

**NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF AIR QUALITY
AIR PERMITS SECTION**

**PREVENTION OF SIGNIFICANT DETERIORATION
REVIEW AND PRELIMINARY DETERMINATION**

FOR

**INTERNATIONAL PAPER, INC. - RIEGELWOOD MILL
COLUMBUS COUNTY
RIEGELWOOD, NORTH CAROLINA**

**THIS REVIEW WAS PERFORMED BY THE
AIR PERMITS SECTION
IN ACCORDANCE WITH NCDAQ REGULATION FOR PREVENTION
OF SIGNIFICANT DETERIORATION OF AIR QUALITY
15A NCAC 2D .0530**

OCTOBER 2006

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- In November of 2003, IP Riegelwood began the process of requesting an alternate compliance approach to the implementation of the 40 CFR 63, Subpart S, §63.443 kraft pulp mill maximum achievable control technology (MACT) standards for high volume, low concentration (HVLC) gases (MACT I, Phase 2) under 40 CFR 63.94 “Equivalency by Permit” (EBP). The EBP Proposal is a major portion of an overall project referred to by IP as the “Innovations Project.” The Innovations Project includes parity with MACT Subpart S through the EBP Proposal as well other identified “Plus Projects”.
- Under the EBP, in lieu of controlling HVLC pulp mill sources as required under the MACT I, Phase 2 standards (40 CFR 63.443), IP proposed that an equivalent methanol emissions reduction could be achieved, in part, by replacing the Nos. 1-3 black liquor storage ponds with new enclosed black liquor storage tanks.
- During the review of the EBP application it became apparent that while the EBP proposal would result in methanol emissions decreases, the goal under MACT, there were potential sulfur dioxide increases that would occur based on the methanol control strategy. In summary, the change from pond storage to tank storage would likely increase the amount of total reduced sulfur (TRS) compounds in the black liquor. The black liquor ponds are sources of fugitive TRS compound emissions. With the installation of the new enclosed tanks, these TRS emissions will be redistributed within the process. While small portion of the emissions will be vented from the new tanks; the remaining TRS emissions will likely be collected in the existing non-condensable gas (NCG) and stripper off gases (SOG) systems and routed to either Power Boiler No. 2 or Power Boiler No. 5. As a result, the EBP Proposal may result in a collateral increase of SO₂ that exceeds the PSD Significant Emission Rate.
- On June 24 2005, the D.C. Circuit of the United State Court of Appeals ruled on the 2002 changes to the PSD rules, as well as key components dating from 1980. Relevant to this application, the court rejected the Pollution Control Project (PCP) exclusion stating that EPA has no authority to exempt possible collateral emissions increases. The PCP exclusion has been used under guidance from EPA since 1990. Due the D.C. Circuit’s rejection of PCP’s, IP was required to submit a PSD application to cover the collateral sulfur dioxide increases resulting from the EBP Proposal.

- URS Corporation, on behalf of International Paper (IP) Riegelwood, submitted a Prevention of Significant Deterioration (PSD) application to the North Carolina Division of Environmental Management (NCDAQ), Air Quality Section (AQS) on December 7, 2005. This application does not implement any alternative compliance approaches for IP under EBP for MACT Subpart S. Implementation of any EBP requires incorporation through a Part 70 TV permit. This incorporation is not able to occur due to the pending appeal or their Title V, filed by the facility. The purpose of this application is to address the collateral sulfur dioxide emissions from Power Boiler Nos. 2 and 5 as a result of the combustion of increased TRS compounds in the collected NCG and SOGs. It does not authorize or enable any compliance portion of the EBP Proposal.
- The application was deemed complete for review purposes pursuant to 40 CFR 51.166 (q) and 15A NCAC 2D .0530 (o) on January 21, 2006.
- The facility is a major source under the definition contained in 40 CFR 51.166 and is therefore subject to a pre-construction PSD review. A source is considered major if it belongs to any one of the 28 source categories listed in the PSD regulations and if it has the potential to emit more than 100 tons per year of any PSD-regulated compound, or any other source which has the potential to emit more than 250 tons per year of any PSD compound. The IP Riegelwood mill is considered a major source under the PSD regulations because kraft pulp and paper manufacturers are one of the 28 listed categories, and the Riegelwood mill emits more than 100 tpy of a regulated criteria compound. The facility is major for Particulate Matter (TSP and PM10), Sulfur Dioxide (SO₂), Nitrogen Oxides (NO_x), Carbon Monoxide (CO), and Volatile Organic Compounds (VOCs)
- The facility supplied a regulatory analysis in accordance with the North Carolina regulations governing the Prevention of Significant Deterioration (PSD) of Air Quality and other applicable State and Federal regulations. The PSD applicability analysis showed that the collateral sulfur dioxide emission increases exceed the PSD Significant Emission Rate defined in 40 CFR 52.21.
- The sulfur dioxide emission increases are indirect results due to the replacement of the ponds with the tanks. A Best Available Control Technology (BACT) Analysis was not performed because the sulfur dioxide increases occur from sources (the NCG system, strippers, and the power boilers) that are affected sources that are not being physically modified. The pond replacement does not result in any increases in pulp production or black liquor capacity. Additionally, the two power boilers are each equipped with existing sulfur dioxide scrubbers.
- An air quality analysis was performed based on the emissions increases. The modeling analysis shows that this facility will not cause or contribute to the exceedance of the Class II NAAQS and PSD Increment, Class I Increment, any NC toxic air pollutant's Acceptable Ambient Levels (AALs) or any Air Quality Related Value (AQRV) for Class 1 areas within 200 kilometers of the facility.

