

I. Applicant

St. Regis Paper Company
Gulf Life Tower
Jacksonville, Florida 32207

II. Location

The proposed modification is to an existing plant located off Highway 29 near the city of Cantonment in Escambia County, Florida. The UTM coordinates of the proposed facilities are 469 east and 3386 north; the latitude is $30^{\circ} 36' 19''$ north and the longitude is $87^{\circ} 19' 13''$ west.

III. Project Description

The applicant proposes to modify its Cantonment Kraft pulp and paper mill by adding a boiler to produce steam to drive power generating turbines and to meet process needs. The boiler will be capable of firing wood residue (bark, etc.), natural gas, fuel oil or combinations of gas/wood and oil/wood in varying proportions. The desired firing condition is straight wood residue firing; however, the 666 million BTUs per hour maximum heat input can be met with any of the fuels or combinations of the fuels depending on process needs. The modification also will include materials handling equipment for wood residue feed to the boiler.

IV. Source Impact Analysis

The proposed modification to this Kraft pulp mill has the potential to emit greater than 100 tons per year of the following pollutants as shown in Table I: sulfur dioxide (SO_2), nitrogen dioxide (NO_2), particulate (TSP), and carbon monoxide (CO). Also, emissions from the proposed modification impact areas currently attaining National Ambient Air Quality Standards (NAAQS). Therefore, review is required under Federal Prevention of Significant Deterioration of Air Quality (PSD) Regulations (40 CFR 52.21). Furthermore, allowable emissions of these pollutants exceed 50 tons per year (see Table I) and full PSD review is required. Full PSD review includes analyses of the following items:

TABLE I
EMISSIONS SUMMARY
(Tons per Year)

	<u>SO₂</u>	<u>TSP</u>	<u>NO_x</u>	<u>CO</u>	<u>HC</u>	<u>TRS</u>
Potential Emissions New Boiler ^a	2334	36,811	3443	688	59	-
Other Potential Emissions Since 8/7/77 ^b	g	37	67	1	22 ^c	0.16
Accumulated Potential Emissions Since 8/7/77	2334	36,848	3510	689	81	0.16
Allowable Emissions New Boiler ^d	1867	292	875 ^e	688	f	f

- a. Estimated at maximum capacity under worst case firing conditions as follows: SO₂ - 100% oil; TSP, NO_x, CO - 100% bark; HC - 70% bark, 30% gas (test data - 0.22 lb HC per ton bark)
- b. As estimated in Final Determination for previous expansion (PSD-FL-029).
- c. Estimate from Final Determination (46 T/Y) was revised based on data submitted in Appendix G of the present application.
- d. To determine applicability, maximum allowable emissions under worst case firing are listed; fuel-specific allowable emissions are listed in a later table.
- e. Worst case, based on 0.3 lb/MM Btu for oil firing. Maximum allowable NO_x emissions for other firing scenarios will vary according to maximum limits in Table II.
- f. Accumulated potential emissions of these pollutants does not exceed 100 tons per year and PSD review for these pollutants does not apply.
- g. SO₂ emissions from the previous expansion (260 T/Y) have already been reviewed under Federal PSD regulations and are not considered in this determination.

- a. Best Available Control Technology (BACT);
- b. Increment Impact;
- c. NAAQS Impact;
- d. Class I Area Impact;
- e. Growth Impact; and
- f. Soils, Vegetation and Visibility Impacts.

It should be noted that the area in which the plant is located is classified as "attainment" with respect to NAAQS for SO₂, TSP, NO₂, CO and hydrocarbons (HC), but that the area is "unclassified" for ozone (O₃). Also, the plant is located within a 36-hour travel time of an O₃ "non-attainment" area in Mobile, Alabama. Under these circumstances, sources can be subject to LAER and emissions offsets. However, in this case, sufficient representative O₃ monitoring data was available to show the area impacted by the plant to be attaining the NAAQS for O₃. In addition, the modification does not have potential emissions of HC greater than 100 tons per year. Therefore, the strict requirements for LAER and offsets are not required for the proposed modification.

