 1.4E-03 |
| Carbon Tetrachloride | 56-23-5 | Y | 4.5E-05 (8) | 1.2E-02 | | | | | | | 1.2E-02 |
| Chlorine | 7782-50-5 | Y | 7.9E-04 (8) | 2.1E-01 | | | | | | | 2.1E-01 |
| Chlorobenzene | 108-90-7 | Y | 3.3E-05 (8) | 8.7E-03 | | | | | | | 8.7E-03 |
| Chloroform | 67-66-3 | Y | 2.8E-05 (8) | 7.4E-03 | | | | | | | 7.4E-03 |
| Chloromethane (methyl chloride) | 74-87-3 | Y | 2.3E-05 (8) | 6.1E-03 | | | | | | | 6.1E-03 |
| 1,2-Dichloroethane | 107-06-2 | Y | 2.9E-05 (8) | 7.7E-03 | | | | | | | 7.7E-03 |
| Dichloromethane | 75-09-2 | Y | 2.9E-04 (8) | 7.7E-02 | | | | | | | 7.7E-02 |
| 1,2-Dichloropropane | 78-87-5 | Y | 3.3E-05 (8) | 8.7E-03 | | | | | | | 8.7E-03 |
| 2,4-Dinitrophenol | 51-28-5 | Y | 1.8E-07 (8) | 4.8E-05 | | | | | | | 4.8E-05 |
| Ethylbenzene | 100-41-4 | Y | 3.1E-05 (8) | 8.2E-03 | | | | | | | 8.2E-03 |
| Formaldehyde | 50-00-0 | Y | 4.4E-03 (8) | 1.2E+00 | 4.0E-03 (2) | 1.4E-03 (2) | 4.3E-02 | 6.6E-02 | | | 1.2E+00 |
| Hydrogen Chloride | 7647-01-0 | Y | 1.9E-02 (8) | 5.0E+00 | | | | | | | 5.0E+00 |
| Methanol | 67-56-1 | Y | | | 1.2E-01 (2) | 6.7E-02 (2) | 1.3E+00 | 3.1E+00 | | | 3.1E+00 |
| Naphthalene | 91-20-3 | Y | 9.7E-05 (8) | 2.6E-02 | | | | | | | 2.6E-02 |
| 4-Nitrophenol | 100-02-7 | Y | 1.1E-07 (8) | 2.9E-05 | | | | | | | 2.9E-05 |
| Pentachlorophenol | 87-86-5 | Y | 5.1E-08 (8) | 1.3E-05 | | | | | | | 1.3E-05 |
| Phenol | 108-95-2 | Y | 5.1E-05 (8) | 1.3E-02 | | | | | | | 1.3E-02 |
| Propionaldehyde | 123-38-6 | Y | 6.1E-05 (8) | 1.6E-02 | 1.0E-03 (2) | 9.1E-04 (2) | 1.1E-02 | 4.3E-02 | | | 5.9E-02 |
| Styrene | 100-42-5 | Y | 1.9E-03 (8) | 5.0E-01 | | | | | | | 5.0E-01 |
| Tetrachloroethene | 127-18-4 | Y | 3.8E-05 (8) | 1.0E-02 | | | | | | | 1.0E-02 |
| Toluene | 108-88-3 | Y | 9.2E-04 (8) | 2.4E-01 | | | | | | | 2.4E-01 |
| 1,1,1-Trichloroethane | 71-55-6 | Y | 3.1E-05 (8) | 8.2E-03 | | | | | | | 8.2E-03 |
| Trichloroethylene (Trichloroethene) | 79-01-6 | Y | 3.0E-05 (8) | 7.9E-03 | | | | | | | 7.9E-03 |
| 2,4,6-Trichlorophenol | 88-06-2 | Y | 2.2E-08 (8) | 5.8E-06 | | | | | | | 5.8E-06 |
| Vinyl Chloride | 75-01-4 | Y | 1.8E-05 (8) | 4.8E-03 | | | | | | | 4.8E-03 |
| o-Xylene | 1330-20-7 | Y | 2.5E-05 (8) | 6.6E-03 | | | | | | | 6.6E-03 |

**Table A-2 (Continued)**

| TAP | CAS | HAP | Welons Wood Boiler | | | Kilns | | | | Cyclones | Target Boxes | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (Y/N) | (lb/MMBTU) | | (ton/yr) [a] | (Max Hourly - lb/MBF) | (Annual - lb/MBF) | (lb/hr) [a] | (ton/yr) [a] | (ton/yr) | (ton/yr) | (ton/yr) |
| *PAH Emissions* | | | | | | | | | | | | |
| Acenaphthene | 83-32-9 | Y | 9.1E-07 | (8) | 2.4E-04 | | | | | | | 2.4E-04 |
| Acenaphthylene | 208-96-8 | Y | 5.0E-06 | (8) | 1.3E-03 | | | | | | | 1.3E-03 |
| Anthracene | 120-12-7 | Y | 3.0E-06 | (8) | 7.9E-04 | | | | | | | 7.9E-04 |
| Benzo(a)anthracene | 56-55-3 | Y | 6.5E-08 | (8) | 1.7E-05 | | | | | | | 1.7E-05 |
| Benzo(a)pyrene | 50-32-8 | Y | 2.6E-06 | (8) | 6.9E-04 | | | | | | | 6.9E-04 |
| Benzo(b)fluoranthene | 205-99-2 | Y | 1.0E-07 | (8) | 2.6E-05 | | | | | | | 2.6E-05 |
| Benzo(e)pyrene | 192-97-2 | Y | 2.6E-09 | (8) | 6.9E-07 | | | | | | | 6.9E-07 |
| Benzo(g,h,i)perylene | 191-24-2 | Y | 9.3E-08 | (8) | 2.5E-05 | | | | | | | 2.5E-05 |
| Benzo(j,k)fluoranthene | | Y | 1.6E-07 | (8) | 4.2E-05 | | | | | | | 4.2E-05 |
| Benzo(k)fluoranthene | 207-08-9 | Y | 3.6E-08 | (8) | 9.5E-06 | | | | | | | 9.5E-06 |
| Chrysene | 218-01-9 | Y | 3.8E-08 | (8) | 1.0E-05 | | | | | | | 1.0E-05 |
| Dibenzo(a,h)anthracene | 53-70-3 | Y | 9.1E-09 | (8) | 2.4E-06 | | | | | | | 2.4E-06 |
| Fluoranthene | 206-44-0 | Y | 1.6E-06 | (8) | 4.2E-04 | | | | | | | 4.2E-04 |
| Fluorene | 86-73-7 | Y | 3.4E-06 | (8) | 9.0E-04 | | | | | | | 9.0E-04 |
| Indeno(1,2,3,c,d)pyrene | 193-39-5 | Y | 8.7E-08 | (8) | 2.3E-05 | | | | | | | 2.3E-05 |
| 2-Methylnaphthalene | 91-57-6 | Y | 1.6E-07 | (8) | 4.2E-05 | | | | | | | 4.2E-05 |
| Phenanthrene | 85-01-8 | Y | 7.0E-06 | (8) | 1.8E-03 | | | | | | | 1.8E-03 |
| Pyrene | 129-00-0 | Y | 3.7E-06 | (8) | 9.8E-04 | | | | | | | 9.8E-04 |
| *PCB Emissions* | | | | | | | | | | | | |
| Decachlorobiphenyl | 2051-24-3 | Y | 2.7E-10 | (8) | 7.1E-08 | | | | | | | 7.1E-08 |
| Dichlorobiphenyl | | Y | 7.4E-10 | (8) | 2.0E-07 | | | | | | | 2.0E-07 |
| Heptachlorobiphenyl | | Y | 6.6E-11 | (8) | 1.7E-08 | | | | | | | 1.7E-08 |
| Hextachlorobiphenyl | | Y | 5.5E-10 | (8) | 1.5E-07 | | | | | | | 1.5E-07 |
| Pentachlorobiphenyl | | Y | 1.2E-09 | (8) | 3.2E-07 | | | | | | | 3.2E-07 |
| Tetrachlorobiphenyl | | Y | 2.5E-09 | (8) | 6.6E-07 | | | | | | | 6.6E-07 |
| Trichlorobiphenyl | | Y | 2.6E-09 | (8) | 6.9E-07 | | | | | | | 6.9E-07 |
| *Dioxin/Furan Emissions* | | | | | | | | | | | | |
| 2,3,7,8-TCDD | 1746-01-6 | Y | 8.6E-12 | (8) | 2.3E-09 | | | | | | | 2.3E-09 |
| 2,3,7,8-TCDF | 51207-31-9 | Y | 9.0E-11 | (8) | 2.4E-08 | | | | | | | 2.4E-08 |
| HpCDF | | Y | 2.4E-10 | (8) | 6.3E-08 | | | | | | | 6.3E-08 |
| HxCDF | | Y | 2.8E-10 | (8) | 7.4E-08 | | | | | | | 7.4E-08 |
| OCDF | | Y | 8.8E-11 | (8) | 2.3E-08 | | | | | | | 2.3E-08 |
| PCDF | | Y | 4.2E-10 | (8) | 1.1E-07 | | | | | | | 1.1E-07 |
| TCDF | | Y | 7.5E-10 | (8) | 2.0E-07 | | | | | | | 2.0E-07 |
| *Metals Emissions* | | | | | | | | | | | | |
| Antimony | 7440-36-0 | Y | 7.9E-06 | (9) | 2.1E-03 | | | | | | | 2.1E-03 |
| Arsenic | 7440-38-2 | Y | 2.2E-05 | (9) | 5.8E-03 | | | | | | | 5.8E-03 |
| Beryllium | 7440-41-7 | Y | 1.1E-06 | (9) | 2.9E-04 | | | | | | | 2.9E-04 |
| Cadmium | 7440-43-9 | Y | 4.1E-06 | (9) | 1.1E-03 | | | | | | | 1.1E-03 |
| Chromium | 7440-47-3 | Y | 2.1E-05 | (9) | 5.5E-03 | | | | | | | 5.5E-03 |
| Chromium (hexavalent) | 18540-29-9 | Y | 3.5E-06 | (9) | 9.2E-04 | | | | | | | 9.2E-04 |
| Cobalt | 7440-48-4 | Y | 6.5E-06 | (9) | 1.7E-03 | | | | | | | 1.7E-03 |
| Lead | 7439-92-1 | Y | 4.8E-05 | (9) | 1.3E-02 | | | | | | | 1.3E-02 |
| Manganese | 7439-96-5 | Y | 1.6E-03 | (9) | 4.2E-01 | | | | | | | 4.2E-01 |
| Mercury | 7439-97-6 | Y | 3.5E-06 | (9) | 9.2E-04 | | | | | | | 9.2E-04 |
| Nickel | 7440-02-0 | Y | 3.3E-05 | (9) | 8.7E-03 | | | | | | | 8.7E-03 |
| Phosphorus | 7723-14-0 | Y | 2.7E-05 | (9) | 7.1E-03 | | | | | | | 7.1E-03 |
| Selenium | 7782-49-2 | Y | 2.8E-06 | (9) | 7.4E-04 | | | | | | | 7.4E-04 |
| Zinc | 7440-66-6 | N | 4.2E-04 | (9) | 1.1E-01 | | | | | | | 1.1E-01 |
| Total HAPs | | | | | 10.22 | | | 2.58 | 7.82 | | | 18.04 |