1.0 INTRODUCTION

International Paper (IP) owns and operates a Kraft pulp and paper mill in Riegelwood, North Carolina. The primary process operations at the site include wood pulping, pulp bleaching, pulp drying, and papermaking. Bleached pulp and paperboard are manufactured from raw material composed of hardwood and softwood fiber. The fiber is obtained from wood feedstocks purchased primarily in the vicinity of the mill. Other on-site process operations that directly support the manufacture of pulp and paper include black liquor recovery, lime production, chemical production, power/steam production, and other support operations. The facility falls under the Standard Industrial Classification (SIC) codes of 2611 for pulp mills and 2621 for paper mills.

In November of 2003, IP Riegelwood began the process of requesting an alternate compliance approach to the implementation of the 40 CFR 63, Subpart S, §63.443 Kraft pulp mill maximum achievable control technology (MACT) standards for high volume, low concentration (HVLC) gases (MACT I, Phase 2) under 40 CFR 63.94 “Equivalency by Permit” (EBP). The EBP Proposal is a major portion of an overall project referred to by IP as an “Innovations Project.” The Innovations Project includes parity with MACT Subpart S through the EBP Proposal as well other identified “Plus Projects”. This review does not provide credits for any emissions reductions that occur as part of any Plus Projects.

Under the EBP, in lieu of controlling HVLC pulp mill sources as required under the MACT I, Phase 2 standards (40 CFR 63.443), IP proposed that an equivalent methanol emissions reduction could be achieved at the Riegelwood Mill as a result of the replacement of the Nos. 1-3 black liquor storage ponds with new enclosed black liquor storage tank(s), elimination of the “gum” weak black liquor tanks, reductions in emissions from the black liquor oxidation system (BLOX) and recovery boilers, and collection and treatment of additional process condensates.

During the review of the EBP application it became apparent that while the EBP proposal would result in methanol emissions decreases, the goal under MACT, that there were potential sulfur

dioxide increases that would occur based on the methanol control strategy. In summary, the change from open pond storage to tank storage would likely increase the amount of TRS compounds in the black liquor. The TRS compounds would have previously been emitted as fugitive emissions from the ponds. The TRS compounds would likely now be emitted during the process and captured in the existing NCG/SOG systems. These systems would ultimately carry these gases to the combustion controls where the TRS would be converted to sulfur dioxide during combustion.

This application does not implement any alternative compliance approaches for IP under EBP for MACT Subpart S. Implementation of any EBP requires incorporation into the facility's Title V permit. The EBP incorporation is not able to occur due to the pending appeal filed by the facility. However, this application does address the collateral increases in sulfur dioxide under the Prevention of Significant Deterioration (PSD) Program. For clarification, this PSD Project will be referred to as the "Pond Replacement Project" in this determination. This Project encompasses the complete replacement of all black liquor storage in open ponds at the facility with two fully enclosed tanks. This project is a fundamental component of the EBP Proposal. It is the sole component that results in an emissions increase.

On June 24 2005, the D.C. Circuit of the United State Court of Appeals ruled on the 2002 changes to the PSD rules, as well as key components dating from 1980. Relevant to this application, the court rejected the Pollution Control Project (PCP) exclusion stating that EPA has no authority to exempt possible collateral emissions increases. The PCP exclusion has been used under guidance from EPA since 1992.

Due the D.C. Circuit's rejection of PCP's, IP was required to submit a PSD application to cover the collateral sulfur dioxide increases resulting from the EBP Proposal.

The proposed project will result in collateral increases in SO₂ emissions by more than the prevention of significant deterioration (PSD) threshold. Thus, the proposed project is subject to review and processing under the North Carolina Administrative Code, Title 15A, Sub-Chapter

2D, Section .0530 "Prevention of Significant Deterioration". The plant must also comply with other specific NCDAQ air pollution regulations where applicable.

Pursuant to the Federal Register notice on February 23, 1982, North Carolina has full authority by the Environmental Protection Agency (EPA) to implement the PSD regulations in the State effective May 25, 1982. Accordingly, the NCDAQ will conduct a full PSD review and process the PSD permit for the proposed facility.

1.1 Preliminary Determination

IP Riegelwood's PSD application has been reviewed by the NCDAQ, Air Permits Section staff to determine compliance with the requirements of all NCDAQ air pollution regulations. New Source Review of the application was performed for the following categories:

- Prevention of Significant Deterioration (PSD) which did not require a determination of Best Available Control Technology (BACT) but did require an air quality impact analysis; and
- Compliance with the North Carolina Environmental Management Commission regulations Title 15A, North Carolina Administrative Code.