A. BACT Analysis

The applicant is required under the provisions of Paragraph (j) of the PSD regulation to apply BACT for all proposed facilities emitting SO₂, TSP, NO_x and CO. This includes the boiler and, for TSP, the waste wood handling system.

For the boiler, the technologies considered for controlling TSP include electrostatic precipitator, baghouses (fabric filters), and a combination cyclone collector/venturi scrubber control system. Each of these devices is capable of meeting the 0.1 lb TSP/MM Btu limit required in the New Source Performance Standard (NSPS) which applies to this facility (40 CFR Subpart D). The analysis concluded and EPA concurs that the NSPS limit achieved by the cyclone/venturi scrubber system is BACT for TSP for this facility. The cyclone/venturi scrubber technology was chosen based on space limitations, reliability, familiarity of operation and capital and operating costs considerations.

This device also will be partially effective in controlling SO₂ emissions. The applicant estimates reduction to be a minimum of 20 percent. Actual SO₂ emissions will depend on the fuel being fired. As BACT, the applicant proposes this 20 percent reduction in conjunction with low sulfur fuel. The applicant

TABLE II
ALLOWABLE EMISSION LIMITS

<u>FUEL FIRED</u>	<u>SO₂</u>	<u>NO_x</u>	<u>TSP</u>	<u>CO</u>
Gas Firing	0.0006	0.2	0.1	0.237
Oil Firing	0.641	0.3	0.1	0.237
Wood Firing	0.03	0.25 ^a	0.1	0.237
Gas/Wood	0.051	0.2	0.1	0.237
Oil/Wood	0.641	0.3	0.1	0.237

^a Determined on a three-hour average.

this unit ranged between 0.107 and 0.16 pounds per million BTUs (3 hour averages). Further, the 0.25 pound per thousand BTU limit is less than the NSPS level for oil firing conditions (0.3 lb/MM BTU) and that for solid fossil fuel firing (0.7 lb/MM BTU). Therefore, the maximum allowable limit for NO_x while firing wood residue is determined to be 0.25 pounds per million BTUs heat input (3 hour averages). Compliance with this limit will be determined with a chemiluminescence test method, as described by the applicant, and checked with a simultaneous EPA standard method 7 test. The 0.25 lb/MM BTU limit was chosen to allow for variations in boiler design, fuels fired, etc. between the boilers tested and the proposed boiler. Further, the limit represents only the upper boundary and does not obviate the requirement to control combustion conditions and maintain the minimum NO_x emission rate.

Consistent with the requirements of the NSPS (40 CFR 60.45), the applicant will install, maintain and operate continuous monitors for measuring and recording opacity of emissions, sulfur dioxide emissions, nitrogen oxides emissions, and either oxygen or carbon dioxide emissions. One exception to the procedures and requirements of 40 CFR 60.45, as applied to this source, is that NO_x emissions for straight wood residue firing can be estimated on a three-hour basis rather than a one-hour basis for the purposes of determining continuous compliance with the allowable limit for NO_x emissions. This is necessary because straight wood combustion, which is not addressed by the NSPS, is less steady state than gas or oil due to variability in the fuel feed rate.

BACT for CO emissions is similar to that for NO_x . Combustion conditions will be maintained to insure complete combustion and minimize CO emissions. However, combustion conditions which minimize CO formation tend to increase formation of NO_x . Therefore, to minimize emissions of both NO_x and CO, the oxygen (or CO_2) monitor will be calibrated and alarmed as described in the attached general provision, "Use of Flue Gas Oxygen Meter as BACT for Combustion Controls". As stated in the general provision, recalibration will be necessary if the fuel(s) being fired in the boiler changes.

