



# Florida Department of Environmental Protection

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## PERMITTEE

Georgia-Pacific Consumer Operations LLC  
P. O. Box 919  
Palatka, Florida 32178-0919

Authorized Representative:  
Mr. Keith Wahoske, Vice President of Palatka Operations

Air Permit No. 1070005-050-AC  
Permit Expires: October 1, 2008  
Georgia-Pacific Palatka Mill  
ARMS ID No. 1070005  
No. 4 Recovery Boiler  
Revisions for SO<sub>2</sub> and Oil Firing

## PROJECT AND LOCATION

This permit authorizes revisions to the SO<sub>2</sub> limits and oil firing restrictions for the No. 4 Recovery Boiler (EU-018), which is located at the existing Palatka pulp and paper mill (SIC Nos. 2611 and 2621) in Putnam County, North of County Road 216 and West of U.S. Highway 17 in Palatka, Florida. The map coordinates are UTM Zone 17, 434.0 km East and 3283.4 km North.

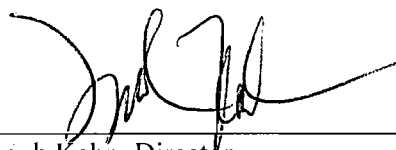
## STATEMENT OF BASIS

This air pollution construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.). The permittee is authorized to conduct the proposed work in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department.

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- Section 1. General Information
- Section 2. Administrative Requirements
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Executed in Tallahassee, Florida

  
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Joseph Kahn, Director  
Division of Air Resource Management

1/31/08  
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(Date)

## SECTION 1. GENERAL INFORMATION

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### FACILITY AND PROJECT DESCRIPTION

Georgia-Pacific operates an existing paper and pulp mill in Palatka, Florida using the Kraft sulfate process. In the Kraft process, the digesting liquor (white liquor) is a solution of sodium hydroxide and sodium sulfide that is mixed with wood chips and cooked under pressure. The spent liquor, known as weak black liquor, is concentrated and sodium sulfate is added to make up for chemical losses. The black liquor solids (BLS) are burned in the recovery furnace to produce a smelt of sodium carbonate and sodium sulfide. The smelt is dissolved in water to form green liquor to which quicklime (calcium oxide) is added to convert the sodium carbonate back to sodium hydroxide, which reconstitutes the cooking liquor. The spent lime cake (calcium carbonate) is recalcined in a rotary lime kiln to produce quicklime, which is used to convert the green liquor to cooking liquor. Other steam and energy needs are met by the power boilers, which burn a variety of fuels including fuel oil and natural gas.

### REGULATORY CLASSIFICATION

- The facility is a major source of hazardous air pollutants (HAP).
- The facility operates no units subject to the acid rain provisions of the Clean Air Act.
- The facility is a Title V major source of air pollution in accordance with Chapter 62-213, F.A.C.
- The facility is a major stationary source subject to the Prevention of Significant Deterioration (PSD) of Air Quality in accordance with Rule 62-212.400, F.A.C.

### PROJECT DESCRIPTION

This permit revises the sulfur dioxide (SO<sub>2</sub>) emissions limits and oil firing specifications for the No. 4 recovery boiler at the Palatka Mill. In Project No. 1070005-038-AC (PSD-FL-380), Georgia-Pacific requested clarification of the SO<sub>2</sub> emissions standards and oil firing restrictions for the No. 4 Recovery Boiler (EU-018), which fires No. 6 fuel oil with a maximum sulfur content of 2.35% by weight. Prior to issuance of Permit No. PSD-FL-380, the request was split off along with the project to modify the No. 4 combination boiler as Project No. 1070005-045-AC (PSD-FL-393). For clarity, this project is now being issued as a separate minor source air construction permit (Project No. 1070005-050-AC) to address only the oil firing and SO<sub>2</sub> conditions for the No. 4 Recovery Boiler.

## SECTION 2. ADMINISTRATIVE REQUIREMENTS

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1. Permitting Authority: The permitting authority for this project is the Bureau of Air Regulation, Division of Air Resource Management, Florida Department of Environmental Protection (DEP). The Bureau of Air Regulation's mailing address is 2600 Blair Stone Road (MS #5505), Tallahassee, Florida 32399-2400. All documents related to applications for permits to operate an emissions unit shall be submitted to the Compliance Authority.
2. Compliance Authority: All documents related to compliance activities such as reports, tests, and notifications shall be submitted to the Air Resource Section of the Department's Northeast District Office. The mailing address is 7825 Baymeadows Way, Suite 200B, Jacksonville, Florida, 32256. The phone number is 904/807-3300.
3. Appendices: The following Appendices are attached as part of this permit: Appendix A (Citation Formats and Glossary of Common Terms), Appendix B (General Conditions), Appendix C (Common Conditions) and Appendix D (CEMS Requirements).
4. Applicable Regulations, Forms and Application Procedures: Unless otherwise specified in this permit, the construction and operation of the subject emissions units shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of: Chapter 403, F.S.; and Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296, and 62-297, F.A.C. Issuance of this permit does not relieve the permittee from compliance with any applicable federal, state, or local permitting or regulations.
5. Modifications: The permittee shall notify the Compliance Authority upon commencement of construction. No emissions unit or facility subject to this permit shall be constructed or modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification. [Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]
6. Source Obligation: At such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by virtue of a relaxation in any enforceable limitation which was established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then the requirements of subsections 62-212.400(4) through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification. Also, at such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by exceeding its projected actual emissions, then the requirements of subsections 62-212.400(4) through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification. [Rule 62-212.400(12), F.A.C.]
7. Title V Permit: This permit authorizes construction of the permitted emissions units and initial operation to determine compliance with Department rules. A Title V operation permit is required for regular operation of the permitted emissions unit. The permittee shall apply for a Title V operation permit at least 90 days prior to expiration of this permit, but no later than 180 days after commencing operation. To apply for a Title V operation permit, the applicant shall submit the appropriate application form, compliance test results, and such additional information as the Department may by law require. The application shall be submitted to the appropriate Permitting Authority with copies to the Compliance Authority. [Rules 62-4.030, 62-4.050, 62-4.220, and Chapter 62-213, F.A.C.]

### SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS

This section of the permit addresses the following emissions unit.

EU No.	Description
018	<p><b>No. 4 Recovery Boiler.</b> As part of the recovery process at the mill, this unit fires black liquor solids (BLS) to recover the cooking liquor. The permitted capacity is 210,000 lb/hour of BLS based on a 24-hour average (equivalent to 1345 MMBtu/hour based on the permitted capacity and an average heating value of 6410 Btu/lb of BLS). Residual fuel oil is fired as a startup, shutdown and supplemental fuel. The maximum steam production rate is 789,000 lb/hour (24-hour average) for steam conditions of 850° F to 900° F at 1250 psi. Particulate matter emissions are controlled by an electrostatic precipitator (ESP) with automatic voltage control, 2-chambers, and 6 electric fields per chamber. Total reduced sulfur (TRS) emissions are controlled by the low-odor boiler design. Emissions of nitrogen oxides (NO<sub>x</sub>) are controlled by a four-level overfire air system. Emissions of carbon monoxide (CO) and volatile organic compounds (VOC) are controlled by the combustion design and good operating practices. The following pollutants are monitored with continuous emissions monitoring systems (CEMS): CO, NO<sub>x</sub>, SO<sub>2</sub>, TRS and opacity. At permitted BLS capacity, the exhaust gas flow rate is 294,000 dscfm at 8% oxygen with an exit temperature of 400° F. Exhaust gases exit a stack that is 12 feet in diameter and 230 feet tall.</p>

The following conditions related to SO<sub>2</sub> emissions and oil firing requirements replace all other similar conditions in previously issued air construction permits.

#### OIL FIRING CAPACITIES

1. Permitted Oil Firing Capacity. The following table specifies the capabilities of the oil firing system designed by Combustion Engineering:

Burner Type	Quantity	Oil Pressure	Maximum Design Capacities			
			Oil Firing Rate (gph)		Heat Input Rates (MMBtu/hour)*	
			Each Burner	Total	Each Burner	Total
Startup Burners	4	88 psig	250	1000	37.5	150
Load Burners	8	80 psig	480	3840	72	576

\* For No. 6 fuel oil, assumes a heating value of 150,000 Btu/gallon and a density of 8.2 lb/gallon.

Any changes to the design or operation of the oil firing system shall require a modification of this permit and a corresponding PSD applicability determination. [Design and Rule 62-210.200(PTE), F.A.C.]

#### PERFORMANCE RESTRICTIONS

2. Oil Firing Restrictions.
  - a. The No. 4 Recovery Boiler is authorized to fire No. 6 fuel oil with a maximum sulfur content of 2.35% by weight as determined by the method specified in this permit.
  - b. The No. 4 Recovery Boiler shall not fire more than 67,680 gallons of fuel oil during any consecutive rolling 24 hours. *{Permitting Note: This is equivalent to a 24-hour average of 47 gpm, which was the basis of the air quality analysis for ensuring compliance with the Ambient Air Quality Standards.}*
  - c. The heat input rate to the No. 4 Recovery Boiler from firing oil shall be less than 1,178,220 MMBtu during any consecutive 12 months. *{Permitting Note: This represents an annual capacity factor of less than 10% of the maximum annual heat input rate of the unit.}*

[Rules 62-4.070(3) and 62-212.300, F.A.C.]

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## SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS

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### SO<sub>2</sub> EMISSIONS STANDARDS

3. SO<sub>2</sub> Emissions Standards. As determined by CEMS, SO<sub>2</sub> emissions from the No. 4 Recovery Boiler shall not exceed 100 ppmvd at 8% O<sub>2</sub> based on a 24-hour rolling average. This emissions standard includes all valid SO<sub>2</sub> CEMS data collected except during periods of boiler startup and shutdown. *{Permitting Note: The limit of 100 ppmvd corrected to 8% oxygen is equivalent to 292.8 lb/hour. This limit is based on the PSD modeling analysis for PSD-FL-380 and PSD-FL-393.}* [Rules 62-4.070(3), 62-210.200(PTE) and 62-212.400(12), F.A.C.]
4. SO<sub>2</sub> Emissions Cap. As determined by all valid CEMS data, SO<sub>2</sub> emissions from the No. 4 Recovery Boiler shall not exceed 153.9 tons during any consecutive 12 months. This emissions cap includes valid SO<sub>2</sub> CEMS data collected including all periods of startup, shutdown, malfunction and oil firing. *{Permitting Note: The purpose of this emissions cap is to avoid PSD preconstruction review for PSD-FL-380 and PSD-FL-393.}* [Rules 62-4.070(3), 62-210.200(PTE) and 62-212.400(12), F.A.C.]

### MONITORING REQUIREMENTS

5. SO<sub>2</sub> CEMS. The permittee shall properly install, calibrate, operate and maintain a CEMS to measure and record SO<sub>2</sub> emissions to demonstrate compliance with the standards specified in this permit. The CEMS shall include the measurement of oxygen (or carbon monoxide) for correction of SO<sub>2</sub> emission concentrations to 8% oxygen. The CEMS shall comply with the applicable requirements of Performance Specification 2 in Appendix B of 40 CFR Part 60 and the quality assurance procedures in Appendix F of 40 CFR Part 60. The permittee shall comply with the conditions of Appendix D (CEMS Requirements) of this permit. [Rule 62-4.070(3), F.A.C.]
6. SO<sub>2</sub> CEMS Data Substitution. The following procedures shall be used for missing data.
  - a. SO<sub>2</sub> 24-hour Rolling Average. No data shall be substituted for the missing data to determine compliance with the standard based on 24-hour rolling average. The next valid 1-hour emissions average shall be used to complete the 24-hour rolling average.
  - b. SO<sub>2</sub> Emissions Cap. All valid CEMS data shall be used to determine compliance with the SO<sub>2</sub> emissions cap. This includes periods of startup, shutdown, malfunction, oil firing and operation while firing BLS. For periods of missing data, the permittee shall calculate the maximum 24-hour rolling average for each method of operation (e.g., startup, shutdown, malfunction, oil firing and operation while firing BLS). For the 12-month period, this average shall be substituted for each missing 1-hour emissions average under the given method of operation.  
[Rule 62-4.070(3), F.A.C.]
7. CEMS Required for Reporting Annual Emissions. The permittee shall use SO<sub>2</sub> data from the CEMS when calculating annual emissions for purposes of computing actual emissions, baseline actual emissions and net emissions increase, as defined at Rule 62-210.200, F.A.C., and for purposes of computing emissions pursuant to the reporting requirements of Rules 62-210.370(3) and 62-212.300(1)(e), F.A.C. The permittee shall follow the procedures in Appendix D (CEMS Requirements) of this permit for calculating annual emissions. [Rule 62-4.070(3), F.A.C.]

### RECORDS AND REPORTS

8. Fuel Oil Sulfur Records. The permittee shall maintain the following records of the sulfur content of fuel oil fired in the No. 4 Recovery Boiler.
  - a. For each delivery of fuel oil, the permittee shall maintain a permanent file of the certified fuel analysis from the vendor identifying the fuel sulfur content and heating value.

### SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS

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- b. The permittee shall demonstrate compliance with the maximum permitted fuel sulfur specification based on a 3-barge rolling average. The permittee shall maintain records of the fuel analysis for each fuel oil shipment received. The permittee shall calculate and maintain a log of the fuel sulfur content based on a 3-barge rolling average (i.e., the average of three consecutive barge deliveries based on the certified fuel oil analysis receipt). Fuel oil analysis shall be conducted using ASTM Methods D-129, D-1552, D-2622, D-4294 or equivalent methods approved by the Department. If the calculated 3-barge rolling average exceeds the permitted maximum fuel sulfur content, the permittee shall notify the Compliance Authority within one working day.
- c. Before April 1<sup>st</sup> of each year, the permittee shall submit an annual report summarizing the fuel oil deliveries and the 3-barge rolling averages of the fuel sulfur content for operations during the previous calendar year.

[Rule 62-4.070(3), F.A.C.]

- 9. Fuel Oil Firing Records. The permittee shall operate and maintain an oil flow monitoring system to determine compliance with the oil firing limitations for the No. 4 Recovery Boiler (gallons per consecutive rolling 24-hour period and MMBtu per consecutive rolling 12-month period). [Rules 62-4.160(15) and 62-4.070(3), F.A.C.]

**SECTION 4. APPENDICES**  
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Appendix A. Citation Formats and Glossary of Common Terms

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Appendix D. CEMS Requirements

**SECTION 4. APPENDIX A**  
**CITATION FORMATS AND GLOSSARY OF COMMON TERMS**

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**CITATION FORMATS**

The following illustrate the formats used in the permit to identify applicable requirements from permits and regulations.

**Old Permit Numbers**

Example: Permit No. AC50-123456 or Permit No. AO50-123456

Where: “AC” identifies the permit as an Air Construction Permit  
“AO” identifies the permit as an Air Operation Permit  
“123456” identifies the specific permit project number

**New Permit Numbers**

Example: Permit Nos. 099-2222-001-AC, 099-2222-001-AF, 099-2222-001-AO, or 099-2222-001-AV

Where: “099” represents the specific county ID number in which the project is located  
“2222” represents the specific facility ID number for that county  
“001” identifies the specific permit project number  
“AC” identifies the permit as an air construction permit  
“AF” identifies the permit as a minor source federally enforceable state operation permit  
“AO” identifies the permit as a minor source air operation permit  
“AV” identifies the permit as a major Title V air operation permit

**PSD Permit Numbers**

Example: Permit No. PSD-FL-317

Where: “PSD” means issued pursuant to the preconstruction review requirements of the Prevention of Significant Deterioration of Air Quality  
“FL” means that the permit was issued by the State of Florida  
“317” identifies the specific permit project number

**Florida Administrative Code (F.A.C.)**

Example: [Rule 62-213.205, F.A.C.]

Means: Title 62, Chapter 213, Rule 205 of the Florida Administrative Code

**Code of Federal Regulations (CFR)**

Example: [40 CFR 60.7]

Means: Title 40, Part 60, Section 7

**GLOSSARY OF COMMON TERMS**

° F: degrees Fahrenheit

acfm: actual cubic feet per minute

ARMS: Air Resource Management System  
(Department’s database)

BACT: best available control technology

Btu: British thermal units

CAM: compliance assurance monitoring

CEMS: continuous emissions monitoring system

cfm: cubic feet per minute

CFR: Code of Federal Regulations

CO: carbon monoxide

COMS: continuous opacity monitoring system



**SECTION 4. APPENDIX A**  
**CITATION FORMATS AND GLOSSARY OF COMMON TERMS**

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<b>DEP:</b> Department of Environmental Protection	<b>NESHAP:</b> National Emissions Standards for Hazardous Air Pollutants
<b>Department:</b> Department of Environmental Protection	<b>NO<sub>x</sub>:</b> nitrogen oxides
<b>dscfm:</b> dry standard cubic feet per minute	<b>NSPS:</b> New Source Performance Standards
<b>EPA:</b> Environmental Protection Agency	<b>O&amp;M:</b> operation and maintenance
<b>ESP:</b> electrostatic precipitator	<b>O<sub>2</sub>:</b> oxygen
<b>EU:</b> emissions unit	<b>Pb:</b> lead
<b>F.A.C.:</b> Florida Administrative Code	<b>PM:</b> particulate matter
<b>F.D.:</b> forced draft	<b>PM<sub>10</sub>:</b> particulate matter with a mean aerodynamic diameter of 10 microns or less
<b>F.S.:</b> Florida Statutes	<b>PSD:</b> prevention of significant deterioration
<b>FGR:</b> flue gas recirculation	<b>psi:</b> pounds per square inch
<b>Fl:</b> fluoride	<b>PTE:</b> potential to emit
<b>ft<sup>2</sup>:</b> square feet	<b>RACT:</b> reasonably available control technology
<b>ft<sup>3</sup>:</b> cubic feet	<b>RATA:</b> relative accuracy test audit
<b>gpm:</b> gallons per minute	<b>SAM:</b> sulfuric acid mist
<b>gr:</b> grains	<b>scf:</b> standard cubic feet
<b>HAP:</b> hazardous air pollutant	<b>scfm:</b> standard cubic feet per minute
<b>Hg:</b> mercury	<b>SIC:</b> standard industrial classification code
<b>I.D.:</b> induced draft	<b>SNCR:</b> selective non-catalytic reduction
<b>ID:</b> identification	<b>SO<sub>2</sub>:</b> sulfur dioxide
<b>kPa:</b> kilopascals	<b>TPH:</b> tons per hour
<b>lb:</b> pound	<b>TPY:</b> tons per year
<b>MACT:</b> maximum achievable technology	<b>UTM:</b> Universal Transverse Mercator coordinate system
<b>MMBtu:</b> million British thermal units	<b>VE:</b> visible emissions
<b>MSDS:</b> material safety data sheets	<b>VOC:</b> volatile organic compounds
<b>MW:</b> megawatt	

**SECTION 4. APPENDIX B**  
**GENERAL CONDITIONS**

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The permittee shall comply with the following general conditions from Rule 62-4.160, F.A.C.

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, F.S. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.
2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
3. As provided in Subsections 403.087(6) and 403.722(5), F.S., the issuance of this permit does not convey and vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.
4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.
5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of F.S. and Department rules, unless specifically authorized by an order from the Department.
6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.
7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:
  - a. Have access to and copy and records that must be kept under the conditions of the permit;
  - b. Inspect the facility, equipment, practices, or operations regulated or required under this permit, and,
  - c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:
  - a. A description of and cause of non-compliance; and
  - b. The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the F.S. or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, F.S.. Such evidence

**SECTION 4. APPENDIX B**  
**GENERAL CONDITIONS**

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shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and F.S. after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by F.S. or Department rules.
11. This permit is transferable only upon Department approval in accordance with Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.
12. This permit or a copy thereof shall be kept at the work site of the permitted activity.
13. This permit also constitutes:
  - a. Determination of Best Available Control Technology;
  - b. Determination of Prevention of Significant Deterioration; and
  - c. Compliance with New Source Performance Standards.
14. The permittee shall comply with the following:
  - a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
  - b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.
  - c. Records of monitoring information shall include:
    - 1) The date, exact place, and time of sampling or measurements;
    - 2) The person responsible for performing the sampling or measurements;
    - 3) The dates analyses were performed;
    - 4) The person responsible for performing the analyses;
    - 5) The analytical techniques or methods used; and
    - 6) The results of such analyses.
15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

**SECTION 4. APPENDIX C**  
**COMMON CONDITIONS**

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Unless otherwise specified in the permit, the following conditions apply to all emissions units and activities at the facility.

**EMISSIONS AND CONTROLS**

1. Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the permittee shall notify each Compliance Authority as soon as possible, but at least within one working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; steps being taken to correct the problem and prevent future recurrence; and, where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit or the regulations. [Rule 62-4.130, F.A.C.]
2. Circumvention: The permittee shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rule 62-210.650, F.A.C.]
3. Excess Emissions Allowed: Excess emissions resulting from startup, shutdown or malfunction of any emissions unit shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized but in no case exceed two hours in any 24 hour period unless specifically authorized by the Department for longer duration. Rule 62-210.700 (Excess Emissions), F.A.C., cannot vary any NSPS or NESHAP provision. [Rule 62-210.700(1), F.A.C.]
4. Excess Emissions Prohibited: Excess emissions caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction shall be prohibited. [Rule 62-210.700(4), F.A.C.]
5. Excess Emissions - Notification: In case of excess emissions resulting from malfunctions, the permittee shall notify the Department or the appropriate Local Program in accordance with Rule 62-4.130, F.A.C. A full written report on the malfunctions shall be submitted in a quarterly report, if requested by the Department. [Rule 62-210.700(6), F.A.C.]
6. VOC or OS Emissions: No person shall store, pump, handle, process, load, unload or use in any process or installation, volatile organic compounds (VOC) or organic solvents (OS) without applying known and existing vapor emission control devices or systems deemed necessary and ordered by the Department. [Rule 62-296.320(1), F.A.C.]
7. Objectionable Odor Prohibited: No person shall cause, suffer, allow or permit the discharge of air pollutants, which cause or contribute to an objectionable odor. An "objectionable odor" means any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance. [Rules 62-296.320(2) and 62-210.200(Definitions), F.A.C.]
8. General Visible Emissions: No person shall cause, let, permit, suffer or allow to be discharged into the atmosphere the emissions of air pollutants from any activity equal to or greater than 20% opacity. This regulation does not impose a specific testing requirement. [Rule 62-296.320(4)(b)1, F.A.C.]
9. Unconfined Particulate Emissions: During the construction period, unconfined particulate matter emissions shall be minimized by dust suppressing techniques such as covering and/or application of water or chemicals to the affected areas, as necessary. [Rule 62-296.320(4)(c), F.A.C.]

**RECORDS AND REPORTS**

10. Records Retention: All measurements, records, and other data required by this permit shall be documented in a permanent, legible format and retained for at least 5 years following the date on which such measurements, records, or data are recorded. Records shall be made available to the Department upon request. [Rule 62-213.440(1)(b)2, F.A.C.]
11. Annual Operating Report: The permittee shall submit an annual report that summarizes the actual operating rates and emissions from this facility. Annual operating reports shall be submitted to the Compliance Authority by March 1st of each year. [Rule 62-210.370(3), F.A.C.]

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## SECTION 4. APPENDIX D.

### CEMS Requirements

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#### INSTALLATION, PERFORMANCE SPECIFICATIONS AND QUALITY ASSURANCE

1. Timelines: The owner or operator shall install the CEMS required by this permit and conduct the appropriate performance specification for each CEMS in accordance with the provisions in Permit No. PSD-FL-380 (1070005-038-AC).
2. Installation: All CEMS shall be installed such that representative measurements of emissions or process parameters from the facility are obtained. The owner or operator shall locate the CEMS by following the procedures contained in the applicable performance specification of 40 CFR part 60, Appendix B.
3. Span Values and Dual Range Monitors: The owner or operator shall set appropriate span values for the CEMS. The owner or operator shall install dual range monitors if necessary.
4. Continuous Flow Monitor: For compliance with mass emission rate standards, the owner or operator shall install a continuous flow monitor to determine the stack exhaust flow rate. The flow monitor shall be certified pursuant to 40 CFR part 60, Appendix B, Performance Specification 6. Alternatively, the owner or operator may install a fuel flow monitor and use an appropriate F-Factor computational approach to calculate stack exhaust flow rate.
5. Diluent Monitor: If it is necessary to correct the CEMS output to the oxygen concentrations specified in this permit's emission standards, the owner or operator shall either install an oxygen monitor or install a CO<sub>2</sub> monitor and use an appropriate F-Factor computational approach.
6. Moisture Correction: If necessary, the owner or operator shall determine the moisture content of the exhaust gas and develop an algorithm to enable correction of the monitoring results to a dry basis (0% moisture).
7. Performance Specifications: The owner or operator shall evaluate the acceptability of the SO<sub>2</sub> CEMS by conducting Performance Specification 2 of 40 CFR part 60, Appendix B. CEMS determined to be unacceptable shall not be considered installed for purposes of meeting the timelines of this permit.
8. Quality Assurance: The owner or operator shall follow the quality assurance procedures of 40 CFR part 60, Appendix F. The required RATA tests for the SO<sub>2</sub> CEMS shall be performed using EPA Method 6C in Appendix A of 40 CFR part 60.

