

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

## **Preliminary Determination**

August 2014

Facility Name: International Paper - Savannah

City: Savannah

County: Chatham

AIRS Number: 04-13-051-00007

Application Number: 22636

Date Application Received: June 2, 2014

Review Conducted by:

State of Georgia - Department of Natural Resources

Environmental Protection Division - Air Protection Branch

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## SUMMARY

The Environmental Protection Division (EPD) has reviewed the application submitted by International Paper - Savannah for the modification of the No. 13 Power Boiler (PB13) in order to comply with the Boiler MACT (40 CFR 63 Subpart DDDDD) and the Regional Haze Rule (40 CFR 51.308) emission limits for HCl and SO<sub>2</sub>. The No. 13 Power Boiler has a heat input capacity of 1280 MMBtu/hr and is currently permitted to burn biomass (bark), pulverized coal, and fuel oil. The No. 13 Power Boiler also burns the non-condensable gases (NCGs) and condensate stripper off-gases (SOGs) as the control device for compliance with 40 CFR 60 Subpart BB and 40 CFR 63 Subpart S. The proposed project includes the following modifications to the No. 13 Power Boiler: the removal of the capability to fire fuel oil, the addition of load-bearing natural gas burners, and the optimization of combustion controls and the combustion air system.

The existing Kraft pulp, paper, and paperboard mill and corrugated paperboard container production facility is a major source under the Prevention of Significant Deterioration (PSD) regulation. The proposed project will result in emissions increases in carbon monoxide (CO) and volatile organic compounds (VOC). The only source of these increases in emissions is the No. 13 Power Boiler.

A Prevention of Significant Deterioration (PSD) analysis was performed for the proposed project for all NSR regulated pollutants to determine if any increase was above the applicable PSD significant emissions rate. The CO emissions increase was above the applicable PSD significant emission rate threshold. Thus, the proposed project is classified as a major PSD modification to an existing PSD major source.

International Paper - Savannah is located in Chatham 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 EPD review of the data submitted by International Paper - Savannah related to the proposed project indicates that the proposed modifications will be in compliance with all applicable state and federal air quality regulations.

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 CO, 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. All visibility-affecting or deposition pollutants are expected to decrease as a result of the proposed project. Therefore, no Class I area analysis was required for the three Class I areas located within 300 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 International Paper - Savannah for the modifications necessary to modify the No. 13 Power Boiler for compliance with the Boiler MACT and the Regional Haze Rule emission limits for HCl and SO<sub>2</sub>. 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 is included in Appendix A. This Preliminary Determination also acts as a narrative for the Title V Permit.

## 1.0 INTRODUCTION – FACILITY INFORMATION AND EMISSIONS DATA

On May 28, 2014, International Paper - Savannah (hereafter IP-Savannah) submitted an application for an air quality permit to modify the No. 13 Power Boiler (PB13) in order to comply with the Boiler MACT and the Regional Haze Rule emission limits. The facility is located at 1201 West Lathrop Avenue in Savannah, Chatham County.

**Table 1-1: 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               | Yes                       | ✓                                                                    |                                   |                         |
| H <sub>2</sub> S  | Yes                       | ✓                                                                    |                                   |                         |
| Individual HAP    | Yes                       | ✓                                                                    |                                   |                         |
| Total HAPs        | Yes                       | ✓                                                                    |                                   |                         |
| Total GHGs        | Yes                       | ✓                                                                    |                                   |                         |

Table 1-2 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 1-2: List of Current Permits, Amendments, and Off-Permit Changes**

| Permit Number and/or Off-Permit Change              | Date of Issuance/ Effectiveness | Purpose of Issuance                                                                                                                                                                        |
|-----------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2631-051-0007-V-02-0                                | April 20, 2010                  | Title V Renewal Permit                                                                                                                                                                     |
| Off-Permit Change (Application No. 20010)           | February 22, 2011               | Off-Permit Change for the installation of a Vented Dryer Transfer Roll (VDTR) on the No. 8 Paper Machine and a new stack for the VDTR.                                                     |
| 2631-051-0007-V-02-1                                | March 2, 2012                   | Minor Modification without Construction for the revision of the periodic reporting deadlines in Condition Nos. 6.1.3, 6.1.4, and 8.17.1.                                                   |
| Off-Permit Changes (Application Nos. 21408 & 21473) | October 5, 2012                 | Off-Permit Changes for the modification of the No. 8 Paper Machine Couch Double Doctor System and the K1 Digester System                                                                   |
| Off-Permit Change (Application No. 21575)           | November 30, 2012               | Off-Permit Change for the replacement of the double-back glue unit associated with the corrugator in the Box Plant.                                                                        |
| Off-Permit Change (Application No. 22381)           | February 3, 2014                | Off-Permit Change for the replacement of the K1 Digester clove rotor pump.                                                                                                                 |
| Off-Permit Change (Application No. 22651)           | August 4, 2014                  | Off-Permit Change for the change in method of weighing chips, from weightometer to chip meter, to calculate digester production as part of the compliance determination for 40 CFR 63.446. |

Based on the proposed project description and data provided in the permit application, the estimated emissions changes of regulated pollutants from the facility are listed in Table 1-3 below:

**Table 1-3: Emissions Changes from the Project**

| Pollutant                  | Baseline Years | Emissions Changes (tpy) | PSD Significant Emission Rate (tpy) | Subject to PSD Review |
|----------------------------|----------------|-------------------------|-------------------------------------|-----------------------|
| PM                         | 2012-2013      | -30.7                   | 25                                  | No                    |
| PM <sub>10</sub>           | 2012-2013      | -693.3                  | 15                                  | No                    |
| PM <sub>2.5</sub>          | 2012-2013      | -680.2                  | 10                                  | No                    |
| VOC                        | 2012-2013      | 12.1                    | 40                                  | No                    |
| NO <sub>x</sub>            | 2012-2013      | -484.5                  | 40                                  | No                    |
| CO                         | 2012-2013      | 1,518.9                 | 100                                 | Yes                   |
| SO <sub>2</sub>            | 2012-2013      | -2,516.3                | 40                                  | No                    |
| Pb                         | 2012-2013      | -0.04                   | 0.6                                 | No                    |
| Fluorides                  | 2012-2013      | -10.5                   | 3                                   | No                    |
| SAM                        | 2012-2013      | -43.44                  | 7                                   | No                    |
| GHG (as CO <sub>2</sub> e) | 2012-2013      | -182,159                | 75,000                              | No                    |

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 preceding the date that a complete permit application was received by EPD. The net emissions changes for all pollutants except CO were calculated by subtracting the past actual emissions (based upon the annual average emissions from 2012-2013) from the future projected actual emissions of the No. 13 Power Boiler (PB13), while considering the emissions that the boiler was capable of accommodating during the baseline period. The net emissions change for CO was calculated by subtracting the past actual emissions (based upon the annual average emissions from 2012-2013) from the future potential emissions of the No. 13 Power Boiler based on the proposed BACT limit. The emissions calculations for Table 1-3 can be found in detail in the facility's PSD application (see Appendix B of Application No. 22636). These calculations have been reviewed and approved by the Division.

Based on the information presented in Table 1-3 above, IP-Savannah's proposed modification, as specified per Georgia Air Quality Application No. 22636, is classified as a major modification under PSD because the potential emissions of CO exceed the PSD Significant Emission Rate threshold.