The proposed modification also includes wood residue handling equipment which has the potential to emit TSP. Because of the normal moisture content of the materials handled (about 50%), TSP emissions are expected to be minimal in quantity. Also, any TSP emissions which do emanate from this equipment will tend to be fugitive in nature. For these reasons, emissions control will be achieved through proper design and operation of the system. Further, the system will be subject to a 0 percent opacity limit as measured by EPA standard method 9.

BEST AVAILABLE COPY**B. Increment Analysis**

The applicant is required under Paragraph (1), Part (2) of the PSD regulations to demonstrate that emissions from the proposed modification and all other applicable sources will not cause or contribute to a violation of the maximum allowable increments as defined in Paragraph (c). This was accomplished by 1) an analysis of the available ambient air monitoring data to determine the amount of available increment in this area and 2) a modeling analysis of the impacts from the proposed modification and all other increment consuming sources.

The stack height for the boiler which was used as input to the modeling does not exceed Good Engineering Practice (GEP) stack height and therefore is acceptable for predicting ambient concentrations. However, because the actual stack height proposed by the applicant is significantly less than GEP (165 ft. vs 178 to 200 ft. depending on building orientation), it also is necessary to determine the effects of downwash. A downwash analysis was performed using accepted Huber-Synder techniques. The results show that 1) downwash did not threaten increment or NAAQS levels, 2) downwash is not expected for ambient wind speeds less than 21 miles per hour, and 3) the maximum 3-hour SO_2 concentration due to downwash effects is 146 ug/m^3 on plant property and 69 ug/m^3 off plant property. Clearly, the maximum concentrations do not threaten the allowable 3-hour SO_2 increment of 512 ug/m^3 and because downwash conditions, that is, winds greater than 21 mph, will not persist for greater than one to two hours at any one occasion, the allowable increments (TSP and SO_2) for longer averaging times (24-hour and annual for TSP and SO_2) will similarly not be threatened. Further, the results show downwash not to affect maximum amount of increment consumed in this area (69 ug/m^3 off-property concentration is less than the 95.3 ug/m^3 maximum predicted without downwash effects). Therefore, downwash was not considered further in the increment and NAAQS analyses.

The modeling for the increment analysis used EPA approved AQDM and CRSTER models. Emissions data input to the model were maximum rates, that is, worst case fuel firing conditions for each pollutant. For AQDM runs (annual averages) 10 years of meteorological data from Milton, Florida was used. For the CRSTER run (short term averages), a single year's data (1964)

was input to the model (note: 1964 was identified as the critical year in earlier analyses by EPA). Maximum impact areas were found using 1.0 kilometer receptor spacing and for the CRSTER model, the maximum impacts were refined to 0.1 kilometer receptor spacing.

The combined air quality impacts of all increment consuming sources were considered in the analysis. A search of State air permit files and other available information surfaced only two additional increment consuming sources: 1) a calciner added to the St. Regis plant in an earlier modification and 2) three gas fired turbines at Exxon Company U.S.A. located about 43 kilometers to the north. The emissions from Exxon were modeled separately and found not to significantly impact the Cantonment area ($<0.1 \text{ ug/m}^3$ on a 24-hour average). The emissions from the calciner were modeled along with those from the proposed modification to determine the full extent of increment consumption within the impact area of the plant.

The results of the modeling analysis are shown in Table III. All modeled values shown are maximum impacts including those for short term averages which can be exceeded once per year. This added degree of conservatism is required by EPA, because only one year of meteorological data was analyzed for the short term concentrations. The modeling results, when compared to the allowable increment for TSP and SO_2 (also listed in Table III), show conclusively that the allowable increments will not be exceeded by the proposed modification. The 24-hour SO_2 concentration comes closest to exceeding the increment, but even in this case, less than 40 percent of the available increment has been consumed.