#### CALCULATION APPROACH

9. CEMS Used for Compliance: Once adherence to the applicable performance specification for each CEMS is demonstrated, the owner or operator shall use the CEMS to demonstrate compliance with the applicable emission standards as specified by this permit.
10. CEMS Data: Each CEMS shall monitor and record emissions during all periods of operation and whenever emissions are being generated, including during episodes of startups, shutdowns, and malfunctions. All data shall be used, except for invalid measurements taken during monitor system breakdowns, repairs, calibration checks, zero adjustments and span adjustments, and except for allowable data exclusions as per this appendix.
11. Operating Hours and Operating Days: For purposes of this appendix, the following definitions shall apply. An hour is the 60-minute period beginning at the top of each hour. Any hour during which an emissions unit is in operation for more than 15 minutes is an operating hour for that emission unit. A day is the 24-hour period from midnight to midnight. Unless otherwise specified by this permit, any day with at least one operating hour for an emissions unit is an operating day for that emission unit.
12. Valid Hourly Averages: Each CEMS shall be designed and operated to sample, analyze and record data evenly spaced over the hour at a minimum of one measurement per minute. All valid measurements collected during an hour shall be used to calculate a 1-hour block average that begins at the top of each hour.
  - a. Hours that are not operating hours are not valid hours.
  - b. For each operating hour, the 1-hour block average shall be computed from at least two data points separated by a minimum of 15 minutes. If less than two such data points are available, there is insufficient data, the 1-hour block average is not valid, and the hour is considered as "monitor unavailable."

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## SECTION 4. APPENDIX D.

### CEMS Requirements

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13. Calculation Approaches: The owner or operator shall implement the calculation approach specified by this permit for each CEMS, as follows:
- Rolling 24-hour average*. Compliance shall be determined after each valid hourly average is obtained by calculating the arithmetic average of that valid hourly average and the prior 23 valid hourly averages.
  - Rolling 12-month total*. Compliance shall be determined after each operating month by calculating the arithmetic total of all the valid emission data collected during the consecutive 12-month period.

### MONITOR AVAILABILITY

14. Monitor Availability: The quarterly excess emissions report shall identify monitor availability for each quarter in which the unit operated. Monitor availability for the CEMS shall be 95% or greater in any calendar quarter in which the unit operated for more than 760 hours. In the event the applicable availability is not achieved, the permittee shall provide the Department with a report identifying the problems in achieving the required availability and a plan of corrective actions that will be taken to achieve 95% availability. The permittee shall implement the reported corrective actions within the next calendar quarter. Failure to take corrective actions or continued failure to achieve the minimum monitor availability shall be violations of this permit.

### EXCESS EMISSIONS

15. Definitions:
- Startup* is defined as the commencement of operation of any emissions unit which has shut down or ceased operation for a period of time sufficient to cause temperature, pressure, chemical or pollution control device imbalances, which result in excess emissions.
  - Shutdown* means the cessation of the operation of an emissions unit for any purpose.
  - Malfunction* means any unavoidable mechanical and/or electrical failure of air pollution control equipment or process equipment or of a process resulting in operation in an abnormal or unusual manner.
16. Excess Emissions Prohibited: Excess emissions caused entirely or in part by poor maintenance, poor operation or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction shall be prohibited.
17. Notification Requirements: The owner or operator shall notify the Compliance Authority within one working day of discovering any emissions that demonstrate noncompliance for a given averaging period.

### ANNUAL EMISSIONS

18. CEMS Used for Calculating Annual Emissions: All valid data, as defined in this appendix, shall be used when calculating annual emissions.
- Annual emissions shall include data collected during startup, shutdown and malfunction periods.
  - Annual emissions shall include data collected during periods when the emission unit is not operating but emissions are being generated (for example, when firing fuel to warm up a process for some period of time prior to the emission unit's startup).
  - Annual emissions shall not include data from periods of time where the monitor was functioning properly but was unable to collect data while conducting a mandated quality assurance/quality control activity such as calibration error tests, RATA, calibration gas audit or RAA. These periods of time shall be considered missing data for purposes of calculating annual emissions.
  - Annual emissions shall not include data from periods of time when emissions are in excess of the calibrated span of the CEMS. These periods of time shall be considered missing data for purposes of calculating annual emissions.
19. Emissions Calculation: Hourly emissions shall be calculated for each hour as the product of the 1-hour block average and the duration of pollutant emissions during that hour. Annual emissions shall be calculated as the sum of all hourly emissions occurring during the year.

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

NOTICE OF FINAL PERMIT

In the Matter of an  
Application for Permit by:

Georgia-Pacific Consumer Operations LLC  
P. O. Box 919  
Palatka, Florida 32178-0919

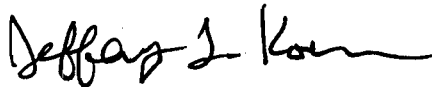
Authorized Representative:  
Mr. Keith Wahoske, Vice President of Palatka Operations

Air Permit No. 1070005-050-AC  
Georgia-Pacific Palatka Mill  
ARMS ID No. 1070005  
No. 4 Recovery Boiler  
Revisions for SO<sub>2</sub> and Oil Firing

Enclosed is the final air construction permit, which authorizes revisions to the SO<sub>2</sub> limits and oil firing restrictions for the No. 4 Recovery Boiler (EU-018). This unit is located at the existing Palatka pulp and paper mill (SIC Nos. 2611 and 2621) in Putnam County, North of County Road 216 and West of U.S. Highway 17 in Palatka, Florida. As noted in the attached final determination, no comments were received on the draft permit. This permit is issued pursuant to Chapter 403, Florida Statutes.

Any party to this order has the right to seek judicial review of it under Section 120.68 of the Florida Statutes by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department of Environmental Protection in the Office of General Counsel (Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000) and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice must be filed within 30 days after this order is filed with the clerk of the Department.

Executed in Tallahassee, Florida.



Trina Vielhauer, Chief  
Bureau of Air Regulation

FOS

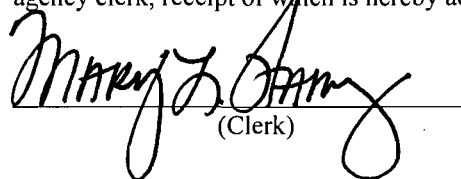
CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this Notice of Final Permit (including the Final Permit and Final Determination) was sent by electronic mail with received receipt requested to the persons listed below.

Mr. Keith Wahoske, Georgia-Pacific ([keith.wahoske@gapac.com](mailto:keith.wahoske@gapac.com))  
Mr. Mike Curtis, Georgia-Pacific ([michael.curtis@gapac.com](mailto:michael.curtis@gapac.com))  
Mr. Christopher Kirts, NED Office ([Christopher.Kirts@dep.state.fl.us](mailto:Christopher.Kirts@dep.state.fl.us))

Clerk Stamp

**FILING AND ACKNOWLEDGMENT FILED**, on this date,  
pursuant to Section 120.52(7), Florida Statutes, with the designated  
agency clerk, receipt of which is hereby acknowledged.


  
(Clerk)

1/31/08  
(Date)

Florida Department of  
Environmental Protection

---

Memorandum

TO: Joseph Kahn, Division of Air Resource Management  
THROUGH: Trina Vielhauer, Bureau of Air Regulation  
FROM: Jeff Koerner, New Source Review Section   
DATE: January 29, 2008  
SUBJECT: Final Air Permit No. 1070005-050-AC  
Georgia-Pacific Palatka Mill  
No. 4 Recovery Boiler, SO<sub>2</sub> and Oil Firing Revisions

The final permit clarifies the oil firing conditions and corrects the SO<sub>2</sub> standard that applies when firing black liquor solids in the No. 4 recovery boiler. Annual SO<sub>2</sub> emissions remain capped at 153.9 tons during any consecutive 12 months with compliance demonstrated by CEMS. The project is subject to minor source preconstruction review.

I recommend your approval of the attached Final Permit.

Attachments



## FINAL DETERMINATION

---

### PERMITTEE

Georgia-Pacific Consumer Operations LLC  
P. O. Box 919  
Palatka, Florida 32178-0919

### PERMITTING AUTHORITY

Florida Department of Environmental Protection  
Division of Air Resource Management  
Bureau of Air Regulation  
2600 Blair Stone Road, MS #5505  
Tallahassee, Florida 32399-2400

### PROJECT

Air Permit No. 1070005-050-AC  
Georgia-Pacific Palatka Mill

The permit authorizes revisions to the SO<sub>2</sub> limits and oil firing restrictions for the No. 4 Recovery Boiler (EU-018), which is located at the existing Palatka pulp and paper mill (SIC Nos. 2611 and 2621) in Putnam County, North of County Road 216 and West of U.S. Highway 17 in Palatka, Florida.

### NOTICE AND PUBLICATION

The Department electronically distributed an Intent to Issue Permit package on December 19, 2007. The applicant published the Public Notice of Intent to Issue in the Palatka Daily News on January 4, 2008. The Department received the proof of publication on January 10, 2008.

### COMMENTS

No comments on the draft permit were received from the public, the Department's Northeast District office or the applicant. There were no requests for an administrative hearing.

### CONCLUSION

The final action of the Department is to issue the permit as drafted.

## Koerner, Jeff

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**From:** Koerner, Jeff  
**Sent:** Wednesday, February 27, 2008 9:18 AM  
**To:** Koerner, Jeff  
**Subject:** Georgia-Pacific - SO2 Revision Project for No. 4 Recovery Boiler

### Project Description

The current Title V air operation permit includes the following limits for sulfur dioxide (SO<sub>2</sub>) emissions.

E.7. Sulfur Dioxide Emissions shall not exceed 75 ppmvd at 8% O<sub>2</sub>; 109.9 lb/hr and 481.4 TPY, based on the average of three (3) test runs conducted in accordance with EPA Method 6C, EPA Method 8 or NCASI Method 106 (Method 8A) to measure the SO<sub>2</sub> concentration and Methods 1 through 4 to measure the volumetric flow rate. [BACT; Permit #AC54-266676; PSD-FL-226]

The applicant requests an air construction permit to revise this standard to 100 ppmvd at 8% O<sub>2</sub> based on a 24-hour average, excluding startup and shutdown. During startup and shutdown, fuel oil firing will be restricted to a 24-hour average of no more than 47 gpm (equivalent to a rolling 24-hour total of 67,680 gallons). The maximum fuel sulfur content will be 2.35% by weight.

### Background

In Project No. 1070005-038-AC (PSD-FL-380), Georgia-Pacific requested clarification of the SO<sub>2</sub> emissions standards and No. 6 fuel oil firing restrictions for the No. 4 Recovery Boiler (EU-018). However, prior to issuance of Permit No. PSD-FL-380, that request was combined with Project No. 1070005-045-AC (PSD-FL-393) to modify the No. 4 Combination Boiler. On November 9, 2007, the Department received the necessary information to process this request. For clarity, this project is now being issued as a separate minor source air construction permit (Project No. 1070005-050-AC) to address only the oil firing and SO<sub>2</sub> conditions for the No. 4 Recovery Boiler. This project file contains only the pertinent documents related specifically to the SO<sub>2</sub> revision. See these other files for additional application forms and supporting information.

Jeff Koerner, BAR - New Source Review Section  
Florida Department of Environmental Protection

**Harvey, Mary**

**From:** Harvey, Mary  
**Sent:** Thursday, January 31, 2008 3:27 PM  
**To:** 'Mr. Keith Wahoske, Georgia-Pacific'; 'Mr. Mike Curtis, Georgia-Pacific'; Kirts, Christopher  
**Cc:** Koerner, Jeff; Walker, Elizabeth (AIR); Gibson, Victoria  
**Subject:** Georgia Pacific Consumer Operations - Facility ID #1070005-050  
**Attachments:** 1070005-050-AC - Appendix.PDF; 1070005-050-AC - Final Determination.PDF; 1070005-050-AC - Final Permit.PDF; 1070005-050-AC - Notice of Final Permit.PDF; Signed Document - 1070005-050-AC-FINAL.pdf

**Tracking:**

Recipient	Read
Mr. Keith Wahoske, Georgia-Pacific	
Mr. Mike Curtis, Georgia-Pacific	
Kirts, Christopher	Read: 2/1/2008 9:36 AM
Koerner, Jeff	
Walker, Elizabeth (AIR)	Read: 2/1/2008 7:56 AM
Gibson, Victoria	Read: 1/31/2008 3:28 PM

Dear Sir/Madam:

Please send a "reply" message verifying receipt of the attached document(s); this may be done by selecting "Reply" on the menu bar of your e-mail software and then selecting "Send". We must receive verification of receipt and your reply will preclude subsequent e-mail transmissions to verify receipt of the document(s).

The document(s) may require immediate action within a specified time frame. Please open and review the document(s) as soon as possible.

The document is in Adobe Portable Document Format (pdf). Adobe Acrobat Reader can be downloaded for free at the following internet site:  
<http://www.adobe.com/products/acrobat/readstep.html>.

The Bureau of Air Regulation is issuing electronic documents for permits, notices and other correspondence in lieu of hard copies through the United States Postal System, to provide greater service to the applicant and the engineering community. Please advise this office of any changes to your e-mail address or that of the Engineer-of-Record.

Thank you,

DEP, Bureau of Air Regulation

## Harvey, Mary

---

**From:** Kirts, Christopher  
**To:** Harvey, Mary  
**Sent:** Friday, February 01, 2008 9:36 AM  
**Subject:** Read: Georgia Pacific Consumer Operations - Facility ID #1070005-050

Your message

**To:** 'Mr. Keith Wahoske, Georgia-Pacific'; 'Mr. Mike Curtis, Georgia-Pacific'; Kirts, Christopher  
**Cc:** Koerner, Jeff; Walker, Elizabeth (AIR); Gibson, Victoria  
**Subject:** Georgia Pacific Consumer Operations - Facility ID #1070005-050  
**Sent:** 1/31/2008 3:27 PM

was read on 2/1/2008 9:36 AM.

## Harvey, Mary

---

**From:** Curtis, Michael [MICHAEL.CURTIS@GAPAC.com]  
**To:** Harvey, Mary  
**Sent:** Thursday, January 31, 2008 7:39 PM  
**Subject:** Read: Georgia Pacific Consumer Operations - Facility ID #1070005-050

Your message

**To:** MICHAEL.CURTIS@GAPAC.com  
**Subject:**

was read on 1/31/2008 7:39 PM.

## Harvey, Mary

---

**From:** Walker, Elizabeth (AIR)  
**To:** Harvey, Mary  
**Sent:** Friday, February 01, 2008 7:56 AM  
**Subject:** Read: Georgia Pacific Consumer Operations - Facility ID #1070005-050

Your message

**To:** 'Mr. Keith Wahoske, Georgia-Pacific'; 'Mr. Mike Curtis, Georgia-Pacific'; Kirts, Christopher  
**Cc:** Koerner, Jeff; Walker, Elizabeth (AIR); Gibson, Victoria  
**Subject:** Georgia Pacific Consumer Operations - Facility ID #1070005-050  
**Sent:** 1/31/2008 3:27 PM

was read on 2/1/2008 7:56 AM.

**Harvey, Mary**

**From:** Wahoske, Keith [KEITH.WAHOSKE@GAPAC.com]  
**Sent:** Thursday, January 31, 2008 4:20 PM  
**To:** Harvey, Mary; Curtis, Michael; Kirts, Christopher  
**Cc:** Koerner, Jeff; Walker, Elizabeth (AIR); Gibson, Victoria  
**Subject:** RE: Georgia Pacific Consumer Operations - Facility ID #1070005-050

We are in receipt of your email.

Thank you

Keith Wahoske

-----Original Message-----

**From:** Harvey, Mary [mailto:Mary.Harvey@dep.state.fl.us]  
**Sent:** Thursday, January 31, 2008 3:27 PM  
**To:** Wahoske, Keith; Curtis, Michael; Kirts, Christopher  
**Cc:** Koerner, Jeff; Walker, Elizabeth (AIR); Gibson, Victoria  
**Subject:** Georgia Pacific Consumer Operations - Facility ID #1070005-050

Dear Sir/Madam:

Please send a "reply" message verifying receipt of the attached document(s); this may be done by selecting "Reply" on the menu bar of your e-mail software and then selecting "Send". We must receive verification of receipt and your reply will preclude subsequent e-mail transmissions to verify receipt of the document(s).

The document(s) may require immediate action within a specified time frame. Please open and review the document(s) as soon as possible.

The document is in Adobe Portable Document Format (pdf). Adobe Acrobat Reader can be downloaded for free at the following internet site:  
<http://www.adobe.com/products/acrobat/readstep.html>.

The Bureau of Air Regulation is issuing electronic documents for permits, notices and other correspondence in lieu of hard copies through the United States Postal System, to provide greater service to the applicant and the engineering community. Please advise this office of any changes to your e-mail address or that of the Engineer-of-Record.

Thank you,

DEP, Bureau of Air Regulation

message verifying receipt of the attached document(s); this

*The Department of Environmental Protection values your feedback as a customer. DEP Secretary Michael W. Sole is committed to continuously assessing and improving the level and quality of services provided to you. Please take a few minutes to comment on the quality of service you received. Simply click on [this link](#) to the DEP Customer Survey. Thank you in advance for completing the survey.*



Palatka Pulp and Paper Operations  
Consumer Products Division

P.O. Box 919  
Palatka, FL 32178-0919  
(386) 325-2001

January 5, 2008

RECEIVED

JAN 08 2008

NORTHEAST DISTRICT  
DEP-JACKSONVILLE

Mr. Christopher L. Kirts  
State of Florida  
Dept. of Environmental Protection  
7825 Baymeadows Way Suite B200  
Jacksonville, FL 32256-7590

RE: Georgia-Pacific, Palatka Operations  
Draft Permit Project No. 1070005-050-AC  
No. 4 Recovery Boiler SO2 Revision

Dear Mr. Kirts:

Please find enclosed Proof of Publication of Public Notice for Intent to issue a revision to Title V Air Operation Permit No. 1070005-050-AC.

If further information is needed, please contact me at (386) 329-0967.

Sincerely,

A handwritten signature in cursive script that reads 'Ron Reynolds'.

Ron Reynolds  
Environmental Air Engineer

lk

Enclosure

cc: B. T. Champion, GP Atlanta  
Scott Matchett, GP Atlanta



STATE OF FLORIDA

County of Putnam

The undersigned personally appeared before me, a Notary Public for the State of Florida, and deposes that the Palatka Daily News is a daily newspaper of general circulation, printed in the English language and published in the City of Palatka in said County and State; and that the attached order, notice, publication and/or advertisement:

PUBLIC NOTICE OF INTENT TO IS

Was published in said newspaper 1 time(s) with said publication being made on the following dates:

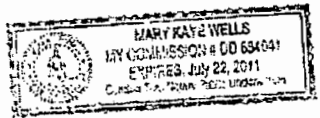
01/04/2008

The Palatka Daily News has been continuously published as a daily newspaper, and has been entered as second class matter at the post office at the City of Palatka, Putnam County, Florida, each for a period of more than one year next preceding the date of the first publication of the above described order, notice and/or advertisement.

Sworn to and subscribed to before me this 4th day of January, 2008 by Mary McGill, Administrative Assistant, of the Palatka Daily News, a Florida corporation, on behalf of the corporation.

Mary Kaye Wells, Notary Public
My commission expires July 22, 2011

Notary Seal
Seal of Office:



Personally known to me, or
Produced identification:
Did take an oath

Because the administrative hearing process is assigned to formulate final agency action, the filing of a petition means that the Permitting Authority's final action may be different from the position taken by it in this Public Notice of Intent to Issue Air Permit. Persons whose substantial interests will be affected by any such final decision of the Permitting Authority on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

PUBLIC NOTICE

PUBLIC NOTICE OF INTENT TO ISSUE AIR PERMIT

Florida Department of Environmental Protection, Division of Air Resources Management, Bureau of Air Regulation Draft Air Permit No. 1070003-059-AC Georgia-Pacific Consumer Operations LLC, Georgia-Pacific Palatka Mill, Putnam County, Florida

Applicant: The applicant for this project is Georgia-Pacific Consumer Operations LLC. The applicant's authorized representative and mailing address is: Mr. Keith W. Wernick, Vice President of Physical Operations, Georgia-Pacific Consumer Operations LLC, P.O. Box 019, Palatka, Florida 32177-0119.

Facility Location: Georgia-Pacific Consumer Operations LLC operates the existing Georgia-Pacific Palatka Mill which is a pulp and paper mill located in Putnam County, North of County Road 218 and West of U.S. Highway 17 in Palatka, Florida.

Project: The No. 4 Recovery Boiler fires black liquor solids (BLS) to recover the cooking liquor as part of the recovery process at the mill. Oil is fired as a startup fuel to bring the boiler up to temperature and pressure before the mill is fully functional on BLS. Oil may also be fired as a supplemental fuel to stabilize boiler operation, when BLS supply is temporarily interrupted or for shutdowns. Currently, sulfur dioxide (SO2) emissions from the boiler are limited to 75 pounds per 24-hour period based on the average of three stack tests. The applicant requests an air construction permit to revise this standard to 100 pounds per 24-hour period based on a 24-hour average, excluding startup and shutdown, with compliance demonstrated by continuous emissions monitoring equipment. During startup and shutdown, maximum fuel oil firing will be restricted to a rolling 24-hour total of 87,660 gallons. The maximum fuel sulfur content will be 2.35% by weight. Annual SO2 emissions will be capped at 19,120 tons during any consecutive 12 months with compliance demonstrated by continuous emissions monitoring equipment.

Permitting Authority: Applications for air construction permits are subject to review in accordance with the provisions of Chapter 403, Florida Statutes (F.S.) and Chapter 62-4, 62-210, and 62-212 of the Florida Administrative Code (F.A.C.). The proposed project is not exempt from permitting requirements and an air permit is required to perform the proposed work. The Bureau of Air Regulation is the Permitting Authority responsible for making a permit determination for this project. The Permitting Authority's mailing address is: 2600 East Stone Road, MS 8509, Tallahassee, Florida 32309-2400. The Permitting Authority's telephone number is 904/438-0114.

Project File: A complete project file is available for public inspection during the normal business hours of 8:00 a.m. to 5:00 p.m., Monday through Friday (except legal holidays), at address indicated above for the Permitting Authority. The complete project file includes the Draft Permit, Preliminary Determination, the application, and the information submitted by the applicant, exclusive of confidential records under Section 104.111, F.S. Interested persons may contact the Permitting Authority's project review engineer for additional information at the address and phone number listed above, in addition, electronic copies of these documents are available on the Internet at: http://www.dep.state.fl.us/air/airconstruction/draftairperm.htm

Notice of Intent to Issue Air Permit: The Permitting Authority gives notice of its intent to issue an air permit to the applicant for the project described above. The applicant has provided reasonable assurance that operation of proposed equipment will not adversely impact air quality and that the project will comply with all applicable provisions of Chapter 62-4, 62-

62-210, 62-211, 62-200, and 62-257, F.A.C. The Permitting Authority will issue a Final Permit in accordance with the conditions of the proposed Draft Permit unless a timely petition for an administrative hearing is filed under Sections 120.569 and 120.57, F.S. or unless public comment received in accordance with this notice results in a different decision or a significant change of terms or conditions.