The NCDAQ, Air Permits Section staff has conducted its review of the application and made a preliminary determination that the proposed project will comply with all applicable North Carolina Environmental Management Commission air pollution regulations including the PSD requirements. Therefore, the NCDAQ proposes to issue an air permit for the source modification and operation pursuant to the Pond Replacement Project. Preliminary approval under the PSD requirements was contingent upon the following findings:

- A demonstration that National Ambient Air Quality Standards (NAAQS) and PSD Increment will not be violated as a result of emissions from the proposed project.

- A demonstration that air emissions resulting from the proposed facility will not adversely impact any PSD Class I area, and
- A demonstration that emissions from the proposed project will neither cause adverse impacts to soils and vegetation nor cause degradation of visibility, and that economic growth associated with the project will not cause a significant increase in regional air pollutant levels.

The remainder of this report contains a review by NCDAQ of the requested demonstration and analyses presented by IP-Riegelwood. Sections 2 and 3 of this report present a general description of the proposed project and a description of the site location. Section 4 presents a regulatory analysis of the North Carolina and Federal air pollution regulations that apply to the project construction and operation. Section 5 contains the determination regarding BACT analysis and Section 6 presents the results of the air quality analysis. The NCDAQ draft air permit is contained in Appendix A. NOTE: At the time of the preparation of this preliminary determination, the facility is operating under a state operating permit 03138R25. The draft permit reflects the permit language of the current, effective state operating permit.

In addition to the regulatory analysis, the application must undergo adequate public participation. The NCDAQ solicits and encourages participation by the general public, industry, and other affected persons impacted by the proposed project. Specific public notice requirements and a thirty (30) day public comment period are required before the NCDAQ takes final action on this application. Additionally, in anticipation of public requests for a public hearing pursuant to this PSD modification, the facility has requested upfront that public hearing be held and the NCDAQ has agreed to hold a hearing. Appendix B contains a copy of the simultaneous 30 day public notice and notification of public hearing.

2.0 GENERAL DESCRIPTION

2.1 Process Description

2.1.1 Existing Operations

The International Paper – Riegelwood Mill is a bleached kraft pulp facility. The facility is located in Columbus County, approximately 12.5 miles northwest of Wilmington, North Carolina along the Cape Fear River. The approximate UTM coordinates of the mill are Zone 17, 756.4 (km) east and 3805.0 (km) north, at an elevation of approximately 50 feet above mean sea level. The primary process operations at the site include wood pulping, pulp bleaching, and papermaking. Bleached pulp and paperboard are manufactured from raw material composed of hardwood and softwood fiber. The fiber is obtained from wood feedstocks purchased primarily in the vicinity of the mill. Other on-site process operations that directly support the manufacture of pulp and paper include kraft liquor recovery, lime production, chemical recovery, power/steam production, and other support operations. The Pond Replacement Project involves modifications to the chemical recovery operations at the mill. Absent the EBP Proposal, the black liquor at the facility would have been stored primarily in one of three open storage ponds. The Pond Replacement Project represents a component of the EBP proposal.

2.1.2 Proposed Modifications

Under the EBP Proposal IP has requested MACT Subpart S-equivalent methanol emissions reduction be achieved at the Riegelwood Mill by (1) replacing the Nos. 1-3 black liquor storage ponds with new enclosed black liquor storage tank(s); (2) elimination of the “gum” weak black liquor tanks; (3) reductions in emissions from the black liquor oxidation system (BLOX) and recovery boilers, and (4) collection and treatment of additional process condensates.

This application encompasses much of the EBP Proposal, but focuses primarily on the replacement of the ponds. The black liquor ponds are sources of total reduced sulfur (TRS) compound

emissions. With the installation of the new enclosed tanks, these TRS emissions will be redistributed within the process. A small portion of the emissions will be vented from the new tanks; the remaining TRS emissions will likely be collected in the non-condensable gas (NCG) system or in the SOGs and routed to either Power Boiler No. 2 or Power Boiler No. 5. As a result, the EBP Proposal may result in a collateral increase of SO₂ that exceeds the PSD Significant Emission Rate. The purpose of this application is to address the collateral sulfur dioxide emissions from Power Boiler Nos. 2 and 5 as a result of the combustion of increased TRS compounds in the collected NCG and SOG streams. The replacement of the ponds will not result in any increased pulp production of black liquor capacity at the Mill.

2.2 Emissions

Under the Innovations Project, IP has represented that an overall reduction of all air emissions will be achieved when compared to what would otherwise be accomplished under the existing air quality regulations. These “base case” reductions are represented in IP’s “Environmental Innovation Proposal” as amended and are summarized in the table below. The reductions provided in the application show decrease ranging from 3 to 41% above the required amounts. The highest reductions occur from VOCs. These overall reductions occur through two primary means; the EBP Proposal (or parity project) and the Plus Projects.