## Table A-2 (Continued)

**Notes:**

(a) Emissions (ton/yr) = (PTE parameter) x (emission factor) x (ton/2,000 lbs)

(b) Emissions (lb/hr) = (PTE parameter) / (annual hours of operation [hr/yr]) x (max short term emission factor)

Annual hours of operation (hr/yr) = 8,760

(c) Planer Shavings and Small Planer (Trimmer) Cyclone emission rates (ton/yr) = (Future PTE throughput [BDT/yr]) x (emission factor [lb/BDT]) x (1 - [baghouse control efficiency (%) / 100]) x (ton/2,000 lbs)

Baghouse control efficiency (%) = 99

**References:**

(1) Taken from 2009 Statement of Basis. Boiler emission factors are based on a 2009 test.

(2) See Table A-1, Drying Kilns Emission Factors. Max hourly emission factor assumes the kilns could dry the highest emitting wood for a period of 24 hours for purposes of emissions modeling.

(3) Cyclone emissions are the sum of the uncontrolled Planer Chipper Cyclone, and the Planer Shavings Cyclone and Small Planer (Trimmer) Cyclone which are controlled by a baghouse. Individual emission rates are calculated in the following table:

| Source | Source ID | Future PTE Throughput (BDT/yr) | $PM_{10}$ Emission Factor [1] (lb/BDT) | $PM_{2.5}$ Emission Factor (lb/BDT) | $PM_{10}$ Emission Rate (ton/yr) | $PM_{2.5}$ Emission Rate (ton/yr) |
|---|---|---|---|---|---|---|
| Planer Chipper Cyclone throughput (BDT/yr) | S1 | 9,111 | 0.25 | 0.06 [4] | 1.14 [a] | 0.27 [a] |
| Planer Shavings Cyclone throughput (BDT/yr) | S2 | 10,513 | 0.25 | 0.11 [5] | 0.013 [c] | 0.006 [c] |
| Small Planer (Trimmer) Cyclone throughput (BDT/yr) | | 1,682 | 0.25 | 0.11 [5] | 0.0021 [c] | 0.0009 [c] |

(4) Forest Products Association of Canada (5/07), Final Report Wood Product Sector Particulate Emission Study. Average $PM_{2.5}$ fraction of $PM_{10}$ calculated from Table 4.1-3.

$PM_{2.5}$ to $PM_{10}$ fraction for cyclone control = 0.238

(5) AP-42 Appendix B.1 (10/86) for woodworking waste collection operations (page B.1-48) based on cumulative weight percentages.

$PM_{2.5}$ to $PM_{10}$ fraction for baghouse control: 14.3% $PM_{2.5}$ / 32.1% $PM_{10}$ = 0.45

(6) Target Box emissions are the sum of the Chip Target Box, Shavings Target Box, Hog Fuel Target Box, and Fuel Silo Target Box. Individual emission rates are calculated in the following table:

| Source | Source ID | Future PTE Throughput (BDT/yr) | $PM_{10}$ Emission Factor [1] (lb/BDT) | $PM_{2.5}$ Emission Factor (lb/BDT) | $PM_{10}$ Emission Rate (ton/yr) | $PM_{2.5}$ Emission Rate (ton/yr) |
|---|---|---|---|---|---|---|
| Chip Target Box throughput (BDT/yr) | S8 | 126,932 | 0.05 | 0.0119 [4] | 3.17 [a] | 0.755 [a] |
| Shavings Target Box throughput (BDT/yr) | S7_B | 6,920 | 0.05 | 0.0119 [4] | 0.17 [a] | 0.041 [a] |
| Hog Fuel Target Box throughput (BDT/yr) | S7_A | 24,616 | 0.05 | 0.0119 [4] | 0.62 [a] | 0.146 [a] |
| Fuel Silo Target Box throughput (BDT/yr) | S6 | 28,558 | 0.05 | 0.0119 [4] | 0.71 [a] | 0.170 [a] |

(7) It is conservatively assumed that 100% of $PM_{10}$ emissions are $PM_{2.5}$.

(8) AP-42, Section 1.6 (9/03), *Wood Residue Combustion in Boilers*, Table 1.6-3. Although AP-42 provides an emission factor for polychlorinated dibenzo-p-dioxins, it was not used for reasons discussed in this submittal.

(9) AP-42, Section 1.6 (9/03), *Wood Residue Combustion in Boilers*, Table 1.6-4. Factors do not fully reflect potential emission reductions due to the particulate control device proposed for this project.

**Table A-3**
**PTE Emissions After Project**
**Stimson Lumber Company, St. Maries, Idaho**

| PTE Parameter | Future PTE Parameter Value | Current PTE Parameter Value | Adjustment Factor Used | Notes |
|---|---|---|---|---|
| Maximum annual boiler fuel input (MMBtu/yr): | 527,878 | 527,878 | 1.000 | No change proposed. |
| Maximum annual boiler steam output (Mlb steam/yr): | 306,600 | 306,600 | 1.000 | No change proposed. |
| Maximum annual kiln throughput (MBF/yr): | 110,000 | 93,450 | 1.177 | = (110,000 MBF/yr)/(93,450 MBF/yr) |
| Planer Chipper Cyclone throughput (BDT/yr): | 10,725 | 9,111 | 1.177 | = (110,000 MBF/yr)/(93,450 MBF/yr) |
| Planer Shavings Cyclone throughput (BDT/yr): | 12,375 | 10,513 | 1.177 | = (110,000 MBF/yr)/(93,450 MBF/yr) |
| Small Planer (Trimmer) Cyclone throughput (BDT/yr): | 1,980 | 1,682 | 1.177 | = (110,000 MBF/yr)/(93,450 MBF/yr) |
| Chip Target Box throughput (BDT/yr): | 149,412 | 126,932 | 1.177 | = (110,000 MBF/yr)/(93,450 MBF/yr) |
| Shavings Target Box throughput (BDT/yr): | 8,146 | 6,920 | 1.177 | = (110,000 MBF/yr)/(93,450 MBF/yr) |
| Hog Fuel Target Box throughput (BDT/yr): | 28,975 | 24,616 | 1.177 | = (110,000 MBF/yr)/(93,450 MBF/yr) |
| Fuel Silo Target Box throughput (BDT/yr): | 28,558 | 28,558 | 1.000 | No change proposed. |

| Pollutant | Wellons Wood Boiler | | Kilns | | | | Cyclones | Target Boxes | Total |
|---|---|---|---|---|---|---|---|---|---|
| | ($lb/10^3$ lb steam) | (ton/yr) (4) | (Max Hourly - lb/MBF) | (Annual - lb/MBF) | (lb/hr) (4) | (ton/yr) (4) | (ton/yr) | (ton/yr) | (ton/yr) |
| $PM_{10}$ | 0.01171 (1) | 1.80 | 0.05 (2) | 0.041 (2) | 0.63 | 2.26 | 0.03 (3) | 1.68 (3) | 5.76 |
| $PM_{2.5}$ | 0.01171 (7) | 1.80 | 0.05 (7) | 0.041 (7) | 0.63 | 2.26 | 0.01 (3) | 0.40 (3) | 4.46 |
| $NO_X$ | 0.36 (1) | 55.19 | | | | | | | 55.19 |
| CO | 0.566 (1) | 86.77 | | | | | | | 86.77 |
| $SO_2$ | 0.0144 (1) | 2.21 | | | | | | | 2.21 |
| VOC | 0.13 (1) | 19.93 | 1.32 (2) | 0.42 (2) | 16.55 | 22.88 | | | 42.81 |