C. NAAQS Analysis

The NAAQS analysis is performed under the requirements of Paragraph (1), Part (1) of the PSD regulations to determine that the NAAQS ceilings are not threatened, and thus, public health and welfare are protected. This analysis was performed by 1) collecting representative ambient monitoring data to establish background concentrations for SO_2 , TSP, NO_x and CO, and 2) adding these background concentrations to the maximum modeled concentrations from the proposed modification. Emissions from the St. Regis calciner, which was permitted previously but which is not yet constructed, also were added to the background concentrations to analyze impacts on NAAQS. The results of the NAAQS analysis are displayed in Table III along with the results of the increment analysis. These show conclusively that emissions from the proposed modification will not degrade ambient air quality beyond the NAAQS ceilings.

D. Class I Area Impact

The Class I area closest to the proposed modification is Breton National Wildlife Refuge which is located about 160 kilometers to the westsouthwest. This distance is beyond the distance at which impacts can be reasonably estimated with current modeling techniques. For this reason, no detailed Class I area impact analysis was performed. However, considering the maximum impacts predicted in the vicinity of the plant and the dilution which will be experienced over the 160 kilometer distance, it is concluded that the proposed modification will not significantly impact any Class I area.

E. Growth Impact

The proposed modification is not expected to significantly impact growth in the area. A number of additional laborers will be employed during the construction phase of the project and a small number of permanent employees will be added to handle the overall plant expansion from this and a previous modification. However, because paper packaging products are not limited to local consumption, the impact on local industrial expansion due to the expansion at the St. Regis plant is expected to be small scale. Further, the proposed modification consumes less than 40 percent of available increment, and thus, will not severely limit unrelated industrial expansion, should it be planned for this region. Therefore, the overall impact on growth from the proposed modification is small and no adverse effects are anticipated.

F. Soils, Vegetation and Visibility Impacts

No significant adverse impacts on soils, vegetation or visibility are expected from the proposed modification. The greatest impact likely would be due to the effects of SO₂ emissions on local vegetation. The ambient concentrations experienced from the boiler, however, are well below the primary and secondary standards set by EPA to protect public health and welfare. Public welfare in this context includes damage to crops, building, vegetation, etc. Therefore, because ambient concentrations will be less than these standards, no significant adverse impact is expected.

The effect of particulate deposition from the plume should be minimal due to the primary (cyclone) and secondary (scrubber) controls on this pollutant.

The plume from the boiler will contain large amounts of water (steam) and will be visible for a good distance from the stack. However, this water vapor should not significantly affect general visibility in the vicinity of the plant.

In general, no significant adverse impacts on soils, vegetation and visibility are anticipated from construction of the proposed modification.

V. Conclusion

EPA Region IV proposes a Final Determination of Approval conditions for construction of the modification described in the application submitted by the St. Regis Paper Company and received by EPA on October 22, 1979. This determination is based on the information contained in the application and additional correspondence from Mr. M. Lukoy dated October 26, 1979.

RESULTS OF AIR QUALITY IMPACT ANALYSIS

(Micrograms per Cubic Meter)

	<u>Modeled Maximum For Boiler</u>	<u>Modeled Maximum For Boiler Plus Other Increment Consuming Sources</u>	<u>Allowable Increments</u>	<u>Existing Ambient Concentrations (Monitoring Data)</u>	<u>Existing Ambient Plus Modeled Maximum Concentrations</u>	<u>NAAQS Ceiling</u>
<u>TSP</u>						
Annual Average	0.2	0.5	19	40 ^a	40.5	
24-Hour Average	5.6	6.6	37	68 ^a	74.6	
<u>SO₂</u>						
Annual Average	1.3	1.3	20	11 ^b	12.3	
24-Hour Average	35.8	35.8	91	231 ^b	266	
3-Hour Average	95.3	95.3	512	760 ^b	855.3	1,
<u>NO_x</u>						
Annual Average	2.5	2.9	N/A	30 ^c	32.9	
<u>CO</u>						
8-Hour Average	e	e	N/A	3,800 ^d	e	10,
1-Hour Average	67.5	67.5	N/A	10,000	10,068	40,

