

# **Prevention of Significant Air Quality Deterioration Review**

## **Preliminary Determination**

May 2015

Facility Name: Georgia-Pacific Wood Products South LLC – Lumber Plant

City: Rome

County: Floyd

AIRS Number: 04-13-115-00016

Application Number: 40038

Date Application Received: March 6, 2015

Review Conducted by:

State of Georgia - Department of Natural Resources

Environmental Protection Division - Air Protection Branch

Stationary Source Permitting Program

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## SUMMARY

The Environmental Protection Division (EPD) has reviewed the application submitted by Georgia-Pacific Wood Products South LLC – Lumber Plant for a permit to construct and operate a 125 MMBF/yr continuous direct-fired lumber kiln with a sawdust gasifier, fuel silo and associated equipment and the replacement of the stacker. The proposed project will increase the production limit from 220 to 345 MMBF/yr.

The proposed project will result in an increase in emissions from the facility. The sources of these increases in emissions include the continuous direct-fired lumber kiln, sawdust gasifier, fuel silo, associated equipment and ancillary equipment including log sawing and debarking, material handling/transfer sources, chipper and hogger, and haul roads. Increases in emissions from ancillary equipment are a result of the increased facility production limit.

The Georgia-Pacific Wood Products South LLC – Lumber Plant is located in Floyd County, which is classified as “attainment” or “unclassifiable” for SO<sub>2</sub>, PM<sub>2.5</sub> and PM<sub>10</sub>, NO<sub>x</sub>, CO, and ozone (VOC).

The modification of the Georgia-Pacific Wood Products South LLC – Lumber Plant due to this project will result in an emissions increase of carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), particulate matter (PM), particulate matter of 10 micrometers or less (PM<sub>10</sub>), particulate matter of 2.5 micrometers or less (PM<sub>2.5</sub>), volatile organic compounds (VOC), total hazardous air pollutants (HAPs), and greenhouse gas (GHGs). The emission increases were compared to PSD “significance” levels and only VOC emissions increase was above the PSD significant level threshold.

Georgia-Pacific Wood Products South LLC – Lumber Plant is a major source with regards to HAPs and is subject to MACT DDDD for Plywood and Composite Wood Products. The modifications associated with this project will not trigger applicability to other MACT standards. The modification at Georgia-Pacific Wood Products South LLC – Lumber Plant will also emit methanol, formaldehyde, styrene, acetaldehyde, acrolein and benzene in addition to other toxic air pollutants (TAPs). TAPs are regulated under Georgia Rules for Air Quality Control 391-3-1-.02(2)(a)3(ii) which authorizes a program to determine if the ambient impact of the emissions of the TAP involved is acceptable, as discussed in Section 7 of the Preliminary Determination.

It is the preliminary determination of the EPD that the proposal provides for the application of Best Available Control Technology (BACT) for the control of VOC emissions, as required by federal PSD regulation 40 CFR 52.21(j).

It has been determined through approved modeling techniques that the estimated emissions will not cause or contribute to a violation of any ambient air standard or allowable PSD increment in the area surrounding the facility or in Class I areas located within 200 km of the facility. It has further been determined that the proposal will not cause impairment of visibility or detrimental effects on soils or vegetation. Any air quality impacts produced by project-related growth should be inconsequential.

This Preliminary Determination concludes that an Air Quality Permit should be issued to Georgia-Pacific Wood Products South LLC – Lumber Plant for the modifications necessary to construct and operate a 125 MMBF/yr continuous direct-fired lumber kiln with a sawdust gasifier, fuel silo and associated equipment and the replacement of the stacker. Various conditions have been incorporated into the current Title V operating permit to ensure and confirm compliance with all applicable air quality regulations. A copy of the draft permit amendment and narrative is included in Appendix A.

## 1.0 INTRODUCTION – FACILITY INFORMATION AND EMISSIONS DATA

On March 9, 2015, Georgia-Pacific Wood Products South LLC – Lumber Plant (hereafter Georgia-Pacific) submitted an application for an air quality permit to construct and operate a 125 MMBF/yr continuous direct-fired lumber kiln with a sawdust gasifier, fuel silo and associated equipment and the replacement of the stacker. The facility is located at 380 Mays Bridge Road in Rome, Floyd County. Table 1-1 specifies the application date, application addendum dates, and associated Georgia EPD correspondence that comprise the PSD application record.

**Table 1-1: Application Correspondence Record**

Date	Description
March 6, 2015	Submittal of Initial PSD Application via GEOS
March 16, 2015	Issuance of Public Advisory. Public Advisory expired on April 17, 2015.
March 23, 2015	EPD emailed Expedited Permitting Program Acceptance Notification
March 23, 2015	EPD resent Expedited Permitting Program Acceptance Notification due to no response
March 31, 2015	EPD requested submittal of Tables 7-1 and 7-2 via email
March 31, 2015	Georgia-Pacific emailed Tables 7-1 and 7-2
April 8, 2015	Georgia-Pacific emailed acceptance into Expedited Permitting Program
April 21, 2015	EPD requested table of net change in emissions via email
April 21, 2015	Georgia-Pacific provided table of net change in emissions via email
April 22, 2015	Georgia-Pacific emailed EPD with change in contact person
April 27, 2015	Georgia-Pacific emailed EPD to note error in HAP emissions
April 28, 2015	EPD requested corrected HAP emissions via email
May 1, 2015	Georgia-Pacific emailed EPD the corrected HAP emissions and updated application pages
June 8, 2015	EPD emailed draft to Georgia-Pacific for review
June 16, 2015	Georgia-Pacific emailed comments on draft to EPD and requested conference call
June 18, 2015	Georgia-Pacific requested the “expedited clock” to stop for review of best operating practices
August 5, 2015	Georgia-Pacific emailed response for best operating practices
August 5, 2015	EPD emailed draft to Georgia-Pacific for review
August 11, 2015	Georgia-Pacific emailed response for changes to draft
August 11, 2015	EPD emailed responses to requested changes

Table 1-2 specifies the Title V Major source status of the facility upon installation and operation of the proposed project.