Comments: The Permitting Authority will accept written comments concerning the proposed Draft Permit for a period of 14 days from the date of publication of this Public Notice. Written comments must be postmarked by the Permitting Authority by close of business (5:00 p.m.) on or before the end of this 14-day period. If written comments received result in a significant change to the Draft Permit, the Permitting Authority shall revise the Draft Permit and re-issue, if applicable, another Public Notice. All comments filed will be made available for public inspection.

Petitions: A person whose substantial interests are affected by the proposed permit may petition for an administrative hearing in accordance with Sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed with (received by) the Department's Agency Clerk in the Office of General Counsel of the Department of Environmental Protection at 2500 Commonwealth Boulevard, Mail Station 855, Tallahassee, Florida 32309-0900. Petitions filed by any persons other than those entitled to written notice under Section 120.569(3), F.S. must be filed within 14 days of publication of this Public Notice or receipt of a written notice, whichever occurs first, under Section 120.569(3), F.S. However, any person who asked the Permitting Authority for notice of agency action may file a petition within 14 days of receipt of that notice regardless of the date of publication. A petitioner shall file a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any person who intervenes in a proceeding initiated by another party will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 29-166.205, F.A.C.

A petition that disputes the material facts upon which the Permitting Authority's action is based must contain the following information: (a) The name and address of each agency affected and each person's name and telephone number, if known; (b) The name, address and telephone number of the petitioner; the name, address and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial rights will be affected by the agency determination; (c) A statement of when and how the petitioner received notice of the agency action or proposed decision; (d) A statement of all disputed issues of material fact. If there are none, the petition must so state; (e) A complete statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action (including an explanation of how the alleged facts relate to the specific rules or statutes); and, (g) A statement of the relief sought by the petitioner, stating precisely the action the petitioner wants the agency to take with respect to the agency's proposed action.

A petition that does not dispute the material facts upon which the Permitting Authority's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 29-166.205.



Palatka Pulp and Paper Operations  
Consumer Products Division

P.O. Box 919  
Palatka, FL 32178-0919  
(386) 325-2001

**CERTIFIED MAIL – RETURN RECEIPT REQUESTED**

November 9, 2007

**RECEIVED**

**NOV 13 2007**

Mr. Jeffery F. Koerner, Air Permitting North Section  
Bureau of Air Regulation  
Florida Department of Environmental Protection  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

**BUREAU OF AIR REGULATION**

**Re: Project No. 1070005-045-AC/PSD-FL-393  
Modification of the No. 4 Combination Boiler and No. 4 Recovery Boiler  
Response to Request for Additional Information No. 1**

Dear Mr. Koerner:

This responds to your June 29, 2007 request for additional information regarding our PSD permit application to modify the No. 4 Combination Boiler and No. 4 Recovery Boiler.

For ease of reference, we have repeated the DEP's questions (*in italicized font*) prior to the answers.

**No. 4 Combination Boiler**

**Question No. 1.** *The revised application proposes to fire natural gas as the startup and supplemental fuel in the No. 4 combination boiler. Oil firing would continue until the gas burners are installed. Once a reliable supply of natural gas is available, oil firing will be permanently discontinued. Describe the proposed schedule for commencing and completing the project (e.g., upgrading wood fuel delivery system, installing an new overfire air system, replacing the existing cyclones with mechanical dust collectors, modifying the existing ESP and adding the existing ESP from the No. 5 power boiler, modifying the NCG ductwork for incorporation into the new overfire air system, possible modification of the under-air grate distribution, and replacing the existing oil burners with new, low-NO<sub>x</sub> burners for firing natural gas).*

**GP's Response to Question No. 1:**

The initial phase of the project will include all changes except the conversion to natural gas. The initial phase will include:

- Upgrade of wood-fuel delivery system with new bark conveyors and feed bin.

- Installation of a new over-fire air (OFA) system,
- Installation of a mechanical dust collector.
- Installation of a bottom-ash handling system.
- Modification of ductwork so that the No.5 Power Boiler ESP/stack will serve the No. 4 Combination Boiler in parallel with the existing No. 4 Combination Boiler ESP/stack.
- Modification of ductwork to introduce dilute non-condensable gases (DNCGs) into the new OFA system.

The existing NCG ductwork and under-grate air distribution will not be modified as part of this project. We plan to complete this initial phase during an outage in May-June 2008, contingent on timely approvals, on-time deliveries, etc.

The project to convert the No. 4 Combination Boiler to natural gas in lieu of fuel oil will require additional pipeline capacity to be installed by Florida Gas Transmission (FGT). GP has initiated the process with FGT to provide this capacity. FGT has estimated a minimum of two years and possibly as long as three years for completion, but is not yet able to provide a firm date at this early stage. GP will complete the conversion of the No. 4 Combination Boiler to natural gas within 180 days of the completion of the necessary pipeline modifications by FGT.

**Question No. 2.** Provide the following information:

- a. *A table summarizing emissions rates for natural gas, wood and natural gas plus wood in conventional units (e.g., grains/dscf @ 8% oxygen, lb/MM Btu, ppmvd @ 8% oxygen, etc.), lb/hour and tons per year. Please include emissions rates for CO, NO<sub>x</sub>, PM, PM<sub>10</sub>, SAM, SO<sub>2</sub>, and VOC.*

**GP's Response to Question No. 2a:**

See tables 2a (1) and 2a (2) below. The pollutant emission rates for firing a combination of both wood and natural gas would be calculated using the same emission factors as those used in the two tables below, multiplied by the respective quantity of each of the two fuels fired.

2b. *The maximum burner capacity for firing natural gas in MM Btu/hour*

GP's response: 427.0 MM Btu/hr

2c. *Any fuel consumption limits on firing natural gas*

GP's response: 0.427 MM ft<sup>3</sup>/hr

2d. *The corresponding application pages for firing natural gas and wood/bark*

GP's response: See attached (electronic) application pages

**Question No. 3.** *Summarize any new BACT determinations posted on the RACT/BACT/LAER Clearinghouse for CO, NO<sub>x</sub>, PM/PM<sub>10</sub> and VOC. Provide an updated BACT review based on*

**GP's Response to Question No. 2a:**

**Table 2a (1)**

<b>Pollutant Emission Rates for No. 4 Combination Boiler Burning 100% Natural Gas, LVHC NCGs, SOGs, and HVLCs</b>						
	<b>PM/PM<sub>10</sub></b>	<b>SO<sub>2</sub></b>	<b>SAM</b>	<b>NO<sub>x</sub></b>	<b>CO</b>	<b>VOC</b>
<b>lb/MM Btu</b>	Gas-0.0076	Gas-0.0006 NCGs-1.08 SOGs-1.16 HVLCs-0.19 Total-2.43	Gas-0.0 NCGs-0.048 SOGs-0.051 HVLCs-0.0084 Total-0.107	Gas-0.15 NCGs-0.10 SOGs-0.0 HVLCs-0.0 Total-0.25	Gas-0.10 Total-0.10	Gas-0.0055 Total-0.0055
<b>lbs/hr</b>	Gas-3.25	Gas-0.3 NCGs-462.9 SOGs-496.0 HVLCs-82.6 Total-1,041.8	Gas-0.0 NCGs-20.4 SOGs-21.8 HVLCs-3.6 Total-45.8	Gas-64.05 NCGs- 43.2 Total-107.3	Gas-42.7 Total-42.7	Gas-2.35 Total-2.35
<b>tons/yr</b>	Gas-14.2 Total-14.2	Gas-1.1 NCGs-264.9 SOGs-283.8 HVLCs-236.3 Total-786.1	Gas-0.0 NCGs-11.6 SOGs-12.5 HVLCs-10.4 Total-34.5	Gas-280.5 NCGs-37.8 Total-318.3	Gas-187.0 Total- 187.0	Gas-10.3 Total-10.3
<b>ppmvd</b>	---	Gas-0.3	Gas-0.0	Gas-90.4	Gas-99.0	Gas-3.5 (as propane)
<b>grains/dscf @ 8% O<sub>2</sub></b>	Gas-0.0038	---	---	---	---	---

**Gas firing rate = 427.0 MM Btu/hr. Exhaust gas flow rate = 98,900 dscfm**

**GP's Response to Question No. 2a:**

**Table 2a (2)**

<b>Pollutant Emission Rates for No. 4 Combination Boiler Burning 100% Wood/Bark, LVHC NCGs, SOGs, and HVLCs</b>						
	<b>PM/PM<sub>10</sub></b>	<b>SO<sub>2</sub></b>	<b>SAM</b>	<b>NO<sub>x</sub></b>	<b>CO</b>	<b>VOC</b>
<b>lb/MM Btu</b>	PM-Wood-0.04 PM Wood Total-0.04 PM <sub>10</sub> -Wood-0.03 PM <sub>10</sub> Wood Total-0.03	Wood-0.025 NCGs-0.54 SOGs-0.57 HVLCs-0.15 Total-1.29	Wood-0.025 NCGs-0.024 SOGs-0.025 HVLCs-0.0064 Total-0.14	Wood-0.24 NCGs-0.077 Total-0.32	Wood-0.5 Total-0.5	Wood-0.017 Total-0.017
<b>lbs/hr</b>	PM-Wood-22.6 PM Total-22.6 PM <sub>10</sub> -Wood-16.7 PM <sub>10</sub> Wood Total-16.7	Wood-14.1 NCGs-462.9 SOGs-496.0 HVLCs-82.6 Total-1,055.6	Wood-0.6 NCGs-20.4 SOGs-21.8 HVLCs-3.6 Total-46.4	Wood-135.4 NCGs-43.2 Total-178.6	Wood-282.0 Total-282.0	Wood-9.6 Total-9.6
<b>tons/yr</b>	PM Wood-98.8 PM Wood Total-98.8 PM <sub>10</sub> -Wood-73.1 PM <sub>10</sub> Wood Total-73.1	Wood-61.8 NCGs-264.9 SOGs-283.8 HVLCs-236.3 Total-846.8	Wood-2.7 NCGs-11.7 SOGs-12.5 HVLCs-10.4 Total-37.3	Wood-592.9 NCGs-37.8 Total-630.7	Wood-1,235.2 Total-1,235.2	Wood-42.0 Total-42.0
<b>ppmvd</b>	---	Wood-10.4	Wood-0.3	Wood-139.5	Wood-477.4	Wood-10.3 (as propane)
<b>grains/dscf @ 8% O<sub>2</sub></b>	PM-Wood-0.0195 PM <sub>10</sub> Wood-0.0144	---	---	---	---	---

**Wood/Bark firing rate = 564.0 MM Btu/hr; Exhaust gas flow rate = 135,400 dscfm**

*the firing of natural gas and include any new postings. Propose specific BACT standards for each pollutant.*

**GP's Response to Question No. 3:**

See attached (electronic) BACT analysis

**No. 4 Recovery Boiler:**

**Question No. 4.** *For the request regarding SO<sub>2</sub> emissions from the No. 4 recovery boiler, provide the following information: identify the number of oil burners and the maximum rated capacity of each (vendor specification) in MM Btu/hour and gallons per hour; describe when the fuel oil is fired as a supplemental fuel; identify the emission rate in terms of "ppmvd @ 8% oxygen" that is equivalent to the maximum fuel oil sulfur content (2.35% by weight).*

*Recently issued Permit No. PSD-FL-380 established an SO<sub>2</sub> emissions cap of 153.9 tons per consecutive 12 months. This is approximately 12 ppmvd @ 8% oxygen and 35.1 lb/hour based on an annual average with compliance demonstrated by certified CEMS. In addition, the PSD permit restricts residual oil firing to no more than 7,860,640 gallons during any consecutive 12 months, which represents an annual capacity factor of approximately 10% of the maximum annual heat input rate. The long-term emissions cap and annual fuel restriction recognizes the typically low SO<sub>2</sub> emissions when firing the primary fuel of BLS and that residual oil is typically fired for startup and infrequently as a supplemental fuel.*

*In the current Title V permit, the SO<sub>2</sub> emissions standards are 75 ppmvd @ 8% oxygen and 109.9 lb/hour based on stack testing. The application maintains that these two standards do not correspond and were accepted in a permit in error. The corresponding mass emissions rate for 75 ppmvd @ 8% oxygen should have been 219.8 lb/hour. Therefore, the application proposes to replace the current standards with the following based on compliance by CEMS:*

- a. 150 ppmvd @ 8% oxygen (439.4 lb/hour) based on a 3-hour average, and*
- b. 100 ppmvd @ 8% oxygen (292.8 lb/hour) based on a 24-hour average.*

*To support this proposal, the applicant conducted an air dispersion modeling analysis at the Department's request based on the proposed emissions standards that showed compliance with the Ambient Air Quality Standards and PSD Class II increments for SO<sub>2</sub>. In addition, the application requests that the firing of compliant residual oil (2.35% sulfur by weight) stand as the compliance method during startup, which may last up to 24 hours. To support this proposal, the applicant conducted an air dispersion modeling analysis based on 100% oil firing that showed compliance with the Ambient Air Quality Standards for SO<sub>2</sub>. The following table summarizes the air quality analyses:*

Operation and Averaging Period	No. 4 Recovery Boiler Emissions Rates		AAQS Analysis		PSD Class II Analysis	
			Impact	AAQS	Impact	Increment
	lb/hour	ppmvd @ 8%O <sub>2</sub>	μ/m <sup>3</sup>	μ/m <sup>3</sup>	μ/m <sup>3</sup>	μ/m <sup>3</sup>
Normal Operation						
3-hour	439.4	150	642	1300	152	512
24-hour	292.8	100	197	260	60	91
Annual	35.1	12	33	60	8	20
Startup						
3-hour	1849.2	632.2*	792	1300		
24-hour	1040.6	355.8*	221	260		
Annual	35.1	12	33	60		

\*Verify that these concentrations are approximately equivalent to the mass emissions rates used in the modeling analysis

Does this properly describe the background for this issue, the proposed SO<sub>2</sub> standards and the supporting air quality analyses?

**GP's Response to Question No. 4:** (Part 1 - "identify the number of oil burners and the maximum rated capacity of each (vendor specification) in MM Btu/hour and gallons per hour; describe when the fuel oil is fired as a supplemental fuel; identify the emission rate in terms of "ppmvd @ 8% oxygen" that is equivalent to the maximum fuel oil sulfur content (2.35% by weight).").

The No. 4 Recovery Boiler has eight (8) "load" burners and four (4) "startup" burners. The vendor (Combustion Engineering) flow capacities are identified in the attached drawing (Fuel Piping Schematic E-1-002-624-03) and are summarized in Table 1 below.

	Fuel Oil Flow (gal/hr)	MM Btu/hr (calculated*)	Fuel Oil Flow (gal/hr)	MM Btu/hr (calculated*)
	Per Burner	Per Burner	Combined	Combined
Startup Burners (4 each)	250 @88 psig	37.5	1,000	150
Load Burners (8 each)	480 @80 psig	72	3,840	576

\* assuming 150,000 Btu/gal

No. 6 fuel oil is fired as supplemental fuel on an as-needed basis, primarily during startup and shutdown of the boiler, but also during periods of high steam demand, malfunctions and/or maintenance of the black liquor system, and during other process upsets in order to stabilize boiler operation.

SO<sub>2</sub> Emission Rates During Normal Operation: The data presented in the air quality summary table above for SO<sub>2</sub> emissions during normal operations are a correct representation of the potential-to-emit calculations shown on Page B-38 of Attachment B from the July 2006 PSD permit application for the No. 4 Recovery Boiler and No. 4 Lime Kiln.

Start-up Emission Rates: The 3-hour SO<sub>2</sub> concentration in ppmvd, corrected to 8% oxygen content that is approximately equivalent to 1,849.2 lbs/hr (based on the maximum fuel oil sulfur content of 2.35%) is 631.5 ppmvd as shown in the calculation below:

$$\text{ppmvd} = 1,849.2 \text{ lbs/hr} \times 1,545.6 \text{ ft-lb/lb-n} \cdot ^\circ\text{R} \times 528 \text{ }^\circ\text{R} / 294,000 \text{ dsft}^3/\text{min} \times 2,116.8 \text{ lb/ft}^2 \times 64 \text{ lb SO}_2/\text{lb-n SO}_2 \times 60 \text{ min/hr} = 631.5 \text{ ppmvd}$$

The concentration value of 631.5 ppmvd is approximately equivalent to the SO<sub>2</sub> concentration modeled by Golder & Associates, Inc. as the 3-hour average SO<sub>2</sub> startup emissions rate of 632.2 ppmvd in the air quality analyses summary table shown above. The 3-hour emissions rate of 1,849.2 lbs/hr is based on an approximate fuel oil firing rate of 83.5 gpm of fuel oil with a sulfur content of 2.35% (wt.) as shown below using the emission factor from Table 1.3-1 of AP-42:

$$\text{lbs SO}_2/\text{hr} = 157 \text{ lbs SO}_2/\text{M gal fuel oil} \times 2.35 \times 83.5 \text{ gal/min} \times 60 \text{ min/hr} = 1,848.4 \text{ lbs SO}_2/\text{hr} \sim 1,849.2 \text{ lbs SO}_2/\text{hr}$$

Similarly, the 24-hour SO<sub>2</sub> concentration in ppmvd, corrected to 8% oxygen content that is equivalent to 1,040.6 lbs/hr (based on the maximum fuel oil sulfur content of 2.35%) is 355.35 ppmvd as shown in the calculation below:

$$\text{ppmvd} = 1,040.6 \text{ lbs/hr} \times 1,545.6 \text{ ft-lb/lb-n} \cdot ^\circ\text{R} \times 528 \text{ }^\circ\text{R} / 294,000 \text{ dsft}^3/\text{min} \times 2,116.8 \text{ lb/ft}^2 \times 64 \text{ lb SO}_2/\text{lb-n SO}_2 \times 60 \text{ min/hr} = 355.35 \text{ ppmvd}$$

The concentration value of 355.35 ppmvd is approximately equivalent to the concentration modeled by Golder & Associates, Inc. as the 24-hour average SO<sub>2</sub> startup emissions rate of 355.8 ppmvd in the air quality analyses summary table shown above. The 24-hour emissions rate of 1,040.6 lbs/hr is based on an approximate fuel oil firing rate of 47 gpm of fuel oil with a sulfur content of 2.35% (wt.) as shown below using the emission factor from Table 1.3-1 of AP-42:

$$\text{lbs SO}_2/\text{hr} = 157 \text{ lbs SO}_2/\text{M gal fuel oil} \times 2.35 \times 47 \text{ gal/min} \times 60 \text{ min/hr} = 1,040.4 \text{ lbs SO}_2/\text{hr} \sim 1,040.6 \text{ lbs SO}_2/\text{hr}$$

The slight discrepancies in the calculated SO<sub>2</sub> emissions rates shown above and the concentration values modeled by Golder & Associates are simply due to variations in number rounding performed by GP versus Golder.

$$\left( \frac{157 \text{ lbs SO}_2}{\text{M gal}} \right) \left( \frac{81 \text{ gal}}{\text{min}} \right) \left( \frac{8.2 \text{ lb}}{\text{gal}} \right) \left( \frac{0.0235 \text{ lb S}}{\text{lb}} \right) \left( \frac{2 \text{ lb SO}_2}{5 \text{ lb S}} \right) = 1873.0 \text{ lb SO}_2/\text{hr}$$



**GP's Response to Question No. 4:** (Part 2 – “Does this properly describe the background for this issue, the proposed SO<sub>2</sub> standards and the supporting air quality analyses?”).

In GP's previous response of May 25, 2007, we requested that the firing of compliant fuel oil stand as the short-term compliance method not only during startup periods, but “during periods when fuel oil is burned, such as start ups, shutdowns, malfunctions and other temporary upset or maintenance situations...” In that response, GP also proposed a maximum short-term (3-hour) oil firing rate of 84 gpm, which also approximates the maximum 3-hour startup mass emissions rate in the air quality analysis shown above. This proposed value was estimated conservatively based on historical maximum rates during startup. However, based on the actual burner specifications in table 1 above, the maximum capacity is 81 gpm which will provide adequate margin of compliance with the short-term AAQS. A 3-hour limit on firing rate will not be necessary.

**Question No. 5.** *Based on current CEMS data, what are maximum measured SO<sub>2</sub> emissions from the No. 4 recovery boiler when firing only BLS? The Department is considering separate standards for BLS firing and oil firing. When oil is used to supplement BLS, the standards would be prorated based on the heat input from each fuel.*

**GP's Response to Question No. 5:**

GP has conducted a review of 2007 SO<sub>2</sub> hourly CEMs data (excluding periods of boiler startup, shutdown, malfunctions, downtime) inclusive only of hours when the #4 Recovery Boiler was burning black liquor >3 MM lbs/day, and burning no significant (<5 gpm) fuel oil. The resulting data included 2700 hours and hourly maximum SO<sub>2</sub> concentrations (corrected to 8% O<sub>2</sub>) up to 21 ppmvd, although the average was <1 ppmvd (corrected to 8% O<sub>2</sub>).

GP is receptive to DEP's consideration of separate standards for fuel oil and BLS, but would prefer not to have a prorated concentration-based standard for periods when the fuels are burned in combination. This would present an onerous burden for the Mill by requiring the calculation of a pro-rated SO<sub>2</sub> standard at all times when the boiler is burning a combination of black liquor and No. 6 fuel oil, dependent upon the heat input ratio of the fuels. The 3-hour and 24-hour SO<sub>2</sub> standards (150 ppmvd and 100 ppmvd) proposed for normal operation will be sufficient for determining compliance during most operating conditions including BLS firing supplemented with fuel oil. During startup, shutdown, and other periods when fuel oil is fired in the absence of or with minimal BLS, the proposed standards for startup conditions (3-hour avg. of 632 ppmvd and 24-hour avg. of 356 ppmvd) should apply. As a back-up to the short-term concentration based limits, GP also requests the flexibility to prove compliance with the associated short-term mass (lb/hr) limits based on actual fuel oil usage and sulfur content, as is the case currently with the #5 power boiler and the #4 combination boiler. This is important because, during startup conditions of high stack O<sub>2</sub> (17-20%), the CEMS O<sub>2</sub>-corrected SO<sub>2</sub>

concentration is increased by a factor of 3 to 6 times and does not correctly predict the mass emissions rate, which is the critical factor. The actual SO<sub>2</sub> mass emissions from fuel oil can readily be calculated if the concentration limit becomes an issue. Of course, the annual SO<sub>2</sub> limit will be unchanged, regardless of fuel mix.

GP spent a significant amount of time developing these proposed standards, with DEP's guidance, and proved through dispersion modeling that the No. 4 Recovery Boiler would not cause an exceedance of any of the time-weighted SO<sub>2</sub> NAAQS standards when complying with these limits.

If there are any questions regarding this response, please do not hesitate to contact Mike Curtis at (386) 329-0918.

I, the undersigned, am the responsible official of the source for which this document is being submitted. I hereby certify, based on the information and belief formed after reasonable inquiry, that the statements made and the data contained in this document are true, accurate, and complete.

Sincerely,

A handwritten signature in cursive script that reads "Keith Wahoske".

Keith W. Wahoske, Vice-President  
Palatka Operations

cc: W. Galler, T. Champion, T. Wyles, S. Matchett, R. Reynolds, M. Curtis - GP



5-1406

Palatka Pulp and Paper Operations  
Consumer Products Division

P.O. Box 919  
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JUN 01 2007

May 25, 2007

BUREAU OF AIR REGULATION

Mr. Jeffery F. Koerner, Air Permitting North Section  
Bureau of Air Regulation  
Florida Department of Environmental Protection  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

RECEIVED

JUN 01 2007

BUREAU OF AIR REGULATION

**Re: Project No. 1070005-038-AC PSD-FL-380**  
**Modification of the No. 4 Recovery Boiler, No. 4 Lime Kiln and No. 4 Combination Boiler**  
**Response to Request for Additional Information No. 3**

Dear Mr. Koerner:

We are in receipt of your request for additional information, dated December 15, 2006, regarding our PSD permit application project to make modifications to the No. 4 Recovery Boiler, No. 4 Lime Kiln, and No. 4 Combination Boiler.

This response addresses question number 5 of the Department's December 15, 2006 request for additional information. A response to questions 2, 6 (second response) and 7 was submitted to FDEP on January 31, 2007. A response to questions 1, 3, 4 and 6 (second response) was submitted to FDEP on March 9, 2007.

Additionally, this response seeks relief from the short-term Recovery Boiler SO<sub>2</sub> limits while burning fuel oil, a concern voiced by GP in a conference call with FDEP on May 4, 2007.