| TAP | CAS | HAP (Y/N) | Wellons Wood Boiler | | Kilns | | | | Cyclones | Target Boxes | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (lb/MMBTU) | (ton/yr) (4) | (Max Hourly - lb/MBF) | (Annual - lb/MBF) | (lb/hr) (4) | (ton/yr) (4) | (ton/yr) | (ton/yr) | (ton/yr) |
| Acetaldehyde | 75-07-0 | Y | 8.3E-04 (8) | 2.2E-01 | 1.1E-01 (2) | 9.7E-02 (2) | 1.4E+00 | 5.3E+00 | | | 5.5E+00 |
| Acetophenone | 98-86-2 | Y | 3.2E-09 (8) | 8.4E-07 | | | | | | | 8.4E-07 |
| Acrolein | 107-02-8 | Y | 4.0E-03 (8) | 1.1E+00 | 1.6E-03 (2) | 1.4E-03 (2) | 2.0E-02 | 7.8E-02 | | | 1.1E+00 |
| Benzene | 71-43-2 | Y | 4.2E-03 (8) | 1.1E+00 | | | | | | | 1.1E+00 |
| bis(2-Ethylhexyl)phthalate (DEHP) | 117-81-7 | Y | 4.7E-08 (8) | 1.2E-05 | | | | | | | 1.2E-05 |
| Bromomethane (methyl bromide) | 74-83-9 | Y | 1.5E-05 (8) | 4.0E-03 | | | | | | | 4.0E-03 |
| 2-Butanone (MEK) | 78-93-3 | N | 5.4E-06 (8) | 1.4E-03 | | | | | | | 1.4E-03 |
| Carbon Tetrachloride | 56-23-5 | Y | 4.5E-05 (8) | 1.2E-02 | | | | | | | 1.2E-02 |
| Chlorine | 7782-50-5 | Y | 7.9E-04 (8) | 2.1E-01 | | | | | | | 2.1E-01 |
| Chlorobenzene | 108-90-7 | Y | 3.3E-05 (8) | 8.7E-03 | | | | | | | 8.7E-03 |
| Chloroform | 67-66-3 | Y | 2.8E-05 (8) | 7.4E-03 | | | | | | | 7.4E-03 |
| Chloromethane (methyl chloride) | 74-87-3 | Y | 2.3E-05 (8) | 6.1E-03 | | | | | | | 6.1E-03 |
| 1,2-Dichloroethane | 107-06-2 | Y | 2.9E-05 (8) | 7.7E-03 | | | | | | | 7.7E-03 |
| Dichloromethane | 75-09-2 | Y | 2.9E-04 (8) | 7.7E-02 | | | | | | | 7.7E-02 |
| 1,2-Dichloropropane | 78-87-5 | Y | 3.3E-05 (8) | 8.7E-03 | | | | | | | 8.7E-03 |
| 2,4-Dinitrophenol | 51-28-5 | Y | 1.8E-07 (8) | 4.8E-05 | | | | | | | 4.8E-05 |
| Ethylbenzene | 100-41-4 | Y | 3.1E-05 (8) | 8.2E-03 | | | | | | | 8.2E-03 |
| Formaldehyde | 50-00-0 | Y | 4.4E-03 (8) | 1.2E+00 | 4.0E-03 (2) | 1.4E-03 (2) | 5.0E-02 | 7.7E-02 | | | 1.2E+00 |
| Hydrogen Chloride | 7647-01-0 | Y | 1.9E-02 (8) | 5.0E+00 | | | | | | | 5.0E+00 |
| Methanol | 67-56-1 | Y | | | 1.2E-01 (2) | 6.7E-02 (2) | 1.5E+00 | 3.7E+00 | | | 3.7E+00 |
| Naphthalene | 91-20-3 | Y | 9.7E-05 (8) | 2.6E-02 | | | | | | | 2.6E-02 |
| 4-Nitrophenol | 100-02-7 | Y | 1.1E-07 (8) | 2.9E-05 | | | | | | | 2.9E-05 |
| Pentachlorophenol | 87-86-5 | Y | 5.1E-08 (8) | 1.3E-05 | | | | | | | 1.3E-05 |
| Phenol | 108-95-2 | Y | 5.1E-05 (8) | 1.3E-02 | | | | | | | 1.3E-02 |
| Propionaldehyde | 123-38-6 | Y | 6.1E-05 (8) | 1.6E-02 | 1.0E-03 (2) | 9.1E-04 (2) | 1.3E-02 | 5.0E-02 | | | 6.6E-02 |
| Styrene | 100-42-5 | Y | 1.9E-03 (8) | 5.0E-01 | | | | | | | 5.0E-01 |
| Tetrachloroethene | 127-18-4 | Y | 3.8E-05 (8) | 1.0E-02 | | | | | | | 1.0E-02 |
| Toluene | 108-88-3 | Y | 9.2E-04 (8) | 2.4E-01 | | | | | | | 2.4E-01 |
| 1,1,1-Trichloroethane | 71-55-6 | Y | 3.1E-05 (8) | 8.2E-03 | | | | | | | 8.2E-03 |
| Trichloroethylene (Trichloroethene) | 79-01-6 | Y | 3.0E-05 (8) | 7.9E-03 | | | | | | | 7.9E-03 |
| 2,4,6-Trichlorophenol | 88-06-2 | Y | 2.2E-08 (8) | 5.8E-06 | | | | | | | 5.8E-06 |
| Vinyl Chloride | 75-01-4 | Y | 1.8E-05 (8) | 4.8E-03 | | | | | | | 4.8E-03 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| o-Xylene | 1330-20-7 | Y | 2.5E-05 (6) | 6.6E-03 | | | | | | | | 6.6E-03 |

## Table A-3 (Continued)

| TAP | CAS | HAP (Y/N) | Wellons Wood Boiler (lb/MMBTU) | Wellons Wood Boiler (ton/yr) [6] | Kilns (Max Hourly - lb/MBF) | Kilns (Annual - lb/MBF) | Kilns (lb/hr) [4] | Kilns (ton/yr) [4] | Cyclones (ton/yr) | Target Boxes (ton/yr) | Total (ton/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *PAH Emissions* | | | | | | | | | | | |
| Acenaphthene | 83-32-9 | Y | 9.1E-07 (8) | 2.4E-04 | | | | | | | 2.4E-04 |
| Acenaphthylene | 208-96-8 | Y | 5.0E-06 (8) | 1.3E-03 | | | | | | | 1.3E-03 |
| Anthracene | 120-12-7 | Y | 3.0E-06 (8) | 7.9E-04 | | | | | | | 7.9E-04 |
| Benzo(a)anthracene | 56-55-3 | Y | 6.5E-08 (8) | 1.7E-05 | | | | | | | 1.7E-05 |
| Benzo(a)pyrene | 50-32-8 | Y | 2.6E-06 (8) | 6.9E-04 | | | | | | | 6.9E-04 |
| Benzo(b)fluoranthene | 205-99-2 | Y | 1.0E-07 (8) | 2.6E-05 | | | | | | | 2.6E-05 |
| Benzo(e)pyrene | 192-97-2 | Y | 2.6E-09 (8) | 6.9E-07 | | | | | | | 6.9E-07 |
| Benzo(g,h,i)perylene | 191-24-2 | Y | 9.3E-08 (8) | 2.5E-05 | | | | | | | 2.5E-05 |
| Benzo(j,k)fluoranthene | | Y | 1.6E-07 (8) | 4.2E-05 | | | | | | | 4.2E-05 |
| Benzo(k)fluoranthene | 207-08-9 | Y | 3.6E-08 (8) | 9.5E-06 | | | | | | | 9.5E-06 |
| Chrysene | 218-01-9 | Y | 3.8E-08 (8) | 1.0E-05 | | | | | | | 1.0E-05 |
| Dibenzo(a,h)anthracene | 53-70-3 | Y | 9.1E-09 (8) | 2.4E-06 | | | | | | | 2.4E-06 |
| Fluoranthene | 206-44-0 | Y | 1.6E-06 (8) | 4.2E-04 | | | | | | | 4.2E-04 |
| Fluorene | 86-73-7 | Y | 3.4E-06 (8) | 9.0E-04 | | | | | | | 9.0E-04 |
| Indeno(1,2,3,c,d)pyrene | 193-39-5 | Y | 8.7E-08 (8) | 2.3E-05 | | | | | | | 2.3E-05 |
| 2-Methylnaphthalene | 91-57-6 | Y | 1.6E-07 (8) | 4.2E-05 | | | | | | | 4.2E-05 |
| Phenanthrene | 85-01-8 | Y | 7.0E-06 (8) | 1.8E-03 | | | | | | | 1.8E-03 |
| Pyrene | 129-00-0 | Y | 3.7E-06 (8) | 9.8E-04 | | | | | | | 9.8E-04 |
| *PCB Emissions* | | | | | | | | | | | |
| Decachlorobiphenyl | 2051-24-3 | Y | 2.7E-10 (8) | 7.1E-08 | | | | | | | 7.1E-08 |
| Dichlorobiphenyl | | Y | 7.4E-10 (8) | 2.0E-07 | | | | | | | 2.0E-07 |
| Heptachlorobiphenyl | | Y | 6.6E-11 (8) | 1.7E-08 | | | | | | | 1.7E-08 |
| Hextachlorobiphenyl | | Y | 5.5E-10 (8) | 1.5E-07 | | | | | | | 1.5E-07 |
| Pentachlorobiphenyl | | Y | 1.2E-09 (8) | 3.2E-07 | | | | | | | 3.2E-07 |
| Tetrachlorobiphenyl | | Y | 2.5E-09 (8) | 6.6E-07 | | | | | | | 6.6E-07 |
| Trichlorobiphenyl | | Y | 2.6E-09 (8) | 6.9E-07 | | | | | | | 6.9E-07 |
| *Dioxin/Furan Emissions* | | | | | | | | | | | |
| 2,3,7,8-TCDD | 1746-01-6 | Y | 8.6E-12 (8) | 2.3E-09 | | | | | | | 2.3E-09 |
| 2,3,7,8-TCDF | 51207-31-9 | Y | 9.0E-11 (8) | 2.4E-08 | | | | | | | 2.4E-08 |
| HpCDF | | Y | 2.4E-10 (8) | 6.3E-08 | | | | | | | 6.3E-08 |
| HxCDF | | Y | 2.8E-10 (8) | 7.4E-08 | | | | | | | 7.4E-08 |
| OCDF | | Y | 8.8E-11 (8) | 2.3E-08 | | | | | | | 2.3E-08 |
| PCDF | | Y | 4.2E-10 (8) | 1.1E-07 | | | | | | | 1.1E-07 |
| TCDF | | Y | 7.5E-10 (8) | 2.0E-07 | | | | | | | 2.0E-07 |
| *Metals Emissions* | | | | | | | | | | | |
| Antimony | 7440-36-0 | Y | 7.9E-06 (9) | 2.1E-03 | | | | | | | 2.1E-03 |
| Arsenic | 7440-38-2 | Y | 2.2E-05 (9) | 5.8E-03 | | | | | | | 5.8E-03 |
| Beryllium | 7440-41-7 | Y | 1.1E-06 (9) | 2.9E-04 | | | | | | | 2.9E-04 |
| Cadmium | 7440-43-9 | Y | 4.1E-06 (9) | 1.1E-03 | | | | | | | 1.1E-03 |
| Chromium | 7440-47-3 | Y | 2.1E-05 (9) | 5.5E-03 | | | | | | | 5.5E-03 |
| Chromium (hexavalent) | 18540-29-9 | Y | 3.5E-06 (9) | 9.2E-04 | | | | | | | 9.2E-04 |
| Cobalt | 7440-48-4 | Y | 6.5E-06 (9) | 1.7E-03 | | | | | | | 1.7E-03 |
| Lead | 7439-92-1 | Y | 4.8E-05 (9) | 1.3E-02 | | | | | | | 1.3E-02 |
| Manganese | 7439-96-5 | Y | 1.6E-03 (9) | 4.2E-01 | | | | | | | 4.2E-01 |
| Mercury | 7439-97-6 | Y | 3.5E-06 (9) | 9.2E-04 | | | | | | | 9.2E-04 |
| Nickel | 7440-02-0 | Y | 3.3E-05 (9) | 8.7E-03 | | | | | | | 8.7E-03 |
| Phosphorus | 7723-14-0 | Y | 2.7E-05 (9) | 7.1E-03 | | | | | | | 7.1E-03 |
| Selenium | 7782-49-2 | Y | 2.8E-06 (9) | 7.4E-04 | | | | | | | 7.4E-04 |
| Zinc | 7440-66-6 | N | 4.2E-04 (9) | 1.1E-01 | | | | | | | 1.1E-01 |
| Total HAPs | | | | 10.22 | | | 3.03 | 9.20 | | | 19.42 |