**Table 1-2: Title V Major Source Status**

Pollutant	Is the Pollutant Emitted?	If emitted, what is the facility’s Title V status for the Pollutant?		
		Major Source Status	Major Source Requesting SM Status	Non-Major Source Status
PM	Yes	✓		
PM <sub>10</sub>	Yes	✓		
PM <sub>2.5</sub>	Yes	✓		
SO <sub>2</sub>	Yes			✓
VOC	Yes	✓		
NO <sub>x</sub>	Yes			✓

CO	Yes			✓
TRS	N/A			
H <sub>2</sub> S	N/A			
Individual HAP	Yes	✓		
Total HAPs	Yes	✓		
Total GHGs	Yes			✓

Table 1-3 below lists all current Title V permits, all amendments, 502(b)(10) changes, and off-permit changes, issued to the facility, based on a review of the "Permit" file(s) on the facility found in the Air Branch office.

**Table 1-3: List of Current Permits, Amendments, and Off-Permit Changes**

Permit Number and/or Off-Permit Change	Date of Issuance/ Effectiveness	Purpose of Issuance
Permit No. 2421-115-0016-V-04-0	August 8, 2013	Change of Ownership and Name
Off Permit	June 27, 2014	Changes to the gang saw, edger saw and the band saw

Based on the proposed project description and data provided in the permit application, the estimated incremental increases of regulated pollutants from the facility are listed in Table 1-4 below:

**Table 1-4: Emissions Increases from the Proposal**

Pollutant	Baseline Years	Proposed Equipment Emissions Increase (tpy)	Associated Equipment Emissions Increase (tpy)	Total Project Emissions Increase (tpy)	PSD Significant Emission Rate (tpy)	Subject to PSD Review
PM	2/11 to 1/13	8.5	11.2	19.7	25	No
PM <sub>10</sub>	2/11 to 1/13	10	4.7	14.7	15	No
PM <sub>2.5</sub>	2/11 to 1/13	6.8	1.9	8.7	10	No
VOC	2/11 to 1/13	343.1	0	343.1	40	Yes
NO <sub>x</sub>	2/11 to 1/13	9.8	0	9.8	40	No
CO	2/11 to 1/13	79.2	0	79.2	100	No
SO <sub>2</sub>	2/11 to 1/13	5.9	0	5.9	40	No
TRS	N/A	N/A	N/A	N/A	10	N/A
Pb	2/11 to 1/13	0.01	0	0.01	0.6	No
Fluorides	N/A	N/A	N/A	N/A	3	N/A
H <sub>2</sub> S	N/A	N/A	N/A	N/A	10	N/A
SAM	N/A	N/A	N/A	N/A	7	N/A
GHG	2/11 to 1/13	32,125	0	32,125	75,000	No

Emissions for the proposed project were calculated as follows:

- Emissions from the continuous direct-fired lumber kiln were calculated using a production capacity of 125,000 MBF per year and a burner capacity of 35 MMBtu per hour. Emission factors for the kiln were based on site test data from several facilities. The SO<sub>2</sub> emission factor for the kiln is from NCASI Technical Bulletin 1020 (December 2013), Table 10.4. The Lead emission factor for the kiln is from NCASI Technical Bulletin 1013 (March 2013), Table 4.3.
- Emissions from the cyclone were calculated with the 3,800 dscfm airflow rate and vendor data.
- Emissions from the Crook Saw, Twin Band Mill, Bucking Saws, Edger, Chipper/Gang Saw, Green Trimmer and Ring Debarker were calculated using the production from the kilns, an average yield of 3.76 tons per green MBF and emission factors from the FIRE database.

- Emissions from the Chippers, Chip Screen and Waste Hog/Rechipper were calculated using the production from the kilns, an average yield of 3.76 tons per green MBF and emission factors from AP-42 Section 13.2.4.
- Ink emissions were calculated using an annual average of 440 gallons per year and an annual maximum of 820.5 gallons per year. These volumes of inks were used in a material balance with the weight percent of pollutant in the ink.
- Emissions from the Haul Roads were calculated using the length of road, average weight of trucks, the type of trucks, the total number of trucks per year, and emission factors from sampling data for the paved roads and AP-42 Section 13.2.2 emission factors for the unpaved roads.

Based on the information presented in Table 1-4 above, Georgia-Pacific's proposed modification, as specified per Georgia Air Quality Application No. 40038, is classified as a major modification under PSD because the potential emissions of VOC exceeded 40 tpy.