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

## 2.0 PROCESS DESCRIPTION

According to Application No. 22636, IP-Savannah has proposed to modify the No. 13 Power Boiler (PB13) in order to comply with the Boiler MACT and the Regional Haze Rule emission limits.

The No. 13 Power Boiler, which has a heat input capacity of 1280 MMBtu/hr, was installed in 1982 and was modified in 2007 to improve combustion efficiency and increase the bark burning capability. The PM emissions from the No. 13 Power Boiler are controlled by an electrostatic precipitator (ESP). Currently, the boiler is permitted to burn biomass (bark), pulverized coal, and fuel oil. The boiler also burns the non-condensable gases (NCGs) and condensate stripper off-gases (SOGs) as the control device for compliance with 40 CFR 60 Subpart BB and 40 CFR 63 Subpart S. The proposed project includes the following modifications to the No. 13 Power Boiler: the removal of the capability to fire fuel oil, the addition of load-bearing natural gas burners, and the optimization of combustion controls and the combustion air system.

Currently, the No. 13 Power Boiler is primarily fired with biomass (bark) and pulverized coal, with fuel oil used during startup and shutdown, as well as the NCGs and SOGs from the pulping process. After completion of the proposed project, the No. 13 Power Boiler will primarily burn biomass (bark) and natural gas, with limited coal burning on an annual basis, and will continue to burn the NCGs and SOGs from the pulping process. The design heat input capacity of the No. 13 Power Boiler will not be impacted by the proposed project. The PM emissions from the No. 13 will continue to be controlled by the existing dry Electrostatic Precipitator. Good combustion practices will be employed to minimize CO emissions.

Per the EPD determination dated May 21, 2014, the No. 13 Power Boiler conforms to the definition of a hybrid suspension grate (HSG) boiler under the Boiler MACT. The proposed modifications to the No. 13 Power Boiler have been proposed to achieve compliance with the emission limits, work practice standards, and other requirements of the Boiler MACT. On June 17, 2014, EPD granted IP-Savannah a one-year compliance extension for the applicable requirements of the Boiler MACT for the No. 13 Power Boiler. Per the compliance extension, the deadline for meeting the emission limits in the Boiler MACT is on or before January 31, 2017, and the initial performance test must be conducted within 180 days of January 31, 2017.

The IP-Savannah 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 391-3-1-.02(2)(d) – Fuel-Burning Equipment

Georgia Rule (d) contains provisions for the PM emissions, opacity, and NO<sub>x</sub> emissions from fuel-burning equipment.

The No. 13 Power Boiler will continue to be subject to the PM emission limit in paragraph (d)2(iii) because the boiler was constructed after January 1, 1972, and has a heat input capacity greater than 250 MMBtu/hr. This paragraph limits the allowable emission rate of fly ash and/or PM from the boiler to 0.10 lb/MMBtu. The requirement of this paragraph is equivalent to the PM requirement under 40 CFR 60 Subpart D and is subsumed by the more stringent requirement established under 40 CFR 52.21, which limits the PM emissions to 0.075 lb/MMBtu.

The No. 13 Power Boiler will also continue to be subject to the opacity limit in paragraph (d)3 because the boiler was constructed after January 1, 1972. This paragraph limits the allowable opacity from the boiler to less than 20 percent, except for one six-minute period per hour of not more than 27 percent opacity. The requirement of this paragraph is also similar to the opacity requirement under 40 CFR 60 Subpart D.

The No. 13 Power Boiler will continue to be subject to the applicable NO<sub>x</sub> emission limits in paragraph (d)4 because the boiler was constructed after January 1, 1972, and has a heat input capacity greater than 250 MMBtu/hr. However, as a result of the proposed project, the boiler will be subject to the emission limit for firing gas and will no longer be subject to the emission limit for firing oil. This paragraph limits the allowable NO<sub>x</sub> emissions from the boiler to 0.7 lb/MMBtu when firing coal, to 0.2 lb/MMBtu when firing gas, and to the emission rate calculated using the listed equation when firing different fuels simultaneously. The requirements of this paragraph are equivalent to the NO<sub>x</sub> requirements under 40 CFR 60 Subpart D for firing gas and for firing coal.

#### Georgia Rule 391-3-1-.02(2)(g) – Sulfur Dioxide

Georgia Rule (g) contains provisions for the SO<sub>2</sub> emissions and fuel sulfur content requirements for fuel-burning sources.

The No. 13 Power Boiler will continue to be subject to the applicable SO<sub>2</sub> emission limits in paragraph (g)1 because the boiler was constructed after January 1, 1972, and has a heat input capacity greater than 250 MMBtu/hr. However, as a result of the proposed project, the boiler will no longer be subject to the emission limit for firing liquid fossil fuel or derived from liquid fossil fuel and wood residue or to the emission limit calculated using the listed equation when firing different fossil fuels simultaneously. This paragraph limits the allowable SO<sub>2</sub> emission from the boiler to 1.2 lb/MMBtu when firing solid fossil fuel or derived from solid fossil fuel and wood residue. The requirements of this paragraph are equivalent to the SO<sub>2</sub> requirements under 40 CFR 60 Subpart D.

### **Federal Rule - PSD**

The regulations for PSD 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). This means that Georgia EPD issues PSD permits for new major sources pursuant to the requirements of Georgia's regulations. It also means that Georgia EPD considers, but is not legally bound to accept, EPA comments or guidance. A commonly used source of EPA guidance on PSD permitting is EPA's Draft October 1990 New Source Review Workshop Manual for Prevention of Significant Deterioration and Nonattainment Area Permitting (NSR Workshop Manual). The NSR Workshop Manual is a comprehensive guidance document on the entire PSD permitting process.

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

### **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.

The following is a discussion of the applicable federal rules and regulations pertaining to the equipment that is the subject of this preliminary determination, which is then followed by the top-down BACT analysis.

### **New Source Performance Standards**

#### **40 CFR 60 Subpart A – General Provisions**

Except as provided in Subparts B and C of 40 CFR 60, the provisions of NSPS Subpart A apply to the owner or operator of any stationary source which contains an affected facility, the construction or modification of which is commenced after the date of publication in this part of any standard (or, if earlier, the date of publication of any proposed standard) applicable to that facility [40 CFR 60.1(a)]. Subpart A requires initial notification, performance testing, recordkeeping, and monitoring; provides reference methods; and mandates general control device requirements for all other subparts as applicable.

The No. 13 Power Boiler will continue to be subject to 40 CFR 60 Subpart A because it will continue to be subject to 40 CFR 60 Subpart D.

#### **40 CFR 60 Subpart D – Standards of Performance for Fossil-Fuel-Fired Steam Generators**

NSPS Subpart D applies to each fossil-fuel-fired steam generating unit of more than 73 MW (250 MMBtu/hr) heat input rate and each fossil-fuel and wood-residue-fired steam generating unit capable of firing fossil fuel at a heat input rate of more than 73 MW (250 MMBtu/hr) that commences construction or modification after August 17, 1971. NSPS Subpart D contains provisions for PM, opacity, SO<sub>2</sub>, and NO<sub>x</sub>.

The No. 13 Power Boiler will continue to be subject to the PM emission limit in §60.42(a)(1). This requirement limits the allowable emission rate of PM from the boiler to 0.10 lb/MMBtu. This requirement is equivalent to the PM requirement under Georgia Rule 391-3-1-.02(2)(d) and is subsumed by the more stringent requirement established under 40 CFR 52.21, which limits the PM emissions to 0.075 lb/MMBtu.