## Table A-3 (Continued)

**Notes:**

(a) Emissions (ton/yr) = (PTE parameter) x (emission factor) x (ton/2,000 lbs)
(b) Emissions (lb/hr) = (PTE parameter) / (annual hours of operation [hr/yr]) x (max short term emission factor)
Annual hours of operation (hr/yr) = 8,760
(c) Emission rates (ton/yr) = (Future PTE throughput [BDT/yr]) x (emission factor [lb/BDT]) x (1 - [baghouse control efficiency (%) / 100]) x (ton/2,000 lbs)
Baghouse control efficiency (%) = 99

**References:**

(1) Taken from 2009 Statement of Basis. Boiler emission factors are based on a 2009 test.
(2) See Table A-1, Drying Kilns Emission Factors. Max hourly emission factor assumes the kilns could dry the highest emitting wood for a period of 24 hours for purposes of emissions modeling.
(3) Cyclone emissions are the sum of the Planer Chipper Cyclone, Planer Shavings Cyclone, and Small Planer (Trimmer) Cyclone, all of which are controlled by a baghouse in the future scenario. Individual emission rates are calculated in the following table:

| Source | Source ID | Future PTE Throughput (BDT/yr) | $PM_{10}$ Emission Factor (1) (lb/BDT) | $PM_{2.5}$ Emission Factor (lb/BDT) | $PM_{10}$ Emission Rate (ton/yr) | $PM_{2.5}$ Emission Rate (ton/yr) |
|---|---|---|---|---|---|---|
| Planer Chipper Cyclone throughput (BDT/yr) (Formerly S1) | S2 | 10,725 | 0.25 | 0.111 (4) | 0.013 (c) | 0.0060 (c) |
| Planer Shavings Cyclone throughput (BDT/yr) | | 12,375 | 0.25 | 0.111 (4) | 0.015 (c) | 0.0069 (c) |
| Small Planer (Trimmer) Cyclone throughput (BDT/yr) | | 1,980 | 0.25 | 0.111 (4) | 0.0025 (c) | 0.0011 (c) |

(4) AP-42 Appendix B.1 (10/86) for woodworking waste collection operations (page B.1-48) based on cumulative weight percentages.
$PM_{2.5}$ to $PM_{10}$ fraction for baghouse control: 14.3% $PM_{2.5}$ / 32.1% $PM_{10}$ = 0.45

(5) Target Box emissions are the sum of the Chip Target Box, Shavings Target Box, Hog Fuel Target Box, and Fuel Silo Target Box. Individual emission rates are calculated in the following table:

| Source | Source ID | Future PTE Throughput (BDT/yr) | $PM_{10}$ Emission Factor (1) (lb/BDT) | $PM_{2.5}$ Emission Factor (6) (lb/BDT) | $PM_{10}$ Emission Rate (ton/yr) | $PM_{2.5}$ Emission Rate (ton/yr) |
|---|---|---|---|---|---|---|
| Chip Target Box throughput (BDT/yr) | S8 | 149,412 | 0.05 | 0.0119 (6) | 0.037 (c) | 0.009 (c) |
| Shavings Target Box throughput (BDT/yr) | S7_B | 8,146 | 0.05 | 0.0119 (6) | 0.20 (a) | 0.05 (a) |
| Hog Fuel Target Box throughput (BDT/yr) | S7_A | 28,975 | 0.05 | 0.0119 (6) | 0.72 (a) | 0.17 (a) |
| Fuel Silo Target Box throughput (BDT/yr) | S6 | 28,558 | 0.05 | 0.0119 (6) | 0.71 (a) | 0.17 (a) |

(6) Forest Products Association of Canada (5/07), Final Report Wood Product Sector Particulate Emission Study. Average $PM_{2.5}$ fraction of $PM_{10}$ calculated from Table 4.1-3.
$PM_{2.5}$ to $PM_{10}$ fraction for cyclone control = 0.238
(7) It is conservatively assumed that 100% of $PM_{10}$ emissions are $PM_{2.5}$.
(8) AP-42, Section 1.6 (9/03), *Wood Residue Combustion in Boilers*, Table 1.6-3. Although AP-42 provides an emission factor for polychlorinated dibenzo-p-dioxins, it was not used for reasons discussed in this submittal.
(9) AP-42, Section 1.6 (9/03), *Wood Residue Combustion in Boilers*, Table 1.6-4. Factors do not fully reflect potential emission reductions due to the particulate control device proposed for this project.

**Table A-3b**
**PTE Emissions After Project (Modeling Threshold Comparison)**
**Stimson Lumber Company, St. Maries, Idaho**

| PTE Parameter | Future PTE Parameter Value (SIL) | Current PTE Parameter Value | Adjustment Factor Used | |
|---|---|---|---|---|
| Maximum annual boiler fuel input (MMBtu/yr): | 527,878 | 527,878 | 1.000 | No change proposed. |
| Maximum annual boiler steam output (Mlb steam/yr): | 306,600 | 306,600 | 1.000 | No change proposed. |
| Maximum annual kiln throughput (MBF/yr): | 110,000 | 93,450 | 1.177 | = (110,000 MBF/yr)/(93,450 MBF/yr) |
| Planer Chipper Cyclone throughput (BDT/yr): | 10,725 | 9,111 | 1.177 | = (110,000 MBF/yr)/(93,450 MBF/yr) |
| Planer Shavings Cyclone throughput (BDT/yr): | 12,375 | 10,513 | 1.177 | = (110,000 MBF/yr)/(93,450 MBF/yr) |
| Small Planer (Trimmer) Cyclone throughput (BDT/yr): | 1,980 | 1,682 | 1.177 | = (110,000 MBF/yr)/(93,450 MBF/yr) |
| Chip Target Box throughput (BDT/yr): | 149,412 | 126,932 | 1.177 | = (110,000 MBF/yr)/(93,450 MBF/yr) |
| Shavings Target Box throughput (BDT/yr): | 8,146 | 6,920 | 1.177 | = (110,000 MBF/yr)/(93,450 MBF/yr) |
| Hog Fuel Target Box throughput (BDT/yr): | 28,975 | 24,616 | 1.177 | = (110,000 MBF/yr)/(93,450 MBF/yr) |
| Fuel Silo Target Box throughput (BDT/yr): | 28,558 | 28,558 | 1.000 | No change proposed. |

| Pollutant | Wellons Wood Boiler | | Kilns | | | | Cyclones | Target Boxes | Total |
|---|---|---|---|---|---|---|---|---|---|
| | (lb/10³ lb steam) | (ton/yr)[4] | (Max Hourly - lb/MBF) | (lb/MBF) | (lb/hr)[5] | (ton/yr)[4] | (ton/yr) | (ton/yr) | (ton/yr) |
| $PM_{10}$ | 0.01171 [1] | 1.80 | 0.05 [2] | 0.041 [2] | 0.63 | 2.26 | 1.36 [3] | 5.38 [6] | 10.79 |
| $PM_{2.5}$ | 0.01171 [7] | 1.80 | 0.050 [7] | 0.041 [7] | 0.63 | 2.26 | 0.33 [3] | 1.28 [6] | 5.66 |
| $NO_X$ | 0.36 [1] | 55.19 | | | | | | | 55.19 |
| CO | 0.566 [1] | 86.77 | | | | | | | 86.77 |
| $SO_2$ | 0.0144 [1] | 2.21 | | | | | | | 2.21 |
| VOC | 0.13 [1] | 19.93 | 1.32 [2] | 0.46 [2] | 16.55 | 25.30 | | | 45.23 |