For ease of following GP's responses, we have repeated the FDEP's questions prior to the answers.

#### No. 4 Combination Boiler

- Based on your submittals, the Department believes several of the identified NO<sub>x</sub> control options are likely cost effective including selective non-catalytic reduction (SNCR), the Ecotube system with urea injection, and flue gas recirculation (FGR). These controls have been successfully installed on similar units. The Department's review focused on the SNCR system, which has been successfully installed and operated on several units in Florida including RDF boilers, wood-fired boilers, and bagasse-fired boilers. However, both the Ecotube with urea injection and flue gas recirculation (FGR) may also be able to provide similar reductions with comparable

costs.

**SNCR:** The preliminary SNCR design was based on the co-firing of residual oil with a maximum fuel sulfur content of 2.5% by weight. When the fuel sulfur content is above approximately 1.5% by weight, the vendor indicates that a critical design constraint is to substantially limit the ammonia slip to prevent the formation of ammonium bisulfates, which can foul boiler heat transfer surfaces. With regard to the SNCR design, this will likely result in more injectors, additional injector levels, restricted urea injection rates, and reduced control efficiencies. Although the vendor indicated a reduction of 35% in the bid for the primary fuel scenario (bark/oil), the cost effectiveness estimate was based upon only 30% reduction. Existing biomass-fired boilers are achieving control efficiencies of up to 50% reduction. Will the No. 4 Combination Boiler fire bark/wood alone without other fuels? Please provide a vendor quote on equipment and installation costs for an SNCR system firing bark/wood alone and firing bark/wood with oil having a maximum fuel sulfur content of less than 1.0%. Please include the input criteria for the bid, the expected control efficiencies, and the urea injection rate.

**Ecotube Plus Urea Injection:** The estimated cost effectiveness for this system is actually lower than that estimated for SNCR. In addition, the vendor indicates co-benefits for reducing CO emissions, which is also subject to a BACT determination for this project. Please provide the vendor quote used for the Ecotube system with/without urea injection including the input criteria, estimated installation costs, control efficiencies, and urea injection rate.

**FGR:** When combined with air staging, flue gas recirculation (FGR) has achieved control efficiencies approaching 50% reduction for similar units depending on initial uncontrolled NO<sub>x</sub> emissions rates. Please provide the vendor quote for the FGR system including the input criteria, estimated installation costs, and control efficiency.

Provide a revised cost effectiveness analysis (\$/ton NO<sub>x</sub> removed) for each of these controls options and identify the most cost effective option.

The project identifies the following physical modifications to the No. 4 Combination Boiler: modified conveyors; new air swept bark distributors; a new overfire air (OFA) system; new low-NO<sub>x</sub> burners (LNB); and possibly new baffles to more evenly distribute the underfire air. The primary purpose for these modifications is to improve combustion of the bark/wood fuel and the overall burning rate of this fuel to reduce oil firing. Such changes will affect pollutant emissions, which could affect the design of the control systems. For the selected NO<sub>x</sub> control option, provide a schedule and comments regarding the following: commencement through completion of the boiler modifications, boiler shakedown; performance and emissions testing after completing the boiler modifications; development and final design of the NO<sub>x</sub> control system; commencement through completion of installing the NO<sub>x</sub> control system; initial startup and shakedown after completing the NO<sub>x</sub> control system; equipment shakedown and tuning; initial compliance testing; and monitor certification.

**Answer:** On Friday, May 4, 2007, a telephone conference call was held between Bruce Mitchell and Jeff Koerner of FDEP and Mike Curtis, Ron Reynolds, Wayne Galler, and Mark Aguilar of GP to discuss NO<sub>x</sub> control options for the No. 4 Combination Boiler. As discussed during the

telephone conversation, since the time that the PSD permit application for the No. 4 Combination Boiler was submitted by Golder & Associates (for GP) to FDEP in July 2006, GP has obtained new and more accurate cost data to install an SNCR system for the reduction of NO<sub>x</sub> emissions from the No. 4 Combination Boiler. The new cost data was prepared by Jacobs Engineering of Greenville, South Carolina in November 2006, and was prepared as part of their contract work for GP to estimate control system costs for the BART requirements. Jacob's cost estimate for installation of an SNCR system for the No. 4 Combination Boiler was based on a +/- 30% accuracy, but Jacob's cost estimate contains much more detail than the one prepared by Golder & Associates for the July 2006 PSD permit application. A copy of Jacob's cost estimate is attached to this submittal as Attachment 1. The basis for Jacob's cost estimate is attached to this submittal as Attachment 2.

Utilizing Jacob's cost data for installation of an SNCR system and Golder's cost effectiveness calculation spreadsheet (Table 5-10) contained in the July 2006 PSD permit application, the cost effectiveness for use of an SNCR system supplied by Fuel-Tech, Inc. would be \$7,848/ton NO<sub>x</sub> removed. This is much higher than the cost effectiveness value of \$5,419/ton NO<sub>x</sub> removed reported in Table 5-10 of Golder's July 2006 PSD permit application. The baseline emissions used in Table 5-10 was 356.1 tons of NO<sub>x</sub>, which is based on a "post-BART" NO<sub>x</sub> emission rate of 0.22 lbs NO<sub>x</sub>/MM Btu heat input. Previous conversations between Mark Aguilar of GP and FDEP resulted in an agreement that the baseline period for this analysis may consider the expected controls that would be in place for the No. 4 Combination Boiler. FDEP reaffirmed this agreement during the May 4<sup>th</sup> telephone discussion with GP. The basis for the 0.22 lb NO<sub>x</sub>/MM Btu heat input value comes from a performance guarantee provided to GP by Jansen Combustion and Boiler Technologies, Inc. for the No. 4 Combination Boiler (dated January 26, 2007, Revision 2-see Section 9.3.2 of Attachment 3). The emissions guarantee is based on the No. 4 Combination Boiler firing a combination of bark and natural gas over an eight-hour test period. The 0.22 lb/MM Btu value assumes the use of low-NO<sub>x</sub> gas-fired burners and an overfire air system.

GP does not believe a value of almost \$8,000 per ton of NO<sub>x</sub> removed for an SNCR system is a cost effective approach for reducing NO<sub>x</sub> emissions from the No. 4 Combination Boiler.

GP has not provided a cost effectiveness analysis for the use of an SNCR system for the No. 4 Combination Boiler burning a combination of bark and No. 6 Fuel Oil since it is not the Mill's intent to burn No. 6 fuel oil in the boiler under the future operating scenario. It is the Mill's intent to burn a combination of bark and natural gas in the No. 4 Combination Boiler under the future operating scenario.

Regarding the FDEP's question about whether or not the No. 4 Combination Boiler can burn 100% bark, the answer is rarely. Fuel oil is expensive and we certainly want to burn as much wood fuel as we can in the Combination Boiler. However, we generally must also burn fuel oil to meet the steam/energy needs of the mill. Even when fuel oil is not necessarily needed to supplement the BTUs from bark/wood fuel, some minimal amount of fuel oil is burned as a safety measure to protect against tripping the boiler, and perhaps shutting down the mill, in case of a malfunction in the wood fuel feed system.

Regarding the Ecotube technology offered by Synterprise LLC, GP does not believe the NO<sub>x</sub> emission reductions obtained with biomass boilers operated by certain Utilities in the northeast

United States are attainable for the No. 4 Combination Boiler. The Ecotube system has primarily been installed on waste to energy boilers and on larger biomass fired boilers which typically had operated in an excess oxygen range of 6% to 10%. NO<sub>x</sub> formation is highly dependant on proper fuel-air mixing as well as time and temperature of the reaction. The amount of excess oxygen in the furnace affects flame temperatures and amount of elemental nitrogen (N<sub>2</sub>) present for NO<sub>x</sub> formation as the higher the percent excess oxygen, the higher the NO<sub>x</sub> will be in general, due to higher flame temperatures and additional N<sub>2</sub> present in the air for conversion to NO<sub>x</sub>. Inversely, as excess oxygen is reduced to levels closer to sub-stoichiometric rates, flame temperatures are reduced, therefore, the amount of N<sub>2</sub> available is reduced, and a slight reducing atmosphere is created, thereby lowering NO<sub>x</sub> emissions.

In reviewing the operations of the No. 4 Combination Boiler, which normally has an excess oxygen content of 4% on a dry basis, the estimated reduction efficiency for NO<sub>x</sub> would be in the 15% range; a review of Ecotube's proposal to GP (E-mail from Bill Buckley of Synterprise to Rob Orender of GP, dated December 22, 2005-see Attachment 4, page 2, second to last paragraph), Synterprise stated that they would expect a 20% reduction in NO<sub>x</sub> emissions. This unit also has 6 burners which utilize air to keep the burners cool while they are out-of-service. This excess air is not effectively utilized in the combustion process and thereby can contribute to higher than expected NO<sub>x</sub> emissions.

Synterprise's available references for NO<sub>x</sub> emissions before and after Ecotube technology installations consist of two sites in Europe with NO<sub>x</sub> reductions and oxygen levels which are listed below:

	% Oxygen Before	% Oxygen After	NO <sub>x</sub> (ppm) Before	NO <sub>x</sub> (ppm) After	% Reduction
Karlskoga	6.0	4.0	130	60	53.8
Kristineheds	6.0	3.0	430	130	69.8

The Karlskoga site used the Ecotube system and limestone for NO<sub>x</sub> emissions controls and the Kristineheds site utilized Ecotube as well as a urea-based de-NO<sub>x</sub> system.

In order to obtain a guaranteed NO<sub>x</sub> reduction value for the No. 4 Combination Boiler from Synterprise, GP would need to pay an estimated \$35,000 fee for a modeling study to be performed by Synterprise. Based on what we know about the Ecotube technology and the operation of the No. 4 Combination Boiler, GP does not think it would be wise to spend the \$35,000 modeling fee with an expectation of only a 15-20% NO<sub>x</sub> reduction. We believe that the performance guarantee from Jansen Combustion and Boiler Technologies, Inc. of 0.22 lb/MM Btu is approximately equivalent to a 15-20% overall NO<sub>x</sub> reduction. The baseline NO<sub>x</sub> emissions from the No. 4 Combination Boiler prepared by Golder & Associates in Table 5-10 of the PSD permit application was 0.27 lb/MM Btu for fuel oil and 0.24 lb/MM Btu for bark. The 0.27 lb/MM Btu value for fuel oil combustion incorporated a 15% reduction with the use of low-NO<sub>x</sub> burners, so the uncontrolled NO<sub>x</sub> emission rate was equal to 0.31 lb/MM Btu. The actual NO<sub>x</sub> reduction achieved by incorporating the modifications required by Jansen to meet their performance guarantee for the No. 4 Combination Boiler will depend upon the fuel mix of bark and natural gas. However, just by switching fuel from No. 6 fuel oil to natural gas, the overall average emission factor changes by a minimum of 12% (by dropping from an average of 0.25 lbs NO<sub>x</sub>/MM Btu to 0.22 lbs/MM Btu). GP expects the actual NO<sub>x</sub> emission rate to be lower than

0.22 lbs/MM Btu when burning gas and bark, therefore, the actual NO<sub>x</sub> reduction achieved by the No. 4 Combination Boiler should be greater than 12%.

Regarding the final selection of the NO<sub>x</sub> control system for the No. 4 Combination Boiler and the control system installation schedule, GP offers the following information:

GP proposes to install a new overfire air system as the selected NO<sub>x</sub> control option for the initial phase of the modification to begin in November 2006. A second phase will proceed with the installation of low-NO<sub>x</sub> burners when the additional natural gas supply is made available by the local utility, which we are told could take up to two years. Shakedown of the boiler is anticipated to require up to 60 days after which initial compliance stack testing will be completed within the usual 60 days of achieving permitted capacity, but not later than 180 days after startup.

#### **No. 4 Recovery Boiler**

GP seeks relief from the short-term SO<sub>2</sub> limits while burning fuel oil, a concern that was also discussed in the conference call with FDEP on May 4, 2007.

**Comment:** GP has no objection to the Recovery Boiler SO<sub>2</sub> limitation of 153.9 tons per year (12-month rolling total) based on CEMS data. However, GP requests the following language be added in order to provide relief during periods of fuel oil firing from the current short term SO<sub>2</sub> limits of 75 ppm and 109.9 lb/hr:

*"During periods when fuel oil is burned, such as start ups, shutdowns, malfunctions, and other temporary upset or maintenance situations, SO<sub>2</sub> emissions shall be limited only by the sulfur content (2.35%) of the fuel oil and a maximum fuel oil firing rate of 84 GPM."*

**Discussion:** The current SO<sub>2</sub> limit, as represented in the Title V permit 1070005-031-AV, condition E.7., states that "Sulfur Dioxide Emissions shall not exceed 75 ppmvd at 8% O<sub>2</sub>; 109.9 lb/hr, and 481.4 TPY based on an average of three test runs"...etc. The proposed draft permit PSD-FL-380 lowers the annual SO<sub>2</sub> limit to 153.9 TPY based on a 12-month rolling CEMS total. GP has concerns regarding the short term limits of 75 ppm and 109.9 lbs/hr during startup, shutdown, malfunction, and other temporary situations when fuel oil must be burned at much higher than normal rates. The Title V permit language clearly states that the limits apply during stack testing conditions, which would typically involve near-maximum black liquor firing rates and very low or no fuel oil. However, if the old short-term limits are to be incorporated into the Title V with the proposed CEMS monitoring scheme then compliance will be impossible during the identified situations requiring high fuel oil use.

During periods of startup, shutdown, malfunction, maintenance on the black liquor system, and process upsets, fuel oil must be burned for periods lasting from several hours to as much as 24 hours at much higher rates than during normal operation. During startup, the boiler must be fired on fuel oil until the furnace is hot enough to sustain combustion of black liquor. Then, the fuel oil guns gradually reduce the amount of fuel oil that is fired while the black liquor guns are added one-by-one until the boiler is stabilized on 100% black liquor. During shutdown periods, fuel oil is burned to burn the smelt bed out of the bottom of the Recovery. Maintenance work on the black liquor feed system may also necessitate burning only fuel oil in order to maintain steam.



Fuel oil may also be burned at higher than normal rates during process upsets or malfunction situations to maintain steam and stabilize the boiler until normal operation can be achieved. The suggested startup/shutdown/malfunction fuel oil firing rate of 84 gpm, and the resulting SO<sub>2</sub> emissions, was accounted for in short-term air modeling that was performed and submitted to the FL DEP in 2006, indicating compliance with the short-term SO<sub>2</sub> NAAQS standards. Therefore, GP proposes that incorporation of the suggested permit language will be sufficiently protective of air quality and allow needed operational flexibility while maintaining compliance.

If there are any questions regarding this response, please do not hesitate to contact Mike Curtis at 386-329-0918.

I, the undersigned, am the responsible official of the source for which this document is being submitted. I hereby certify, based on the information and belief formed after reasonable inquiry, that the statements made and the data contained in this document are true, accurate, and complete.

Sincerely,

A handwritten signature in cursive script that reads "Keith Wahoske".

Keith W. Wahoske, Vice-President  
Palatka Operations

cc: W. Galler, T. Champion, T. Wyles, S. Matchett, R. Reynolds, M. Curtis - GP

**TABLE 5-10  
COST EFFECTIVENESS OF SNCR SYSTEM  
FOR NO. 4 COMBINATION BOILER, GP PALATKA MILL**

Cost Items	Cost Factors <sup>a</sup>	Cost (\$)
<b>DIRECT CAPITAL COSTS (DCC):</b>		
Purchased Equipment Cost (PEC)		
SNCR Basic Process	Vendor quote <sup>b</sup>	\$875,000
NO <sub>x</sub> OUT Storage Tank	10,000 gallon; included in vendor quote	--
Emissions Monitoring	15% of equipment cost	\$131,250
Foundation and Structure Support	8% of equipment cost	\$70,000
Freight	Vendor quote <sup>b</sup>	\$12,000
Taxes	Florida sales tax, 6%	\$52,500
<b>Total PEC:</b>		<b>\$1,140,750</b>
Direct SNCR Installation	GP vendor quotes for similar boiler: 70% of basic	\$753,375
<b>Total DCC:</b>		<b>\$1,894,125</b>
<b>INDIRECT CAPITAL COSTS (ICC):</b>		
Air and Water Piping	Based on GP Engineering Estimate	\$50,000
Electrical and Controls	Based on GP Engineering Estimate	\$50,000
Performance testing	Based on GP Engineering Estimate	\$100,000
Engineering and Supervision	Portion performed by GP (5% of Total DCC)	\$94,706
Modeling	Included in vendor quote	--
Start-up and Optimization Service	Included in vendor quote	--
Temperature monitoring	Based on Engineering Estimate	\$45,000
Operation and Maintenance Manuals (5)	Included in vendor quote	--
General Facilities	5% of DCC	\$94,706
Engineering and home office fees	10% of DCC	\$189,413
Process Contingency	5% of DCC	\$94,706
<b>Total ICC:</b>		<b>\$718,531</b>
PROJECT CONTINGENCY (RETROFIT):	30% of (DCC + ICC)	\$783,797
<b>TOTAL CAPITAL INVESTMENT (TCI):</b>	<b>DCC + ICC + PROJECT CONTINGENCY</b>	<b>\$4,267,000</b>
<b>DIRECT OPERATING COSTS (DOC):</b>		
(1) Operating Labor		
Operator	2 hours/week, \$16/hr, 52 weeks/yr	\$1,664
Supervisor	15% of operator cost	\$250
(2) Maintenance	1.5% of TCI	\$64,005
(3) NO <sub>x</sub> -OUT solution cost	18 gal/hr, \$1.45/gal <sup>c</sup> , 80% C.F.	\$182,909
(4) Electricity	66 kW, \$0.08/kW-hr, 80% C.F.	\$37,002
(5) Water	520 gph; \$0.0064/ga, 80% C.F.	\$2,332
(6) Fuel- bark/wood (loss in efficiency)	1 MM Btu/yr, \$3/MM Btu, 80% C.F.	\$21,024
<b>Total DOC:</b>		<b>\$309,186</b>
<b>INDIRECT OPERATING COSTS (IOC):</b>		
Overhead	30% of oper. labor & maintenance	\$19,776
Property Taxes	0.5% of total capital investment	\$21,335
Insurance	1% of total capital investment	\$42,670
Administration	1% of total capital investment	\$42,670
<b>Total IOC:</b>		<b>\$126,451</b>
CAPITAL RECOVERY COSTS (CRC):	CRF of 0.09439 times TCI (20 yrs @ 7%)	\$402,762
<b>ANNUALIZED COSTS (AC):</b>	<b>DOC + IOC + CRC</b>	<b>\$838,399</b>
BASELINE NO <sub>x</sub> EMISSIONS (TPY) :	Bark-avg of 2004/2005 = 2,563,380 MM Btu	356.1 <sup>d</sup>
	Oil-avg of 2004/2005 = 673,878 MM Btu	
	0.22 lb/MMBtu for natural gas and for bark	
MAXIMUM NO <sub>x</sub> EMISSIONS w/SNCR (TPY) :	0.22 lb/MM for bark (4,042,127 MM Btu/yr)	444.6
	0.22 lb/MM Btu for natural gas (750,000 MM Btu)	82.5
	Total NO <sub>x</sub> future	527.1
REDUCTION IN NO <sub>x</sub> EMISSIONS (TPY):	30% reduction from baseline <sup>e</sup>	106.8
<b>COST EFFECTIVENESS:</b>	<b>\$ per ton of NO<sub>x</sub> Removed</b>	<b>\$7,848</b>

Footnotes:

<sup>a</sup> Unless otherwise specified, factors and cost estimates reflect EPA Air Pollution Cost Control Manual, Sixth Edition (EPA/452/B-02-001, Jan. 2002).

<sup>b</sup> NO<sub>x</sub>OUT SNCR NO<sub>x</sub> Reduction System Proposal, Fuel Tech, Inc., January 5, 2006.

<sup>c</sup> NO<sub>x</sub>OUT solution cost based on actual cost incurred by U.S. Sugar Corporation for their SNCR system, as of January 2006.

<sup>d</sup> Based on bark average usage of 284,820 tons/yr @ 4,500 Btu/lb; fuel oil average usage of 4,492,520 gal/yr @ 150,000 Btu/gal  
Bark = 2,563,380 MM Btu/yr and oil = 673,878 MM Btu/yr for a total of 3,237,258 MM Btu/yr  
NO<sub>x</sub> = baseline of 0.22 lb/MM Btu (after BART controls in place) or 356.1 tons/yr

<sup>e</sup> 30% NO<sub>x</sub> reduction was used as this was an average of the different fuel firing scenarios.

35% NO<sub>x</sub> reduction for bark/wood and 25% on fuel oil-bottom of Page 5-14 in July 2006 PSD application

Note: Natural gas will replace the Btu content of oil burned in the No. 4 Combination Boiler in the future

**ATTACHMENT I**

TOTAL COST SUMMARY - JE PRIME CODE



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 14DC0000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (H-30%)  
 G:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\14DC0000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\14DC0000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR\_R1.xls\PRIME

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

PRIME CODE	DESCRIPTION	W-H	QTY	UNIT	LABOR	EQUIPMENT	MATERIAL	SUBCONTRACT	TOTAL COST
<b>DIRECT COSTS</b>									
50	MAJOR EQUIPMENT	1,699	0	0	\$92,082	\$1,022,900	\$15,344	\$0	\$1,130,305
51	DEMOLITION	469	0	0	\$25,432	\$0	\$0	\$0	\$25,432
52	SITE EARTHMOVING	0	0	0	\$0	\$0	\$0	\$0	\$0
53	SITE IMPROVEMENTS	0	0	0	\$0	\$0	\$0	\$56,515	\$56,515
54	PILING, CAISSONS	0	791	LF	\$0	\$0	\$0	\$79,121	\$79,121
55	BUILDINGS	0	1	LOT	\$0	\$0	\$0	\$80,000	\$80,000
56	CONCRETE	369	31	CY	\$16,955	\$0	\$16,955	\$0	\$33,909
57	MASONRY, REFRACTORY	0	0	0	\$0	\$0	\$0	\$0	\$0
58	STRUCTURAL STEEL	1,353	39	TN	\$67,818	\$0	\$135,637	\$0	\$203,455
59	ROOFING AND SIDING	0	0	0	\$0	\$0	\$0	\$0	\$0
60	FIRE PROOFING	0	0	0	\$0	\$0	\$0	\$0	\$0
61	PROCESS DUCTWORK (NON-BUILDING)	0	0	0	\$0	\$0	\$0	\$0	\$0
62	PIPING	1,669	556	LF	\$90,424	\$0	\$101,727	\$0	\$192,152
63	INSULATION - PIPE, EQUIPMENT & DUCTWORK	1,108	1	LOT	\$50,884	\$0	\$0	\$50,884	\$101,727
64	INSTRUMENTATION	111	6	EA	\$5,652	\$11,303	\$11,303	\$0	\$28,258
65	ELECTRICAL	550	2,200	LF	\$27,941	\$93,615	\$45,212	\$0	\$166,768
69	PAINTING, PROTECTIVE COATINGS	123	0	0	\$5,652	\$0	\$5,652	\$0	\$11,303
67	FURNITURE, LAB & SHOP EQUIPMENT	0	0	0	\$0	\$0	\$0	\$0	\$0
<b>TOTAL DIRECT COSTS</b>		<b>7,452</b>			<b>\$382,799</b>	<b>\$1,127,818</b>	<b>\$331,829</b>	<b>\$256,500</b>	<b>\$2,108,946</b>
	\$ / WH	\$51.37							
<b>CONSTRUCTION INDIRECT COSTS</b>									
75	CONSTRUCTION SUPPORT LABOR	1,490			\$60,408	\$0	\$0	\$0	\$60,409
76	TEMPORARY CONSTRUCTION FACILITIES (IN WAGE RATES)				\$0	\$0	\$0	\$0	\$0
78	PREMIUM TIME				\$23,854	\$0	\$0	\$0	\$23,394
79	CRAFT FRINGE BENEFITS (IN WAGE RATES)				\$0	\$0	\$0	\$0	\$0
	CRAFT PER DIEM (\$7 PER HOUR ON 100 % OF THE HOURS)				\$0	\$0	\$0	\$62,601	\$62,601
80	PAYROLL TAXES & INSURANCE (IN WAGE RATES)				\$0	\$0	\$0	\$0	\$0
83	SMALL TOOLS (IN WAGE RATES)				\$0	\$0	\$0	\$0	\$0
84	CONSUMABLE SUPPLIES (IN WAGE RATES)				\$0	\$0	\$0	\$0	\$0
85	CONSTRUCTION EQUIPMENT (IN WAGE RATES)				\$0	\$0	\$0	\$0	\$0
87	FIELD STAFF (IN WAGE RATES)				\$0	\$0	\$0	\$0	\$0
01	NON-PAYROLL TAX, INSURANCE & PERMITS				\$0	\$73,308	\$21,569	\$8,661	\$103,538
93	CONSTRUCTION HOME OFFICE COST (INC. WITH CONTRACTOR'S CONSTRUCTION FEE)				\$0	\$0	\$0	\$0	\$0
71	CRAFT START-UP ASSISTANCE	450			\$33,300	\$0	\$0	\$0	\$33,300
99	CONTRACTOR'S CONSTRUCTION HOME OFFICE & FEE		10.0%	TCC LESS EQ.	\$46,597	\$0	\$53,010	\$33,776	\$132,382
<b>TOTAL CONSTRUCTION INDIRECT COSTS</b>		<b>1,940</b>			<b>\$162,659</b>	<b>\$73,308</b>	<b>\$74,579</b>	<b>\$105,039</b>	<b>\$415,584</b>
<b>TOTAL CONSTRUCTION COSTS (TCC)</b>		<b>9,393</b>			<b>\$545,458</b>	<b>\$1,201,126</b>	<b>\$406,407</b>	<b>\$371,539</b>	<b>\$2,524,531</b>
	\$ / WH	\$73.57							
<b>PROJECT INDIRECT COSTS</b>									
88	CONSTRUCTION MANAGEMENT		4.5%	TIC	\$0	\$0	\$0	\$192,798	\$192,798
90	ENGINEERING PROFESSIONAL SERVICES		10.0%	TIC	\$0	\$0	\$0	\$424,953	\$424,953
90	STUDY COST				\$0	\$0	\$0	\$50,000	\$50,000
96	OUTSIDE CONSULTANT SERVICES				\$0	\$0	\$0	\$100,000	\$100,000
91	OWNER'S COST		3.0%	TIC	\$0	\$0	\$0	\$128,928	\$128,928
70	SPARE PARTS				\$0	\$58,391	\$0	\$0	\$58,391
71	NON-CRAFT START-UP ASSISTANCE				\$48,950	\$0	\$0	\$69,200	\$118,150
98	ALLOWANCE FOR UNFORESEEN		0.3%	TIC	\$59,541	\$125,752	\$40,641	\$129,742	\$354,675
98	ESCALATION		5.0%	TIC	\$0	\$125,752	\$58,102	\$33,483	\$215,418
	AIR INFILTRATION ALLOWANCE				\$0	\$0	\$0	\$100,000	\$100,000
	ROUND OFF				\$52	(\$21)	(\$231)	\$357	\$167
<b>TOTAL PROJECT COSTS</b>		<b>9,393</b>			<b>\$655,000</b>	<b>\$1,509,000</b>	<b>\$503,000</b>	<b>\$1,600,000</b>	<b>\$4,267,000</b>
	\$ / WH	\$73.97							



