Georgia-Pacific

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CERTIFIED MAIL – RETURN RECEIPT REQUESTED

November 9, 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

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_x 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-condensible 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_x, PM, PM_{10}, SAM, SO_2, 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^3/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_x, PM/PM_{10} and VOC. Provide an updated BACT review based on*

GP's Response to Question No. 2a:

Table 2a (1)

Pollutant Emission Rates for No. 4 Combination Boiler Burning 100% Natural Gas, LVHC NCGs, SOGs, and HVLCs						
	PM/PM_{10}	**SO_2**	**SAM**	**NO_x**	**CO**	**VOC**
lb/MM Btu	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
lbs/hr	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
tons/yr	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
ppmvd	---	Gas-0.3	Gas-0.0	Gas-90.4	Gas-99.0	Gas-3.5 (as propane)
grains/dscf @ 8% O_2	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)

Pollutant Emission Rates for No. 4 Combination Boiler Burning 100% Wood/Bark, LVHC NCGs, SOGs, and HVLCs						
	PM/PM_{10}	**SO_2**	**SAM**	**NO_x**	**CO**	**VOC**
lb/MM Btu	PM-Wood-0.04 PM Wood Total-0.04 PM_{10}-Wood-0.03 PM_{10} 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
lbs/hr	PM-Wood-22.6 PM Total-22.6 PM_{10}-Wood-16.7 PM_{10} 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
tons/yr	PM Wood-98.8 PM Wood Total-98.8 PM_{10}-Wood-73.1 PM_{10} 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
ppmvd	---	Wood-10.4	Wood-0.3	Wood-139.5	Wood-477.4	Wood-10.3 (as propane)
grains/dscf @ 8% O_2	PM-Wood-0.0195 PM_{10} Wood-0.0144	---	---	---	---	---

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

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_2	μ/m^3	μ/m^3	μ/m^3	μ/m^3
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_2 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.

Table 1

	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_2 Emission Rates During Normal Operation: The data presented in the air quality summary table above for SO_2 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_2 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:

ppmvd = 1,849.2 lbs/hr x 1,545.6 ft-lb/lb-n - °R x 528 °R / 294,000 $dsft^3$/min x 2,116.8 lb/ft^2 x 64 lb SO_2/lb-n SO_2 x 60 min/hr = 631.5 ppmvd

The concentration value of 631.5 ppmvd is approximately equivalent to the SO_2 concentration modeled by Golder & Associates, Inc. as the 3-hour average SO_2 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:

lbs SO_2/hr = 157 lbs SO_2/M gal fuel oil x 2.35 x 83.5 gal/min x 60 min/hr = 1,848.4 lbs SO_2/hr ~ 1,849.2 lbs SO_2/hr

Similarly, the 24-hour SO_2 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:

ppmvd = 1,040.6 lbs/hr x 1,545.6 ft-lb/lb-n -°R x 528 °R / 294,000 $dsft^3$/min x 2,116.8 lb/ft^2 x 64 lb SO_2/lb-n SO_2 x 60 min/hr = 355.35 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_2 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:

lbs SO_2/hr = 157 lbs SO_2/M gal fuel oil x 2.35 x 47 gal/min x 60 min/hr = 1,040.4 lbs SO_2/hr ~ 1,040.6 lbs SO_2/hr

The slight discrepancies in the calculated SO_2 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.

$\left(\frac{\text{Comb. Air}}{\text{no.5}}\right)\left(\frac{81\ \text{gal}}{\text{min}}\right)\left(\frac{8.2\ \text{lbs}}{\text{gal}}\right)\left(\frac{0.0235\ \text{lbs}}{\text{lb}}\right)\left(\frac{2\ \text{lb}\ SO_2}{\text{lbs}}\right) = 1873.0\ \frac{\text{lb}\ SO_2}{\text{hour}}$

GP's Response to Question No. 4: (Part 2 – *"Does this properly describe the background for this issue, the proposed SO_2 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_2 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_2 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_2 concentrations (corrected to 8% O2) up to 21 ppmvd, although the average was <1 ppmvd (corrected to 8% O2).

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_2 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_2 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 O2 (17-20%), the CEMS O2-corrected SO2

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 SO2 mass emissions from fuel oil can readily be calculated if the concentration limit becomes an issue. Of course, the annual SO2 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_2 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,

Keith Wahoske

Keith W. Wahoske, Vice-President
Palatka Operations

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