| TAP | CAS | HAP (Y/N) | Wellons Wood Boiler | | Kilns | | | | Cyclones | Target Boxes | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (lb/MMBTU) | (ton/yr)[4] | (Max Hourly - lb/MBF) | (lb/MBF) | (lb/hr)[5] | (ton/yr)[4] | (ton/yr) | (ton/yr) | (ton/yr) |
| Acetaldehyde | 75-07-0 | Y | 8.3E-04 [8] | 2.2E-01 | 1.1E-01 [2] | 9.7E-02 [2] | 1.4E+00 | 5.3E+00 | | | 5.5E+00 |
| Acetophenone | 98-86-2 | Y | 3.2E-09 [8] | 8.4E-07 | | | | | | | 8.4E-07 |
| Acrolein | 107-02-8 | Y | 4.0E-03 [8] | 1.1E+00 | 1.6E-03 [2] | 1.4E-03 [2] | 2.0E-02 | 7.8E-02 | | | 1.1E+00 |
| Benzene | 71-43-2 | Y | 4.2E-03 [8] | 1.1E+00 | | | | | | | 1.1E+00 |
| bis(2-Ethylhexyl)phthalate (DEHP) | 117-81-7 | Y | 4.7E-08 [8] | 1.2E-05 | | | | | | | 1.2E-05 |
| Bromomethane (methyl bromide) | 74-83-9 | Y | 1.5E-05 [8] | 4.0E-03 | | | | | | | 4.0E-03 |
| 2-Butanone (MEK) | 78-93-3 | N | 5.4E-06 [8] | 1.4E-03 | | | | | | | 1.4E-03 |
| Carbon Tetrachloride | 56-23-5 | Y | 4.5E-05 [8] | 1.2E-02 | | | | | | | 1.2E-02 |
| Chlorine | 7782-50-5 | Y | 7.9E-04 [8] | 2.1E-01 | | | | | | | 2.1E-01 |
| Chlorobenzene | 108-90-7 | Y | 3.3E-05 [8] | 8.7E-03 | | | | | | | 8.7E-03 |
| Chloroform | 67-66-3 | Y | 2.8E-05 [8] | 7.4E-03 | | | | | | | 7.4E-03 |
| Chloromethane (methyl chloride) | 74-87-3 | Y | 2.3E-05 [8] | 6.1E-03 | | | | | | | 6.1E-03 |
| 1,2-Dichloroethane | 107-06-2 | Y | 2.9E-05 [8] | 7.7E-03 | | | | | | | 7.7E-03 |
| Dichloromethane | 75-09-2 | Y | 2.9E-04 [8] | 7.7E-02 | | | | | | | 7.7E-02 |
| 1,2-Dichloropropane | 78-87-5 | Y | 3.3E-05 [8] | 8.7E-03 | | | | | | | 8.7E-03 |
| 2,4-Dinitrophenol | 51-28-5 | Y | 1.8E-07 [8] | 4.8E-05 | | | | | | | 4.8E-05 |
| Ethylbenzene | 100-41-4 | Y | 3.1E-05 [8] | 8.2E-03 | | | | | | | 8.2E-03 |
| Formaldehyde | 50-00-0 | Y | 4.4E-03 [8] | 1.2E+00 | 4.0E-03 [2] | 1.4E-03 [2] | 5.0E-02 | 7.7E-02 | | | 1.2E+00 |
| Hydrogen Chloride | 7647-01-0 | Y | 1.9E-02 [8] | 5.0E+00 | | | | | | | 5.0E+00 |
| Methanol | 67-56-1 | Y | | | 1.2E-01 [2] | 6.7E-02 [2] | 1.5E+00 | 3.7E+00 | | | 3.7E+00 |
| Naphthalene | 91-20-3 | Y | 9.7E-05 [8] | 2.6E-02 | | | | | | | 2.6E-02 |
| 4-Nitrophenol | 100-02-7 | Y | 1.1E-07 [8] | 2.9E-05 | | | | | | | 2.9E-05 |
| Pentachlorophenol | 87-86-5 | Y | 5.1E-08 [8] | 1.3E-05 | | | | | | | 1.3E-05 |
| Phenol | 108-95-2 | Y | 5.1E-05 [8] | 1.3E-02 | | | | | | | 1.3E-02 |
| Propionaldehyde | 123-38-6 | Y | 6.1E-05 [8] | 1.6E-02 | 1.0E-03 [2] | 9.1E-04 [2] | 1.3E-02 | 5.0E-02 | | | 6.6E-02 |
| Styrene | 100-42-5 | Y | 1.9E-03 [8] | 5.0E-01 | | | | | | | 5.0E-01 |
| Tetrachloroethene | 127-18-4 | Y | 3.8E-05 [8] | 1.0E-02 | | | | | | | 1.0E-02 |
| Toluene | 108-88-3 | Y | 9.2E-04 [8] | 2.4E-01 | | | | | | | 2.4E-01 |
| 1,1,1-Trichloroethane | 71-55-6 | Y | 3.1E-05 [8] | 8.2E-03 | | | | | | | 8.2E-03 |
| Trichloroethylene (Trichloroethene) | 79-01-6 | Y | 3.0E-05 [8] | 7.9E-03 | | | | | | | 7.9E-03 |
| 2,4,6-Trichlorophenol | 88-06-2 | Y | 2.2E-08 [8] | 5.8E-06 | | | | | | | 5.8E-06 |
| Vinyl Chloride | 75-01-4 | Y | 1.8E-05 [8] | 4.8E-03 | | | | | | | 4.8E-03 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| o-Xylene | 1330-20-7 | Y | 2.5E-05 [8] | 6.6E-03 | | | | | | | | 6.6E-03 |

**Table A-3b (Continued)**

| TAP | CAS | HAP (Y/N) | Wellons Wood Boiler (lb/MMBTU) | Wellons Wood Boiler (ton/yr) [4] | Kilns (Max Hourly - lb/MBF) | Kilns (lb/MBF) | Kilns (lb/hr) [5] | Kilns (ton/yr) [4] | Cyclones (ton/yr) | Target Boxes (ton/yr) | Total (ton/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *PAH Emissions* | | | | | | | | | | | |
| Acenaphthene | 83-32-9 | Y | 9.1E-07 [8] | 2.4E-04 | | | | | | | 2.4E-04 |
| Acenaphthylene | 208-96-8 | Y | 5.0E-06 [8] | 1.3E-03 | | | | | | | 1.3E-03 |
| Anthracene | 120-12-7 | Y | 3.0E-06 [8] | 7.9E-04 | | | | | | | 7.9E-04 |
| Benzo(a)anthracene | 56-55-3 | Y | 6.5E-08 [8] | 1.7E-05 | | | | | | | 1.7E-05 |
| Benzo(a)pyrene | 50-32-8 | Y | 2.6E-06 [8] | 6.9E-04 | | | | | | | 6.9E-04 |
| Benzo(b)fluoranthene | 205-99-2 | Y | 1.0E-07 [8] | 2.6E-05 | | | | | | | 2.6E-05 |
| Benzo(e)pyrene | 192-97-2 | Y | 2.6E-09 [8] | 6.9E-07 | | | | | | | 6.9E-07 |
| Benzo(g,h,i)perylene | 191-24-2 | Y | 9.3E-08 [8] | 2.5E-05 | | | | | | | 2.5E-05 |
| Benzo(j,k)fluoranthene | | Y | 1.6E-07 [8] | 4.2E-05 | | | | | | | 4.2E-05 |
| Benzo(k)fluoranthene | 207-08-9 | Y | 3.6E-08 [8] | 9.5E-06 | | | | | | | 9.5E-06 |
| Chrysene | 218-01-9 | Y | 3.8E-08 [8] | 1.0E-05 | | | | | | | 1.0E-05 |
| Dibenzo(a,h)anthracene | 53-70-3 | Y | 9.1E-09 [8] | 2.4E-06 | | | | | | | 2.4E-06 |
| Fluoranthene | 206-44-0 | Y | 1.6E-06 [8] | 4.2E-04 | | | | | | | 4.2E-04 |
| Fluorene | 86-73-7 | Y | 3.4E-06 [8] | 9.0E-04 | | | | | | | 9.0E-04 |
| Indeno(1,2,3,c,d)pyrene | 193-39-5 | Y | 8.7E-08 [8] | 2.3E-05 | | | | | | | 2.3E-05 |
| 2-Methylnaphthalene | 91-57-6 | Y | 1.6E-07 [8] | 4.2E-05 | | | | | | | 4.2E-05 |
| Phenanthrene | 85-01-8 | Y | 7.0E-06 [8] | 1.8E-03 | | | | | | | 1.8E-03 |
| Pyrene | 129-00-0 | Y | 3.7E-06 [8] | 9.8E-04 | | | | | | | 9.8E-04 |
| *PCB Emissions* | | | | | | | | | | | |
| Decachlorobiphenyl | 2051-24-3 | Y | 2.7E-10 [8] | 7.1E-08 | | | | | | | 7.1E-08 |
| Dichlorobiphenyl | | Y | 7.4E-10 [8] | 2.0E-07 | | | | | | | 2.0E-07 |
| Heptachlorobiphenyl | | Y | 6.6E-11 [8] | 1.7E-08 | | | | | | | 1.7E-08 |
| Hextachlorobiphenyl | | Y | 5.5E-10 [8] | 1.5E-07 | | | | | | | 1.5E-07 |
| Pentachlorobiphenyl | | Y | 1.2E-09 [8] | 3.2E-07 | | | | | | | 3.2E-07 |
| Tetrachlorobiphenyl | | Y | 2.5E-09 [8] | 6.6E-07 | | | | | | | 6.6E-07 |
| Trichlorobiphenyl | | Y | 2.6E-09 [8] | 6.9E-07 | | | | | | | 6.9E-07 |
| *Dioxin/Furan Emissions* | | | | | | | | | | | |
| 2,3,7,8-TCDD | 1746-01-6 | Y | 8.6E-12 [8] | 2.3E-09 | | | | | | | 2.3E-09 |
| 2,3,7,8-TCDF | 51207-31-9 | Y | 9.0E-11 [8] | 2.4E-08 | | | | | | | 2.4E-08 |
| HpCDF | | Y | 2.4E-10 [8] | 6.3E-08 | | | | | | | 6.3E-08 |
| HxCDF | | Y | 2.8E-10 [8] | 7.4E-08 | | | | | | | 7.4E-08 |
| OCDF | | Y | 8.8E-11 [8] | 2.3E-08 | | | | | | | 2.3E-08 |
| PCDF | | Y | 4.2E-10 [8] | 1.1E-07 | | | | | | | 1.1E-07 |
| TCDF | | Y | 7.5E-10 [8] | 2.0E-07 | | | | | | | 2.0E-07 |
| *Metals Emissions* | | | | | | | | | | | |
| Antimony | 7440-36-0 | Y | 7.9E-06 [9] | 2.1E-03 | | | | | | | 2.1E-03 |
| Arsenic | 7440-38-2 | Y | 2.2E-05 [9] | 5.8E-03 | | | | | | | 5.8E-03 |
| Beryllium | 7440-41-7 | Y | 1.1E-06 [9] | 2.9E-04 | | | | | | | 2.9E-04 |
| Cadmium | 7440-43-9 | Y | 4.1E-06 [9] | 1.1E-03 | | | | | | | 1.1E-03 |
| Chromium | 7440-47-3 | Y | 2.1E-05 [9] | 5.5E-03 | | | | | | | 5.5E-03 |
| Chromium (hexavalent) | 18540-29-9 | Y | 3.5E-06 [9] | 9.2E-04 | | | | | | | 9.2E-04 |
| Cobalt | 7440-48-4 | Y | 6.5E-06 [9] | 1.7E-03 | | | | | | | 1.7E-03 |
| Lead | 7439-92-1 | Y | 4.8E-05 [9] | 1.3E-02 | | | | | | | 1.3E-02 |
| Manganese | 7439-96-5 | Y | 1.6E-03 [9] | 4.2E-01 | | | | | | | 4.2E-01 |
| Mercury | 7439-97-6 | Y | 3.5E-06 [9] | 9.2E-04 | | | | | | | 9.2E-04 |
| Nickel | 7440-02-0 | Y | 3.3E-05 [9] | 8.7E-03 | | | | | | | 8.7E-03 |
| Phosphorus | 7723-14-0 | Y | 2.7E-05 [9] | 7.1E-03 | | | | | | | 7.1E-03 |
| Selenium | 7782-49-2 | Y | 2.8E-06 [9] | 7.4E-04 | | | | | | | 7.4E-04 |
| Zinc | 7440-66-6 | N | 4.2E-04 [9] | 1.1E-01 | | | | | | | 1.1E-01 |
| Total HAPs | | | | 10.22 | | | 3.03 | 9.20 | | | 19.42 |

## Table A-3b (Continued)

**Notes:**

(a) Emissions (ton/yr) = (PTE parameter) x (emission factor) x (ton/2,000 lbs)

(b) Emissions (lb/hr) = (PTE parameter) / (annual hours of operation [hr/yr]) x (max short term emission factor)

Annual hours of operation (hr/yr) = 8,760

(c) Planer Shavings and Small Planer (Trimmer) Cyclone emission rates (ton/yr) = (Future PTE throughput [BDT/yr]) x (emission factor [lb/BDT]) x (1 - [baghouse control efficiency (%) / 100]) x (ton/2,000 lbs)

Baghouse control efficiency (%) = 99

**References:**

(1) Taken from 2009 Statement of Basis. Boiler emission factors are based on a 2009 test.