Through its new source review procedure, EPD has evaluated Georgia-Pacific's proposal for compliance with State and Federal requirements. The findings of EPD have been assembled in this Preliminary Determination.

The definition of baseline actual emissions is the average emission rate, in tons per year, at which the emission unit actually emitted the pollutant during any consecutive 24-month period selected by the facility within the 10-year period immediately proceeding the date a complete permit application was received by EPD. The net increases were calculated by subtracting the past actual emissions (based upon the annual average emissions from February 2011 to January 2013) from the future projected actual emissions of the continuous direct-fired lumber kiln with a sawdust gasifier, fuel silo and associated emission increases from non-modified equipment. Table 1-4 details this emissions summary. The emissions calculations for Tables 1-3 and 1-5 can be found in detail in the facility's PSD application (see Section 3 of Application No. 40038). Table 1-5 shows the list of affected units.

**Table 1-5: Affected Units from the Proposal**

ID	Name	Activity
Green End		
EP1	Crook Saw	Sawing
EP1	Crook Saw	Sawdust Dropping
EP3	Bucking Saws	Sawing
EP3	Bucking Saws	Sawdust Dropping
EP4	Chip-n-Saw	Chip Dropping
EP5	Twin Band Mill	Sawing
EP5	Twin Band Mill	Sawdust Dropping
EP6	Edger	Sawing
EP6	Edger	Sawdust Dropping
EP7	Chipper/Gang	Sawing
EP7	Chipper/Gang	Sawdust Dropping
EP8	Green Trimmer	Sawing
EP8	Green Trimmer	Sawdust Dropping
EP2	Ring Debarker	Debarking
EP2	Ring Debarker	Bark Dropping
EP9	Whole Log Chipper	Chip Dropping
EP10	No. 2 Chipper	Chip Dropping
EP11	No. 1 Chipper	Chip Dropping
EP12	Chip Screen	Chip and Sawdust Dropping
EP13	Waste Hog/Rechipper	Chip Dropping
Dry End / Other		
CDK*	New continuous direct-fired lumber kiln	Lumber Drying
PM	Planer Cyclone	Dry Sawing

<b>ID</b>	<b>Name</b>	<b>Activity</b>
SFS/CY*	Sawdust Fuel Silo with Cyclone	Sawdust Storage and Cyclone
N/A	Stencil/Logo	Ink Application
N/A	Haul Roads	Facility Roadways

\*proposed equipment within current application

## **2.0 PROCESS DESCRIPTION**

According to Application No. 40038, Georgia-Pacific) has proposed to construct and operate a 125 MMBF/yr continuous direct-fired lumber kiln with a 35 MMBtu/hr sawdust gasifier, fuel silo and associated equipment and the replacement of the stacker. The proposed project will increase the production limit from 220 to 345 MMBF/yr. The increased lumber drying capacity for the facility will result in more material processed therefore an increase in emissions from existing equipment. The existing equipment will be capable of accommodating the increase in lumber production from the expansion without any additional modifications.

### **Continuous Kiln**

Continuous lumber drying kilns are an emerging technology. Where traditional batch kilns lose efficiency when the doors open; continuous kilns retain heat. There is no downtime between batches therefore the continuous kiln remains at operating temperatures. Additional chambers are constructed on each end of the kiln heating chamber and a pusher system on each end conveys a continuous feed of lumber on one track into the kiln and on a second track in the opposite direction out of the kiln. The heat from the dried lumber coming out of the kiln also preheats the green lumber entering the kiln on the second track.

### **Support Facility**

The modification will result in the increase of emissions from sawing and debarking, material handling/transfer sources, hogger and chipper, and haul roads. The increase in capacity at the facility will result in higher emissions from the existing upstream and downstream equipment since more material will be processed through these units.

The Georgia-Pacific permit application and supporting documentation are included in Appendix A of this Preliminary Determination and can be found online at [www.georgiaair.org/airpermit](http://www.georgiaair.org/airpermit).



### **3.0 REVIEW OF APPLICABLE RULES AND REGULATIONS**

#### **State Rules**

Georgia Rule for Air Quality Control (Georgia Rule) 391-3-1-.03(1) requires that any person prior to beginning the construction or modification of any facility which may result in an increase in air pollution shall obtain a permit for the construction or modification of such facility from the Director upon a determination by the Director that the facility can reasonably be expected to comply with all the provisions of the Act and the rules and regulations promulgated thereunder. Georgia Rule 391-3-1-.03(8)(b) continues that no permit to construct a new stationary source or modify an existing stationary source shall be issued unless such proposed source meets all the requirements for review and for obtaining a permit prescribed in Title I, Part C of the Federal Act [i.e., Prevention of Significant Deterioration of Air Quality (PSD)], and Section 391-3-1-.02(7) of the Georgia Rules (i.e., PSD).