The No. 13 Power Boiler will also continue to be subject to the opacity limit in §60.42(a)(2). This requirement limits the allowable opacity from the boiler to no greater than 20 percent, except for one six-minute period per hour of not more than 27 percent opacity. This requirement is also similar to the opacity requirement under Georgia Rule 391-3-1-.02(2)(d).

The No. 13 Power Boiler will continue to be subject to the applicable SO<sub>2</sub> emission limits in §60.43(a). However, as a result of the proposed project, the boiler will no longer be subject to the emission limit for firing liquid fossil fuel or liquid fossil fuel and wood residue or to the emission limit calculated using the listed equation when firing different fossil fuels simultaneously. This requirement limits the allowable SO<sub>2</sub> emission from the boiler to 1.2 lb/MMBtu when firing solid fossil fuel or solid fossil fuel and wood residue. The requirements of this paragraph are equivalent to the SO<sub>2</sub> requirements under Georgia Rule 391-3-1-.02(2)(g).

The No. 13 Power Boiler will continue to be subject to the applicable NO<sub>x</sub> emission limits in §60.44(a). However, as a result of the proposed project, the boiler will be subject to the emission limit for firing gas and will no longer be subject to the emission limit for firing oil. This requirement limits the allowable NO<sub>x</sub> emissions from the boiler to 0.7 lb/MMBtu when firing solid fossil fuel or solid fossil fuel and wood residue, to 0.2 lb/MMBtu when firing gaseous fossil fuel, to 0.3 lb/MMBtu when firing gaseous fossil fuel and wood residue, and to the emission rate calculated using the listed equation when firing different fuels simultaneously. The requirements of this paragraph are equivalent to the NO<sub>x</sub> requirements under Georgia Rule 391-3-1-.02(2)(d) for firing gaseous fossil fuel and for firing solid fossil fuel.

40 CFR 60 Subpart Da – Standards of Performance for Electric Utility Steam Generating Units

NSPS Subpart Da applies to each electric utility steam generating unit that commences construction, modification, or reconstruction after September 18, 1978, and that is capable of combusting more than 73 MW (250 MMBtu/hr) heat input of fossil fuel (either alone or in combination with any other fuel). According to NSPS Subpart Da, electric utility steam-generating unit means any *steam electric generating unit that is constructed for the purpose of supplying more than one-third of its potential electric output capacity and more than 25 MW net-electrical output to any utility power distribution system for sale. Also, any steam supplied to a steam distribution system for the purpose of providing steam to a steam-electric generator that would produce electrical energy for sale is considered in determining the electrical energy output capacity of the affected facility.* The No. 13 Power Boiler does not meet this definition as the electrical output supplied to any utility power distribution system is limited specifically for avoidance of NSPS Subpart Da. Therefore, 40 CFR 60 Subpart Da does not apply to the proposed project.

40 CFR 60 Subpart Db – Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units

NSPS Subpart Db applies to each steam generating unit that commences construction, modification, or reconstruction after June 19, 1984, and that has a heat input capacity from fuels combusted in the steam generating unit of greater than 29 MW (100 MMBtu/hr). NSPS Subpart Db contains provisions for SO<sub>2</sub>, PM, opacity, and NO<sub>x</sub>.

The No. 13 Power Boiler was evaluated for modification under 40 CFR 60.14 of the NSPS General Provisions. A modification that triggers NSPS applicability is any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted. The maximum hourly emissions of PM, SO<sub>2</sub>, and NO<sub>x</sub> from the No. 13 Power Boiler will not increase as a result of the proposed project, and no new pollutants will be emitted. Furthermore, the elimination of the capability of firing fuel oil and the replacement of fuel oil with natural gas is expected to reduce actual emissions on an hourly basis. Therefore, the No. 13 Power Boiler does not trigger applicability to NSPS Subpart Db through the NSPS modification provisions.

Under 40 CFR 60.15 of the NSPS General Provisions, reconstruction means the replacement of components of an existing facility to such an extent that the fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility and it is technologically and economically feasible to meet the applicable standards. Because the costs associated with the proposed project are less than 50 percent of the cost of a comparable new unit, the No. 13 Power Boiler will not be considered as reconstructed as part of the proposed project and does not trigger applicability to NSPS Subpart Db as a reconstructed unit.

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

#### **40 CFR 63 Subpart A – General Provisions**

This regulation contains national emission standards for hazardous air pollutants (NESHAP) established pursuant to section 112 of the Act as amended November 15, 1990. These standards regulate specific categories of stationary sources that emit (or have the potential to emit) one or more hazardous air pollutants listed in this part pursuant to section 112(b) of the Act. The standards in this part are independent of NESHAP contained in 40 CFR 61. The NESHAP in Part 61 promulgated by signature of the Administrator before November 15, 1990, (i.e., the date of enactment of the Clean Air Act Amendments of 1990) remain in effect until they are amended, if appropriate, and added 40 CFR 63 [40 CFR 63.1(a)(1) and (2)]. No emission standard or other requirement established under 40 CFR 63 shall be interpreted, construed, or applied to diminish or replace the requirements of a more stringent emission limitation or other applicable requirement established by the Administrator pursuant to other authority of the Act (section 111, part C or D or any other authority of this Act), or a standard issued under State authority. The Administrator may specify in a specific standard under this part that facilities subject to other provisions under the Act need only comply with the provisions of that standard [40 CFR 63.1(a)(3)]. IP-Savannah is a major source of HAP emissions as total HAP emissions exceed 25 tpy.

The No. 13 Power Boiler is subject to 40 CFR 63 Subpart A because it will be subject to 40 CFR 63 Subpart DDDDD.

#### **40 CFR 63 Subpart DDDDD – National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters**

MACT Subpart DDDDD establishes national emission standards for HAPs emitted from industrial boilers and process heaters located at major HAP sources.

Under 40 CFR 63.2 of the MACT General Provisions, reconstruction means the replacement of components of an existing facility to such an extent that the fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility and it is technologically and economically feasible to meet the applicable standards. Because the costs associated with the proposed project are less than 50 percent of the cost of a comparable new unit, the No. 13 Power Boiler will not be considered as reconstructed as part of the proposed project and does not trigger applicability to MACT Subpart DDDDD as a new unit.

The No. 13 Power Boiler is classified as a hybrid suspension grate boiler. On June 17, 2014, EPD granted IP-Savannah a one-year compliance extension for the applicable requirements of the Boiler MACT for the No. 13 Power Boiler. Per the compliance extension, the deadline for meeting the emission limits in the Boiler MACT is on or before January 31, 2017, and the initial performance test must be conducted within 180 days of January 31, 2017. The boiler will be subject to the following limits and requirements:

- Emission Limits as specified in Table 2 of 40 CFR 63 Subpart DDDDD:
  - 0.44 lb/MMBtu Filterable PM OR  $4.5 \times 10^{-4}$  lb/MMBtu TSM
  - 2,800 ppmv CO, dry basis @ 3% O<sub>2</sub> (3-run average) OR 900 ppmv CO, dry basis @ 3% O<sub>2</sub> (using a CEMS, 30-day rolling average)
  - $2.2 \times 10^{-2}$  lb/MMBtu HCl
  - $5.7 \times 10^{-6}$  lb/MMBtu Hg

- Work Practice Standards as specified in Table 3 of 40 CFR 63 Subpart DDDDD
  - Conduct an initial tune-up and subsequent tune-ups annually (unless the boiler has an O<sub>2</sub> trim system which reduces the tune-up frequency to once every five years)
  - Conduct a one-time energy assessment
  - Use clean fuels during startup
  - Direct emissions to operating control device when firing coal or biomass during periods of startup and shutdown
  - Operate all CMS during periods of startup and shutdown
- Monitoring
  - Follow the ongoing compliance demonstration requirements for performance testing or fuel analysis for filterable PM, CO, HCl, and Hg emissions
  - Install, maintain, and operate an oxygen analyzer system for ongoing compliance demonstration for CO emissions
  - Maintain and operate a COMS for ongoing compliance with the opacity operating limit of less than or equal to 10% opacity (daily block average) for a boiler with a dry ESP in Table 4

#### **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 No. 13 Power Boiler associated 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.