Table 2.2-1 IP Innovations Project Emissions Reduction Summary

Compounds (emission rates in tpy)	Current Regulatory Requirements (MACT I, Phase 2)	IP Innovations Project		
		EBP/Parity alone	Parity and Plus Projects	Compared to MACT I, Phase 2
		Reduction (Increase)	Reduction (Increase)	Reduction (Increase)
Methanol	695	735	754	59
Total HAPs	727	780	814	87
SO ₂	(16)	(163)*	598	614
NO _x	(7)	42	509	515
PM	0.6	2	148	147
PM10	0.6	2	122	121
TRS	217	410	146	199
H ₂ S	16	66	71	55
CO	(26)	4	584	610
VOC	975	2,869	2,917	1,942

* See further discussion below regarding analysis based on 188 tpy increase.

The table above is provided solely for reference. The only aspect of the Innovations Project that has any air quality regulatory basis is the EBP Proposal. This draft determination does not attempt to provide any credit or netting analysis for any of the reductions claimed by IP under the Innovations Proposal. Additionally, only the elements of the EBP proposal will be included in the ultimate Part 70 TV permit to insure parity with MACT I, Phase 2.

The purpose of the EBP Proposal was to provide overall HAP reductions that were equivalent to MACT reductions. As originally submitted and as late as May 2005, IP's submittals indicated that the EBP Proposal would result in decreases in all regulated pollutants. However it became apparent during the review that while the EBP proposal would result in HAP/methanol emissions decreases, which the goal under MACT, that there were potential sulfur dioxide increases that would occur based on the HAP control strategy. In summary, the change from open pond storage to tank storage would likely increase the amount of TRS compounds in the black liquor. These TRS compounds would have previously been emitted as fugitive emissions from the ponds. The TRS compounds would likely now be emitted during the process and captured in the existing NCG/SOG systems. These systems would ultimately carry these gases to the combustion controls where the TRS would be converted to sulfur dioxide during combustion

The potential emission increase for SO₂ was determined by subtracting the TRS emissions from the new liquor storage tanks from the TRS emissions credited to the black liquor storage ponds under the EBP Proposal and assuming all of the remaining TRS is captured by the NCG system and SOG and oxidized to SO₂ in the power boilers with 75 percent scrubber SO₂ control. The controlled collateral SO₂ emission increases from the power boilers will be 188 tons, which exceeds the PSD Significant Emission Rate of 40 tons, triggering PSD review as summarized in the table below. Note that the table above represents a smaller overall increase in SO₂ emissions. The net values above is based on an approximate 25 ton per year decrease in SO₂ emissions which is creditable to the reduced fuel combustion-related energy demand needed in the evaporators due to this project. This decrease in energy is based on the reduced rain water content in black liquor that would otherwise have to be evaporated under the open pond storage system. Although this reduction is related to the installation of the tanks, this reduction has not

been included in the PSD analysis for SO₂. The total SO₂ increase based on the black liquor TRS content increase was conservatively evaluated under this review.

Compounds	PSD Significant Net Emissions Increase (TPY)	Net Emissions Increase/Decrease (TPY)	PSD Review Required?
Particulate (TSP)	25	-2	No
Particulate (PM10)	15	-2	No
SO ₂	40	188	Yes
NO _x	40	-42	No
CO	100	-4	No
VOC (ozone)	40	-2,869	No

The sulfur dioxide netting analysis performed by the facility and presented in the table above were based on the guidelines and principles outlined in 40 CFR 52.21, NCAC 2D .0530. All physical and operating modifications resulting in emission changes were evaluated. As described above, the potential decreases in sulfur dioxide were not taken into account for the increased value provided above.

As indicated above, based on the netting analysis the project is classified as a major modification because it will result in emission increases of SO₂ that exceed the PSD Significant Emission Rates for this compound.

3.0 REGIONAL DESCRIPTION

3.1 Area Classification

The IP – Riegelwood Mill facility is located in Columbus County, approximately 12.5 miles northwest of Wilmington, North Carolina along the Cape Fear River. The approximate UTM coordinates of the mill are Zone 17, 756.4 (km) east and 3805.0 (km) north, at an elevation of approximately 50 feet above mean sea level. Air Quality in that area is classified with respect to the National Ambient Air Quality Standards (NAAQS) as listed below:

Pollutant	Attainment Status
Particulate	Attainment
Sulfur Dioxide	Attainment
Nitrogen Dioxide	Attainment
Carbon Monoxide	Attainment
Ozone	Attainment

There are no Class I areas located within 200 km of the IP Riegelwood mill site. The closest Class I Area is the Swanquarter National Wildlife Refuge, which is located approximately 210 km northeast of the site.

4.0 REGULATORY ANALYSIS

The following discussion pertains to the regulatory requirements that must be met for the modification of the IP-Riegelwood facility. These requirements include both federal Prevention of Significant Deterioration (PSD) regulations and State air quality regulations.

4.1 PSD Applicability and Required Analysis

The basic goal of the PSD regulations is to ensure that the air quality in clean (i.e. attainment) areas does not significantly deteriorate while maintaining a margin for future industrial growth. The PSD regulations focus on industrial facilities, both new and modified, that create large increases in the emission of certain pollutants. The EPA promulgated final regulations governing the Prevention of Significant Deterioration (PSD) in the Federal Register published August 7, 1980. Effective March 25, 1982, the North Carolina Division of Air Quality (NCDAQ) received full authority from the EPA to implement PSD regulations in the State.