- Georgia Rule (b) [391-3-1-.02(2)(b)] – The new continuous direct-fired lumber kiln will be subject to the 40% opacity limit and will be added to Condition 3.4.3 in Air Quality Permit No. 2421-115-0016-V-04-0.
- Georgia Rule (e) [391-3-1-.02(2)(e)] – The continuous direct-fired lumber kiln will be subject to the particulate matter emission limit and will be added to Condition 3.4.1 in Air Quality Permit No. 2421-115-0016-V-04-0. The kiln is will equipped with a sawdust gasifier. No controls are present on the kilns for particulate matter emissions.
- Georgia Rule (g) [391-3-1-.02(2)(g)] – The new continuous direct-fired lumber kiln will be subject to the 2.5% sulfur limit which will be a new condition in the permit amendment. This limit applies to all fuel burning sources with heat input capacities less than 100 MMBtu/hr. Each kiln is equipped with a single burner fired with green sawdust. No controls are present on the kilns for sulfur dioxide emissions. Based on available technical literature, the kilns typically burn sawdust containing less than 2.5 percent sulfur; therefore it was concluded that the facility will be in compliance with Georgia Rule (g).
- Georgia Rule (n) [391-3-1-.02(2)(n)] – The new fuel silo will be subject to the fugitive dust limit which are Conditions 3.4.4 and 3.4.5 in Air Quality Permit No. 2421-115-0016-V-04-0. This limit requires reasonable precautions to prevent dust and limits the fugitive dust to a 20% opacity limit. The Sawdust Fuel Silo will be equipped with a cyclone to reduce fugitive dust.

#### **Federal Rule - PSD**

The PSD regulations as codified in 40 CFR 52.21 require that any new major source or modification of an existing major source be reviewed to determine the potential emissions of all pollutants subject to regulations under the Clean Air Act. The PSD review requirements apply to any new or modified source which belongs to one of 28 specific source categories having potential emissions of 100 tons per year or more of any regulated pollutant, or to all other sources having potential emissions of 250 tons per year or more of any regulated pollutant. They also apply to any modification of a major stationary source which results in a significant net emission increase of any regulated pollutant.

Georgia has adopted a regulatory program for PSD permits, which the United States Environmental Protection Agency (EPA) has approved as part of Georgia's State Implementation Plan (SIP). This regulatory program is located in the Georgia Rules at 391-3-1-.02(7).

The PSD regulations require that any major stationary source or major modification subject to the regulations meet the following requirements:

- Application of BACT for each regulated pollutant that would be emitted in significant amounts;
- Analysis of the ambient air impact;
- Analysis of the impact on soils, vegetation, and visibility;
- Analysis of the impact on Class I areas; and
- Public notification of the proposed plant in a newspaper of general circulation

### **New Source Performance Standards**

The new continuous direct-fired lumber kiln is not subject to a NSPS.

### **National Emissions Standards For Hazardous Air Pollutants**

The new continuous direct-fired lumber kiln will be subject to 40 CFR 63 Subpart A and 40 CFR 63 Subpart DDDD.

- 40 CFR 63 Subpart A, *General Provisions* – The new continuous direct-fired lumber kiln will be subject to the general provisions which is stated in Condition 3.3.1 in Air Quality Permit No. 2421-115-0016-V-04-0.
- 40 CFR 63 Subpart DDDD, *Plywood and Composite Wood Products* – The new continuous direct-fired lumber kiln is subject to this standard and only required to submit the initial notification. Applicability to this standard is stated in the amended Condition 3.3.2 for this application.

### **State and Federal – Startup and Shutdown and Excess Emissions**

Excess emission provisions for startup, shutdown, and malfunction are provided in Georgia Rule 391-3-1-.02(2)(a)7. Excess emissions from the continuous direct-fired lumber kiln with the proposed project would most likely results from a malfunction of the associated control equipment. The facility cannot anticipate or predict malfunctions. However, the facility is required to minimize emissions during periods of startup, shutdown, and malfunction.

### **Federal Rule – 40 CFR 64 – Compliance Assurance Monitoring**

Under 40 CFR 64, the *Compliance Assurance Monitoring* Regulations (CAM), facilities are required to prepare and submit monitoring plans for certain emission units with the Title V application. The CAM Plans provide an on-going and reasonable assurance of compliance with emission limits. Under the general applicability criteria, this regulation applies to units that use a control device to achieve compliance with an emission limit and whose pre-controlled emissions levels exceed the major source thresholds under the Title V permitting program. Although other units may potentially be subject to CAM upon renewal of the Title V operating permit, such units are not being modified under the proposed project and need not be considered for CAM applicability at this time.

Therefore, this applicability evaluation only addresses the continuous direct-fired lumber kiln, which does not employ any air pollution control devices; therefore, the CAM requirements are not triggered by the proposed modification.

## 4.0 CONTROL TECHNOLOGY REVIEW

The proposed project will result in emissions that are significant enough to trigger BACT review for the following pollutants: Volatile Organic Compounds (VOCs).

### Continuous Direct-Fired Lumber Kiln CDK - Background

The continuous direct-fired lumber kiln (Source Code CDK) is 125 MMBF/yr continuous direct-fired lumber kiln with a 35 MMBtu/hr sawdust gasifier, fuel silo and associated equipment and the replacement of the stacker. Heat from the dried lumber coming out of the kiln preheats the green lumber entering the kiln on the second track.

### Definition of BACT

The PSD regulation requires that BACT be applied to all regulated air pollutants emitted in significant amounts. Section 169 of the Clean Air Act defines BACT as an emission limitation reflecting the maximum degree of reduction that the permitting authority (in this case, EPD), on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such a facility through application of production processes and available methods, systems, and techniques. In all cases BACT must establish emission limitations or specific design characteristics at least as stringent as applicable New Source Performance Standards (NSPS). In addition, if EPD determines that there is no economically reasonable or technologically feasible way to measure the emissions, and hence to impose and enforceable emissions standard, it may require the source to use a design, equipment, work practice or operations standard or combination thereof, to reduce emissions of the pollutant to the maximum extent practicable.