DETAIL DIRECT COST

JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
CLIENT: GEORGIA PACIFIC  
LOCATION: PALATKA, FLORIDA  
JOB NUMBER: 16DC0000  
CONSTRUCTION DURATION: TBD  
ESTIMATE TYPE: CLASS 5 (+/- 30%)  
G:\ESTIMAT\GEORPAC\FLORIDA\PALATKA\16DC0000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC0000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR\_R1.xls\PRIME CODE TCS

ESTIMATE DATE: 11/27/06  
REVISION NO.: 1  
ESTIMATOR: WSJ  
PROJECT MGR: LELAND HENSON  
EST. FILE #: 00212

LINE NO.	JE PRIME CODE	01 PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR DESCRIPTION	QTY.	UNIT	W.H/ UNIT	TOTAL W.H.	COST/ W.H.	TOTAL DIRECT LABORS	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	UNIT COST	TOTAL ALL COSTS
<b>DIRECT COST - DETAILS</b>																
<b>MAJOR EQUIPMENT</b>																
3	50	FUEL TECH SNCR SYSTEM	1	LOT	1,350.00	1,350	\$54.17	\$73,131	\$875,000	\$875,000	\$0.00	\$0	\$0.00	\$0	\$948,131	\$948,131
4	50	LEVEL 1 NOZZLES (WITH RETRACTABLE LANCES)	6	EA	INCLUDED	0	\$54.17	\$0	INCL.	\$0	\$0.00	\$0	\$0.00	\$0	\$0	\$0
5	50	RETRACTABLE NOZZLES	6	EA	INCLUDED	0	\$54.17	\$0	INCL.	\$0	\$0.00	\$0	\$0.00	\$0	\$0	\$0
6	50	LEVEL 2 NOZZLES (FIXED POSITION NOZZLES)	3	EA	INCLUDED	0	\$54.17	\$0	INCL.	\$0	\$0.00	\$0	\$0.00	\$0	\$0	\$0
7	50	DISTRIBUTION SKIDS	2	EA	INCLUDED	0	\$54.17	\$0	INCL.	\$0	\$0.00	\$0	\$0.00	\$0	\$0	\$0
8	50	METERING SKID	1	EA	INCLUDED	0	\$54.17	\$0	INCL.	\$0	\$0.00	\$0	\$0.00	\$0	\$0	\$0
11	50	PUMPING SKID	1	EA	INCLUDED	0	\$54.17	\$0	INCL.	\$0	\$0.00	\$0	\$0.00	\$0	\$0	\$0
16	50	UREA STORAGE TANK - 10' DIAMETER X 12' HIGH	1	EA	100.00	100	\$54.17	\$5,417	\$14,000	\$14,000	\$0.00	\$0	\$0.00	\$0	\$19,417	\$19,417
17	50	DIKE	1	EA	IN CONCRETE	0	\$54.17	\$0	\$0	\$0	IN CONCRETE	\$0	\$0.00	\$0	\$0	\$0
18	50	LADDER	1	EA	8.00	8	\$54.17	\$433	\$1,000	\$1,000	\$0.00	\$0	\$0.00	\$0	\$1,433	\$1,433
20	50	PIPING FROM UREA STORAGE TANK TO METERING SKID	1	LOT	IN PIPING	0	\$54.17	\$0	\$0	\$0	IN PIPING	\$0	\$0.00	\$0	\$0	\$0
21	50	PIPING FROM METERING SKID TO PUMPING SKID	1	LOT	IN PIPING	0	\$54.17	\$0	\$0	\$0	IN PIPING	\$0	\$0.00	\$0	\$0	\$0
22	50	PIPING FROM PUMPING SKID TO DISTRIBUTION SKIDS	1	LOT	IN PIPING	0	\$54.17	\$0	\$0	\$0	IN PIPING	\$0	\$0.00	\$0	\$0	\$0
24	50	NEW AIR COMPRESSOR	1	EA	200.00	200	\$54.17	\$10,834	\$75,000	\$75,000	\$0.00	\$0	\$0.00	\$0	\$85,834	\$85,834
29	50	FREIGHT	1	LOT	N/A	0	\$54.17	\$0	\$57,900	\$57,900	\$0.00	\$0	\$0.00	\$0	\$57,900	\$57,900
30	50	SHIMS AND GROUT	1	LOT	41.45	41	\$54.17	\$2,245	\$0	\$0	\$15,344	\$15,344	\$0.00	\$0	\$17,589	\$17,589
35	50	<b>TOTAL - MAJOR EQUIPMENT</b>				1,699	\$54.17	\$92,062		\$1,022,900		\$15,344	\$0		\$1,130,305	
<b>DEMOLITION</b>																
51	51	FACTORED FROM INSTALLED PROCESS EQUIPMENT COST	1	LOT	468.47	469	\$54.17	\$25,432	\$0	\$0	\$0	\$0	\$0	\$0	\$25,432	\$25,432
51	51	<b>TOTAL - DEMOLITION</b>				469	\$54.17	\$25,432		\$0		\$0	\$0		\$25,432	
<b>SITE IMPROVEMENTS</b>																
53	53	FACTORED FROM INSTALLED PROCESS EQUIPMENT COST	1	LOT	0.00	0	\$45.91	\$0	\$0	\$0	\$0	\$0	\$56,515	\$56,515	\$56,515	\$56,515
53	53	<b>TOTAL - SITE IMPROVEMENTS</b>				0	\$0.00	\$0		\$0		\$0		\$56,515	\$56,515	
<b>PILING, CAISSONS</b>																
54	54	FACTORED FROM INSTALLED PROCESS EQUIPMENT COST	1	LOT	0.00	0	\$45.91	\$0	\$0	\$0	\$0	\$0	\$79,121	\$79,121	\$79,121	\$79,121
54	54	<b>TOTAL - PILING, CAISSONS</b>	791	LF	0.00	0	\$0.00	\$0		\$0		\$0		\$79,121	\$79,121	
<b>SPECIAL CONSTR. (SEISMIC CONTROL, PRE-ENGR BUILDINGS, ETC.)</b>																
56.360	56.360	MCC ROOM, 20' X 20'	400	SF	S/C	0	\$45.91	\$0	\$0.00	\$0	\$0.00	\$0	\$200.00	\$80,000	\$200.00	\$80,000
56.360	56.360	<b>TOTAL - SPECIAL CONSTRUCTION</b>				0	\$0.00	\$0		\$0		\$0		\$80,000	\$80,000	
<b>CONCRETE</b>																
56	56	DIKE (INCLUDED IN FACTOR)				0	\$45.91	\$0	\$0.00	\$0	\$0.00	\$0	\$0.00	\$0	\$0	\$0
56	56	FACTORED FROM INSTALLED PROCESS EQUIPMENT COST	1	LOT	359.31	359	\$45.91	\$16,855	\$0	\$0	\$16,855	\$16,855	\$0	\$0	\$33,509	\$33,509
56	56	<b>TOTAL - CONCRETE</b>	31	CY	12.0	359	\$45.91	\$16,855		\$0		\$16,855	\$0		\$33,509	
<b>STRUCTURAL STEEL</b>																

DETAIL DIRECT COST

JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX  
 REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 16DC0000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 6 (4% - 30%)  
 G:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\16DC0000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC0000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR\_R1.xls\PRIME CODE TCS

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

LINE NO.	IS PRIME CODE	01 PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR DESCRIPTION	QTY.	UNIT	W.H./ UNIT	TOTAL W.H.'s	COST/ W.H.	TOTAL DIRECT LABOR	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	UNIT COST	TOTAL ALL COSTS
<b>DIRECT COST - DETAILS</b>																
210																
251	58	FACTORED FROM INSTALLED PROCESS EQUIPMENT COST	1	LOT	1,352.86	1,353	\$50.13	\$67,818	\$0	\$0	\$135,637	\$135,637	\$0	\$0	\$203,455	\$203,455
233	58	TOTAL - STRUCTURAL STEEL	39	TN	35.0	1,353	\$50.13	\$67,818		\$0		\$135,637		\$0		\$203,455
PIPING																
270																
307	62	FACTORED FROM INSTALLED PROCESS EQUIPMENT COST	1	LOT	1,689.23	1,689	\$54.47	\$90,424	\$0	\$0	\$101,727	\$101,727	\$0	\$0	\$192,152	\$192,152
309	62	TOTAL - PIPING	556	LF	3.00	1,689	\$54.47	\$90,424		\$0		\$101,727		\$0		\$192,152
INSULATION - PIPE, EQUIPMENT & DUCTWORK																
314	63	UREA TANK (INCLUDED IN FACTOR)					0	\$45.91	\$0	\$0.00	\$0	\$0.00	\$0	\$0.00	\$0	\$0
310	63	FACTORED FROM INSTALLED PROCESS EQUIPMENT COST	1	LOT	1,107.82	1,108	\$45.91	\$50,864	\$0	\$0	\$0	\$0	\$50,864	\$50,864	\$101,727	\$101,727
321	63	TOTAL - INSULATION - PIPE, EQUIPMENT & DUCTWORK	1	LOT		1,108	\$45.91	\$50,864		\$0		\$0		\$50,864		\$101,727
INSTRUMENTATION																
336	64	FACTORED FROM INSTALLED PROCESS EQUIPMENT COST	1	LOT	111.23	111	\$50.81	\$5,652	\$11,303	\$11,303	\$11,303	\$11,303	\$0	\$0	\$28,258	\$28,258
338	64	TOTAL - INSTRUMENTATION	6	EA	20.00	111	\$50.01	\$5,652		\$11,303		\$11,303		\$0		\$28,258
ELECTRICAL																
343	65	UREA TANK HEAT TRACING (INCLUDED IN FACTOR)					0	\$50.81	\$0	\$0.00	\$0	\$0.00	\$0	\$0.00	\$0	\$0
344	65	TRANSFORMER - 13,800 V TO 480 V, RATED FOR 400 HP CONNECTED LOAD	1	EA	100.00	100	\$50.81	\$5,081	\$35,000	\$35,000	\$0.00	\$0	\$0.00	\$0	\$40,081	\$40,081
345	65	TESTING AND STARTUP	1	LOT	5.00	5	\$50.81	\$254	\$0.00	\$0	\$0.00	\$0	\$0.00	\$0	\$254.04	\$254
346	65	FREIGHT	1	LOT	N/A	0	\$50.81	\$0	\$2,100	\$2,100	\$0	\$0	\$0.00	\$0	\$2,100	\$2,100
360	65	FACTORED FROM INSTALLED PROCESS EQUIPMENT COST	1	LOT	444.93	445	\$50.81	\$22,806	\$58,515	\$58,515	\$45,212	\$45,212	\$0	\$0	\$124,334	\$124,334
362	65	TOTAL - ELECTRICAL	2,200	LF	0.25	550	\$50.81	\$27,941		\$93,616		\$45,212		\$0		\$166,768
PAINTING, PROTECTIVE COATINGS																
371	66	FACTORED FROM INSTALLED PROCESS EQUIPMENT COST	1	LOT	123.10	123	\$45.91	\$5,652	\$0	\$0	\$5,652	\$5,652	\$0	\$0	\$11,303	\$11,303
373	66	TOTAL - PAINTING, PROTECTIVE COATINGS				123	\$45.91	\$5,652		\$0		\$5,652		\$0		\$11,303
<b>TOTAL - DIRECT COST</b>						<b>7,452</b>	<b>\$51.37</b>	<b>\$382,799</b>		<b>\$1,127,818</b>		<b>\$331,829</b>		<b>\$266,500</b>		<b>\$2,108,946</b>

**CONTRACTOR'S CONSTRUCTION INDIRECT COST - CONSTRUCTION SUPPORT LABOR**



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 16DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)  
 G:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\16DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX I

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

PRIME CODE	DESCRIPTION	QTY.	UNIT	W.H./ UNIT	TOTAL W.H.'s	COST/ W.H.	TOTAL DIRECT LABOR	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	TOTAL ALL COSTS
75	<b>CONSTRUCTION SUPPORT LABOR</b>											
	(LABOR COST ONLY)											
	CAPITAL - CONSTRUCTION SUPPORT LABOR - ALLOWANCE @ 20 % OF DIRECT LABOR HOURS FOR BELOW LISTED ITEMS	7,452	WH	0.20	1,490	\$40.53	\$60,409	\$0	\$0	\$0	\$0	\$60,409
	CONS EQUIP OPERATION - CRANE				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	WELDER QUALIFICATIONS				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	RAINED OUT LABOR				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	SAFETY TRAINING				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	SCAFFOLDING (Rental Incl. W/ Constr. Eq. Rental)				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	UNLOAD AND STORE BULK MATERIAL				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	WAREHOUSEMAN				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	TOOL MAN				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	FIRE WATCH				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	YARD CREWS				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	SPECIAL HAULING / RIGGING				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	STARTUP - CRAFTSMEN				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	CLEAN UP				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	EMPLOYMENT & RANDOM DRUG TESTS				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	MOVE IN / MOVE OUT LABOR				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	WATER / ICE				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
75	<b>TOTAL - CONSTRUCTION SUPPORT LABOR</b>				1,490		\$60,409		\$0		\$0	\$60,409

**CONTRACTOR'S CONSTRUCTION INDIRECT COST - PREMIUM TIME**



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 16DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)  
 G:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\16DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC9000 - TCS - PALA

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

JE PRIME CODE	DESCRIPTION	TOTAL WEEKLY W.H.'S	TOTAL PREMIUM W.H.'S	PREMIUM COST ADDER	TOTAL COST
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**78 PREMIUM & EFFICIENCY LOSS TIME CALCULATION WORKSHEET**

CAPITAL PREMIUM TIME COST:	BASED ON BARE WAGE RATE OF:				\$22.72	
	TOTAL CRAFT HOURS:			8,943 HRS		
CRAFT HOURS WORKED ON 40 HR WEEK (0 HRS PT)	0.0%	0	0	0 HRS		
CRAFT HOURS WORKED ON 50 HR WEEK (10 HRS PT)	100.0%	8,943	1,789	1,789 HRS	\$13.06	\$23,354
CRAFT HOURS WORKED ON 60 HR WEEK (20 HRS PT)	0.0%	0	0	0 HRS	\$13.06	\$0
CRAFT HOURS WORKED ON 70 HR WEEK (30 HRS PT)	0.0%	0	0	0 HRS	\$13.06	\$0
CRAFT HOURS WORKED ON 84 HR WEEK (44 HRS PT)	0.0%	0	0	0 HRS	\$13.06	\$0
	100.0%	8,943	1,789	1,789 HRS		

<b>TOTAL CAPITAL PREMIUM TIME COST</b>	<b>\$23,354</b>
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<b>78 TOTAL</b>	<b>\$23,354</b>
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**CONTRACTOR'S CONSTRUCTION INDIRECT COST - NON-PAYROLL TAX, INSURANCE AND PERMITS**



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR

CLIENT: GEORGIA PACIFIC

LOCATION: PALATKA, FLORIDA

JOB NUMBER: 16DC9000

CONSTRUCTION DURATION: TBD

ESTIMATE TYPE: CLASS 5 (+/- 30%)

ESTIMATE: GEORPACIFLORIDAIPALATKA16DC9000 - BART BOILER PROGRAMIPALATKA COMBINATION BOILER NO. 4 - SNCR[16DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMO

ESTIMATE DATE: 11/27/06

REVISION NO.: 1

ESTIMATOR: WSJ

PROJECT MGR: LELAND HENSON

EST. FILE #: 06212

JE PRIME CODE	DESCRIPTION	QTY.	UNIT	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	TOTAL ALL COSTS
81	<b>NON-PAYROLL TAX, INSURANCE AND PERMITS</b>									
	SALES & USE TAX									
	6.5% OF EQUIPMENT			6.50%	\$73,308					\$73,308
	6.5% OF MATERIAL					6.50%	\$21,569			\$21,569
	6.5% ON 50% OF SUBCONTRACTS							6.50%	\$8,661	\$8,661
81	<b>TOTAL NON-PAYROLL TAX, INSURANCE AND PERMITS</b>					<b>\$73,308</b>		<b>\$21,569</b>	<b>\$8,661</b>	<b>\$103,538</b>

CONTRACTOR'S CONSTRUCTION INDIRECT COST - CRAFT START-UP ASSISTANCE



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 16DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)  
 G:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\16DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR\_R1.xls\PRIME CODE TCS

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

JE PRIME CODE	DESCRIPTION	QTY.	UNIT	W.H./ UNIT	TOTAL W.H.	COST/ W.H.	TOTAL DIRECT LABOR	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	TOTAL ALL COSTS
71	<b>CRAFT START-UP ASSISTANCE</b>													
	CRAFT START-UP SERVICES (3 CRAFT PERSONNEL @ 50 HOURS EACH)	3	WK	150.00	450	\$74.00	\$33,300	\$0	\$0	\$0	\$0	\$0	\$0	\$33,300
71	<b>TOTAL CRAFT START-UP ASSISTANCE</b>						\$33,300	\$0	\$0	\$0	\$0	\$0	\$33,300	

CONTRACTOR'S CONSTRUCTION INDIRECT COST - CONTRACTOR'S CONSTRUCTION FEE



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 16DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)  
 G:ESTIMATE\GEORPAC\FLORIDA\PALATKA\16DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR\_R1.xls]PRIME CODE TC

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

JE PRIME CODE	DESCRIPTION	QTY.	UNIT	LABOR UNIT COST	TOTAL DIRECT LABOR	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	TOTAL ALL COSTS
99	<b>CONTRACTOR'S CONSTRUCTION FEE</b>											
	LABOR (INCLUDED IN WAGE RATES)	499,861	LABS	9.1%	\$45,597							\$45,597
	EQUIPMENT	1,201,128	EQS			0.00%	\$0					\$0
	MATERIAL	353,398	MATS					15.00%	\$53,010			\$53,010
	SUBCONTRACT	337,763	SUBS							10.00%	\$33,776	\$33,776
99	<b>TOTAL CONTRACTOR'S CONSTRUCTION FEE</b>				<b>\$45,597</b>		<b>\$0</b>		<b>\$53,010</b>		<b>\$33,776</b>	<b>\$132,382</b>

**TOTAL CONTRACTOR'S CONSTRUCTION FEE AS A % OF TOTAL CONSTRUCTION COST - EQUIP. = 10.0%**

**TOTAL CONSTRUCTION COST LESS PROCESS EQUIPMENT = \$1,323,404**

PROJECT INDIRECT COST - CONSTRUCTION MANAGEMENT



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 16DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

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JE PRIME CODE	DESCRIPTION	QTY.	UNIT	W.H./ UNIT	TOTAL W.H.'s	COST/ W.H.	TOTAL DIRECT LABOR	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	UNIT COST	TOTAL ALL COSTS
88	<b>TOTAL CONSTRUCTION MANAGEMENT</b>												
	TOTAL - CONSTRUCTION MANAGEMENT	1	LOT		0	\$0.00	\$0	\$0.00	\$0	\$192,798	\$192,798	\$192,798	\$192,798
88	<b>TOTAL - CONSTRUCTION MANAGEMENT</b>				0		\$0		\$0		\$192,798		\$192,798

PROJECT INDIRECT COST - ENGINEERING PROFESSIONAL SERVICES



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 16DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)  
 G:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\16DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR\_R1.xls]PRIME CODE YCS

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

JE PRIME CODE	DESCRIPTION	QTY.	UNIT	W.H./ UNIT	TOTAL W.H's	COST/ W.H.	LABOR UNIT COST	TOTAL DIRECT LABOR	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	UNIT COST	TOTAL ALL COSTS
90	<b>ENGINEERING PROFESSIONAL SERVICES</b>															
	JACOBS	1	LOT		0	\$0.00	\$0.00	\$0	\$0	\$0	\$0	\$0	\$424,953	\$424,953	\$424,953	\$424,953
90	<b>TOTAL ENGINEERING PROFESSIONAL SERVICES</b>							\$0		\$0		\$0		\$424,953		\$424,953

PROJECT INDIRECT COST - STUDY COST



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR

CLIENT: GEORGIA PACIFIC

LOCATION: PALATKA, FLORIDA

JOB NUMBER: 16DC9000

CONSTRUCTION DURATION: TBD

ESTIMATE TYPE: CLASS 5 (+/- 30%)

GAESTIMATIGEORPACIFLORIDAIPALATKA16DC9000 - BART BOILER PROGRAM/PALATKA COMBINATION BOILER NO. 4 - SNCR/16DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMO

ESTIMATE DATE: 11/27/06

REVISION NO.: 1

ESTIMATOR: WSJ

PROJECT MGR: LELAND HENSON

EST. FILE #: 06212

JE PRIME CODE	DESCRIPTION	QTY.	UNIT	TOTAL DIRECT LABOR	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	TOTAL ALL COSTS
90	<b>STUDY COST</b>										
	STUDY COST	1	LOT	\$0	\$0	\$0	\$0	\$0	\$50,000	\$50,000	\$50,000
90	<b>STUDY COST</b>			\$0		\$0		\$0		\$50,000	\$50,000

**PROJECT INDIRECT COST - OUTSIDE CONSULTANT SERVICES**



**JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR**  
**CLIENT: GEORGIA PACIFIC**  
**LOCATION: PALATKA, FLORIDA**  
**JOB NUMBER: 16DC9000**  
**CONSTRUCTION DURATION: TBD**  
**ESTIMATE TYPE: CLASS 5 (+/- 30%)**  
**ESTIMATE: GEORPACIFLORIDAPALATKA16DC9000 - BART BOILER PROGRAM/PALATKA COMBINATION BOILER NO. 4 - SNCR/16DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMO**