The No. 13 Power Boiler is currently subject to CAM for PM emissions regulated under 40 CFR 52.21 (PSD BACT limit), which subsumes the PM limits in 40 CFR 60 Subpart D and Georgia Rule (d). The boiler will become subject to a PM limit under a MACT standard, which are exempt from CAM; however, the existing PSD BACT limit for PM is more stringent. Therefore, the unit will continue to be subject to CAM.

#### **Federal Rule – 40 CFR 51.300 through 51.309 – Regional Haze**

U.S. EPA's Regional Haze Rule [40 CFR 51.308] requires that visibility in all Class I areas be restored to natural background by 2064. In accordance with this rule, EPD is required to submit to EPA a Regional Haze State Implementation Plan that will demonstrate reasonable progress toward the 2064 levels starting in 2018 [40 CFR 51.308(d)(1)]. As part of the reasonable progress analysis, EPD identified emission units that, following implementation of all currently required controls, will significantly contribute to visibility impairment at one or more Class I areas.

As part of Georgia's implementation plan, IP-Savannah elected to take an SO<sub>2</sub> emissions cap. This emissions cap functions to reduce visibility impairment from the emission units to levels that would no longer be considered significant by EPD. The SO<sub>2</sub> emissions cap limits the SO<sub>2</sub> emissions from the No. 13 Power Boiler and from the combustion of LVHC non-condensable gases, HVLC non-condensable gases, and stripper off-gases (excluding the combustion of any of these gases in the No. 7 Lime Kiln) to 6578 tpy.

## 4.0 CONTROL TECHNOLOGY REVIEW

The proposed project will result in emissions that are significant enough to trigger PSD review for the following pollutant: CO.

### No. 13 Power Boiler – Background

The No. 13 Power Boiler (Source Code: PB13) was originally installed in 1982 and was modified in 2007 to improve combustion efficiency and increase the bark burning capability. The boiler is classified as a hybrid suspension grate (HSG) boiler under the Boiler MACT and is equipped with a dry ESP to control PM emissions. Currently, the boiler is primarily fired with biomass (bark) and pulverized coal, with fuel oil used during startup and shutdown, as well as the NCGs and SOGs from the pulping process. The proposed project will remove the capability to fire fuel oil, add load-bearing natural gas burners, and optimize combustion controls and the combustion air system. The heat input capacity of the boiler will remain at 1280 MMBtu/hr.

The No. 13 Power Boiler was upgraded in 2007 to allow increased bark burning. The project involved the following changes:

- Modifying bark bins to reduce pluggage;
- Upgrading the ash system, including replacing the primary and secondary collectors;
- Adding a magnet and metal detector in the bark lines;
- Reconfiguring the bark feeders to reduce housekeeping issues.

### No. 13 Power Boiler – CO Emissions

The applicant performed the 5-step BACT analysis for CO emissions from the No. 13 Power Boiler. Please refer to the applicant's CO BACT analysis presented in Section 5 of the application for detailed information.

#### Applicant's Proposal

##### ***Step 1: Identifying All Control Technologies***

The applicant identified the following potential CO control strategies as part of this BACT analysis for the No. 13 Power Boiler:

- Good combustion practices
- Catalytic oxidation
- Thermal oxidation

#### Good Combustion Practices

The applicant provided an overview of good combustion practices.

Implementation of proper burner design and optimization of combustion air systems to achieve good combustion efficiency in boilers will minimize the generation of CO. Good combustion efficiency relies on both hardware design and operating procedures. A firebox design that provides proper residence time, temperature, and combustion zone turbulence, in combination with proper control of air-to-fuel ratio, are essential elements of a biomass boiler operating with low CO emissions. To minimize CO emission from properly operated industrial boilers, no auxiliary equipment is needed.

### Catalytic Oxidation

Regenerative catalytic oxidation (RCO) technology can be used to reduce CO emissions. It is the only catalytic oxidation technology evaluated because it requires only moderate reheating to a minimum temperature of 450°F to 700°F, depending upon catalyst selection. Furthermore, RCOs can achieve a high thermal efficiency because they utilize a ceramic bed to recapture the heat of the stream exiting the combustion zone. Because oxidation catalysts can be poisoned by wood fly ash, the type of RCO system evaluated is based on use of a “tail end” oxidation system manufactured by Babcock Power in which the catalyst system is located downstream of the boiler’s ESP.

The No. 13 Power Boiler also burns NCGs and SOGs that contain sulfur. Sulfur species are poisons for all catalytic processes employing reduced metals as the primary active phase. Sulfur may cause significant deactivation even at very low concentrations, due to the formation of strong metal-S bonds. Sulfur chemisorbs onto and reacts with the active catalyst sites, preventing reactant access. Furthermore, the stable metal-adsorbate bonds can lead to nonselective side reactions, which modify the surface chemistry. Therefore, in order to apply a catalyst to No. 13 Power Boiler, sulfur controls would also have to be added. IP-Savannah already operates a white liquor scrubber to remove sulfur from some of the NCG’s burned in the boiler. The cost analysis for the RCO includes addition of a second white liquor scrubber to remove additional sulfur prior to combustion of the gases in the boiler.

The addition of a white liquor scrubber would address the SO<sub>2</sub> formed in the boiler from combustion of NCGs and SOGs, but the facility will also be able to burn up to approximately 6% coal on an annual heat input basis and still comply with the Boiler MACT HCl limit and Regional Haze SO<sub>2</sub> limit during periods when natural gas may be unavailable. The SO<sub>2</sub> and HCl emissions from un-scrubbed coal combustion could make operation of the catalyst problematic. According to Babcock Power, the chlorine will react with the coating that is added to the catalyst and deteriorate performance, leading to more frequent catalyst replacement. In addition, the SO<sub>2</sub> oxidation would be 5 to 10% and would result in SO<sub>3</sub> and eventually H<sub>2</sub>SO<sub>4</sub> emissions that could cause a blue plume from the stack. Addition of additional acid gas controls would likely be necessary to ensure proper operation of a CO catalyst when burning coal. For this application, we assumed installation of a wet ESP and pre-quench system following the catalyst to control H<sub>2</sub>SO<sub>4</sub> emissions and replacement of catalyst every 2 years. The addition of the wet ESP and pre-quench system will change the characteristics of the flue gas such that it is saturated. The current fan and stack for No. 13 Power Boiler cannot accommodate this change and would also require replacement.