- a. St. Regis monitors north and south station; data period - 3/28/79 to 9/9/79; maximum 24-hour concentration rather than highest, second highest.
- b. Gulf Power monitors Brunson and Brentwood stations; 1978 data; maximum rather than highest, second highest concentrations displayed for 24 and 3-hour averages.
- c. Florida D.E.R. station at Leonard and Palafox; 1978 data; maximum of three regional stations.
- d. Florida D.E.R. station at Ellison Field; 8-hour data is from 1978, 1-hour data is from 1977; highest, second highest concentrations.

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- Florida D.E.R. station at Ellison Field; 8-hour data is from 1978, 1-hour data is from 1977; highest, second

October 29, 1979, November 12, 1979 and November 27, 1979. The conditions set forth in the permit are as follow:

1. The proposed modification will be constructed in accordance with the capacities, specifications, and description contained in the application. This specifically includes a maximum heat input rate of 605 million BTUs per hour for the boiler.
2. The boiler will be fired with fuel oil, natural gas, wood residue, a combination of wood residue and natural gas or a combination of wood residue and fuel oil. The allowable emissions limits for the boiler for each fuel firing scenario are as outlined in Table II of this determination.
3. The sulfur content of fuel oil fired in the boiler will not exceed 0.8 percent.
4. Emissions of NO_x and CO will be maintained at the lowest possible level through the installation, calibration and operation of a flue gas oxygen monitor as described in the attached general provision, "Use of Flue Gas Oxygen Meter as BACT for Combustion Controls".
5. Compliance with the allowable emissions limits required in condition 2 will be demonstrated with performance tests consistent with EPA standard methods and the applicable provisions of 40 CFR 60.8 and 40 CFR 60.46. Compliance with the NO_x emissions limit for wood residue firing of the boiler (0.25 lb/MM BTU) will be determined by the chemiluminescence method described in the supporting information to the application. In addition, a simultaneous EPA standard method 7 test will be conducted as a check on the chemiluminescence method. All such performance tests will be conducted within 90 days of plant startup and test results will be submitted to EPA within 90 days of test completion.
6. The applicant will notify EPA prior to conversion from gas, wood, and/or gas/wood combination firing conditions to fuel oil, wood, and/or oil/wood combination firing conditions.

Within 90 days of such gas to oil fuel switching, additional testing consistent with the provisions of condition 5 is required to show compliance with the allowable emission limits specified in condition 2.

7. Emissions of nitrogen oxides and sulfur oxides in the flue gases, flue gas opacity, and flue gas oxygen or carbon dioxide content will be monitored with continuous monitor/recorders consistent with the provisions of 40 CFR 60.45.
8. Consistent with 40 CFR 60.42 (c) (2), the opacity of the boiler flue gases will not exceed 20 percent except for one six-minute period per hour during which the opacity will not exceed 27 percent.
9. The opacity of gases exiting the wood residue handling system shall not exceed zero percent as measured by EPA standard method 9.
10. The applicant will comply with the requirements and provisions of the attached General Conditions.

Within 90 days of attaining full operation of the boiler or heater (or other such combustion equipment) the owner will conduct performance tests in accordance with approved EPA methods as described in 40 CFR Part 60.

Such performance tests will be conducted at two levels of operation of the boiler or heater:

- 1) Full load, and
- 2) Normal operational load.

Results of stack testing (performance tests) will be correlated to the flue gas oxygen monitor and the following points will be determined with regard to the "% O₂" content of the flue gas:

- 1) The point at which NO_x emission (lb/MMBTU) equals the allowable NO_x emission rate contained in the permit or the appropriate emission factor found in the latest edition of AP-42, "Compilation of Air Pollution Emission Factors" whichever is lower.
- 2) The point at which CO emission exceeds either the allowable CO emission rate contained in the permit or the applicable CO emission factor found in AP-42 "Compilation of Air Pollution Emission Factors", whichever is lower.