**ESTIMATE DATE: 11/27/06**  
**REVISION NO.: 1**  
**ESTIMATOR: WSJ**  
**PROJECT MGR: LELAND HENSON**  
**EST. FILE #: 06212**

JE PRIME CODE	DESCRIPTION	QTY.	UNIT	TOTAL DIRECT LABOR	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	TOTAL ALL COSTS
96	<b>OUTSIDE CONSULTANT SERVICES</b>										
	OUTSIDE CONSULTANT SERVICES	1	LOT	\$0	\$0	\$0	\$0	\$0	\$100,000	\$100,000	\$100,000
96	<b>TOTAL OUTSIDE CONSULTANT SERVICES</b>			\$0		\$0		\$0		\$100,000	\$100,000

PROJECT INDIRECT COST - OWNER'S COST



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR

CLIENT: GEORGIA PACIFIC

LOCATION: PALATKA, FLORIDA

JOB NUMBER: 16DC9000

CONSTRUCTION DURATION: TBD

ESTIMATE TYPE: CLASS 5 (+/- 30%)

G:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\16DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMO

ESTIMATE DATE: 11/27/06

REVISION NO.: 1

ESTIMATOR: WSJ

PROJECT MGR: LELAND HENSON

EST. FILE #: 06212

JE PRIME CODE	DESCRIPTION	QTY.	UNIT	TOTAL DIRECT LABOR	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	TOTAL ALL COSTS
91	<b>OWNER'S COST</b>										
	OWNER'S COST	1	LOT	\$0	\$0	\$0	\$0	\$0	\$128,928	\$128,928	\$128,928
91	<b>TOTAL OWNER'S COST</b>			\$0		\$0		\$0		\$128,928	\$128,928



PROJECT INDIRECT COST - SPARE PARTS



JOB: BART BOILER PROGRAM - PALATKA -  
 COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 16DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)  
 G:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\16DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

JE PRIME CODE	DESCRIPTION	QTY.	UNIT	TOTAL DIRECT LABOR	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	TOTAL ALL COSTS
70	<b>SPARE PARTS</b>										
	SPARE PARTS - ALLOWANCE OF 5% OF EQUIPMENT COST		1 LOT	\$0	\$56,391	\$56,391	\$0	\$0	\$0	\$0	\$56,391
70	<b>TOTAL SPARE PARTS</b>			\$0		\$56,391		\$0		\$0	\$56,391

PROJECT INDIRECT COST - NON-CRAFT START-UP ASSISTANCE



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 16DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)  
 G:\ESTIMATE\GEORPACIFLORIDA\PALATKA\16DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR\_R1.xls\PRIME CODI

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

JE PRIME CODE	DESCRIPTION	QTY.	UNIT	W.H./ UNIT	TOTAL W.H.'s	COST/ W.H.	TOTAL DIRECT LABOR	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	TOTAL ALL COSTS
71	<b>NON-CRAFT START-UP ASSISTANCE</b>													
	PROFESSIONAL SERVICES START-UP	4	WK	150.00	600	\$83.25	\$49,950	\$0	\$0	\$0	\$0	\$0	\$0	\$49,950
	PROFESSIONAL SERVICES START-UP - EXPENSES	4	WK	0.00	0	\$0.00	\$0	\$0	\$0	\$0	\$0	\$4,800	\$19,200	\$19,200
	VENDOR START-UP SERVICES	1	LOT		0	\$0.00	\$0	\$0	\$0	\$0	\$0	\$50,000	\$50,000	\$50,000
71	<b>TOTAL NON-CRAFT START-UP ASSISTANCE</b>						\$49,950	\$0	\$0	\$0	\$0	\$54,800	\$69,200	\$119,150

PROJECT INDIRECT COSTS - ALLOWANCE FOR UNFORESEEN



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 10DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS S (47-50%)  
 G:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\10DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR R1.xls\PRIME CODE TCS

ESTIMATE DATE: 11/27/00  
 REVISION NO.: 1  
 ESTIMATOR: WJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

PRIME CODE	PRIME CODE	DESCRIPTION	LABOR	EQUIPMENT	MATERIAL	SUBCONT.	TOTAL COST	PERCENTAGES				DOLLARS				
								LABOR	EQUIP.	MATL	SIC	LABOR	EQUIPMENT	MATERIAL	SUBCONT.	TOTAL COST
<b>DIRECT COSTS</b>																
60	60	MAJOR EQUIPMENT	\$92,062	\$1,022,000	\$15,344	\$0	\$1,130,406	10.0%	10.0%	10.0%	10.0%	\$0,206	\$102,200	\$1,634	\$0	\$113,031
60	61	DEMOLITION	\$26,432	\$0	\$0	\$0	\$26,432	10.0%	10.0%	10.0%	10.0%	\$2,543	\$0	\$0	\$0	\$2,543
60	62	SITE EARTHMOVING	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
60	63	SITE IMPROVEMENTS	\$0	\$0	\$0	\$58,515	\$58,515	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$5,652	\$5,652
60	64	PILING, CAISSONS	\$0	\$0	\$0	\$78,121	\$78,121	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$7,912	\$7,912
60	65	BUILDINGS	\$0	\$0	\$0	\$80,000	\$80,000	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$8,000	\$8,000
60	66	CONCRETE	\$18,855	\$0	\$18,855	\$0	\$33,809	10.0%	10.0%	10.0%	10.0%	\$1,885	\$0	\$1,885	\$0	\$3,391
60	67	MASONRY, REFRACTORY	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
60	68	STRUCTURAL STEEL	\$67,615	\$0	\$135,637	\$0	\$203,455	10.0%	10.0%	10.0%	10.0%	\$8,782	\$0	\$13,664	\$0	\$20,345
60	69	ROOFING AND SIDING	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
60	70	FIRE PROOFING	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
60	71	PROCESS DUCTWORK (NON-BUILDING)	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
60	72	PIPING	\$60,424	\$0	\$101,727	\$0	\$182,152	10.0%	10.0%	10.0%	10.0%	\$8,042	\$0	\$10,173	\$0	\$18,215
60	73	INSULATION - PIPE, EQUIPMENT & DUCTWORK	\$50,854	\$0	\$0	\$50,854	\$101,727	10.0%	10.0%	10.0%	10.0%	\$5,085	\$0	\$0	\$5,085	\$10,173
60	74	INSTRUMENTATION	\$5,852	\$11,303	\$11,303	\$0	\$28,258	10.0%	10.0%	10.0%	10.0%	\$585	\$1,130	\$1,130	\$0	\$2,828
60	75	ELECTRICAL	\$27,541	\$93,616	\$45,212	\$0	\$166,369	10.0%	10.0%	10.0%	10.0%	\$2,754	\$9,362	\$4,521	\$0	\$16,637
60	76	PAINTING, PROTECTIVE COATINGS	\$5,652	\$0	\$5,652	\$0	\$11,303	10.0%	10.0%	10.0%	10.0%	\$565	\$0	\$565	\$0	\$1,130
60	77	FURNITURE, LAB & SHOP EQUIPMENT	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
<b>TOTAL DIRECT COSTS</b>			<b>\$362,799</b>	<b>\$1,127,818</b>	<b>\$331,829</b>	<b>\$265,500</b>	<b>\$2,108,946</b>					<b>\$38,280</b>	<b>\$112,762</b>	<b>\$33,183</b>	<b>\$26,650</b>	<b>\$210,895</b>
<b>CONSTRUCTION INDIRECT COSTS</b>																
60	78	CONSTRUCTION SUPPORT LABOR	\$80,408	\$0	\$0	\$0	\$80,408	10.0%	10.0%	10.0%	10.0%	\$8,041	\$0	\$0	\$0	\$8,041
60	79	TEMPORARY CONSTRUCTION FACILITIES (IN WAGE RATE)	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
60	80	PREMIUM TIME	\$23,354	\$0	\$0	\$0	\$23,354	10.0%	10.0%	10.0%	10.0%	\$2,335	\$0	\$0	\$0	\$2,335
60	81	CRAFT FRINGE BENEFITS (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
60	82	CRAFT PER DIEM (\$7 PER HOUR ON 100% OF THE HOURS)	\$0	\$0	\$0	\$62,601	\$62,601	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$6,260	\$6,260
60	83	PAYROLL TAXES & INSURANCE (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
60	84	SMALL TOOLS (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
60	85	CONSUMABLE SUPPLIES (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
60	86	CONSTRUCTION EQUIPMENT (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
60	87	FIELD STAFF (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
60	88	NON-PAYROLL TAX, INSURANCE & PERMITS	\$0	\$73,308	\$21,589	\$8,661	\$103,538	10.0%	10.0%	10.0%	10.0%	\$0	\$7,331	\$2,157	\$866	\$10,354
60	89	CONSTRUCTION HOME OFFICE COST (INC. WITH CONTRA)	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
60	90	CRAFT START-UP ASSISTANCE	\$33,300	\$0	\$0	\$0	\$33,300	10.0%	10.0%	10.0%	10.0%	\$3,330	\$0	\$0	\$0	\$3,330
60	91	CONTRACTOR'S CONSTRUCTION HOME OFFICE & FEE	\$45,597	\$0	\$53,010	\$33,776	\$132,382	10.0%	10.0%	10.0%	10.0%	\$4,560	\$0	\$5,301	\$3,376	\$13,238
<b>TOTAL CONSTRUCTION INDIRECT COSTS</b>												<b>\$16,268</b>	<b>\$7,331</b>	<b>\$7,498</b>	<b>\$10,504</b>	<b>\$41,599</b>
<b>TOTAL CONSTRUCTION COSTS (TCC)</b>			<b>\$548,458</b>	<b>\$1,201,128</b>	<b>\$406,407</b>	<b>\$371,539</b>	<b>\$2,524,531</b>					<b>\$54,548</b>	<b>\$120,113</b>	<b>\$40,641</b>	<b>\$37,154</b>	<b>\$252,453</b>
96	88	CONSTRUCTION MANAGEMENT	\$0	\$0	\$0	\$192,788	\$192,788	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$19,280	\$19,280
96	89	ENGINEERING PROFESSIONAL SERVICES	\$0	\$0	\$0	\$424,853	\$424,853	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$42,485	\$42,485
96	90	STUDY COST	\$0	\$0	\$0	\$50,000	\$50,000	10.0%	10.0%	10.0%	0.0%	\$0	\$0	\$0	\$0	\$0
96	91	OUTSIDE CONSULTANT SERVICES	\$0	\$0	\$0	\$100,000	\$100,000	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$10,000	\$10,000
96	92	OWNER'S COST	\$0	\$0	\$0	\$128,828	\$128,828	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$12,893	\$12,893
96	93	SPARE PARTS	\$0	\$58,391	\$0	\$0	\$58,391	10.0%	10.0%	10.0%	10.0%	\$0	\$5,838	\$0	\$0	\$5,838
96	94	NON-CRAFT START-UP ASSISTANCE	\$49,960	\$0	\$0	\$69,200	\$119,160	10.0%	10.0%	10.0%	10.0%	\$4,995	\$0	\$0	\$6,020	\$11,015
96	95	ALLOWANCE FOR UNFORESEEN	N/A													
96	96	ESCALATION	N/A													
96	97	EPG FEE	N/A													
96	98	CAPITAL INTEREST	N/A													
96	99	ROUND OFF	N/A													
<b>TOTAL PROJECT COSTS</b>			<b>\$595,408</b>	<b>\$1,257,517</b>	<b>\$406,407</b>	<b>\$1,337,418</b>	<b>\$3,598,760</b>					<b>\$59,541</b>	<b>\$125,762</b>	<b>\$40,641</b>	<b>\$37,142</b>	<b>\$354,675</b>

PROJECT INDIRECT COSTS - ESCALATION



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA

ESCALATION IS BASED ON THE ASSUMPTION THAT ALL WORK WILL BE COMPLETED BY DECEMBER 31, 2008

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: VWSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

JOB NUMBER: 18000000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 3 (41-30%)  
 GUESTIMATE@GEORGIA.PACIFIC.COM \PALATKA\18000000 - BART BOILER PROGRAM \PALATKA COMBINATION BOILER NO. 4 - SNCR\18000000 - YES - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR (M.HIS) PRIME CODE TGS

CODE	PRIME CODE	DESCRIPTION	LABOR	EQUIPMENT	MATERIAL	SUBCONT.	TOTAL COST	PERCENTAGES				DOLLARS				
								LABOR	EQUIP.	MAT'L	SIC	LABOR	EQUIPMENT	MATERIAL	SUBCONT.	TOTAL COST
<b>DIRECT COSTS</b>																
00	50	MAJOR EQUIPMENT	\$92,082	\$1,022,000	\$15,344	\$0	\$1,130,308	0.0%	10.0%	10.0%	5.0%	\$0	\$102,390	\$1,634	\$0	\$103,024
00	51	DEMOLITION	\$25,432	\$0	\$0	\$0	\$25,432	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	52	SITE EARTHMOVING	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	
00	53	SITE IMPROVEMENTS	\$0	\$0	\$0	\$68,515	\$68,515	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$2,028	\$70,543
00	54	PILING, CAISSONS	\$0	\$0	\$0	\$76,121	\$76,121	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$3,958	\$79,079
00	55	BUILDINGS	\$0	\$0	\$0	\$80,000	\$80,000	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$4,000	\$84,000
00	56	CONCRETE	\$16,958	\$0	\$16,958	\$0	\$33,909	0.0%	10.0%	15.0%	5.0%	\$0	\$0	\$2,643	\$0	\$36,552
00	57	MASONRY, REFRACTORY	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	58	STRUCTURAL STEEL	\$97,818	\$0	\$135,837	\$0	\$203,455	0.0%	10.0%	15.0%	5.0%	\$0	\$0	\$20,345	\$0	\$223,800
00	59	ROOFING AND SIDING	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	60	FIRE PROOFING	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	61	PROCESS DUCTWORK (NON-BUILDING)	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	62	PIPING	\$90,424	\$0	\$101,727	\$0	\$192,152	0.0%	10.0%	15.0%	5.0%	\$0	\$0	\$15,259	\$0	\$207,411
00	63	INSULATION - PIPE, EQUIPMENT & DUCTWORK	\$50,884	\$0	\$0	\$50,884	\$101,727	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$2,543	\$104,270
00	64	INSTRUMENTATION	\$5,652	\$11,303	\$11,303	\$0	\$28,258	0.0%	10.0%	15.0%	5.0%	\$0	\$1,100	\$1,695	\$0	\$30,053
00	65	ELECTRICAL	\$27,941	\$93,615	\$45,212	\$0	\$168,768	0.0%	10.0%	15.0%	5.0%	\$0	\$9,382	\$6,782	\$0	\$164,832
00	66	PAINTING, PROTECTIVE COATINGS	\$5,652	\$0	\$5,652	\$0	\$11,303	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$565	\$0	\$11,868
00	67	FURNITURE, LAB & SHOP EQUIPMENT	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
<b>TOTAL DIRECT COSTS</b>			<b>\$382,799</b>	<b>\$1,127,818</b>	<b>\$331,829</b>	<b>\$260,500</b>	<b>\$2,103,948</b>					<b>\$0</b>	<b>\$112,782</b>	<b>\$46,725</b>	<b>\$13,325</b>	<b>\$172,831</b>
<b>CONSTRUCTION INDIRECT COSTS</b>																
00	75	CONSTRUCTION SUPPORT LABOR	\$60,409	\$0	\$0	\$0	\$60,409	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	76	TEMPORARY CONSTRUCTION FACILITIES (IN WAGE RATE)	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	78	PREMIUM TIME	\$23,354	\$0	\$0	\$0	\$23,354	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	79	CRAFT FRINGE BENEFITS (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	80	CRAFT PER DIEM (\$7 PER HOUR ON 100% OF THE HOUR)	\$0	\$0	\$0	\$62,601	\$62,601	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$3,130	\$65,731
00	81	PAYROLL TAXES & INSURANCE (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	83	SMALL TOOLS (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	84	CONSUMABLE SUPPLIES (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	85	CONSTRUCTION EQUIPMENT (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	87	FIELD STAFF (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	81	NON-PAYROLL TAX, INSURANCE & PERMITS	\$0	\$73,308	\$21,589	\$9,081	\$103,988	0.0%	10.0%	10.0%	5.0%	\$0	\$7,331	\$2,157	\$433	\$113,909
00	93	CONSTRUCTION HOME OFFICE COST (INC. WITH CONTR)	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	71	CRAFT START-UP ASSISTANCE	\$33,300	\$0	\$0	\$0	\$33,300	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	92	CONTRACTOR'S CONSTRUCTION HOME OFFICE & FEE	\$46,587	\$0	\$53,010	\$33,770	\$133,367	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$5,301	\$1,889	\$140,557
<b>TOTAL CONSTRUCTION INDIRECT COSTS</b>			<b>\$0</b>	<b>\$7,331</b>	<b>\$7,458</b>	<b>\$5,282</b>	<b>\$20,041</b>					<b>\$0</b>	<b>\$7,331</b>	<b>\$6,182</b>	<b>\$18,577</b>	<b>\$42,001</b>
<b>TOTAL CONSTRUCTION COSTS (TCC)</b>			<b>\$545,488</b>	<b>\$1,201,126</b>	<b>\$466,407</b>	<b>\$371,839</b>	<b>\$2,524,531</b>					<b>\$0</b>	<b>\$120,113</b>	<b>\$56,182</b>	<b>\$18,577</b>	<b>\$194,872</b>
00	98	CONSTRUCTION MANAGEMENT	\$0	\$0	\$0	\$192,709	\$192,709	0.0%	0.0%	0.0%	0.0%	\$0	\$0	\$0	\$0	\$0
00	99	ENGINEERING PROFESSIONAL SERVICES	\$0	\$0	\$0	\$424,833	\$424,833	0.0%	0.0%	0.0%	0.0%	\$0	\$0	\$0	\$0	\$0
00	69	STUDY COST	\$0	\$0	\$0	\$50,000	\$50,000	0.0%	0.0%	0.0%	0.0%	\$0	\$0	\$0	\$0	\$0
00	98	OUTSIDE CONSULTANT SERVICES	\$0	\$0	\$0	\$100,000	\$100,000	0.0%	0.0%	0.0%	0.0%	\$0	\$0	\$0	\$0	\$0
00	51	OWNER'S COST	\$0	\$0	\$0	\$128,928	\$128,928	0.0%	0.0%	0.0%	5.0%	\$0	\$0	\$0	\$5,000	\$133,928
00	70	SPARE PARTS	\$0	\$58,391	\$0	\$0	\$58,391	0.0%	10.0%	0.0%	0.0%	\$0	\$5,639	\$0	\$0	\$64,030
00	71	NON-CRAFT START-UP ASSISTANCE	\$49,950	\$0	\$0	\$85,200	\$135,150	0.0%	0.0%	0.0%	5.0%	\$0	\$0	\$0	\$3,460	\$138,610
00	98	ALLOWANCE FOR UNFORESEEN	N/A	N/A	N/A	N/A	N/A									
00	98	ESCALATION	N/A	N/A	N/A	N/A	N/A									
00	98	EPC FEE	N/A	N/A	N/A	N/A	N/A									
00	98	CAPITAL INTEREST	N/A	N/A	N/A	N/A	N/A									
00	98	ROUND OFF	N/A	N/A	N/A	N/A	N/A									
<b>TOTAL PROJECT COSTS</b>			<b>\$595,408</b>	<b>\$1,257,517</b>	<b>\$466,407</b>	<b>\$1,337,418</b>	<b>\$3,596,750</b>					<b>\$0</b>	<b>\$125,752</b>	<b>\$58,182</b>	<b>\$33,483</b>	<b>\$215,418</b>

"ALL-IN WAGE RATE"

CONSTRUCTION "ALL-IN" WAGE RATE																		
JOB: BARTY BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - BNCR CLIENT: GEORGIA PACIFIC LOCATION: PALATKA, FLORIDA JOB NUMBER: 16DC0009																		
ITEM	CRAFT CONCRETE / MASONRY			CRAFT STRUCTURAL STEEL			CRAFT PIPING & MECHANICAL			CRAFT INSTRUMENTATION			CRAFT ELECTRICAL			CRAFT SUPPORT (INC. OPERATORS)		
	NOTES	%	COST	NOTES	%	COST	NOTES	%	COST	NOTES	%	COST	NOTES	%	COST	NOTES	%	COST
BASE JOURNEYMAN			\$22.50			\$22.50			\$22.50			\$22.50			\$22.50			\$21.50
COMPOSITE RATE		87.35%	\$19.65		96.41%	\$21.69		99.86%	\$22.47		99.78%	\$22.23		99.78%	\$22.23		97.37%	\$20.93
<b>PAYROLL TAXES &amp; INSURANCES:</b>	<b>33.60%</b>																	
WORKMEN'S COMPENSATION		14.70%	\$2.89		14.70%	\$3.19		14.70%	\$3.30		14.70%	\$3.27		14.70%	\$3.27		14.70%	\$3.08
GENERAL LIABILITY		3.66%	\$0.78		3.95%	\$0.88		3.95%	\$0.89		3.95%	\$0.89		3.95%	\$0.89		3.95%	\$0.83
EXCESS LIABILITY		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00
FICA		7.65%	\$1.50		7.65%	\$1.66		7.65%	\$1.72		7.65%	\$1.70		7.65%	\$1.70		7.65%	\$1.60
FLI		0.80%	\$0.16		0.80%	\$0.17		0.80%	\$0.18		0.80%	\$0.18		0.80%	\$0.18		0.80%	\$0.17
SUI		6.50%	\$1.28		6.50%	\$1.41		6.50%	\$1.46		6.50%	\$1.44		6.50%	\$1.44		6.50%	\$1.36
OTHER		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00
FRINGES		12.50%	\$2.46		12.50%	\$2.71		12.50%	\$2.81		12.60%	\$2.78		12.50%	\$2.78		12.50%	\$2.62
PREMIUM TIME		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00
CONSTRUCTION SUPPORT LABOR		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00
TEMPORARY FACILITIES		7.50%	\$1.47		7.50%	\$1.63		7.50%	\$1.69		7.50%	\$1.67		7.50%	\$1.67		7.50%	\$1.57
SMALL TOOLS		7.50%	\$1.47		7.50%	\$1.63		7.50%	\$1.69		7.50%	\$1.67		7.50%	\$1.67		7.50%	\$1.57
CONSUMABLES		7.50%	\$1.47		10.00%	\$2.17		10.00%	\$2.25		7.50%	\$1.67		7.50%	\$1.67		7.50%	\$1.57
FIELD STAFF		25.00%	\$4.91		25.00%	\$5.42		35.00%	\$7.88		35.00%	\$7.78		35.00%	\$7.78		25.00%	\$5.23
EQUIPMENT RENTAL		40.00%	\$7.86		35.00%	\$7.59		35.00%	\$7.86		25.00%	\$5.58		25.00%	\$5.58		0.00%	\$0.00
CONSTRUCTION HOME OFFICE (ON TCS SHEET)		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00
PER DIEM		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00
CONTRACTOR FEE (ON TCS SHEET)		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00
<b>TOTAL WAGE RATE WITH FEE</b>		<b>233.60%</b>	<b>\$45.91</b>		<b>231.10%</b>	<b>\$50.13</b>		<b>241.10%</b>	<b>\$54.17</b>		<b>228.60%</b>	<b>\$50.81</b>		<b>228.60%</b>	<b>\$50.81</b>		<b>193.60%</b>	<b>\$40.53</b>

# **ATTACHMENT II**

# **Appendix A: Basis of Estimated Costs**

## BASIS OF ESTIMATED COSTS

GEORGIA PACIFIC  
PALATKA, FLORIDA  
REGIONAL HAZE / BOILER BART PROGRAM  
JACOBS PROJECT NO. 16DC9000

### GENERAL

The purpose of these cost estimates is to provide Georgia Pacific with a Feasibility Study Level Report in 2006 dollars with an accuracy range of  $\pm 30\%$  for the Regional Haze/Boiler BART Program at the Wauna, Oregon Mill.