EPA's NSR Workshop Manual includes guidance on the 5-step top-down process for determining BACT. In general, Georgia EPD requires PSD permit applicants to use the top-down process in the BACT analysis, which EPA reviews. The five steps of a top-down BACT review procedure identified by EPA per BACT guidelines are listed below:

- Step 1: Identification of all control technologies;
- Step 2: Elimination of technically infeasible options;
- Step 3: Ranking of remaining control technologies by control effectiveness;
- Step 4: Evaluation of the most effective controls and documentation of results; and
- Step 5: Selection of BACT.

### Continuous Direct-Fired Lumber Kiln CDK – VOC Emissions

#### Applicant's Proposal

##### Step 1 – Identification of Potential Control Techniques:

The applicant has suggested the following BACT for control of VOC emissions. An analysis of these technologies can be found in Section 5 (pages 5-3 through 5-7) of the application.

- Wet electrostatic precipitator (WESP) followed by Thermal Oxidation
- Wet electrostatic precipitator (WESP) followed by Catalytic Oxidation
- Condensation
- Carbon Adsorption
- Wet Scrubbing

- Biofiltration

The Division has reviewed Step 1 of the applicant's analysis and the Division agrees with the findings.

**Step 2 – Elimination of Technically Infeasible Control Options:**

- Wet electrostatic precipitator (WESP) followed by Catalytic Oxidation is not feasible due to the potential for blinding and poisoning of the catalyst. Blinding occurs when particulates build-up and coat the catalyst. Blinding prevents oxidation of VOC emissions in catalyst. Poisoning occurs when heavy metals in the gas stream become chemically bound to the catalyst and reduce the surface area for oxidation of VOC emissions. The applicant's analysis can be found on page 5-9.
- Condensation is not feasible because of the low temperature required of the exhaust stream with the potential of freezing the water vapor in the gas stream. The applicant's analysis can be found on page 5-10.
- Carbon Adsorption is not feasible because of the high humidity of the exhaust stream. The applicant's analysis can be found on page 5-11.
- Wet Scrubbing is not feasible because of this requires water soluble VOC compounds to be controlled and the constituents of the gas stream are not water soluble. The adsorption media could easily be plugged. The applicant's analysis can be found on page 5-11.
- Biofiltration is not feasible due to the inconsistent flow of the exhaust stream and also the potential to buildup insoluble VOC compounds within the biofilter bed which could plug the media. The applicant's analysis can be found on page 5-11.

The Division agrees with the applicant that the use of wet electrostatic precipitator (WESP) followed by catalytic oxidation, condensation, carbon adsorption, wet scrubbing and biofiltration are technically infeasible.

Because wet electrostatic precipitator (WESP) followed by thermal oxidation was found to be technically feasible, it was evaluated further for BACT

**Step 3 – Rank of Remaining Control Technologies:**

The following is a ranking of the control technologies based on control effectiveness found on page 5-12 of the application.

**Table 4-1: Efficiency Ranking of Feasible Control Technologies**

Rank	Control Technology	Potential Control Efficiency (%)
1	Wet Electrostatic Precipitator (WESP) followed by Regenerative Thermal Oxidizer (RTO)	95%
2	Proper Maintenance and Work Practices	Base Case

The list also includes "Proper Maintenance and Work Practices." The efficiency of this method varies according to industry.

The Division agrees with the applicant that the RTO is ranked as the most effective control technology to use with the continuous kilns for VOC control.

Step 4 – Evaluation of Most Stringent Controls:

The applicant provided an analysis of the wet electrostatic precipitator (WESP) followed by thermal oxidation on pages 5-9, 5-10, and in Appendix E of the application. The applicant calculated the annualized cost of the RTO and WESP as \$10,759 per ton of VOC removed. The cost of the RTO and WESP exceeds the benefit of the VOC reduction.

The Division agrees with the applicant that the RTO and WESP costs exceed the benefit of the VOC reduction.

Step 5 – Selection of BACT:

The applicant has determined BACT as Proper Maintenance and Work Practices. Pages 5-15 and 5-16 in the application describe the BACT selection.

The applicant will use a VOC emission factor of 4.28 lb/MBF to calculate VOC emissions from the continuous direct-fired lumber kiln. Georgia-Pacific will have a 125 MMBF/yr production limit. This limit is based on potential throughput for the continuous direct-fired lumber kiln per year and is not a PSD avoidance limit.

BACT is generally an emission limit. However in the case of continuous kilns which are an emerging technology, enough test data does not exist to impose a limit on the facility. Therefore, BACT in this case is not a numerical value but proper maintenance and work practices. Work practices will include proper maintenance and minimizing over-drying.