The boiler or heater flue gas oxygen content will be maintained between these points and alarms will be set to sound when F.G. oxygen levels exceed either side of this range. Any operation outside of this range will constitute "excess emissions" of the applicable pollutant.

Should any combustion equipment modifications be made to the boiler or heater such as different type burners, combustion air relocation, fuel conversion, tube removal or addition, etc., performance tests as described above shall be conducted within 90 days of attaining full operation after such modification. Results of all performance tests shall be sent to the Regional Administrator within 90 days after completion of the tests.

GENERAL CONDITIONS

1. The permittee shall notify the permitting authority in writing of the beginning of construction of the permitted source within 30 days of such action and the estimated date of start-up of operation.
2. The permittee shall notify the permitting authority in writing of the actual start-up of the permitted source within 30 days of such action and the estimated date of demonstration of compliance as required in the specific conditions.
3. Each emission point for which an emission test method is established in this permit shall be tested in order to determine compliance with the emission limitations contained herein within sixty (60) days of achieving the maximum production rate, but in no event later than 180 days after initial start-up of the permitted source. The permittee shall notify the permitting authority of the scheduled date of compliance testing at least thirty (30) days in advance of such test. Compliance test results shall be submitted to the permitting authority within forty-five (45) days after the complete testing. The permittee shall provide (1) sampling ports adequate for test methods applicable to such facility, (2) safe sampling platforms, (3) safe access to sampling platforms, and (4) utilities for sampling and testing equipment.
4. The permittee shall retain records of all information resulting from monitoring activities and information indicating operating parameters as specified in the specific conditions of this permit for a minimum of two (2) years from the date of recording.
5. If, for any reason, the permittee does not comply with or will not be able to comply with the emission limitations specified in this permit, the permittee shall provide the permitting authority with the following information in writing within five (5) days of such conditions:
 - (a) description of noncomplying emission(s),
 - (b) cause of noncompliance,
 - (c) anticipated time the noncompliance is expected to continue or, if corrected, the duration of the period of noncompliance,
 - (d) steps taken by the permittee to reduce and eliminate the noncomplying emission,and
 - (e) steps taken by the permittee to prevent recurrence of the noncomplying emission.

Failure to provide the above information when appropriate shall constitute a violation of the terms and conditions of this permit. Submittal of this report does not constitute a waiver of the emission limitations contained within this permit.

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6. Any change in the information submitted in the application regarding facility emissions or changes in the quantity or quality of materials processed that will result in new or increased emissions must be reported to the permitting authority. If appropriate, modifications to the permit may then be made by the permitting authority to reflect any necessary changes in the permit conditions. In no case are any new or increased emissions allowed that will cause violation of the emission limitations specified herein.
7. In the event of any change in control or ownership of the source described in the permit, the permittee shall notify the succeeding owner of the existence of this permit by letter and forward a copy of such letter to the permitting authority.
8. The permittee shall allow representatives of the State environmental control agency or representatives of the Environmental Protection Agency, upon the presentation of credentials:
 - (a) to enter upon the permittee's premises, or other premises under the control of the permittee, where an air pollutant source is located or in which any records are required to be kept under the terms and conditions of the permit;
 - (b) to have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit, or the Act;
 - (c) to inspect at reasonable times any monitoring equipment or monitoring method required in this permit;
 - (d) to sample at reasonable times any emission of pollutants;and
 - (e) to perform at reasonable times an operation and maintenance inspection of the permitted source.
9. All correspondence required to be submitted by this permit to the permitting agency shall be mailed to the:

Chief, Air Facilities Branch
Air and Hazardous Materials Division
U.S. Environmental Protection Agency
Region IV
345 Courtland Street
Atlanta, Georgia 30308
10. The conditions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

The emission of any pollutant more frequently or at a level in excess of that authorized by this permit shall constitute a violation of the terms and conditions of this permit.