Although higher temperature catalysts can be used in different applications to reduce emissions by up to 90 percent, evaluation of the lower temperature catalyst considered in this evaluation has been demonstrated on a few large power and cogeneration boilers in the U.S. to be the only practical way of operating these systems, due to the gas reheat involved, achieving approximately 70 percent control efficiency. Information received from Babcock Power in May 2014 confirms that a catalyst operating at 450°F will achieve 70 percent CO control.

### Thermal Oxidation

Thermal oxidation oxidizes CO to carbon dioxide and water by passing exhaust gas through a burner flame zone to combust remaining carbon compounds at temperatures of approximately 1,500°F or higher to achieve control efficiencies of up to 95 percent or higher. Similar to catalytic oxidation, a secondary fuel-burning system would be necessary to elevate exhaust temperatures, resulting in additional cost and increased combustion-related emissions. Combustion of NCGs and SOGs that contain sulfur and combustion of coal results in SO<sub>2</sub> emissions that would get oxidized to SO<sub>3</sub> and cause H<sub>2</sub>SO<sub>4</sub> emissions that could result in a blue plume from the stack. Therefore, addition of a thermal oxidizer will necessitate use of a wet ESP to prevent a significant increase in H<sub>2</sub>SO<sub>4</sub> emissions and formation of a blue plume when sulfur-containing gases and fuels are burned. The addition of the wet ESP and pre-quench system will change the characteristics of the flue gas such that it is saturated. The current fan and stack for No. 13 Power Boiler cannot accommodate this change and would also require replacement.

***Step 2: Eliminating Technically Infeasible Control Options******Good Combustion Practices***

The applicant found good combustion practices to be technically feasible.

***Regenerative Catalytic Oxidation***

Although Babcock Power has not installed their catalytic oxidation system on a boiler that burns sulfur-containing gases and IP-Savannah is not optimistic that the system would provide reliable and effective control during all modes of operation without experiencing operational difficulty or adverse impacts related to emissions of other compounds, the applicant included a cost analysis for the RCO option.

***Thermal Oxidation***

The applicant found thermal oxidation to be technically feasible.

***Step 3: Ranking the Remaining Control Technologies by Control Effectiveness***

The applicant ranked the remaining control technologies by control effectiveness as listed below:

1. Thermal oxidation: 95% control
2. Regenerative catalytic oxidation: 70% control
3. Good combustion practices: Not specifically quantified

***Step 4: Evaluating the Most Effective Controls and Documentation******Thermal Oxidation***

The applicant evaluated the economic, energy, and environmental impacts of thermal oxidation as a control option. The cost analysis was conducted using various guidance from the EPA documents as well as various cost estimates obtained for a wet ESP and for fan and stack improvements.

The applicant also noted that the addition of thermal oxidation to the site would have negative energy and environmental impacts. Additional power would be required to operate the add-on control equipment and for the new fan to overcome the additional pressure drop through the system. There would also be additional fuel requirements from the secondary fuel-burning system to elevate exhaust temperatures. An increase in NO<sub>x</sub> emissions would result from the combustion of the additional fuel requirements. The oxidation of VOC, CO, and SO<sub>2</sub> emissions would also lead to increased CO<sub>2</sub> and H<sub>2</sub>SO<sub>4</sub> emissions.

Based on the cost analysis, the applicant determined that thermal oxidation is not economically feasible. The estimated cost effectiveness of thermal oxidation is approximately \$12,356 per ton of CO removed.

Please see Section 5, pages 5-8 and 5-9 and Tables 5-2, 5-3, and 5-6 of the application for the assumptions and detailed calculation information associated with the analysis.

***Regenerative Catalytic Oxidation***

The applicant evaluated the economic, energy, and environmental impacts of regenerative catalytic oxidation as a control option. The cost analysis was conducted using various guidance from the EPA documents and a BACT evaluation conducted for an equivalently sized biomass boiler submitted as part of a PSD application approved by EPD as well as various cost estimates obtained for a wet Electrostatic Precipitator, for an additional white liquor scrubber, and for fan and stack improvements.

The applicant also noted that the addition of regenerative catalytic oxidation to the site would have negative energy and environmental impacts. Additional power would be required to operate the add-on control equipment and for the new fan to overcome the additional pressure drop through the system. There would also be additional fuel requirements from the secondary fuel-burning system to elevate exhaust temperatures. An increase in NO<sub>x</sub> emissions would result from the combustion of the additional fuel requirements. The oxidation of VOC, CO, and SO<sub>2</sub> emissions would also lead to increased CO<sub>2</sub> and H<sub>2</sub>SO<sub>4</sub> emissions.

Based on the cost analysis, the applicant determined that regenerative catalytic oxidation is not economically feasible. The estimated cost effectiveness of regenerative catalytic oxidation is approximately \$10,470 per ton of CO removed.

Please see Section 5, pages 5-8 and 5-9 and Tables 5-4 and 5-6 of the application for the assumptions and detailed calculation information associated with the analysis.

#### *Good Combustion Practices*

The applicant found the use of good combustion practices to be economically feasible for the No. 13 Power Boiler. The boiler will be operated with a combination of the design and work practices listed in the steps above. In addition to the existing energy efficiency design and work practices, including the OFA upgrades detailed in the equipment background section, the boiler will also be required to perform periodic tune-ups and an energy assessment under Boiler MACT.

#### ***Step 5: Selection of BACT***

The applicant has proposed that good combustion practices to achieve minimum emissions of CO constitutes BACT for the No. 13 Power Boiler. The applicant has also proposed a CO limit of 400 ppm at 3% O<sub>2</sub>, which is equivalent to 1,742 tpy of CO. The range of BACT limits for similar units in the RBLC is 0.3 to 2.3 lb/MMBtu (up to 1,998 ppm). The proposed BACT limit for the No. 13 Power Boiler is roughly equivalent to the lowest biomass boiler entry in the RBLC database and is lower than the lowest CO limit for any subcategory of biomass boilers under the Boiler MACT.

IP will stack test following implementation of the boiler modifications to demonstrate compliance with the BACT limit and will monitor the O<sub>2</sub> concentration in the furnace exhaust (minimum O<sub>2</sub> level, 30-day rolling average as required in Boiler MACT) to demonstrate that good combustion conditions are maintained during normal operations.

#### *EPD Review – CO Control*

The Division reviewed the RBLC database, the permit application, and the supporting documentation to assess the viability of the applicant's proposal. It was confirmed that no add-on controls were required for the representative boilers listed in the RBLC database with CO limits. The listed control methods include good combustion practices and over-fire air systems. The No. 13 Power Boiler is already equipped with an over-fire air system.

The Division agrees with the applicant's good combustion practices proposal for CO BACT. The Division also agrees with the applicant's proposed CO BACT limit of 400 ppm at 3% O<sub>2</sub>. Following implementation of the boiler modifications, compliance with the BACT limit will be demonstrated through stack testing based on the schedule and frequency specified in the Boiler MACT, and the O<sub>2</sub> concentration in the exhaust gases (minimum O<sub>2</sub> level, 30-day rolling average as required under the Boiler MACT) will be monitored to demonstrate that good combustion conditions are being maintained during normal operations. The installation and operation of an O<sub>2</sub> analyzer will be required as a result of the proposed project as well as under the Boiler MACT.