Conclusion – VOC Control

The Division reviewed all of the RBLC entries for VOC from continuous lumber drying kilns since 2002 (see Appendix E of the application). This review showed that none of the entries require an add-on control device for VOC and that BACT is Proper Maintenance and Operating Practices. The BACT selection for the continuous direct-fired lumber kiln (Source Code CDK) is summarized below in Table 4-2:

**Table 4-2: BACT Summary for the Continuous Direct-Fired Lumber Kiln CDK**

Pollutant	Control Technology	Proposed Emission Factor	Compliance Determination Method
VOC	Proper Maintenance and Work Practices	4.28 lb/MBF (as carbon) 5.49 lb/MBF (as WPP1)	Recordkeeping

VOC emissions for the project were presented on a WPP1 basis per William Wehrum's 2006 memo and EPA's subsequent July 2007 Interim VOC Measurement Protocol for the Wood Products Industry. However, the data within the RBLC predates these two guidance documents and presents VOC emissions on a carbon basis. To remain consistent with the previous BACT analyses, the BACT analysis was performed using project VOC emissions on a carbon basis.

## **5.0 TESTING AND MONITORING REQUIREMENTS**

### Testing Requirements:

There are no applicable testing requirements being imposed.

### Monitoring Requirements:

Georgia-Pacific is required to develop and implement a work practice and preventive maintenance program for lumber drying kilns including the continuous direct-fired lumber kiln (Source Code CDK) to assure efficient operation of the kilns.

The continuous direct-fired lumber kiln (Source Code CDK) is subject to Georgia Rules 391-3-1-.02(2)(b) for Visible Emissions and (e) for Particulate Matter. The kiln is equipped with a gasifier which will burn sawdust. No controls are present on the continuous direct-fired lumber kiln for Particulate Matter emissions.

The continuous direct-fired lumber kiln is subject to Georgia Rules 391-3-1-.02(2)(g) for Sulfur Dioxide. The kiln is equipped with a gasifier which will burn sawdust. No controls are present on the continuous direct-fired lumber kiln for Sulfur Dioxide emissions. Based on available technical literature, sawdust burned in this type of kiln contains less than 2.5 percent sulfur; therefore it was concluded that no monitoring for sulfur dioxide is required by the permit.

### CAM Applicability:

Because there is no control for the continuous direct-fired lumber kiln (Source Code CDK), CAM is not applicable and is not being triggered by the proposed modification. Therefore, no CAM provisions are being incorporated into the facility's permit.

## 6.0 AMBIENT AIR QUALITY REVIEW

An air quality analysis is required to determine the ambient impacts associated with the construction and operation of the proposed modifications. The main purpose of the air quality analysis is to demonstrate that emissions emitted from the proposed modifications, in conjunction with other applicable emissions from existing sources (including secondary emissions from growth associated with the new project), will not cause or contribute to a violation of any applicable National Ambient Air Quality Standard (NAAQS) or PSD increment in a Class I or Class II area. NAAQS exist for NO<sub>2</sub>, CO, PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub>, Ozone (O<sub>3</sub>), and lead. PSD increments exist for SO<sub>2</sub>, NO<sub>2</sub>, and PM<sub>10</sub>.

The proposed project at the Georgia-Pacific triggers PSD review for VOC emissions. VOC does not have established PSD modeling significance levels (MSL) (an ambient concentration expressed in either µg/m<sup>3</sup> or ppm). Therefore, modeling is not required for VOC emissions. However, an ozone analysis is required since VOC emissions are greater than 100 tpy. An additional analysis was conducted to demonstrate compliance with the Georgia air toxics program.

### Class I Area Analysis

Federal Class I areas are regions of special national or regional value from a natural, scenic, recreational, or historic perspective. Class I areas are afforded the highest degree of protection among the types of areas classified under the PSD regulations. U.S. EPA has established policies and procedures that generally restrict consideration of impacts of a PSD source on Class I Increments to facilities that are located near a federal Class I area. Historically, a distance of 100 km has been used to define “near”, but more recently, a distance of 300 kilometers has been used for all facilities that do not combust coal.

**Table 6-1: Class I Areas**

<b>Class I Area</b>	<b>Approximate Distance to Class I Area(km)</b>
Cohutta Wilderness	93
Joyce Kilmer – Slick Rock Wilderness	173
Great Smokey Mountains National Park	186
Sipsey Wilderness Area	186
Shining Rock Wilderness	252

The applicant notified the applicable Federal Land Managers (FLMs) of the proposed project. No FLM responded to this notification.

### Ozone Analysis

Since no significant air quality concentration has been established for ozone impact analysis, PSD permit applicants with a proposed net emission increase of 100 tons/year or more of VOC or NO<sub>x</sub> are required to conduct an ambient air impact analysis that includes pre-application monitoring data to determine the current state of the ambient air conditions for this pollutant.

The proposed modification is expected to emit 343.1 tpy VOC. There are no ozone monitors in Floyd County. The closest ozone monitor to Georgia-Pacific is located approximately 15 miles north-northwest at Summerville, Chattooga County, GA (site ID: 13-055-0001). The second closest ozone monitor is located approximately 50 miles northeast of Georgia-Pacific in Chatsworth, Murray County GA (site ID: 13-213-0003). Both monitors were chosen to review due to the proximity of the monitor and prevailing downwind of the facility. The applicant examined the 3-year rolling average ozone concentration at both monitors. The latest three-year design value (2012-2014) average of the 4 highest annual values is 65 ppbv for the Summerville site and 68 ppbv for the Chatsworth site. This area is in attainment with the 8-hour ozone standard (75 ppbv).

## 7.0 ADDITIONAL IMPACT ANALYSES

PSD requires an analysis of impairment to visibility, soils, and vegetation that will occur as a result of a modification to the facility and an analysis of the air quality impact projected for the area as a result of the general commercial, residential, and other growth associated with the proposed project.