Under PSD requirements all major new or modified stationary sources of air pollutants regulated and listed in this section of the Clean Air Act must be reviewed and approved prior to construction by the permitting authority. A "major stationary source" is defined as any one of 28 named source categories which has the potential to emit 100 tons per year of any regulated pollutant, or any other stationary source which has the potential to emit 250 tons per year of any PSD regulated pollutant. The IP Riegelwood mill is considered a major source under the PSD regulations because kraft pulp and paper manufacturers are one of the 28 listed categories, and the Riegelwood mill emits more than 100 tpy of a regulated criteria compound. The following actual emission rates were reported in the 2005 Annual Air Pollutant Emissions Inventory:

PSD Regulated Pollutant	2005 Actual Emission Rate (facility wide)
PM (TSP)	497 tpy
PM (PM10)	364 tpy
SO ₂	1,499 tpy
NO _x	2,205 tpy
CO	1,973 tpy
VOC	4,502 tpy

Because the proposed facility is considered a major stationary source, each pollutant with a "potential to emit" greater than the significance levels is subject to PSD review and must meet certain review requirements. Therefore, the emission increases as a result of this modification must be compared to the "significance levels" as listed in 40 CFR 51.166 (23)(i) to determine which pollutants must undergo a PSD review. As outlined in the table below, the EBP Proposal, which specifically includes the Pond Replacement Project, results in collateral net emissions increases for SO₂ that exceed the PSD significance levels. While the overall EBP Proposal also includes SO₂ reductions as discussed in Section 2.2 above, these reductions were not credited when determining the emissions increases from the Pond Replacement Project. This approach was taken in order to provide a conservative analysis of the Project's air quality impacts. Further, the additional reductions from any Innovation

Compounds	PSD Significant Net Emissions Increase (TPY)	Net Emissions Increase/Decrease (TPY)	PSD Review Required?
SO ₂	40	188	Yes

A PSD applicability analysis was performed for the proposed project to determine if the sulfur dioxide emissions would be subject to PSD review. The potential emission calculations are presented in Appendix B of the permit application. The emission increase for SO₂ was determined by subtracting the TRS emissions from the new liquor storage tanks from the TRS emissions credited to the black liquor storage ponds under the Innovations Project/EBP Proposal

and assuming all of the remaining TRS is captured by the NCG and SOG systems and oxidized to SO₂ in the power boilers with 75 percent scrubber SO₂ control. The controlled collateral SO₂ emission increases from the power boilers was calculated at 188 tons, which exceeds the PSD Significant Emission Rate of 40 tons, triggering PSD review. The 188 ton increase is a controlled value. The Nos. 2 and 5 Power Boilers are equipped with wet scrubbers with caustic injection for SO₂ control.

Although the project is subject to PSD review for SO₂, a BACT analysis was not required in this case. A BACT analysis is not required for non-modified emission units, or modified units whose emissions of PSD pollutants do not have a net increase as a result of the project. For this specific situation, the SO₂ increases occur from the modification of sources up-stream of the sources with emissions increases. These sources, the NCG collection system, strippers, and the Nos. 2 and 5 Power Boilers, are affected units for this project. However, no physical modifications will be made to these units. .

As discussed elsewhere in this determination, the SO₂ increases are occurring due to a shift from fugitive-to-controlled TRS emissions due to the Pond Replacement Project. Ultimately, these TRS compounds will be captured by the existing NCG/SOG control systems at the Mill and will result in SO₂ emissions. These SO₂ emissions increases are occurring without any production or capacity increases associated with this project. These emissions are occurring secondarily to the primary purpose of the modification, which is to provide methanol control, required under MACT Subpart S. It is important to note that this project would have originally been reviewed under the PCP exclusions in PSD when first submitted, however the D.C. Circuit Court ruling occurred while this original application was under review.

IP performed the following reviews and analysis related to PSD for SO₂:

- 1) An Air Quality Impact Analysis including monitoring and air modeling to determine the extent and significance of any potential air quality impact, and
- 2) An Additional Impacts Analysis including effects on soils, vegetation, and visibility.

A discussion of the PSD determinations can be found in Sections 5 and 6 of this document.

4.2 NCDAQ Air Pollution Regulations

NC DAQ air quality regulations for stationary sources are codified in 15A of the North Carolina Administrative Code, Subchapter 2D (Air Pollution Control Requirements) and Subchapter 2Q (Air Quality Permit Procedures). This section summarizes other regulations that are potentially applicable to the proposed project.

4.2.1 15A NCAC 2Q .0101 - Required Air Quality Permits

This regulation requires the owner or operator of all sources for which there is an ambient air quality or emission control standard, that is not exempted from permit requirements, to apply for an air quality permit. The owner or operator of a source required to have a permit shall not begin construction or operation of the source without first obtaining a permit. The sources to be modified under the Pond Replacement Projects are not exempted sources, and thus, IP-Riegelwood is required to file an air permit application and obtain a permit prior to any construction of the source. IP-Riegelwood. has submitted the required application and information sufficient to obtain an air quality permit.