(2) See Table A-1, Drying Kilns Emission Factors. Max hourly emission factor assumes the kilns could dry the highest emitting wood for a period of 24 hours for purposes of emissions modeling.

(3) Cyclone emissions are the sum of the uncontrolled Planer Chipper Cyclone, and the Planer Shavings Cyclone and Small Planer (Trimmer) Cyclone which are controlled by a baghouse. Individual emission rates are calculated in the following table:

| Source | Source ID | Future PTE Throughput (BDT/yr) | $PM_{10}$ Emission Factor (lb/BDT) | $PM_{10}$ Emission Factor (lb/BDT) | $PM_{2.5}$ Emission Factor (lb/BDT) | $PM_{10}$ Emission Rate (ton/yr) | $PM_{2.5}$ Emission Rate (ton/yr) |
|---|---|---|---|---|---|---|---|
| Planer Chipper Cyclone throughput (BDT/yr) | S1 | 10,725 | 0.25 | 0.25 | 0.06 | 1.34 (a) | 0.32 (a) |
| Planer Shavings Cyclone throughput (BDT/yr) | S2 | 12,375 | 0.25 | 0.25 | 0.11 | 0.015 (c) | 0.007 (c) |
| Small Planer (Trimmer) Cyclone throughput (BDT/yr) | | 1,980 | 0.25 | 0.25 | 0.11 | 0.0025 (c) | 0.0011 (c) |

(4) Forest Products Association of Canada (5/07), Final Report Wood Product Sector Particulate Emission Study. Average $PM_{2.5}$ fraction of $PM_{10}$ calculated from Table 4.1-3.

$PM_{2.5}$ to $PM_{10}$ fraction for cyclone control: 23.8% $PM_{2.5}$ = 0.238

(5) AP-42 Appendix B.1 (10/86) for woodworking waste collection operations (page B.1-48) based on cumulative weight percentages.

$PM_{2.5}$ to $PM_{10}$ fraction for baghouse control: 14.3% $PM_{2.5}$ / 32.1% $PM_{10}$ = 0.45

(6) Target Box emissions are the sum of the Chip Target Box, Shavings Target Box, Hog Fuel Target Box, and Fuel Silo Target Box. Individual emission rates are calculated in the following table:

| Source | Source ID | Future PTE Throughput (BDT/yr) | $PM_{10}$ Emission Factor (lb/BDT) | $PM_{10}$ Emission Factor (lb/BDT) | $PM_{2.5}$ Emission Factor (lb/BDT) | $PM_{10}$ Emission Rate (ton/yr) | $PM_{2.5}$ Emission Rate (ton/yr) |
|---|---|---|---|---|---|---|---|
| Chip Target Box throughput (BDT/yr) | S8 | 149,412 | 0.05 | 0.05 | 0.0119 | 3.74 (a) | 0.889 (a) |
| Shavings Target Box throughput (BDT/yr) | S7_B | 8,146 | 0.05 | 0.05 | 0.0119 | 0.20 (a) | 0.048 (a) |
| Hog Fuel Target Box throughput (BDT/yr) | S7_A | 28,975 | 0.05 | 0.05 | 0.0119 | 0.72 (a) | 0.172 (a) |
| Fuel Silo Target Box throughput (BDT/yr) | S6 | 28,558 | 0.05 | 0.05 | 0.0119 | 0.71 (a) | 0.170 (a) |

(7) It is conservatively assumed that 100% of $PM_{10}$ emissions are $PM_{2.5}$.

(8) AP-42, Section 1.6 (9/03), *Wood Residue Combustion in Boilers*, Table 1.6-3. Although AP-42 provides an emission factor for polychlorinated dibenzo-p-dioxins, it was not used for reasons discussed in this submittal.

(9) AP-42, Section 1.6 (9/03), *Wood Residue Combustion in Boilers*, Table 1.6-4. Factors do not fully reflect potential emission reductions due to the particulate control device proposed for this project.

**Table A-4**
**Modeling Threshold Comparison**
**Stimson Lumber Company, St. Maries, Idaho**

| Pollutant | Emission Change (1) | | | | | | Total Change | Threshold (3) | Total Change | Threshold (3) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Kilns | | Cyclones | | Target Boxes | | | | | |
| | (lb/hr) | (ton/yr) | (lb/hr) (2) | (ton/yr) | (lb/hr) (2) | (ton/yr) | (lb/hr) | (lb/hr) | (ton/yr) | (ton/yr) |
| $PM_{10}$ | 0.09 | 0.34 | 0.05 | 0.20 | 0.16 | 0.70 | 0.30 | 0.22 | 1.25 | - |
| $PM_{2.5}$ | 0.09 | 0.34 | 0.01 | 0.05 | 0.04 | 0.17 | 0.14 | 0.054 | 0.56 | 0.35 |
| $NO_X$ | - | - | - | - | - | - | 0.00 | 0.2 | 0.00 | 1.2 |
| CO | - | - | - | - | - | - | 0.00 | 15 | 0.00 | - |
| $SO_2$ | - | - | - | - | - | - | 0.00 | 0.21 | 0.00 | 2.5 |
| VOC | 2.49 | 5.86 | - | - | - | - | 2.49 | - | 5.86 | - |

| Pollutant | CAS | Emission Change (1) | | | | | | Total Change | Threshold | Total Change | Threshold |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Kilns | | Cyclones | | Target Boxes | | | | | |
| | | (lb/hr) | (ton/yr) | (lb/hr) | (ton/yr) | (lb/hr) | (ton/yr) | (lb/hr) | (lb/hr) | (ton/yr) | (ton/yr) |
| Acetaldehyde | 75-07-0 | 2.1E-01 | 8.0E-01 | - | - | - | - | 2.1E-01 | - | 8.0E-01 | - |
| Acrolein | 107-02-8 | 3.0E-03 | 1.2E-02 | - | - | - | - | 3.0E-03 | - | 1.2E-02 | - |
| Formaldehyde | 50-00-0 | 7.6E-03 | 1.2E-02 | - | - | - | - | 7.6E-03 | - | 1.2E-02 | - |
| Methanol | 67-56-1 | 2.3E-01 | 5.5E-01 | - | - | - | - | 2.3E-01 | - | 5.5E-01 | - |
| Propionaldehyde | 123-38-6 | 1.9E-03 | 7.5E-03 | - | - | - | - | 1.9E-03 | - | 7.5E-03 | - |

**Notes:**
(1) Comparison represents the difference between the facility PTE prior to the project and the PTE after the project due to increased production only. Emission reductions achieved by the addition of emission control devices are not included in the comparison.
(2) Hourly emissions (lb/hr) equal to annual emissions (ton/yr) multiplied by 2,000 lb/ton and divided by 8,760 hours per year.
(3) Idaho DEQ Modeling Thresholds, Threshold I.

**Table A-5**
**Emissions Increase Comparison to Idaho Emission Limits**
**Stimson Lumber Company, St. Maries, Idaho**

| Pollutant | CAS | PTE Emissions Increase (1) (lb/hr) | Emission Level (2) (lb/hr) | PTE Emissions Increase > Emission Level? (Yes/No) | Evaluated as 24-hr or Annual Concentration? |
|---|---|---|---|---|---|
| Acetaldehyde | 75-07-0 | 2.1E-01 | 3.0E-03 | Yes | Annual |
| Acrolein | 107-02-8 | 3.0E-03 | 1.7E-02 | No | Not Evaluated |
| Formaldehyde | 50-00-0 | 7.6E-03 | 5.1E-04 | Yes | Annual |
| Methanol | 67-56-1 | 2.3E-01 | 1.7E+01 | No | Not Evaluated |
| Propionaldehyde | 123-38-6 | 1.9E-03 | 2.9E-02 | No | Not Evaluated |

**Notes:**

(1) PTE Emissions Increase taken from Table A-4, Modeling Threshold Comparison.

(2) Emission Levels are the screening emissions levels (EL) from Idaho Administrative Code 58.01.01, Sections 585 and 586. If the PTE emissions increase is less than or equal to the EL, no further preconstruction compliance demonstration is required for that specific HAP.

# APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

## MEMORANDUM

**DATE:** August 29, 2012

**TO:** Ken Hanna, Permit Writer, Air Quality Division

**FROM:** Cheryl Robinson, P.E., Air Quality Engineer/Modeling Analyst, Air Quality Division

**PROJECT NUMBER:** P-2009.0070 PROJ 61053

**SUBJECT:** Modeling Review for Stimson Lumber St. Maries, Facility ID 009-00004
Increase Annual Lumber Output from 93.45 to 101 MMBF, route chip target box and planer chipper cyclone emissions to 99% efficient baghouse. No increase in boiler steaming rate.

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### 1.0 Summary

On May 11, 2012 DEQ received an application from Stimson Lumber Company, Inc., to make several modifications to their St. Maries sawmill facility. The proposed changes included: an increase in annual lumber output from 93.45 to 110 MMBF, installation of baghouses on the planer chip cyclone, and installation of stacks on the lumber kiln vents. Revised modeling was received on July 23, 2012 for a substantially reduced project scope: the requested increased lumber output was reduced from 110 MMBF to 101 MMBF, emissions were reduced by a now completed project to vent emissions from the chip target box to a new baghouse with at least 99% control efficiency for $PM_{10}$ /$PM_{2.5}$, exhaust from the existing planer chipper cyclone (source ID S1) will be routed to existing baghouse (source ID S2) which reduces $PM_{10}$ /$PM_{2.5}$ emissions by at least 99%. No changes will be made to the existing kiln vent configuration as part of this reduced-scope project. The pneumatic transfer system associated with the chip target box (source ID S8) will at some point be replaced with a tube conveyor, which will eliminate all PM emissions from this source.