Conclusion – CO Control

The BACT selection for the No. 13 Power Boiler is summarized below in Table 4-1:

**Table 4-1: BACT Summary for the No. 13 Power Boiler**

| <b>Pollutant</b> | <b>Control Technology</b> | <b>Proposed BACT Limit</b>  | <b>Averaging Time</b> | <b>Compliance Determination Method</b> |
|------------------|---------------------------|-----------------------------|-----------------------|----------------------------------------|
| CO               | Good combustion practices | 400 ppm @ 3% O <sub>2</sub> | 3-hour stack test     | 3-hour stack test                      |

The CO stack testing will be conducted based on the schedule and frequency specified in the Boiler MACT. An O<sub>2</sub> analyzer will be installed and operated as a result of the proposed project and under the Boiler MACT. The O<sub>2</sub> concentration in the exhaust gases will be monitored to demonstrate that good combustion conditions are being maintained during normal operations.

## 5.0 TESTING AND MONITORING REQUIREMENTS

### Testing Requirements:

The No. 13 Power Boiler testing requirements associated with the proposed project are as follows:

- Demonstrate initial and ongoing compliance with the CO BACT emission limit established as a result of the proposed project through performance testing.
- If the Permittee elects to comply through performance testing, demonstrate initial and ongoing compliance with the applicable emission limits under 40 CFR 63 Subpart DDDDD through performance testing.
- Conduct initial and ongoing periodic tune-ups under 40 CFR 63 Subpart DDDDD. Tune-ups are required annually unless the boiler is equipped with an O<sub>2</sub> trim system which reduces the frequency to once every five years.
- Perform the one-time energy assessment under 40 CFR 63 Subpart DDDDD.

### Monitoring Requirements:

The No. 13 Power Boiler monitoring requirements associated with the proposed project are as follows:

- Operate a continuous oxygen analyzer as required under 40 CFR 63 Subpart DDDDD for CO emissions compliance.
- Operate a continuous opacity monitor as required under 40 CFR 63 Subpart DDDDD for filterable PM emissions compliance.
- If the Permittee elects to comply through fuel analysis, demonstrate initial and ongoing compliance with the applicable emission limits under 40 CFR 63 Subpart DDDDD through fuel analysis.

### CAM Applicability:

The No. 13 Power Boiler is subject to the requirements of compliance assurance monitoring (CAM) as specified in 40 CFR 64. CAM is only applicable to emission units that have potential emissions greater than the major source threshold, located at a major source, use a control device to control a pollutant emitted in an amount greater than the major source threshold for that pollutant, and have a specific emission standard for that pollutant.

The No. 13 Power Boiler uses a dry ESP to control PM emissions regulated under a PSD BACT limit, which subsumes the PM limits under NSPS Subpart D and Georgia Rule (d). The boiler will become subject to a PM limit under a MACT standard, which are exempt from CAM; however, the existing PSD BACT limit for PM is more stringent. Therefore, the boiler will continue to be subject to the existing CAM requirements for PM.

## 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 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 IP-Savannah triggers PSD review for CO. An air quality analysis was conducted to demonstrate the facility's compliance with the NAAQS and PSD Increment standards for CO. An additional analysis was conducted to demonstrate compliance with the Georgia air toxics program. This section of the application discusses the air quality analysis requirements, methodologies, and results. Supporting documentation may be found in the Air Quality Dispersion Report of the application and in the additional information packages.

### **Modeling Requirements**

The air quality modeling analysis was conducted in accordance with Appendix W of Title 40 of the Code of Federal Regulations (CFR) §51, *Guideline on Air Quality Models*, and Georgia EPD's *Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions (Revised)*.

The proposed project will cause net emission increases of CO that are greater than the applicable PSD Significant Emission Rates. Therefore, air dispersion modeling analyses are required to demonstrate compliance with the NAAQS and PSD Increment.

### **Significance Analysis: Ambient Monitoring Requirements and Source Inventories**

Initially, a Significance Analysis is conducted to determine if the CO emissions increases at IP-Savannah would significantly impact the area surrounding the facility. Maximum ground-level concentrations are compared to the pollutant-specific U.S. EPA-established Significant Impact Level (SIL). The SIL for the pollutant of concern are summarized in Table 6-1.

If a significant impact (i.e., an ambient impact above the SIL) does not result, no further modeling analyses would be conducted for that pollutant for NAAQS or PSD Increment. If a significant impact does result, further refined modeling would be completed to demonstrate that the proposed project would not cause or contribute to a violation of the NAAQS or consume more than the available Class II Increment.

Under current U.S. EPA policies, the maximum impacts due to the emissions increases from a project are also assessed against monitoring *de minimis* levels to determine whether pre-construction monitoring should be considered. These monitoring *de minimis* levels are also listed in Table 6-1. If either the predicted modeled impact from an emission increase or the existing ambient concentration is less than the monitoring *de minimis* concentration, the permitting agency has the discretionary authority to exempt an applicant from pre-construction ambient monitoring. This evaluation is required for CO.

If any off-site pollutant impacts calculated in the Significance Analysis exceed the SIL, a Significant Impact Area (SIA) would be determined. The SIA encompasses a circle centered on the facility with a radius extending out to (1) the farthest location where the emissions increase of a pollutant from the project causes a significant ambient impact, or (2) a distance of 50 km, whichever is less. All sources within a distance of 50 km of the edge of a SIA are assumed to potentially contribute to ground-level concentrations within the SIA and would be evaluated for possible inclusion in the NAAQS and PSD Increment analyses. PM<sub>2.5</sub> does not yet have established SILs (3 options proposed on 9/12/07)

**Table 6-1: Summary of Modeling Significance Levels**

| Pollutant | Averaging Period | PSD Significant Impact Level (ug/m <sup>3</sup> ) | PSD Monitoring Deminimis Concentration (ug/m <sup>3</sup> ) |
|-----------|------------------|---------------------------------------------------|-------------------------------------------------------------|
| CO        | 8-Hour           | 500                                               | 575                                                         |
|           | 1-Hour           | 2000                                              | --                                                          |

**NAAQS Analysis**

The primary NAAQS are the maximum concentration ceilings, measured in terms of total concentration of pollutant in the atmosphere, which define the “levels of air quality which the U.S. EPA judges are necessary, with an adequate margin of safety, to protect the public health.” Secondary NAAQS define the levels that “protect the public welfare from any known or anticipated adverse effects of a pollutant.” The primary and secondary NAAQS are listed in Table 6-2 below.

**Table 6-2: Summary of National Ambient Air Quality Standards**

| Pollutant | Averaging Period | NAAQS                                    |                           |
|-----------|------------------|------------------------------------------|---------------------------|
|           |                  | Primary / Secondary (ug/m <sup>3</sup> ) | Primary / Secondary (ppm) |
| CO        | 8-Hour           | 10,000 / None                            | 9 / None                  |
|           | 1-Hour           | 40,000 / None                            | 35 / None                 |

If the maximum pollutant impact calculated in the Significance Analysis exceeds the SIL at an off-property receptor, a NAAQS analysis is required. The NAAQS analysis would include the potential emissions from all emission units at IP-Savannah, except for units that are generally exempt from permitting requirements and are normally operated only in emergency situations. The emissions modeled for this analysis would reflect the results of the BACT analysis for the modified emission unit. Facility emissions would then be combined with the allowable emissions of sources included in the regional source inventory. The resulting impacts, added to appropriate background concentrations, would be assessed against the applicable NAAQS to demonstrate compliance. For an annual average NAAQS analysis, the highest modeled concentration among five consecutive years of meteorological data would be assessed, while the highest second-high impact would be assessed for the short-term averaging periods.