4.2.2 15A NCAC 2D .0503 - Particulates from Fuel Burning Indirect Heat Exchangers

This standard establishes the limit for particulate matter emissions from natural gas, coal, and fuel oil combustion. The Nos. 2 and 5 Power Boilers are limited to 0.16 pounds per million Btu heat input. The project will not affect the Mill's compliance status with this regulation.

4.2.3 15A NCAC 2D .0504 - Particulates from Wood Burning Indirect Heat Exchangers

This standard establishes the limit for particulate matter emissions from firing bark and wood fiber sludge. The Nos. 2 and 5 Power Boilers are limited to 0.25 pounds per million Btu heat input, or a limit calculated by the equation found in 2D .0504. The project will not affect the Mill's compliance status with this regulation.

4.2.4 15A NCAC 2D .0516 - Sulfur Dioxide Emissions from Combustion Sources

This standard establishes the limit for sulfur dioxide emissions from combustion sources. Overall, the No. 2 and No. 5 Power Boilers are limited to 1.6 and 2.3 pounds per million Btu heat input, respectively. The boilers are equipped with scrubbers that achieve approximately 75 percent SO₂ control. The potential increase in TRS/SO₂ represent an approximate increase of 0.17 pounds per million Btu heat input based on the potential hourly rate and the lower maximum heat input rate. In addition, the primary fuel for Nos. 2 and 5 Power Boilers is bark, which is a low sulfur fuel. Therefore, the project should not affect the Mill's compliance status with this regulation.

4.2.5 15A NCAC 2D .0519 - Control of Nitrogen Dioxide and Nitrogen Oxides Emissions

This standard establishes limits for nitrogen dioxide and nitrogen oxides emissions from coal, oil, and natural gas combustion. The Nos. 2 and 5 Power Boilers are limited to 0.08 pounds per million Btu heat input when firing fuel oil or natural gas, and 1.8 pounds per million Btu heat input while burning coal. The project will not affect the Mill's compliance status with this regulation.

4.2.6 15A NCAC 2D .0521 - Control of Visible Emissions

This regulation establishes opacity standards for combustion sources. Power Boiler No. 2 is limited to 40 percent opacity, averaged over a six-minute period, except for one six-minute period not exceeding 90 percent opacity once per hour or more than four times in any 24-hour period. Power Boiler No. 5 is limited to 20 percent opacity, averaged over a six-minute period, except for one six-minute period not exceeding 87 percent opacity once per hour or more than four times in any 24-hour period. The project will not affect the Mill's compliance status with this regulation.

4.2.7 15A NCAC 2D .0524 - Standards of Performance for New Stationary Sources (NSPS) - 40 CFR 60

Per NSPS, a modification is defined as "...any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility...". However, the SO₂ emissions resulting from NCG or SOG burning are not regulated 40 CFR 60, Subpart Db. Additionally, No physical and/or method change is occurring to the boilers. No new collection systems are being created. No new streams are being introduced. Finally, Subpart Db specifically exempts changes made to combust TS gases. Because this application addresses collateral SO₂ emissions increases from increased NCG and SOG combustion in the boilers and not a change in fossil fuel and/or wood combustion rates, there are no applicable NSPS standards.

4.2.8 15A NCAC 2D .0530 - Prevention of Significant Deterioration

The PSD applicability of this project is addressed in Section 4.1 above. Additionally, the No. 5 Power Boiler is subject to existing fuel-based SO₂ limitations. This project is not making any modifications to the existing fuels or control device(s). Therefore, the project should not affect the Mill's compliance status with this regulation.

4.2.9 15A NCAC 2D .1100 - Control of Toxic Air Pollutants – 2D .1100

Pursuant to the State Air Toxic program, any source that emit air toxic in quantities greater than the de minimis levels (listed in 15A NCAC 2H .0610) must demonstrate compliance with the ambient concentrations listed in 15A NCAC 2D .1104(a). For a modification, only those toxic air pollutants with a net increase emitted pursuant to the modification need to be assessed for compliance. There are no net increases in toxics based on this project. The project will not affect the Mill's compliance status with this regulation. The Mill is required to submit a complete facility-wide toxics demonstration under the "Last MACT" requirements no later than April 2007.

4.2.10 15A NCAC 2D .1111 - National Emission Standards for Hazardous Air Pollutants – 40 CFR 63 Pulp and Paper NESHAP (MACT I) – 40 CFR 63, Subpart S

The Nos. 2 and 5 Power Boilers serve as LVHC gas control devices under 40 CFR 63, Subpart S (MACT I, Phase 1). This permit application addresses collateral SO₂ increases that may occur from the power boilers as a result of increased combustion of TRS gases under the MACT I, Phase 2 (HVLC) Equivalency by Permit option. The increase in SO₂ emissions does not affect Subpart S compliance.

4.2.11 15A NCAC 2Q .0113 - Notification in Areas without Zoning

The Riegelwood Mill is located in an area without zoning. Therefore, the Mill must follow the requirements presented in 2Q .0113 when the facility is completing a project under this rule. The required 2Q .0113 notification procedures were met for this project.