The increase to 101 MMBF was selected because at that production rate, dispersion modeling demonstrated that the increase in $PM_{2.5}$ ambient impacts was less than significant. This allows the facility to ramp up production by a target date of September 1, 2012. The facility has indicated that they still intend to request additional increases in production, but will do so in a separate permitting action. This will allow the facility additional time to conduct engineering and operational analyses on the various stack options (i.e., adding multiple smaller stacks or one or two combined stacks on each kiln). To avoid issuing a sham permit for the anticipated additional production increase, modeling for the follow-up project must demonstrate compliance for all changes (increases and decreases in emissions) compared to facility operations allowed in permit P-2009.0070, issued May 21, 2010.

Air quality analyses involving atmospheric dispersion modeling of emissions associated with the facility were performed to demonstrate the facility would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02 [Idaho Air Rules Section 203.02]) or Toxic Air Pollutant (TAP) increment (Idaho Air Rules Section 203.03). The application was prepared by Spring Environmental, Inc. (Spring) of Spokane, Washington, with modeling analyses conducted by the Lake Oswego, Oregon office of Golder Associates, Inc. (Golder).

Air impact analyses are required by Idaho Air Rules to be conducted according to methods outlined in 40 CFR 51, Appendix W (Guideline on Air Quality Models). Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition. The submitted information demonstrated to the satisfaction of the Department that operation of the proposed facility or modification will not cause or significantly contribute to a violation of any ambient air quality standard, provided the key conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition.

| Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES | |
|---|---|
| **Criteria/Assumption/Result** | **Explanation/Consideration** |
| • Future analyses should treat the railroad right-of-way as ambient air.<br>• Annual production should be limited to a maximum of 101 MMBF.<br>• Chip target box emissions and planer chipper cyclone emissions (source ID S1) must be vented to a baghouse with at least 99% control for $PM_{10}$ /$PM_{2.5}$.<br>• Replacement of the pneumatic transfer system associated with the chip target box (source ID S8) with a tube conveyor is not required at this time. | • The area within the railroad right-of-way used by Stimson was excluded from ambient air, based on an assertion that the public does not have access to this area. Please note that railroad personnel are considered members of the public. The highest modeled impacts from this project occur to the east and south of the facility. It does not appear that incorporating the railroad right-of-way as part of the Stimson facility affected the compliance demonstration for this project.<br>• The revised modeling submitted on July 23, 2012 included emission reductions associated with routing chip target box emissions and planer chipper cyclone emissions to a 99% efficient baghouse.<br>• The revised modeling submitted on July 23, 2012 included PM emissions from the existing pneumatic transfer system associated with the chip target box. |

## 2.0 Background Information

## 2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance for this facility located at 500 Milltown Road in Saint Maries. Approximate UTM coordinates for the facility are 534.5 km Easting and 5241.6 km Northing, in UTM Zone 11 (Datum WGS84). The base elevation at the facility is approximately 658 m (2,159 ft).

### *2.1.1 Area Classification*

The facility is located within Benewah County which is designated as an attainment or unclassifiable area for carbon monoxide (CO), lead (Pb), nitrogen dioxide ($NO_2$), ozone, particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers ($PM_{10}$), particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers ($PM_{2.5}$), and sulfur oxides ($SO_x$). There are no Class I areas within 10 kilometers of this location.

### *2.1.2 DEQ Modeling Thresholds*

Modeling is typically not required if the changes in estimated criteria pollutant emission rates for a proposed project are below DEQ's modeling thresholds, shown in Table 2. "Case-by-case" thresholds may be used only with prior DEQ approval. DEQ required the use of "Threshold I" values for this project in the October 13, 2011 modeling protocol approval.

| Table 2. DEQ CRITERIA POLLUTANT MODELING THRESHOLDS | | | | | |
|---|---|---|---|---|---|
| **Criteria Air Pollutants** | **Averaging Period** | **DEQ Modeling Threshold** | | | |
| | | **Threshold I** | | **Threshold II (Case-by-Case)** | |
| $PM_{10}$ | 24-hr | 0.22 | lb/hr | 2.6 | lb/hr |
| $PM_{2.5}$ | 24-hr | 0.054 | lb/hr | 0.63 | lb/hr |
| | Annual | 0.35 | T/yr | 4.1 | T/yr |
| CO | 1-hr, 8-hr | 15 | lb/hr | 175 | lb/hr |
| $NO_2$ | 1-hour | 0.20 | lb/hr | 2.4 | lb/hr |
| | Annual | 1.2 | T/yr | 14 | T/yr |
| $SO_2$ | 1-hr | 0.21 | lb/hr | 2.5 | lb/hr |
| | 24-hr | 0.22 | lb/hr | 2.6 | lb/hr |
| | Annual | 1.2 | T/yr | 14 | T/yr |

| Table 2. DEQ CRITERIA POLLUTANT MODELING THRESHOLDS | | | | | |
|---|---|---|---|---|---|
| Criteria Air Pollutants | Averaging Period | DEQ Modeling Threshold | | | |
| | | Threshold I | | Threshold II (Case-by-Case) | |
| Lead | 3-month rolling avg | 14 | lb/mo | | |

Information provided with the application demonstrated that the increase in emissions of criteria pollutants associated with this project were below DEQ's modeling thresholds for all pollutants and averaging times except for $PM_{2.5}$. Revised dispersion modeling demonstrated that the increase in ambient impacts for the reduced project scope were below applicable significance levels. Background concentrations of criteria pollutants were therefore not needed for this project.

#### *2.1.3 Toxic Air Pollutant Analyses*

Emissions of toxic substances are generally addressed by Idaho Air Rules Section 161:

> *Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.*

Permit requirements for toxic air pollutants (TAPs) from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.

Per Section 210, if the emissions increase associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emissions increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated.

In accordance with Section 210.20 of the Idaho Air Rules, a demonstration of compliance with state-only TAPs standards is not required for any TAP that is regulated at the time of permit issuance under 40 CFR Part 60 (New Source Performance Standards [NSPS]), 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants [NESHAP], or 40 CFR Part 63 (NESHAP for Source Categories / MACT standards).

## 3.0 <u>Modeling Impact Assessment</u>

### 3.1 Modeling Methodology

This section describes the modeling methods used by the applicant to demonstrate compliance with applicable air quality standards.

#### *3.1.1 Overview of Analyses*

Golder performed air quality analyses using AERMOD in support of the submitted permit application. A brief description of parameters used in the modeling analyses is provided in Table 3.

| Table 3. MODELING PARAMETERS | | |
|---|---|---|
| **Parameter** | **Description/Values** | **Documentation/Addition Description** |
| Model | AERMOD | AERMOD with the PRIME downwash algorithm, version 12060 using Lakes Environmental AERMOD View |
| Meteorological data | Sandpoint/ Coeur d'Alene, 2002-2006<br><br>Soda Springs (P4) /Pocatello, 2004-2008 | DEQ provided AERMOD-ready surface (.sfc) and upper air profile (.pfl) files for two met station locations: 1) For the years 2002-2006 developed using surface data collected by DEQ in Sandpoint, supplemented with NWS surface data collected at the Coeur d'Alene airport, with upper air soundings collected at the Spokane Airport, and 2) For the years 2004-2008 developed using surface data collected at the Monsanto P4 facility in Soda Springs, supplemented with NWS surface data collected at the Pocatello airport, with upper air soundings collected at the Boise Airport. |
| Terrain | NED 1/3 arc-sec | AERMAP v. 11103, using 1/3 arc-second NED terrain data files (NAD83/WGS84). |
| Building downwash | BPIP-PRIME v. 04274 | Building downwash parameters were calculated using the BPIP PRIME algorithm (version 04274). |
| Receptor Grid | Receptors | Receptor locations were defined in UTM coordinates (NAD83) |
| | Nested Square Grids | 25-meter (m) spacing along the ambient air boundary<br>50-meter (m) spacing from the facility fence line out to 1000 m (1 km)<br>250-m spacing between 1 km and 3 km |

### 3.1.2 Modeling Protocol and Methodology

A modeling protocol received by DEQ on September 9, 2011 was approved with comment on October 13, 2011. A May 8, 2012 email from Brian Patterson (Golder) to Cheryl Robinson (DEQ) described a new project compared to the previously planned project. DEQ confirmed in an email reply dated May 16, 2012 that the modeling approach described and approved for the previous project would also apply to the new project. Modeling was generally conducted using data described in the protocol and methods described in the *State of Idaho Air Quality Modeling Guideline*. Default rural dispersion was used.

### 3.1.3 Model Selection

Idaho Air Rules Section 202.02 requires that estimates of ambient concentrations be based on air quality models specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models). The refined, steady state, multiple source, Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. EPA provided a one-year transition period during which either ISCST3 or AERMOD could be used at the discretion of the permitting agency. AERMOD must be used for all air impact analyses, performed in support of air quality permitting, conducted after November 2006.

AERMOD retains the single straight line trajectory of ISCST3, but includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD offers the following improvements over ISCST3:

- Improved dispersion in the convective boundary layer and the stable boundary layer.
- Improved plume rise and buoyancy calculations.
- Improved treatment of terrain effects on dispersion.
- New vertical profiles of wind, turbulence, and temperature.

### 3.1.4 Meteorological Data

There are currently no representative meteorological data for the St. Maries location. DEQ provided AERMOD-ready surface (.sfc) and upper air profile (.pfl) files for two met station locations: 1) For the years 2002-2006 developed using surface data collected by DEQ in Sandpoint, supplemented with NWS surface data collected at the Coeur d'Alene airport, with upper air soundings collected at the Spokane Airport, and 2) For the years 2004-2008 developed using surface data collected at the Monsanto P4 facility in Soda Springs, supplemented with NWS surface data collected at the Pocatello airport, with upper air soundings collected at the Boise Airport. Modeling using both data sets was required, with the higher of the two results to be reported as the modeled impacts for this project.

### 3.1.5 Terrain Effects

Terrain effects on dispersion were considered in these analyses. Olsson used AERMAP v. 11103 to extract the actual elevation of each receptor and determine the controlling hill height elevation from a 1/3-arc second (about 10 meter resolution) tiff file downloaded from the Seamless National Elevation Database (NED). The NED file encompassed the area between -116.635 and -116.448 degrees longitude and 47.266 and 47.393 degrees north latitude (coordinate system NAD83).