### Soils and Vegetation

The applicant submitted an analysis of the potential adverse impacts of increased VOC emissions on soils and vegetation (see Section 7 of Application No. 40038) in the areas surrounding the facility. The analysis concluded that any adverse impacts are expected to be insignificant. The Division agrees with the applicant's conclusion.

### Growth

The purpose of a growth analysis is to predict how much new growth is likely to occur as a result of the project and the resulting air quality impacts from this growth. No adverse impacts on growth are anticipated from the project since any workforce growth and residential and commercial growth that would be associated with the proposed project (expected to be minimal) would not cause a quantifiable impact on the air quality of the area surrounding the facility.

### Visibility

Visibility impairment is any perceptible change in visibility (visual range, contrast, atmospheric color, etc.) from that which would have existed under natural conditions. Poor visibility is caused when fine solid or liquid particles, usually in the form of volatile organics, nitrogen oxides, or sulfur oxides, absorb or scatter light. This light scattering or absorption actually reduces the amount of light received from viewed objects and scatters ambient light in the line of sight. This scattered ambient light appears as haze.

VOC emissions do not impact visibility. Therefore the project will not impact Class I and Class II visibility for purposes of PSD review of the project (See Section 7.1.3 of Application 40038).

### **Georgia Toxic Air Pollutant Modeling Analysis**

Georgia EPD regulates the emissions of toxic air pollutant (TAP) emissions through a program covered by the provisions of *Georgia Rules for Air Quality Control*, 391-3-1-.02(2)(a)3.(ii). A TAP is defined as any substance that may have an adverse effect on public health, excluding any specific substance that is covered by a State or Federal ambient air quality standard. Procedures governing the Georgia EPD's review of TAP emissions as part of air permit reviews are contained in the agency's "*Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions (Revised)*."

### **Selection of Toxic Air Pollutants for Modeling**

Generally, an initial screening analysis is performed in which the total TAP emission rate is modeled from the stack with the lowest effective release height to obtain the maximum ground level concentration (MGLC). Note the MGLC could occur within the facility boundary for this evaluation method. The individual MGLC is obtained and compared to the smallest AAC. Due to the likelihood that this screening would result in the need for further analysis for most TAP, the analyses were initiated with the secondary screening technique.



West Fraser modeled maximum ground-level concentrations (MGLCs) using the ISCST3 Version 02035 for 1-hour, 24-hour, and annual averaging periods. Note that the 15-min impact is based on the maximum 1-hour modeled impact multiplied by a factor of 1.32.

Table 7-1 below shows the modeled MGLCs for all TAPs evaluated with their respective AAC levels. Therefore, the applicant meets the applicable Georgia Air Toxics Guidelines.

**Table 7-1: Modeled MGLCs and the Respective AACs**

Pollutant	CAS	Averaging Period	MGLC ( $\mu\text{g}/\text{m}^3$ )	AAC ( $\mu\text{g}/\text{m}^3$ )	Exceed AAC?	Averaging Period	MGLC ( $\mu\text{g}/\text{m}^3$ )	AAC ( $\mu\text{g}/\text{m}^3$ )	Exceed AAC?
Acetaldehyde	75-07-0	Annual	0.88	4.55	No	15-min	65.45	4500	No
Acrolein	107-02-8	Annual	0.13	0.15	No	15-min	10.02	23	No
Benzene	71-43-2	Annual	0.00	0.45	No	15-min	0.46	1600	No
Formaldehyde	50-00-0	Annual	0.96	1.1	No	15-min	76.27	245	No
Methanol	67-56-1	24-hour	49.17	619	No	15-min	408.66	32800	No
Styrene	100-42-5	Annual	0.00	1000	No	15-min	0.03	85200	No

## **8.0 EXPLANATION OF DRAFT PERMIT CONDITIONS**

The permit requirements for this proposed facility are included in draft Permit Amendment No. 2421-115-0016-V-04-1.

### Section 1.0: Facility Description

Georgia-Pacific Wood Products South LLC – Lumber Plant is proposing to construct and operate a 125 MMBF/yr continuous direct-fired lumber kiln with a 35 MMBtu/hr sawdust gasifier, fuel silo and associated equipment and the replacement of the stacker. The proposed project will increase the production limit from 220 to 345 MMBF/yr. The increased lumber drying capacity for the facility will result in more material processed therefore an increase in emissions from existing equipment. The existing equipment will be capable of accommodating the increase in lumber production from the expansion without any additional modifications.

### Section 2.0: Requirements Pertaining to the Entire Facility

No conditions in Section 2.0 are being added, deleted or modified as part of this permit action.