**PSD Increment Analysis**

The PSD Increments were established to “prevent deterioration” of air quality in certain areas of the country where air quality was better than the NAAQS. To achieve this goal, U.S. EPA established PSD Increments for certain pollutants. The sum of the PSD Increment concentration and a baseline concentration defines a “reduced” ambient standard, either lower than or equal to the NAAQS that must be met in an attainment area. Significant deterioration is said to have occurred if the change in emissions occurring since the baseline date results in an off-property impact greater than the PSD Increment (i.e., the increased emissions “consume” more that the available PSD Increment).

U.S. EPA has established PSD Increments for NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>; no increments have been established for CO. The PSD Increments are further broken into Class I, II, and III Increments. IP-Savannah is located in a Class II area.

To demonstrate compliance with the PSD Increments, the increment-affecting emissions (i.e., all emissions increases or decreases after the appropriate baseline date) from the facility and those sources in the regional inventory would be modeled to demonstrate compliance with the PSD Class II increment for any pollutant greater than the SIL in the Significance Analysis. For an annual average analysis, the highest incremental impact will be used. For a short-term average analysis, the highest second-high impact will be used.

### **Modeling Methodology**

Details on the dispersion model, including meteorological data, source data, and receptors can be found in EPD's PSD Dispersion Modeling and Air Toxics Assessment Review in Appendix C of this Preliminary Determination and in Appendix C of the permit application.

### **Modeling Results**

Table 6-4 shows that the proposed project will not cause ambient impacts of CO above the appropriate SIL. Because the emissions increases from the proposed project result in ambient impacts less than the SIL, no further PSD analyses were conducted for this pollutant.

**Table 6-3: Class II Significance Analysis Results – Comparison to SILs**

| Criteria Pollutant | Averaging Period | Significance Impact Level    | Maximum Projected Concentration* | Receptor UTM Zone: <u>17</u> |               | Model Met Data Period | Significant? |
|--------------------|------------------|------------------------------|----------------------------------|------------------------------|---------------|-----------------------|--------------|
|                    |                  | ( $\mu\text{g}/\text{m}^3$ ) | ( $\mu\text{g}/\text{m}^3$ )     | (meter East)                 | (meter North) | [yymmddhh]            |              |
| CO                 | 8-Hour           | 500                          | 26.28                            | 488300.00                    | 3550800.00    | 07050816              | No           |
|                    | 1-Hour           | 2000                         | 51.53                            | 486400.00                    | 3552100.00    | 09121411              | No           |

Data for worst year provided only.

\* Highest concentration over all averaging periods

- If the maximum projected concentration exceeds the significant level for any averaging period, refined NAAQS/Increment analysis is required for that pollutant.

The Class II area significant impact analysis was conducted using AERMOD model (version 14134) for CO. Receptors along the project fence line were spaced 100 meters apart. Beyond the fence line, receptors were spaced 100 meters apart in a Cartesian grid extending out to a distance of 3 km with 500 m spacing extending from 3 km to 5 km.

As indicated in Table 6-3 above, maximum modeled impacts were below the corresponding SILs for CO.

### **Ambient Monitoring Requirements**

**Table 6-4: Significance Analysis Results – Comparison to Monitoring *De Minimis* Levels**

| Criteria Pollutant | Averaging Period | Monitoring <i>De Minimis</i> Level | Maximum Projected Concentration* | Receptor UTM Zone: <u>17</u> |               | Model Met Data Period | Exceeds <i>De Minimis</i> ? |
|--------------------|------------------|------------------------------------|----------------------------------|------------------------------|---------------|-----------------------|-----------------------------|
|                    |                  | ( $\mu\text{g}/\text{m}^3$ )       | ( $\mu\text{g}/\text{m}^3$ )     | (meter East)                 | (meter North) | [yymmddhh]            |                             |
| CO                 | 8-Hour           | 575                                | 26.28                            | 488300.00                    | 3550800.00    | 07050816              | No                          |

Data for worst year provided only.

\* Highest concentration over all averaging periods.

The impact for CO quantified in Table 6-3 of the Class I Significance Analysis is compared to the Monitoring *de minimis* concentration, shown in Table 6-1, to determine if ambient monitoring requirements need to be considered as part of this permit action. Because the maximum modeled impact is below the corresponding *de minimis* concentration, no pre-construction monitoring is required for CO.

### **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 200 kilometers has been used for all facilities that do not combust coal.

The three Class I areas within approximately 300 kilometers of IP-Savannah are the Wolf Island National Wildlife Refuge Wilderness Area, Okefenokee National Wildlife Refuge Wilderness Area, and Cape Romain National Wildlife Refuge Wilderness Area. The Wolf Island National Wildlife Refuge Wilderness Area is the closest Class I area, located approximately 84 kilometers south of the facility. The U.S. Fish and Wildlife Service (FWS) is the designated Federal Land Manager (FLM) responsible for oversight of all three of these Class I areas.

Because all visibility-affecting or deposition pollutants are expected to decrease as a result of the proposed project, no Class I analysis is required.

## **7.0 ADDITIONAL IMPACT ANALYSES**

Because all visibility-affecting or deposition pollutants are expected to decrease as a result of the proposed project, the potential soil and vegetation impacts and the Class II visibility analysis are not required.

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

IP-Savannah is removing the capability to fire fuel oil from the No. 13 Power Boiler for compliance with a MACT standard, and the capacity of the boiler is not increasing. Therefore, a toxic impact assessment was not required for this project.

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

The permit requirements for this proposed facility are included in draft Permit Amendment No. 2631-051-0007-V-02-2.

### **Section 1.0: Facility Description**

Please see Part 2.0 of this document.

### **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**

#### *3.3: Equipment Federal Rule Standards*

Existing Condition No. 3.3.7, which contains the PM, SO<sub>2</sub>, and NO<sub>x</sub> emission limits for the No. 13 Power Boiler, will become null and void after the completion of the proposed project. This Condition will be replaced by new Condition No. 3.3.38.

New Condition No. 3.3.34 contains the PSD BACT limit for CO from the No. 13 Power Boiler.

New Condition No. 3.3.35 contains the general applicability provisions for 40 CFR 63 Subparts A and DDDDD for the No. 13 Power Boiler.

New Condition No. 3.3.36 contains the filterable PM, HCl, and Hg emission limits for the No. 13 Power Boiler under 40 CFR 63 Subpart DDDDD.

New Condition No. 3.3.37 contains the startup and shutdown provisions for the No. 13 Power Boiler under 40 CFR 63 Subpart DDDDD.

New Condition No. 3.3.38 contains the PM, SO<sub>2</sub>, and NO<sub>x</sub> emission limits for the No. 13 Power Boiler that have been updated to reflect the appropriate limits for the fuels to be fired after completion of the proposed project. This Condition will replace existing Condition No. 3.3.7.

#### *3.4: Equipment SIP Rule Standards*

Existing Condition No. 3.4.11, which contains the specifications for used oil fired in the No. 7 Lime Kiln and the No. 13 Power Boiler, will become null and void after the completion of the proposed project as the boiler will no longer be capable of firing oil. This Condition will be replaced by new Condition No. 3.4.15.

New Condition No. 3.4.15 contains the specifications for used oil fired in the No. 7 Lime Kiln. This Condition will replace existing Condition No. 3.4.11, which also permitted used oil to be fired in the No. 13 Power Boiler.