4.2.12 15A NCAC 2Q .0500 - Title V Operating Permits – 40 CFR 70

The IP Riegelwood Mill submitted a complete Title V Operating Permit Application in August 1996. An updated application was submitted in November 1997 to incorporate the mill modernization and effluent reduction initiative project, and a second update was submitted in October 2003. The Riegelwood Mill currently operates under state air permit 03138R25 based on an appeal of the initial Title V. TV Permit application forms were included in the application.

4.2.13 15A NCAC 2Q .0500 - Compliance Assurance Monitoring (CAM) Rule – 40 CFR 64

The Compliance Assurance Monitoring (CAM) Rule (40 CFR Part 64) applies to pollutant specific emissions units (PSEU) that meet all of the following requirements:

- (1) Are subject to an emission limit or standard;
- (2) Use a control device to achieve compliance with that emission limit or standard;
and
- (3) Have potential pre-control device emissions in the amount required to classify the unit as a major source under Part 70 of the Clean Air Act (CAA);
- (4) Have been issued a Title V permit.

Part 64 does not apply to emission limitations or standards proposed after November 15, 1990 pursuant to section 111 or 112 of the Clean Air Act (e.g., post-1990 NSPS or NESHAP). Facilities are required to address CAM as part of the Title V renewal process, if it has not been

previously addressed as part of a permit modification. CAM must be addressed as part of a Part 70 or 71 permit modification if the post-control emissions classify the unit as a major source. Potential sulfur dioxide emissions from this project exceed the major source threshold of 100 tons per year. However, IP Riegelwood is not operating under a Part 70 permit and is not required to address CAM at this time.

4.3 Source-by-Source Analysis

4.3.1. Summary of Emission Sources and Control Devices

The following table contains a summary of relevant permitted emission sources and associated air pollution control devices and appurtenances:

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
ES-PB2 NSPS Subpart BB Control Device MACT Subpart S Control Device	No. 2 Power Boiler – natural gas/No. 4 equivalent used oil/No. 6 fuel oil/coal/bark/wood fiber sludge/woodwaste absorbed oil residue/TRS gas-fired (425 million Btu per hour maximum heat input rate)	CD-PB2-MC and CD-PB2-SCRB	multicyclone (240, nine inch diameter tubes each) and a venturi scrubber (1,500 gallons per minute nominal minimum scrubber solution injection rate)
ES-PB5 PSD NSPS Subpart BB Control Device MACT Subpart S Control Device	No. 5 Power Boiler – No. 4 equivalent used oil/No. 6 fuel oil/coal/bark/wood fiber sludge/woodwaste absorbed oil residue/TRS gas-fired (249 million Btu per hour maximum heat input rate when burning oil or coal, 600 million Btu per hour maximum heat input rate when burning bark/wood fiber sludge/fossil fuel) utilizing an Over-Fired Air (OFA) combustion system	CD-PB5-MC and CD-PB5-SCRB	multicyclone (56, twenty-four (24) inch diameter tubes each) and a venturi scrubber (1,300 gallons per minute nominal minimum scrubber solution injection rate)
ES-ST001 and ES-ST002	Two weak black liquor storage tanks (2,167,900 gallons each),	NA	NA

Power Boilers ES-PB2 and ES- PB5

As discussed in the sections above, no physical changes are being made to the power boilers. No changes are being made to their respective control devices. Since no new regulations are triggered per this application, no new operating conditions have been added in the draft permit per this application.

Storage Tanks ES-ST001 and ES- ST002

As discussed in the sections above, the tanks are being added in anticipation of approval of the EBP Proposal for parity with MACT Subpart S [MACT I, Phase 2]. The Mill cannot operate

under MACT parity pursuant to any EBP conditions unless the EBP conditions are provided in a Part 70 TV permit (see 40 CFR 63.94). Since the Mill has appealed their Part 70 permit, there is no permit in which to include the EBP conditions. There are no regulatory operating conditions that apply to the tanks absent the EBP Proposal. Therefore no operating conditions have been added per this application for these tanks. However, in order to memorialize this PSD determination, the following language is included in the draft permit equipment description:

“These tanks will replace the function of the existing black liquor storage ponds under the proposed Equivalency By Permit (EBP) Project. These tanks are permitted to allow replacement of the ponds pursuant to PSD Application 2400036.05D, which evaluated the collateral increases in sulfur dioxide emissions associated with the combustion of formerly fugitive TRS emissions in the existing NCG system(s).”

5.0 BEST AVAILABLE CONTROL TECHNOLOGY

Although the project is subject to PSD review for SO₂, a BACT analysis was not required in this case. A BACT analysis is not required for non-modified emission units, or modified units whose emissions of PSD pollutants do not have a net increase as a result of the project. For this specific situation, the SO₂ increases occur from the modification of sources up-stream of the sources with emissions increases. These sources, the NCG collection system, strippers, and the Nos. 2 and 5 Power Boilers, are affected units for this project. However, no physical modifications will be made to these units. As discussed elsewhere in this determination, the SO₂ increases are occurring due to a shift from fugitive-to-controlled TRS emissions due to the Pond Replacement Project. Ultimately, these TRS compounds will be captured by the existing NCG/SOG control systems at the Mill and will result in SO₂ emissions. These SO₂ emissions increases are occurring without any production or capacity increases associated with this project. These emissions are occurring secondarily to the primary purpose of the modification, which is to provide methanol control, required under MACT Subpart S. It is important to note that this project would have originally been reviewed under the PCP exclusions in PSD when first submitted, however the D.C. Circuit Court ruling occurred while this original application was under review.