### Section 3.0: Requirements for Emission Units

- Condition 3.2.3 is a new condition which limits production in the continuous direct-fired lumber kiln (Source Code CDK) to 125 million board feet of lumber per year. The condition also includes the VOC emission factor of 5.49 pounds per thousand board feet of lumber (lb/MBF) dried for the continuous direct-fired lumber kiln (Source Code CDK) if future calculations are necessary. 5.49 lb/MBF is the WPP1 emission factor as determined by 4.28 lb/MBF as carbon.
- Condition 3.2.4 is a new condition which requires operation of the cyclone for the sawdust fuel silo.
- Condition 3.2.5 is a new condition which limits the hours of operation of the Planer Mill to 6,000 hours. Because the emission calculations used the projected actual hours of operation, this limit is required for PSD. The Planer Cyclone is required to be operated at all times that the Planer Mill is operated; therefore, the hours of operation for the Planer Cyclone will also be the same. The Planer Mill is an existing unit and calculations included projected actual emissions from the Planer Mill. As required by the Division based on the definition of projected actual emissions, the emissions shall be tracked for five years “following the date the unit resumes regular operation after the project” in order to verify the maximum annual rate.
- Condition 3.2.6 is a new condition that includes the continuous direct-fired lumber kiln (Source Code CDK) for the work practice and preventative maintenance program requirements and to make the requirements more applicable to the specific kilns. This condition was previously Condition 5.2.5 of Permit No. 2421-115-0016-V-04-0.
- Condition 3.3.2 subjects the lumber kilns to 40 CFR 63 Subpart A and 40 CFR 63 Subpart DDDD and was modified to include the continuous direct-fired lumber kiln (Source Code CDK).
- Condition 3.3.5 is a new condition which requires the facility to construct and operate the continuous direct-fired lumber kiln (Source Code CDK) as proposed in the application.
- Condition 3.3.6 is a new condition which requires the facility to complete the modification within 18 months after the permit is issued.
- Condition 3.4.1 was modified to include the continuous direct-fired lumber kiln (Source Code CDK) in the requirements for Georgia Rule (e).
- Condition 3.4.3 was modified to include the continuous direct-fired lumber kiln (Source Code CDK) in the requirements for Georgia Rule (b).
- Condition 3.4.4 was modified to include the sawdust fuel silo in the requirements for Georgia Rule (n).
- Condition 3.4.5 was modified to include all of the requirements applicable for Georgia Rule (n).

- Condition 3.4.6 is a new condition which subjects continuous direct-fired lumber kiln (Source Code CDK) to Georgia Rule (g).

#### Section 4.0: Requirements for Testing

- Condition 4.1.3 was modified to include a testing reference for wood products. Though testing is not required at this time, this will provide guidance if necessary in the future.

#### Section 5.0: Requirements for Monitoring

- Condition 5.2.2 was modified to include the cyclone for the sawdust fuel silo into the operation and maintenance checks.
- Condition 5.2.5 was deleted because it was modified to include continuous direct-fired lumber kiln (Source Code CDK) and was relocated to Section 3.2 of the permit amendment.

#### Section 6.0: Other Recordkeeping and Reporting Requirements

- Condition 6.1.7b.i. was modified to include the name of the existing kilns in order to differentiate the kilns and to exclude the proposed continuous direct-fired lumber kiln (Source Code CDK) from this exceedance.
- Condition 6.1.7b.ii. is a new condition that includes an exceedance for the production limit for the continuous direct-fired lumber kiln (Source Code CDK).
- Condition 6.1.7b.iii. is a new condition that includes an exceedance for the hours of operation for the Planer Mill.
- Condition 6.1.7c.i. was modified to include an excursion for the cyclone for the sawdust fuel silo.
- Condition 6.2.2 was modified to include the continuous direct-fired lumber kiln (Source Code CDK) for the requirements of monthly records of the lumber dried. The continuous direct-fired lumber kiln (Source Code CDK) requires separate records.
- Condition 6.2.3 was modified to include the continuous direct-fired lumber kiln (Source Code CDK) for 12 month totals of lumber production. The continuous direct-fired lumber kiln (Source Code CDK) requires separate calculations.
- Condition 6.2.4 was modified to include the continuous direct-fired lumber kiln (Source Code CDK) for semiannual reports of the 12 month totals of lumber production. The continuous direct-fired lumber kiln (Source Code CDK) requires separate calculations.
- Condition 6.2.5 was modified to include the name of the existing kilns in order to differentiate the kilns.
- Condition 6.2.8 is new condition which requires a notification if any one month of production in the continuous direct-fired lumber kiln (Source Code CDK) exceeds 10,416,666 board feet of lumber.
- Condition 6.2.9 is a new condition which requires a notification of the startup date of the continuous direct-fired lumber kiln (Source Code CDK).
- Condition 6.2.10 is a new condition which requires records for the hours of operation for the Planer Mill (Source Code PM).
- Condition 6.2.11 is a new condition which requires calculation of monthly hours of operation for the Planer Mill and notification if any one month exceeds 500 hours of operation.
- Condition 6.2.12 is a new condition which requires calculation of 12 month rolling total of hours of operation for the Planer Mill and notification if any one 12 month total exceeds 6,000 hours of operation.

#### Section 7.0: Other Specific Requirements

No conditions in Section 7.0 are being added, deleted or modified as part of this permit action.

## APPENDIX A

Draft Revised Title V Operating Permit Amendment  
Georgia-Pacific Wood Products South LLC – Lumber Plant  
Rome (Floyd County), Georgia

## APPENDIX B

### Georgia-Pacific Wood Products South LLC – Lumber Plant PSD Permit Application and Supporting Data

#### Contents Include:

1. PSD Permit Application No. 40038, dated March 6, 2015
2. Additional Information Package Dated May 1, 2015

## APPENDIX C

### EPD'S PSD Dispersion Modeling and Air Toxics Assessment Review