Estimates were prepared by Jacobs for various SO<sub>2</sub> and NO<sub>x</sub> control technologies for the boilers which were put in place or under construction between August 7, 1962 and August 7, 1977. These cost estimates were prepared in such a manner to ensure that each boiler proposed control technology and related cost estimate would stand alone on its own merit. This approach was selected to better address the uncertainty that will exist between which project or combination of projects might ultimately be implemented to meet the emissions targets established for the EPA Regional Haze / Boiler BART 2013 compliance date. Certain site specific conditions and / or the presence of alternate control technologies in the future may ultimately impact the overall project costs and feasibility of these projects if several of these projects are implemented concurrently on any given site.

In addition, the numbers used in this estimate for equipment cost do not always reflect the exact dollar amount that was provided by a vendor and reported in Appendix D. In many cases, Jacobs has used their sound engineering judgment and previous experience to change these prices. These changes may be for many reasons including but not limited to: adding or removing installation costs, adjusting for construction with a more expensive material, adding or removing options, increasing the controls included, etc.

In order to allow for air in-leakage in the existing Boilers, \$100,000 has been added to each estimate to locate and repair any areas where excessive air infiltration may be occurring. This is required to ensure that any control technologies installed operate as they were designed.

GP plans to utilize the results from this feasibility study report and cost estimate(s) to support the Regional Haze / Boiler BART documentation submittal requirements to the individual States. This will establish the viability for installing the Boiler BART Control Technologies on these respective site boilers or whether to de-rate or decommission them to a capacity level below BART-eligibility.

At the time of issue, this estimate reflects the fair market value for construction costs, based upon 2006 dollars, in the Wauna, Oregon area.



## **BASIS OF ESTIMATED COSTS**

### **ESTIMATE APPROACH**

The estimate is based on Jacobs providing Engineering, Construction Management and Procurement Services.

For the basis of the cost estimate, detailed engineering, procurement and construction activities are assumed be completed by December 31, 2006.

### **WAGE RATES**

This estimate is based on Union Wage Rates. The wage rates used in this estimate are composite all-in rates. The base journeyman rates range from \$28.34 to \$33.84. Jacobs established a crew mix for each craft, ranging from 89.98 % to 97.67 % of the base journeyman rate - see the All-In Wage Rate Sheet in the Estimate Detail Printout. Included in the wage rates are the following:

- **81 - PAYROLL TAXES AND INSURANCE**

Payroll Taxes and Insurance are included at 28.1 % of bare craft labor.

- **79 - CRAFT FRINGE BENEFITS**

Union Craft Fringe Benefits are included ranging from 35.11 % to 47.70 % of bare craft labor.

- **76 - TEMPORARY CONSTRUCTION FACILITIES**

Temporary Construction Facilities include Contractor's office supplies, PC's, copiers, postage, phones, Fed Ex, temporary sanitary facilities, mobilization, trash removal and temporary lights. These items are calculated at 7.5% of bare craft labor.

- **83 & 84 - SMALL TOOLS AND CONSUMABLES**

Small tools are included in the estimate at 7.5 % of bare craft labor. Construction consumables are included in the estimate at 7.5 % to 10 % of bare craft labor.

- **87 - CONTRACTORS FIELD STAFF**

Field staff includes all contractors' field support staff except for craft foremen which are included in the crew mix calculations. Contractors Field Staff is calculated at 25 % to 35 % of bare craft labor based on the type of work being performed.

- **85 - CONSTRUCTION EQUIPMENT RENTAL**

Construction equipment rental includes the contractors' automotive equipment, general equipment and small cranes. This construction equipment cost is calculated at 25 % to 40 % of bare craft labor based on the discipline - concrete, steel, pipe,

## **BASIS OF ESTIMATED COSTS**

electrical, etc. - being supported - see the All-In Wage Rate Sheet in the Estimate Detail Printout for the percent used for each discipline. If required, a line item is listed in the estimate for situations that require large cranes not covered by the allowance carried in the rate.

- **93 – CONTRACTOR’S HOME OFFICE**

Contractor’s Home Office cost includes time for Project Manager, accounting, safety, quality control, etc. is included in the Contractor’s Fee.

- **99 - CONTRACTOR’S FEE**

Contractor’s fee is included in the estimate at 10 % of contractor’s construction cost.

- **75 - CONSTRUCTION SUPPORT LABOR**

Construction Support Labor includes drug testing, safety training, fire watch, final cleanup, yard crews, etc. This cost is calculated as 20 % of bare craft labor.

## **DIRECT COSTS**

### **50 - MAJOR EQUIPMENT**

Vendor budget quotes were received for the Major Equipment.

Pump and motor installation hours are from Jacobs Standards. Other equipment installation cost items are based on historical experience.

Freight cost is included at 6 % of equipment cost.

### **51 – DEMOLITION AND RELOCATION**

Demolition cost is factored from installed process equipment cost but have been adjusted, as required, to reflect specific site requirements.

### **53 - SITE IMPROVEMENTS**

Site Improvement costs are factored from installed process equipment cost but have been adjusted, as required, to reflect specific site requirements.

### **56 – CONCRETE**

Concrete costs are factored from installed process equipment cost but have been adjusted, as required, to reflect specific site requirements.

### **58 – STRUCTURAL STEEL**

Structural Steel costs are factored from installed process equipment cost but have been adjusted, as required, to reflect specific site requirements.

## **BASIS OF ESTIMATED COSTS**

### **62 – PIPING**

Piping costs are factored from installed process equipment cost but have been adjusted, as required, to reflect specific site requirements.

### **63 – INSULATION**

Insulation costs are factored from installed process equipment cost but have been adjusted, as required, to reflect specific site requirements.

### **64 – INSTRUMENTATION**

Instrumentation costs are factored from installed process equipment cost but have been adjusted, as required, to reflect specific site requirements.

### **65 – ELECTRICAL**

Electrical Costs are factored from installed process equipment cost but have been adjusted, as required, to reflect specific site requirements.

### **66 – PAINTING**

Painting costs are factored from installed process equipment cost but have been adjusted, as required, to reflect specific site requirements.

## **INDIRECT COSTS**

### **70 – SPARE PARTS**

An allowance for Spare Parts of 5 % of the process equipment cost is included.

### **78 - PREMIUM TIME**

Premium Time is included based on the assumption that 100 % of the craft labor hours will be worked on a 50-hour week.

### **XX - CRAFT PER DIEM**

Craft Per Diem is included at \$7.00 per craft hour for all workers.

### **81 - NON-PAYROLL TAXES, INSURANCE AND PERMITS**

Sales Tax is included at 5 % on equipment, materials and 5 % on 50 % of subcontract costs.

### **88 - CONSTRUCTION MANAGEMENT**

Construction Management is estimated at 4.5 % of Total Installed Cost.

## **BASIS OF ESTIMATED COSTS**

### **90 – ENGINEERING PROFESSIONAL SERVICES**

Detail Design Engineering is estimated at 10 % of Total Installed Cost.

### **91 – OWNER'S COST**

Owner's Cost is included at approximately 3 % of Total Installed Cost.

### **96 – OUTSIDE CONSULTANT SERVICES**

**An allowance of \$100,000 is carried** in the estimates for Outside Consultant Services.

### **98 – CONTINGENCY**

Contingency is included in the estimate at 10 % of labor, equipment, material and subcontract costs.

This Contingency is part of the estimated project cost and is to cover unusual weather conditions, productivity issues, increases in costs not covered by contractual provisions, delays in delivery of equipment or materials, etc. It does not cover cost of additional work or scope changes after the definition of the project has been frozen for the estimate.

### **98 – ESCALATION**

**Escalation is based on the assumption that all work will be completed by December 31, 2006.** No escalation is included for labor. Escalation is included at 10 % on equipment, 10 % on all material except for concrete, steel, pipe, instrumentation and electrical material which is included at 15 % and 5 % on subcontract cost.

## **BASIS OF ESTIMATED COSTS**

### **ITEMS NOT INCLUDED**

The following is a list of items not included in this estimate:

- Cost of Land
- Cost of borrowing money
- Cost of operating supplies
- Property taxes
- Hazardous materials handling or disposal
- All Risk Insurance
- Payment and Performance Bond
- Permits, Fees and Licenses

### **ITEMS AFFECTING THE COST ESTIMATE**

Items, which may change the estimated construction cost, include, but are not limited to:

- Modifications to the scope of work included in this estimate
- Above normal escalation in material costs due to market availability and demands
- Special phasing requirements
- Restrictive technical specifications
- Volume discounts on National agreements
- Sole source specifications of materials or products
- Bids delayed beyond the projected schedule
- Sales and Use Tax exemptions
- Labor disputes or difficulties

**ATTACHMENT III**

## 9. Performance and Guarantees

It is recognized that the performance of the equipment covered in this proposal cannot be exactly predicted for every possible operating condition. In consequence, any predicted performance data submitted is intended to show probable operating results.

JANSEN will work with G-P to better define the performance guarantees once the boiler evaluation phase of the work has been completed.

All performance data listed here are based on the conditions stated below and are to be substantiated or revised based on the Phase 1 performance testing and evaluation done by JANSEN at the initiation of the project.

### 9.1 Predicted Performance

Predicted performance data is submitted for G-P's convenience only. Such data is not offered by JANSEN, or to be construed by G-P as a proposal, offer, contract obligation, representation, warranty, or guarantee.

Table 9-1 provides predicted future operating conditions for waste wood firing only and combination of waste wood and natural gas.

<b>Table 9.1 Predicted Performance</b>			
	<b>Units</b>	<b>Waste Wood Only</b>	<b>MCR on Wood and Natural Gas</b>
Total Steam Production	lb/hr	262,500	360,000
Steam Production from Waste Wood	lb/hr	262,500	293,000
Wood Fuel Burned (as-fired wet)	ton/hr	50.0	56.1
Wood Fuel Burned (as-fired wet)	ton/day	1,200	1,346
Natural gas	scfh	0.0	92,243
No. 6 Fuel Oil	lb/hr	0.0	0.0
Waste Wood Fuel Moisture Content	%	50	50
Feedwater Temperature	°F	445	445
Flue Gas O <sub>2</sub> at Boiler Bank Outlet	vol. %, wet	4.1	4.1
Total Combustion Air Flow	lb/hr	407,800	539,200
Air Temperature from TAH	°F	523	559
Flue Gas Temperature from TAH	°F	420	477
Boiler Thermal Efficiency	%	65.7	66.4
Total Heat Input	10 <sup>6</sup> Btu/hr-ft <sup>2</sup>	412.9	558.3
Grate Heat Release	10 <sup>6</sup> Btu/hr-ft <sup>2</sup>	1.07	1.2
Particulate Matter at Generating Bank Outlet	grains/dscf @8% O <sub>2</sub>	1.15	1.50

**9.2 Fuel Quality**

The performance information and performance guarantees provided in this section pertain to operation of the unit while burning waste wood fuel and natural gas that are similar in elemental composition (ultimate analysis), moisture content, and heating value as listed in Table 9-2.

**9.3 Performance Guarantees**

The guarantees presented below are subject to the conditions specified in this section at the waste wood and natural gas quantities specified in Table 9-1.

The fuel used during the performance testing shall have a moisture content, nitrogen content, and heating value not less favorable than the values in Table 9-2. The remaining fuel components specified in Table 9-2 may vary by  $\pm 10\%$  during the testing. The waste wood size distribution is to be as described below:

100% shall be smaller than 4 inches in any direction, a maximum of 50% shall pass through a 1/4 inch screen, and no more than 25% shall pass through a 1/8 inch screen.

<b>Table 9-2. Fuel Composition</b>			
	<b>Unit</b>	<b>Waste Wood</b>	<b>Natural Gas</b>
Carbon	%, dry	49.8	69.3
Hydrogen	%, dry	6.1	22.7
Nitrogen *	%, dry	<0.2	8.0
Sulfur	%, dry	0.0	0.0
Oxygen	%, dry	42.5	0.0
Ash	%, dry	1.5	0.0
Moisture Content	%, as-received	50	0.0
HHV (Dry)	Btu/lb	8,200	23,000
HHV (Wet)	Btu/lb	4,100	23,000
*Nitrogen content to be determined by Kjeldahl method			



### **9.3.1 Steam Generation Rate**

9.3.1.1 JANSEN guarantees that the No. 4 Combination Boiler will be able to sustain an average steam generation rate of 360,000 lb/hr on waste wood and natural gas with the quantity of steam from waste wood of 293,000lb/hr, provided that the fuel qualities are as specified in Table 9-2 over an eight (8) hour test period.

9.3.1.2 JANSEN guarantees that the No. 4 Combination Boiler will be able to sustain an average steam generation rate of 262,500 lb/hr on waste wood only, with the fuel qualities specified in Table 9-2 over an eight (8) hour test period.

### **9.3.2 Emissions**

Under the conditions specified in paragraph 9.3.1.1 above, JANSEN guarantees the following emission levels at the stack:

The average of three (3) one-hour tests within an eight (8) hour test period for nitrogen oxides (NO<sub>x</sub>) will not exceed 0.22 lb/MMBtu.

This NO<sub>x</sub> guarantee is based on the premise that if the initial Phase 1 evaluation determines that an OFA system is not sufficient by itself to meet the guarantee, the use of flue gas recirculation, auxiliary fuel burner modifications, and/or changes in non-condensable gas incineration practices are acceptable options to enhance the NO<sub>x</sub> emissions reduction. The commercial terms for the additional work would be mutually agreed upon by GP and JANSEN.

### **9.4 Performance Tests**

JANSEN has guaranteed a certain performance level as per section 9.3. In order to determine the attainment of these guarantees, a performance test shall be performed. All performance tests shall be carried out on the boiler at the sole expense of G-P. These tests will be conducted within 60 days following start-up of the boiler, with the boiler in a clean state. G-P shall give JANSEN at least 15 days notice of the date or dates on which tests will be made. Test conditions will also require:

1. The general arrangement of equipment furnished by JANSEN, and the general design and arrangement of related equipment furnished by others shall not be less favorable than described in this Proposal. The equipment shall have been erected in accordance with JANSEN's plans and specifications, properly maintained and operated by G-P, and shall be in operating conditions satisfactory to both G-P and JANSEN.
2. The system for blending and feeding the fuel, and combustion control strategy shall be acceptable to both G-P and JANSEN. Further, G-P shall provide JANSEN with sufficient time to optimize the unit's operation over the load and fuel range prior to performance testing.

conformance to the equipment. Such corrective action may include, but shall not be limited to:

Repair, replacement, modification of the equipment, or additional design, equipment and construction services.

Upon completion of the corrective action, JANSEN shall notify G-P and additional tests shall be scheduled by G-P and conducted by G-P.

Any out-of-pocket expense to G-P for additional testing, except the expenses for G-P's mill operators and the raw materials required for the re-testing, shall be reimbursed by JANSEN.

JANSEN's total liability under this Section 9.5 is limited to the lesser of \$77,000 or 10% of the final contract price, including any change orders.

**ATTACHMENT IV**

**From:** Bill Buckley [mailto:bbuckley@synterprise.com]  
**Sent:** Thursday, December 22, 2005 11:18 PM  
**To:** Orender, Robert H.  
**Subject:** GP - PAL - Palatka Ecotube System Cost & Performance Estimates 12-22-05  
**Importance:** High

Robert: Thank you so much again for your continuing interest in the Ecotube technology and its potential application in your Palatka, Florida operation. As you are probably aware, we have just commissioned our fifth project in the US with very positive results and have several other Ecotube projects on the drawing boards for calendar year 2006.

Following review of your information, it appears that a system consisting of two Ecotube assemblies would be appropriate for the Palatka boiler with a furnace dimension that's approximately 20 feet square. With that basis in mind, I have attached a "draft budgetary" purchase order for an "air only" system that will provide you with an estimated "turnkey" cost, a view of project division of responsibilities, Synterprise and GP obligations and possible milestone and payment schedules for a project with a target completion date of mid September 2006. We have just experienced a price increase in November from Ecomb but I feel confident that we can still meet or possibly beat this cost structure based on the results of an on-site engineering study.

The on-site engineering study is necessary to get an accurate sense of furnace temperature profiles which will help us determine the optimum elevation(s) for the actual Ecotube penetrations, obtain a more accurate estimate of project cost and performance benefits. Obviously, that location will determine the extent of structural steel support that might be required, obstacle clearance issues that must be addressed and things of that nature. In addition, the engineering study will generally consist of the following scope:

Synterprise Associate(s) will work closely with client personnel to:

- Schedule, coordinate and perform the required Engineering testing and site assessment activities
- Collect all plant operating, general equipment and electrical/mechanical design information necessary for Ecotube system installation
- Analyze all collected operating and design information
- Prepare Ecotube System Engineering Study Report

Some of the more specific value points of the Engineering Study process include:

- A. Boiler performance measurements and variance analysis will provide the client, and Synterprise, with a better understanding of current boiler operational modes
  - ◆ Boiler flame pattern analysis of combustion conditions (Video analysis)
  - ◆ Furnace gas temperatures (Multiple tests with optical pyrometer)
  - ◆ Boiler operational data review and analysis –
    - Air heater exit gas temp.
    - Air heater air inlet temp.
    - Relative humidity
    - Excess air
    - Cost of fuel \$/ton
    - Capacity factor
    - Gross heat rate BTU/kwh
    - O2 % at boiler exit
    - Reheat spray flow lb/hr [if applicable]
  - ◆ Review of original boiler design acceptance test information and any additional performance analysis data that may be available
  - ◆ Boiler fuel analysis
    - Fuel heating value btu/lb

Ultimate fuel analysis

% by Weight

Ash

Sulfur

Hydrogen

Carbon

Nitrogen

Oxygen

Moisture

- ◆ Boiler ash analysis - unburned carbon

B. Provide projected operational performance improvement based on implementation of the Ecotube system will provide the client with boiler performance improvement potential

- ◆ Boiler performance assessment and projected improvement opportunity identification
- ◆ Predicted performance projection based on Synterprise proprietary spreadsheet model built using ASME boiler performance criteria (if applicable)

C. Provide an equipment configuration arrangement and a project plan

- ◆ Ecotube system project equipment configuration plan developed to obtain projected performance objectives
- ◆ Project plan developed to install the required Ecotube system lance assemblies and wall boxes as required
- ◆ Location of equipment, platforms (if required), and control equipment
- ◆ Air and source of cooling water requirements will be defined

Our clients (even those that have not elected to go forward with Ecotube projects) have found significant value in the Engineering Studies. Typical pricing for a study is \$35,000 but I expect to have a team in the southeast region in mid January so, if you're interested, Synterprise will offer to perform the study at Palatka for \$27,400 during that period which will keep the project on a fast track toward a possible completion date in the September 2006 timeframe.

From an emissions reduction performance perspective, it is realistic to assume that a minimum NOx reduction of 20% and a CO reduction of 80% can be achieved with an "air only" installation. Our actual results have ranged close to 40% for NOx reduction and 90% for CO reduction in certain applications.

If reagent is added to the Ecotube system for purposes of NOx reduction, a minimum NOx reduction of 60% should be attainable. Actual results have indicated that NOx reduction with reagent may approach 70-75% in certain cases. The "ballpark" added cost for a reagent storage and delivery system with controls integrated into the Ecotube system would be around \$800 for a budgetary view.

As you know, the Ecotube technology also differentiates itself from many of the other "parasitic" emission reduction systems because Ecotube offers substantial combustion optimization value as well. Synterprise would be pleased to schedule a webcast or a direct visit to further discuss the Ecotube technology with GP personnel. In addition, we would be pleased to coordinate an actual site tour at either the Stratton or Ashland sites in Maine where Ecotube systems are in service on boilers with steam flows in the same region as your Palatka boiler.

Since you mentioned the potential replacement of your overfire air system at Palatka, let me advise you of another possible product that might be of interest. Synterprise now offers the Ecojet technology, which is a new proprietary "high energy", separated and "tunable" overfire air concept that has been developed by Synterprise during the last year (patent pending) to address issues that have been raised by a variety of clients. Basically, many clients are constrained by limited Capex, have serious combustion problems and have found that existing overfire air systems (both OEM and aftermarket offerings) are inadequate from a performance perspective. To address this need, we have successfully developed, completed production and conducted initial testing of the Ecojet system which now positions Synterprise to offer an integrated and phased strategy designed to give our clients the most appropriate system, yielding maximum benefits with lowest costs that best matches their particular business plans and objectives.

Again Robert, thank you very much for your continued interest in Synterprise's products and professional services and we'll look forward to your feedback. Please advise if you wish to proceed directly with an Engineering Study at Palatka and I'll get a proposal to you right away to initiate that effort.

Have a Joyous and Prosperous Holiday Season!

Very Best Regards,  
Bill

*William J. Buckley*

*Vice President Engineering and Construction*

*423 267 5363 Office  
423 265 2350 Fax*

[www.synterprise.com](http://www.synterprise.com)

*Innovative Solutions for  
Operational Excellence*



Palatka Pulp and Paper Operations  
Consumer Products Division  
P.O. Box 919  
Palatka, FL 32178-0919  
(386) 325-2001

January 31, 2007

Mr. Jeffery F. Koerner  
Air Permitting North Section  
Bureau of Air Regulation  
Florida Department of Environmental Protection  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, FL 32299-2400

RECEIVED

FEB 05 2007

BUREAU OF AIR REGULATION

Re: Modification of the No. 4 Recovery Boiler, No. 4 Lime Kiln and No. 4 Combination Boiler  
Project No. 1070005-038-AC/PSD-FL-380  
Response to Request for Additional Information

Dear Mr. Koerner:

We are in receipt of your request for additional information, dated December 15, 2006, regarding our permit application to modify the No. 4 Recovery Boiler, No. 4 Lime Kiln and No. 4 Combination Boiler.

As noted in your question #7; Georgia-Pacific is requesting that the Department separate the projects into two separate PSD applications for the purposes of review and permit issuance due to the critical timing associated with the projects for the Recovery Boiler and Lime Kiln. Separate permits would be issued as suggested for the No. 4 Recovery Boiler and No. 4 Lime Kiln as one project, and for the No. 4 Combination Boiler as the second project. Our responses to the questions in your letter are intended to only address issues associated with the No. 4 Recovery Boiler and No. 4 Lime Kiln. A separate response will be forthcoming address the issues associated with the No. 4 Combination Boiler. For ease of following GP's responses, we have repeated the FDEP's questions prior to the answers.

- 1. The project is significant for sulfuric acid mist emissions and requires a BACT determination. SAM emissions from the No. 4 Lime Kiln result from firing residual oil; however, overall emissions are very low (estimated < 2 tons/year) due to the natural scrubbing action of the lime kiln and possible additional reductions in the venturi scrubber. For the No. 4 Combination Boiler, the control technology review indicates the following technologies are available for the control for SAM emissions: dry ESPs, wet**

**ESPs, and wet scrubbers. Your control technology review for the No. 4 Recovery Boiler also indicates mist eliminators in addition to this equipment. Dry ESPs, wet ESPs, wet scrubbers were eliminated from consideration due to expected high capital costs. Mist eliminators were eliminated from consideration because no actual installations were identified that reduced SAM emissions with mist eliminators on a recovery boiler. However, this technology appears transferable. Please provide a cost effectiveness analysis for adding mist eliminators to the No. 4 Recovery Boiler and the No. 4 Combination Boiler.**

**As stated in the application for the No. 4 Recovery Boiler, reducing SO<sub>2</sub> emissions will also result in lower SAM emissions. For this reason, the Department will consider reducing the fuel sulfur content of the residual oil in making its BACT determination. Please provide a control technology review for lowering the fuel sulfur content of the residual oil currently being fired to include a cost effectiveness analysis.**

**Alternatively, provide a combination of fuel consumption/fuel sulfur limits that maintain the net emissions increases below the PSD significant emissions rate for SAM emissions (7 tons/year). Depending on future use, this may be readily achievable because the primary fuels are BLS for the No. 4 Recovery Boiler and bark/wood for the No. 4 Combination Boiler. In fact, the stated purpose of the modifications to the No. 4 Combination Boiler is to more efficiently combust bark/wood and to displace oil firing.**

Answer: GP will address the sulfuric acid emissions (SAM) associated with this project by reducing those emissions below the PSD threshold. The specifics of the reduction strategy are being formulated. A specific plan and updated netting table will be provided to the Department with the response for the #4 Combination Boiler, which we expect to submit within the next few weeks.