6.0 AIR QUALITY IMPACT ANALYSIS

This air dispersion modeling analysis is for the proposed Pond Replacement Project. PSD regulations (40 CFR 51.166 (k)) require an applicant to perform an air quality ambient impact analysis to show that no National Ambient Air Quality Standard and PSD Increment will be exceeded in the area where the proposed new source will have a significant impact. **The modeling analysis shows that this facility will not cause or contribute to the exceedance of the Class II NAAQS and PSD Increment, Class I Increment, any NC toxic air pollutant's Acceptable Ambient Levels (AALs) or any Air Quality Related Value (AQRV) for Class 1 areas within 200 kilometers of the facility.**

6.1 Netting Analysis

IP has proposed an overall "Innovations Project" for the Kraft pulp mill Maximum Achievable Control Technology (MACT) for high volume, low concentration (HVLC) gases. This project will assess the Power Boiler Nos. 2 and 5 sulfur dioxide (SO₂) emissions as a result of the combustion of increased total reduced sulfur (TRS) compounds.

The netting analysis (Table 6.1-1) shows SO₂ emissions exceed their Significant Emission Rates (SERs) as established in the **New Source Review Workshop Manual (NSRWM), Draft October 1990.**

Table 6.1-1 Pollutant Netting Analysis

Pollutant	Net Annual Emission Rate increase (Tons/year)	Significant Emission Rate	Review required
Sulfur Dioxide	188	40	Yes

6.2 NAAQS/PSD Increment Air Dispersion Modeling Analysis

6.2.1 Preliminary Impact Analysis

The preliminary impact analysis for the above pollutant was accomplished to determine if the emission increases would result in impacts that exceed the EPA's New Source Review

Workshop Manual (NSRWM), draft 1990, Significant Impact Levels (SILs). The modeling was accomplished using the EPA approved Industrial Source Complex Short Term Prime (ISCST3) and SCREEN3 models to evaluate simple/rolling terrain and building cavity impacts.

The facility is located in the North Carolina coastal plain (Columbus County) near the town of Riegelwood. The area is characterized by generally flat terrain and is rural in nature. The two emission sources (Power Boilers Nos. 2 and 5) were each modeled using 1987 – 1991 Wilmington, NC surface and Charleston, SC upper-air meteorological data to determine location and extent of the maximum impacts. Two receptor grids, totaling 2,446 receptors, extended outwards to 10 kilometers. The first grid placed receptors at 100-meter spacing along the property boundary and mill road. The second grid extended from the property boundary outwards to 500 meters at 100-meter intervals and from 500 meters to 10 kilometer at 500-meter intervals.

The modeling analysis (Table 6.2.1-1) shows that the SO₂ impacts **will not** exceed its Class II Significant Impact Levels (SILs) and thus no further modeling is required.

Table 6.2.1-1 Class II SIL Modeling Results (ug/m³)

Pollutant	Averaging Period	Emission rate (g/s)¹	Facility-worst case impact	Class II SIL	Exceed the Class II SIL
SO ₂	Annual	5.41	.228	1	No
	24-hour	5.41	3.269	5	No
	3-hour	5.41	13.553	25	No

¹Based on 8760 hours/year operations.

6.3 Non Regulated Pollutant Impact Analysis (North Carolina Toxics)

A toxic pollutant impact analysis was not performed for non-regulated pollutant emissions as part of the Best Available Control Technology (BACT) analysis process since all TAPS decreased as a result of this modification.

6.4 Additional Impact Analysis

PSD regulations [40 CFR 51.166 (o)] and the Interagency Workgroup on Air Quality Modeling (IWAQM), Phase 1 Report, requires an applicant to provide an analysis of the impacts of the proposed source on growth, soils, vegetation, regional visibility, and any Federal Class I area Air Quality Related Values (AQRVs) that the facility might adversely impact.

6.5 Class I Increment, Air Quality Related Values (AQRV)/Regional Haze, and Non-Attainment Impact Analysis

The modeling accomplished and discussed above showed that the facility was well below the pollutants significant Impact Levels (SILs). Based on the relatively low total facility emissions and considerable distance to the nearest Class I area, 120 kilometers south and west of the Swanquarter National Wildlife Refuge and approximately 200 kilometers north and west of Cape Romain National Wildlife Refuge. The reviewing Federal Land Manager did not express a concern with the visibility and deposition impacts in the Class I area; subsequently, a Class I area analysis was not required.

6.5.1 Non-attainment Analysis

There are no designated non-attainment areas impacted by this project.

6.6 Source Impact Analysis Conclusion

Based on the ambient impact analysis, the proposed IP facility modifications will not cause or contribute to any violation of the Class II NAAQS and PSD increment, Class I Increment or any Class I AQRV's.

APPENDIX A

Draft Permit

APPENDIX B

Public Notice

APPENDIX C

Application