### 3.1.6 Facility Layout

The Stimson St. Maries facility layout is shown in Figure 3-1.

**Figure 3-1. STIMSON LUMBER ST.MARIES FACILITY**

### 3.1.7 Building Downwash

Plume downwash effects caused by structures present at the facility were accounted for in the submitted modeling analyses. The Building Profile Input Program with Plume RIse Model Enhancements (BPIP-PRIME) was used to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emission release parameters for input to AERMOD.

### 3.1.8 Ambient Air Boundary

Ambient air is defined in Section 006 of the Idaho Air Rules as "that portion of the atmosphere, external to buildings, to which the general public has access. Except along the west side of the property, the property boundary was used as the ambient air boundary for the modeling analyses for this project. The area within the railroad right-of-way used by Stimson was excluded from ambient air, based on an assertion that the public does not have access to this area. **Please note that railroad personnel are considered members of the public. The highest modeled impacts from this project occur to the east and south of the facility. It does not appear that incorporating the railroad right-of-way as part of the Stimson facility affected the compliance demonstration for this project. Future analyses should treat the railroad right-of-way as ambient air.** The ambient air boundary used for this project is shown in Figure 3-2 (Figure 7 from the modeling report submitted with the PTC application).

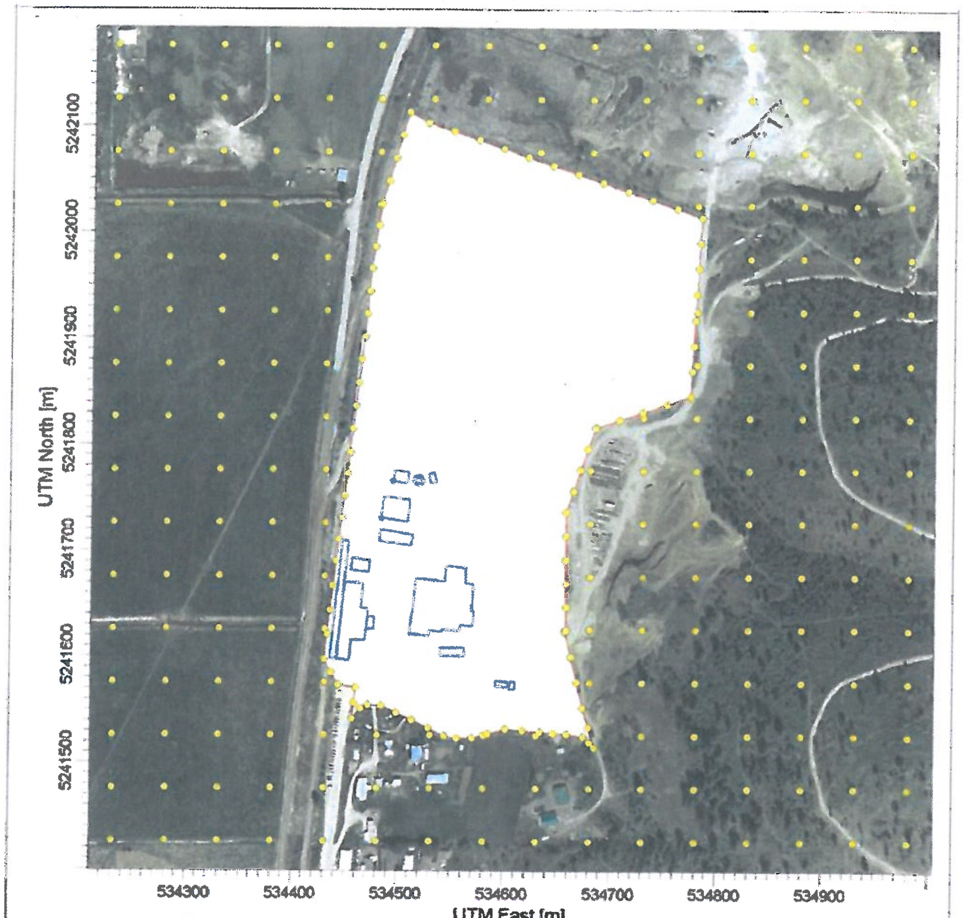


**Figure 3-2. STIMSON LUMBER ST.MARIES AMBIENT AIR BOUNDARY**

### *3.1.9 Receptor Network*

The receptor grids used for the submitted modeling analyses are summarized in Table 3, and shown graphically in Figure 3-3.

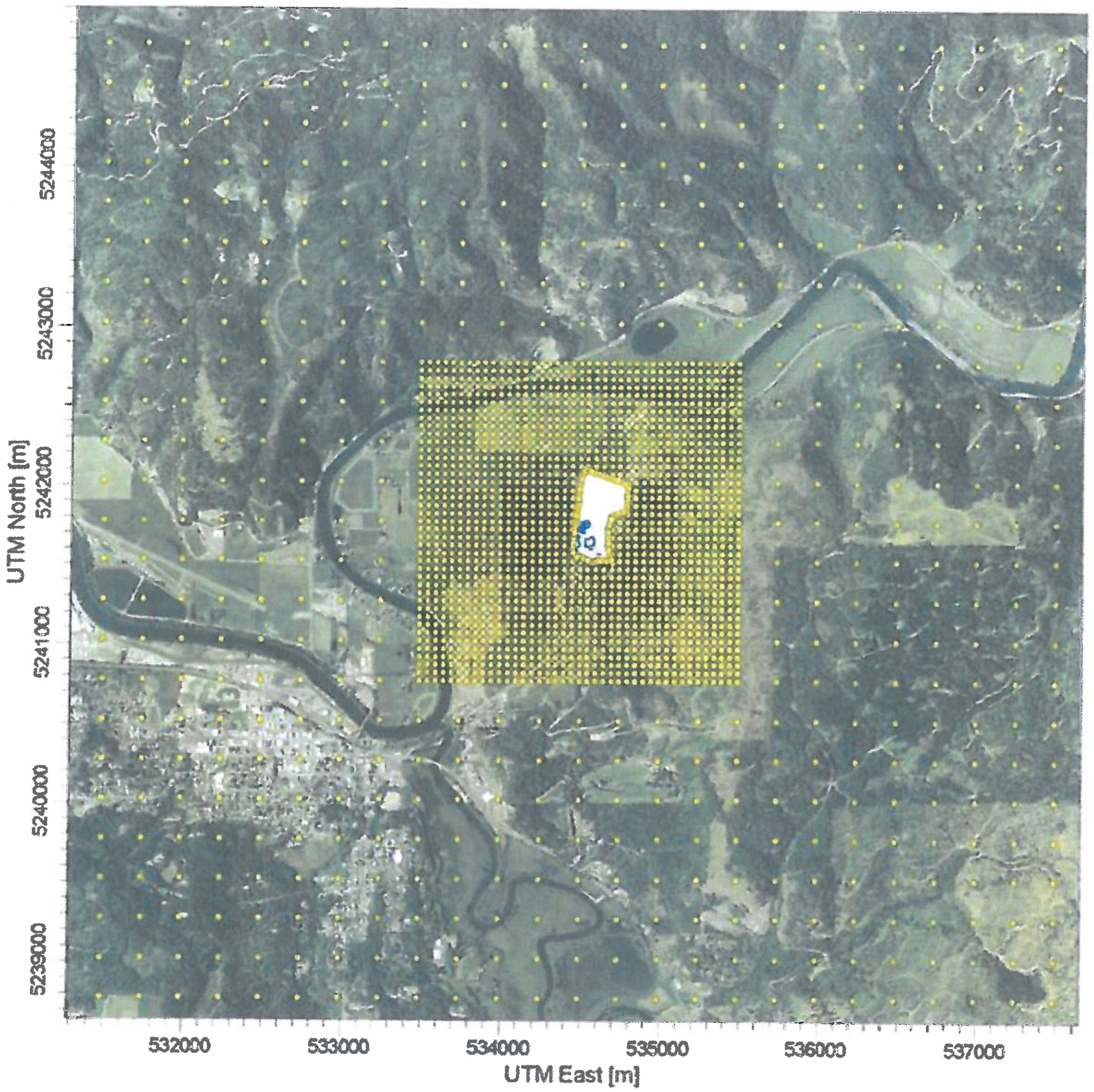


**Figure 3-3. RECEPTOR GRID**

### 3.2 Emission Release Parameters

Emission release parameters are shown in Table 1 of the July 2012 modeling report prepared by Golder Associates.

### 3.3 Emission Rates

The net change in emissions of criteria pollutants and TAPs associated with this project are shown in Table A-1 of the July 2012 modeling report prepared by Golder Associates.

### 3.4 Modeling Results

The modeled maximum ambient impacts for increased short-term $PM_{2.5}$ emissions are shown in Table 4. As shown in the table, the worst-case impacts from either met data set are slightly below the significant concentration level (SCL). A full-impact analysis was therefore not required.

**Table 4. CRITERIA POLLUTANT SIGNIFICANCE MODELING RESULTS**

| Pollutant | Averaging Period | Met Data Set | Modeled Maximum Ambient Impact (μg/m³) | SCL (μg/m³) | Exceeds SCL? | Full-Impact Analysis Required? |
|---|---|---|---|---|---|---|
| $PM_{2.5}$ | 24-hour | Sandpoint | 1.19 | 1.2 | No | No |
| | | Soda Springs | 0.87 | 1.2 | No | No |

The modeled maximum ambient impacts for TAPs with increases in emissions above the screening emission level (EL) are shown in Table 5. As shown in the table, the increase in ambient impacts from acetaldehyde and formaldehyde are below the applicable acceptable ambient concentration for carcinogens.

**Table 5. TOXIC AIR POLLUTANT MODELING RESULTS**

| Pollutant | Averaging Period | Met Data Set | Modeled Maximum Ambient Impact (μg/m³) | AACC Increment (μg/m³) | Percent of AACC Increment | AACC Exceeded? |
|---|---|---|---|---|---|---|
| Acetaldehyde | Annual | Sandpoint | 0.352 | 0.45 | 78.2% | No |
| | | Soda Springs | 0.259 | 0.45 | 57.6% | No |
| Formaldehyde | Annual | Sandpoint | 0.0051 | 0.077 | 66.2% | No |
| | | Soda Springs | 0.0038 | 0.077 | 49.4% | No |

## 4.0 Conclusions

The submitted ambient air impact analyses demonstrated to DEQ's satisfaction that ambient air quality impacts from the reduced-scope project not cause or significantly contribute to a violation of any air quality standard.