- 2. On November 30<sup>th</sup>, we received a graph by facsimile labeled “Recovery Boiler 12 Hr. Startup Curve”. The graph plots steam pressure (psi) versus time (hours). A statement following the graph indicates that “..., it is also a normal startup curve that has been doubled to accommodate an extended boiler outage.” Please provide the original graph for a normal startup and identify the conditions for a normal startup. Also, please identify the conditions of a startup after an extended outage and explain the rationale for “doubling” the original graph.**

Answer

Georgia-Pacific’s permit currently recognizes an 8-hour startup period for the Recovery Furnace. We are specifically requesting a longer startup period to better reflect normal startup procedures for recovery furnaces. We believe the Department has the inherent authority to provide for such necessary startup processes under the Florida rules, including the excess emission rule.<sup>1</sup>

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<sup>1</sup> Florida Rule 62-210.700(1) expressly allows excess emissions resulting from SSM conditions provided the source uses best operational practices to minimize emissions and the excess emissions do not exceed two hours, “unless specifically authorized by the Department for longer duration.”



As will be demonstrated by this information being provided in this response, a startup period can routinely be more than 24 hours from first fire to the point of removing the oil guns from the furnace. **Georgia-Pacific is requesting a 24-hour startup period for the Recovery Furnace.** The attached charts demonstrate the need for this startup period.

Georgia-Pacific is specifically concerned with startup due to the extended amount of time the recovery furnace is typically on residual fuel (either as the exclusive fuel or as a stabilizing fuel when black liquor is being introduced) during this period. This can result in an extended period during which we are potentially unable to comply with the sulfur dioxide and nitrogen oxide standards that apply during normal (non-SSM) recovery furnace operations. The SO<sub>2</sub> and NO<sub>x</sub> emissions of the unit during these times are closer to those of an oil fired boiler than a recovery furnace. This issue is not unique to Palatka – all recovery furnaces use auxiliary fuels during periods of startup/shutdown and/or to stabilize the combustion process during periods of low black liquor burning rates and periods of low solids in the liquor or poor quality liquor.

The sulfur dioxide emissions from the recovery furnace when starting up and shutting down the unit are directly related to the sulfur content of the auxiliary fuels used. Georgia-Pacific requests that compliance with the sulfur dioxide standard during these periods be demonstrated by using fuels that comply with the permitted sulfur content.

Reliance on a start up curve to demonstrate the length of a reasonably-necessary startup period for the recovery furnace is not adequate. The startup curve only demonstrates the time necessary to build pressure / temperature in the steam system and to bring the unit online, thus making steam. The full startup ends when black liquor burning is self-sustaining and oil is removed from the furnace.

Figure 1 contains three startup curves for the recovery furnace. The first is the rapid startup curve typically used for the unit. The second is the startup curve in the DCS which is used during a cold startup. The third is the textbook curve which is based on increasing temperature of the steam by 100 degrees Fahrenheit (°F) per hour to control the tube expansion rate. Controlling the startup temperature of the furnace maximizes the cyclic life of the superheater section of the unit. As you are aware, this furnace currently has issues with steam tube cracking that will be addressed by the implementation of this project.

As you consider the information being presented, please keep in mind that the recovery furnace is not a boiler, but a chemical recovery unit. Its primary function in this capacity is to recover the chemicals from the Kraft pulping process first and then produce steam as a secondary function. Rapidly pushing a recovery furnace through a startup can result in very unsafe conditions.

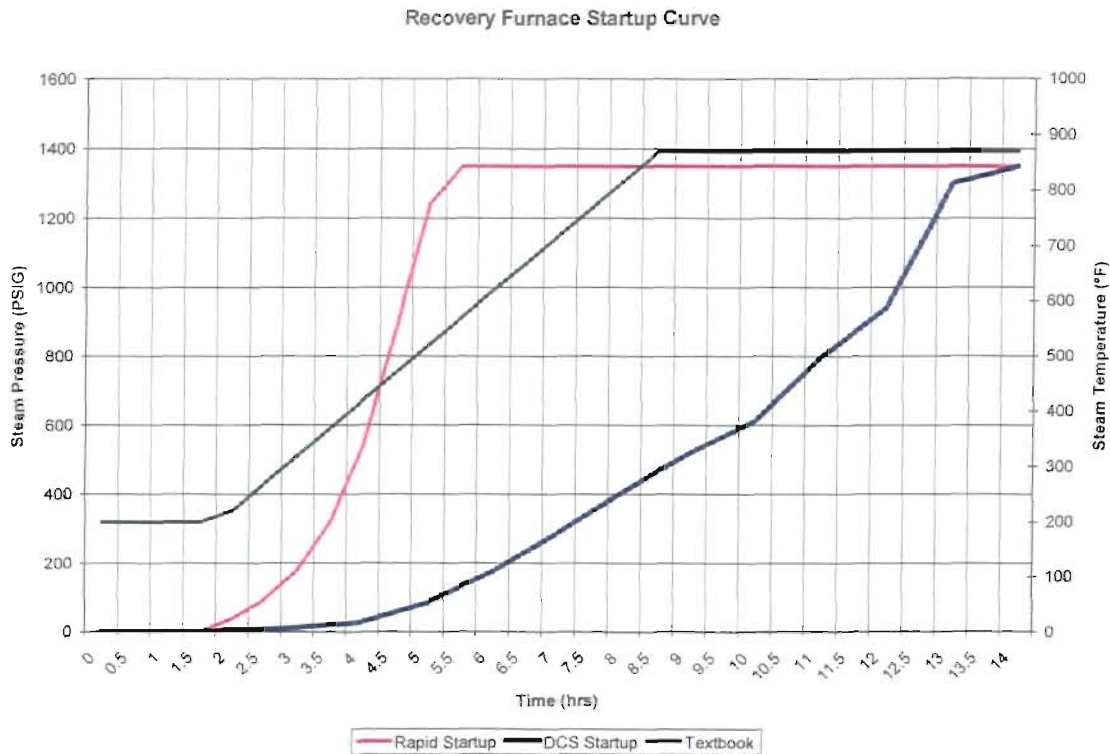


Figure 1. Startup curves for the Kraft Recovery Furnace at Georgia-Pacific, Palatka Operations

As previously noted, the startup curve in Figure 1 does not represent the end of the startup process for the recovery furnace. After the unit is brought on line with oil, we must continue to burn oil along with the black liquor until a minimum sustainable load is reached on black liquor. At that point, the heat available from the black liquor is sufficient to dry and combust the organics. At that time, the oil burners are gradually removed from service. When all the oil is removed, the unit is considered to be fully out of the startup period.

Figures 2 through 5 show graphs that are screen prints of the actual operations data from the Plant Information system during four startup/shutdown periods of the recovery furnace within the past year. These graphs demonstrate the actual startup periods of the recovery furnace which can last much longer than the standard 8-hour period allowed in current Title V permit. The information hand written on the graphs comes from the operator logs during those periods or interpretation of the graphics. It should be noted that black liquor flow is not adequately represented on the graphics because it includes materials recycled through the black liquor feed system.

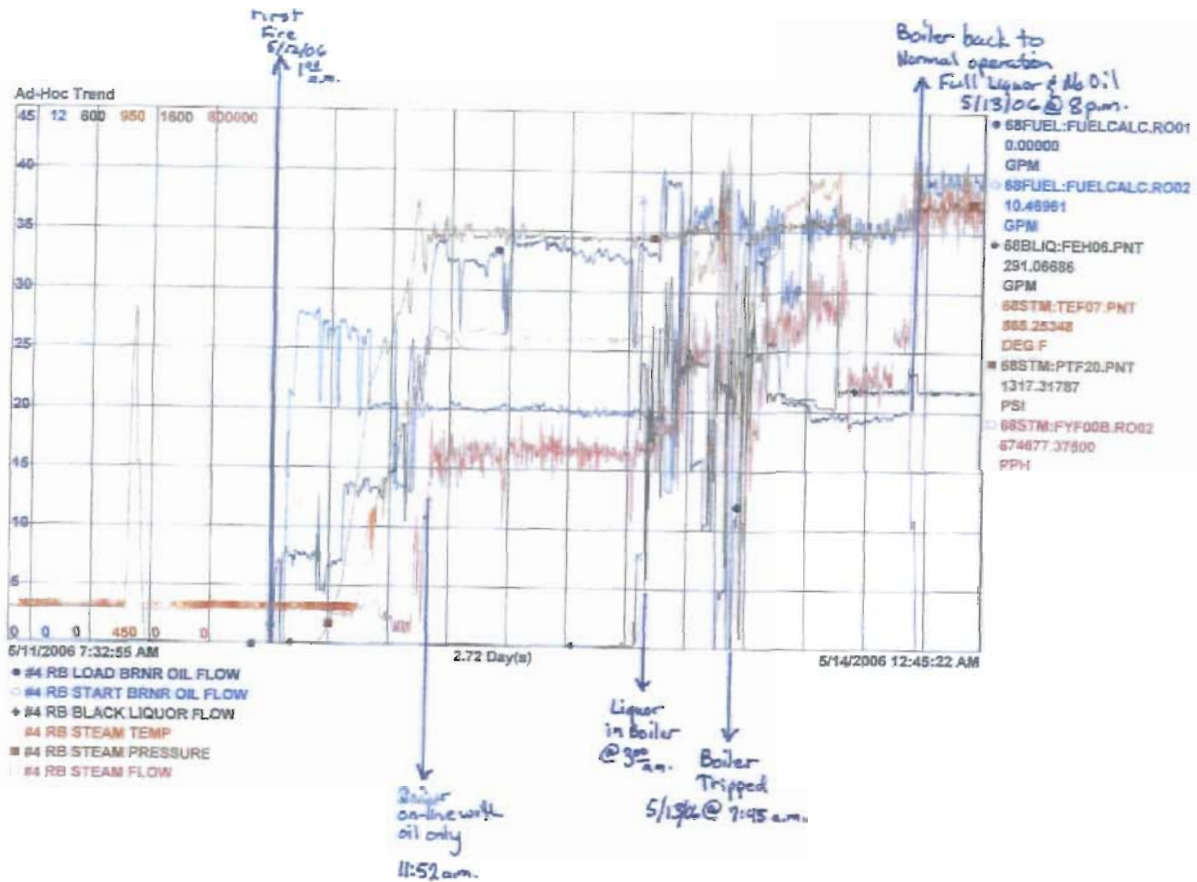


Figure 2. Printout from the May 12, 2006 cold startup of the recovery furnace. The first fire of the furnace on oil occurred at 1:00 a.m. on May 12. The unit went through its startup curve and was online with only oil at 11:52 a.m. The furnace was operated on only oil until 3:00 a.m. on May 13. At that point, black liquor was initially fired in the unit. At 7:45 a.m. on May 13, the furnace tripped and was immediately restarted. The furnace operated with oil as a supplementary fuel until 8:00 p.m. on May 13. As such, for this scenario, the total startup curve was 43 hours.

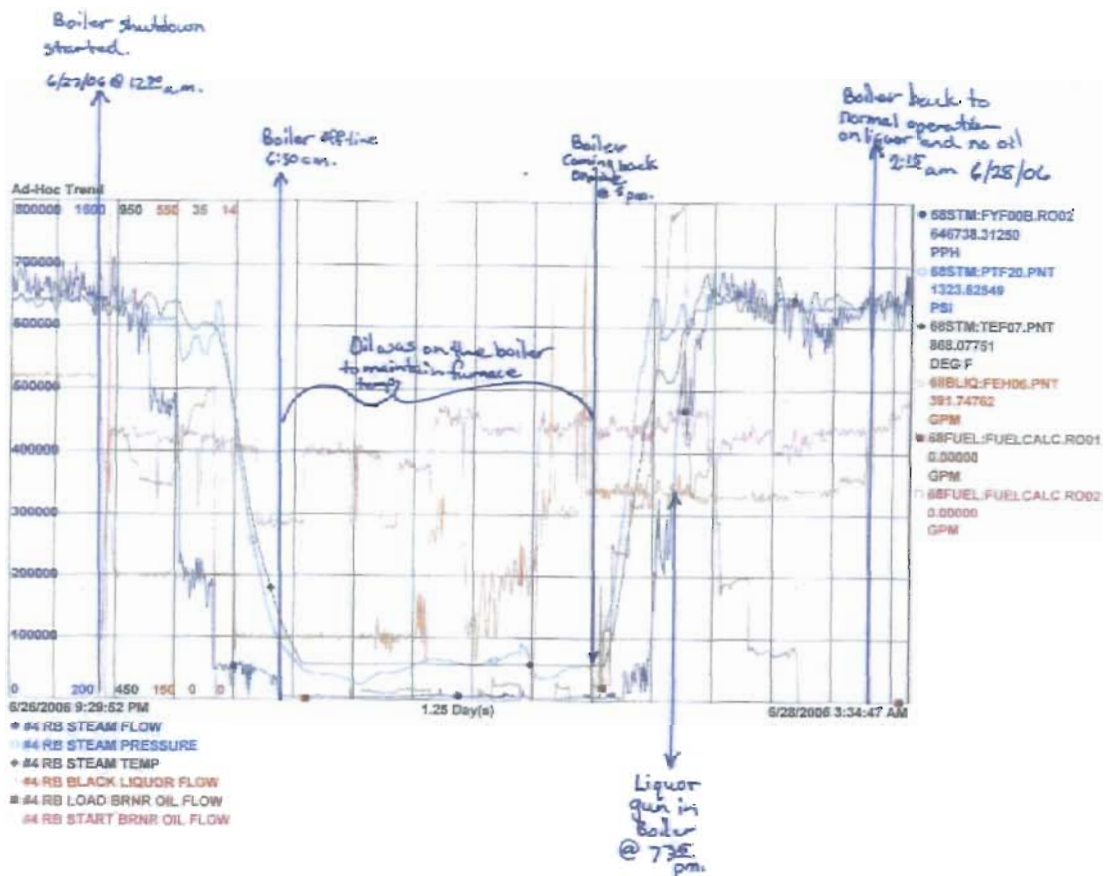


Figure 3. This figure documents the shutdown and startup of the Recovery Furnace on June 27 & 28, 2006. The shutdown process began at 12:30 a.m. on 6/27/06; at that point, oil was put in the Recovery and black liquor was taken out. The smelt bed was burned out and the boiler was offline at 6:30 a.m. on 6/27/06. During the downtime on the unit, a small amount of oil was burned in the furnace to maintain a minimum header pressure and temperature. At 5:00 p.m. on 6/27/06; the oil flow was increased and the process of bringing the furnace back online was started. Black liquor burning was reestablished at 7:55 p.m. and oil was removed from the unit at 2:15 a.m. on 6/28/06.

This review demonstrates a typical practice of burning only oil in the furnace during maintenance outages to allow the furnace to come back online quickly and eliminate a cool down / heat up cycle on the furnace.



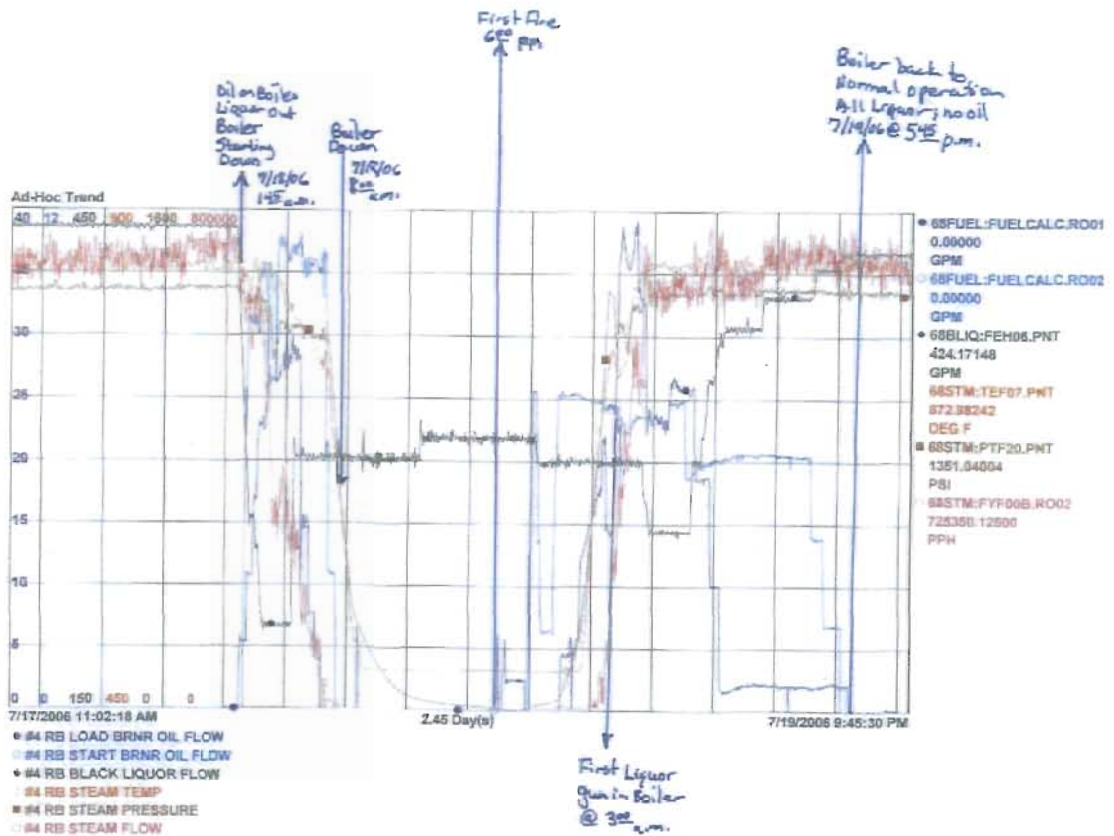


Figure 4. Printout for shutdown/startup of the recovery furnace on July 18-19, 2006. The shutdown process began at 1:45 a.m. on July 18 when oil was placed in the furnace and liquor was pulled. Over the next 6 hours, the smelt bed was burned down and then the unit was taken offline by 8:00 a.m. on July 18. The startup process began at 6:50 p.m. when oil was first fired in the furnace. The unit was brought online and stabilized, with black liquor first introduced to the unit at 3:00 a.m. on July 19. After stabilizing the liquor burning, oil was continuously worked out of the unit and the last oil gun was removed at 5:45 p.m. on July 19. The start-up period lasted approximately 23 hours.

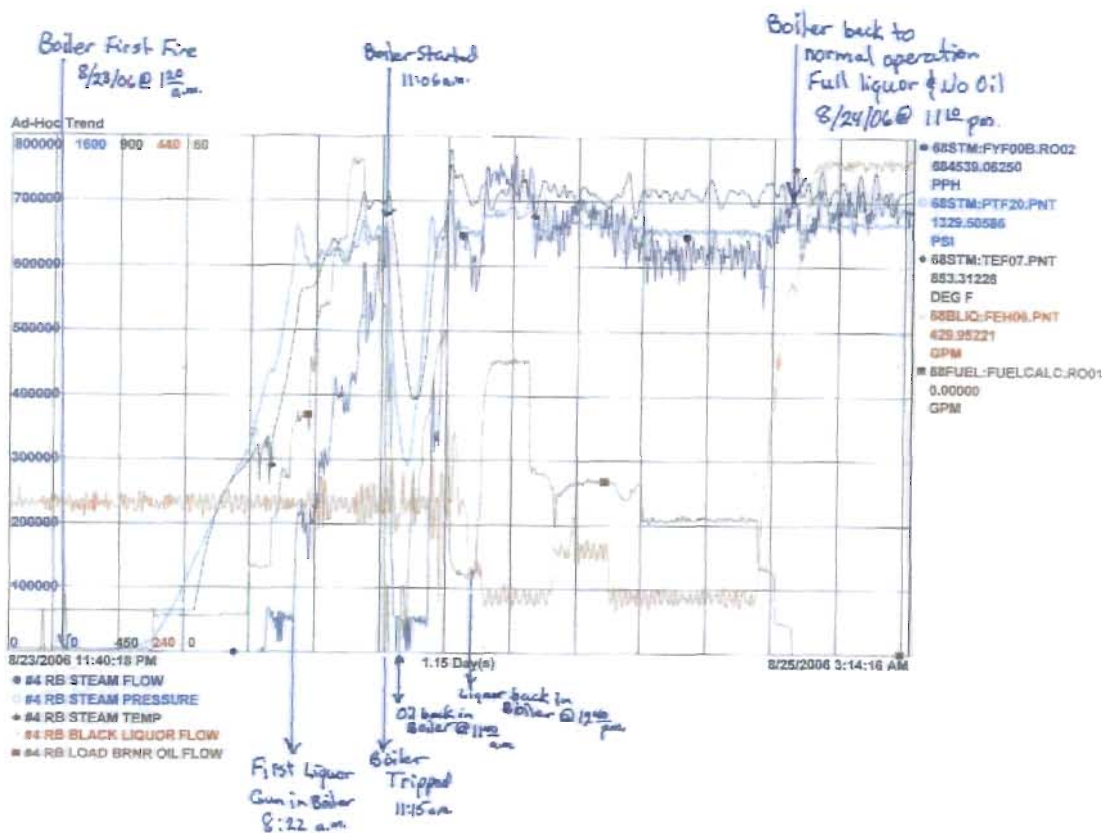


Figure 5. Printout for recovery furnace startup on August 24, 2006. The startup of the unit began with the first fire of oil at 1:30 a.m. on August 24. The first liquor gun was put in the unit at 8:22 a.m. as the furnace was being brought online. As is not unusual, the unit tripped offline at 11:15 a.m. and was brought back online in a rapid fashion on oil, with liquor reintroduced at 12:40 p.m. on August 24. As the unit was stabilized, residual fuel was progressively removed from the furnace and the last oil gun was removed from service at 11:10 p.m. on August 24. The start-up period lasted between 21 and 22 hours.

As is demonstrated by Figures 3 & 4, the shutdown period is generally less than 8 hours. A recovery furnace typically has a shutdown period that is much longer than a typical oil-fired boiler. The shutdown period for the recovery furnace is initiated when oil is put in the unit and black liquor is reduced / removed. The auxiliary fuel, in this case fuel oil, is continually burned in the unit until the smelt bed in the bottom of the furnace is below the smelt spouts. If the smelt bed is not taken below the spouts, the spouts will plug as the furnace cools, causing extensive delays during the startup process.

As previously stated; Georgia-Pacific believes a startup period of 24 hours is justified and should be granted by the Department.

**Questions 3 through 5 will be responded to under separate cover as previously discussed in this response**

- 6. Based on your last submittal, a new ESP will be installed on the No. 5 Power Boiler. No vendor has yet been selected. As you are aware, the No. 5 Power Boiler has been identified as a "BART-eligible" unit. Please ensure that this new control equipment will be designed and selected in accordance with this upcoming regulatory requirement.**

Answer: Georgia-Pacific is aware that the No. 5 Boiler is a "BART-eligible" unit and we will ensure that the emission controls are consistent with the upcoming regulatory requirements under that program. A tentative BART control submittal will be provided to the Department in the next couple weeks.

- 7. The Department is aware of your upcoming spring outage and a stated critical need to implement the modifications for the No. 4 Recovery Boiler and the No. 4 Lime Kiln during this period. The Department believes that this portion of the application is nearly complete. In addition, the Department also believes that the combined netting analysis properly identifies the PSD-significant pollutants for the projects and that the requirements for the air quality analysis have been satisfied. If requested, the Department is now willing to separate the project into two related PSD applications: (1) the No. 4 Recovery Boiler and No. 4 Lime Kiln, and (2) the No. 4 Combination Boiler. Please keep in mind that each related project remains subject to the same PSD-significant pollutants, air quality modeling requirements, etc.**

Answer: Georgia-Pacific appreciates the Department's understanding of the critical timing issues associated with the upcoming spring outage and vital work that must be completed on these two units. As stated in the opening of this response, Georgia-Pacific is officially requesting that the applications be split as suggested in Question 7.

If you have any questions regarding this response, please contact Michael Curtis at 386-329-0918.

I, the undersigned, am the responsible official of the source for which this document is being submitted. I hereby certify, based on the information and belief formed after reasonable inquiry, that the statements made and the data contained in this document are true, accurate, and complete.

Sincerely,

A handwritten signature in black ink that reads "Keith Wahoske". The signature is written in a cursive style with a large initial 'K'.

Keith W. Wahoske, Vice-President  
Palatka Operations

cc: W. Galler – GP  
T. Champion - GP  
T. Wyles - GP  
S. Matchett - GP  
M. Curtis -GP