### **Section 4.0: Requirements for Testing**

#### *4.1: General Testing Requirements*

New Condition Nos. 4.1.3.x through 4.1.3.gg specify the test methods for conducting performance test under 40 CFR 63 Subpart DDDDD.

New Condition No. 4.1.5 specifies the requirements for performance test submittal in accordance with NSPS and MACT standards.

#### *4.2: Specific Testing Requirements*

New Condition No. 4.2.8 specifies the initial testing requirements for determining compliance with the CO PSD BACT limit for the No. 13 Power Boiler.

New Condition No. 4.2.9 specifies the periodic testing requirements for determining compliance with the CO PSD BACT limit for the No. 13 Power Boiler.

New Condition No. 4.2.10 specifies the initial compliance demonstrations through performance testing for the No. 13 Power Boiler under 40 CFR 63 Subpart DDDDD.

New Condition No. 4.2.11 specifies the periodic compliance demonstrations through performance testing for the No. 13 Power Boiler under 40 CFR 63 Subpart DDDDD.

New Condition No. 4.2.12 specifies the initial and periodic tune-up requirements for the No. 13 Power Boiler under 40 CFR 63 Subpart DDDDD.

New Condition No. 4.2.13 specifies the requirements for the one-time energy assessment for the No. 13 Power Boiler under 40 CFR 63 Subpart DDDDD.

### **Section 5.0: Requirements for Monitoring**

#### *5.2: Specific Monitoring Requirements*

Existing Condition No. 5.2.1.c, which requires the facility to operate a COMS to continuously monitor the opacity from the No. 13 Power Boiler, has been modified to add the citation for continuous opacity monitoring under 40 CFR 63 Subpart DDDDD.

New Condition No. 5.2.1.d requires the facility to operate an oxygen analyzer on the No. 13 Power Boiler to demonstrate compliance with the CO PSD BACT limit and the CO limit under 40 CFR 63 Subpart DDDDD.

New Condition No. 5.2.19 specifies the initial compliance demonstrations through fuel analysis for the No. 13 Power Boiler under 40 CFR 63 Subpart DDDDD.

New Condition No. 5.2.20 specifies the periodic compliance demonstrations through fuel analysis for the No. 13 Power Boiler under 40 CFR 63 Subpart DDDDD.

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

#### *6.1: General Record Keeping and Reporting Requirements*

Existing Condition No. 6.1.7.a.vi, which defines an excess emission for SO<sub>2</sub> emissions from the No. 13 Power Boiler, will become null and void after completion of the proposed project. This Condition will be replaced by new Condition No. 6.1.7.a.xi.

New Condition No. 6.1.7.a.xi defines an excess emission for SO<sub>2</sub> emissions from the No. 13 Power Boiler that have been updated to reflect the appropriate limits for the fuels to be fired after completion of the proposed project. This Condition will replace existing Condition No. 6.1.7.a.vi.

Existing Condition No. 6.1.7.b.xiv, which defines an exceedance for SO<sub>2</sub> emissions from the No. 13 Power Boiler, will become null and void after completion of the proposed project. This Condition will be replaced by new Condition No. 6.1.7.b.xv.

New Condition No. 6.1.7.b.xv defines an exceedance for SO<sub>2</sub> emissions from the No. 13 Power Boiler that have been updated to reflect the appropriate limits for the fuels to be fired after completion of the proposed project. This Condition will replace existing Condition No. 6.1.7.b.xiv.

New Condition No. 6.1.7.c.xii defines an excursion for the O<sub>2</sub> concentration for the No. 13 Power Boiler for demonstrating compliance with the CO PSD BACT limit and the CO limit under 40 CFR 63 Subpart DDDDD.

New Condition No. 6.1.7.c.xiii defines an excursion for the SO<sub>2</sub> emissions from the No. 13 Power Boiler for demonstrating compliance with the Regional Haze SO<sub>2</sub> emission limit.

New Condition No. 6.1.7.d.xiii requires the facility to include in each quarterly report each opacity deviation from the No. 13 Power Boiler under 40 CFR 63 Subpart DDDDD.

#### *6.2: Specific Record Keeping and Reporting Requirements*

Existing Condition No 6.2.6, which specifies the recordkeeping requirements for SO<sub>2</sub> emissions from the No. 13 Power Boiler, will become null and void after completion of the proposed project. This Condition will be replaced by new Condition No. 6.2.40.

Existing Condition No. 6.2.12, which specifies the recordkeeping requirements for residual oil to be fired in the No. 7 Lime Kiln and the No. 13 Power Boiler, will become null and void after the completion of the proposed project as the boiler will no longer be capable of firing oil. This Condition will be replaced by new Condition No. 6.2.41.

New Condition No. 6.2.40 specifies the recordkeeping requirements for SO<sub>2</sub> emissions from the No. 13 Power Boiler. Paragraph a. has been updated to reflect the appropriate limits for the fuels to be fired after completion of the proposed project. Paragraph c. has been added to determine compliance with the Regional Haze emission limit. This Condition will replace existing Condition No. 6.2.6.

New Condition No. 6.2.41 specifies the recordkeeping requirements for residual oil to be fired in the No. 7 Lime Kiln. This Condition will replace existing Condition No. 6.2.12, which also specified recordkeeping requirements for residual oil to be fired in the No. 13 Power Boiler.

New Condition No. 6.2.42 requires the facility to submit a compliance plan for the No. 13 Power Boiler under 40 CFR 63 Subpart DDDDD no later than October 30, 2016.

New Condition No. 6.2.43 specifies the performance test notification requirements for the No. 13 Power Boiler under 40 CFR 63 Subpart DDDDD.

New Condition No. 6.2.44 specifies the Notification of Compliance Status requirements for the No. 13 Power Boiler under 40 CFR 63 Subpart DDDDD.

New Condition No. 6.2.45 specifies the periodic reporting requirements for the No. 13 Power Boiler under 40 CFR 63 Subpart DDDDD.

New Condition Nos. 6.2.46 and 6.2.47 specify the recordkeeping requirements for the No. 13 Power Boiler under 40 CFR 63 Subpart DDDDD.

New Condition Nos. 6.2.48 through 6.2.50 specify the recordkeeping and reporting requirements for projected actual emissions from the No. 13 Power Boiler as a result of the proposed project calculated under the PSD regulations.

New Condition No. 6.2.51 specifies the reporting requirements for the results of performance tests conducted to determine compliance with the CO PSD BACT limit for the No. 13 Power Boiler.

#### **Section 7.0: Other Specific Requirements**

##### *7.14: Specific Conditions Associated with this Amendment*

New Condition No. 7.14.1 specifies the startup notification requirements for the No. 13 Power Boiler after completion of the proposed project.

New Condition No. 7.14.2 specifies the conditions that will become null and void after completion of the proposed project.

New Condition No. 7.14.3 specifies the conditions that will become applicable after completion of the proposed project.

New Condition No. 7.14.4 specifies the condition that will become applicable no later than January 31, 2017 for compliance with 40 CFR 63 Subpart DDDDD.

## APPENDIX A

Draft Revised Title V Operating Permit Amendment  
International Paper - Savannah  
Savannah (Chatham County), Georgia

## APPENDIX B

International Paper - Savannah PSD Permit Application and Supporting Data

Contents Include:

1. PSD Permit Application No. 22636, dated May 28, 2014

## APPENDIX C

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