

---

**N.C. Department of Environment and Natural Resources**  
**Division of Water Quality**  
**Fact Sheet For NPDES Permit NC0000272**

---



### **Facility Information**

Applicant/Facility Name: Blue Ridge Paper Products Inc. dba Evergreen Packaging  
Applicant Address: P.O. Box 4000  
Facility Address: 175 Main Street, Canton NC  
Permitted Flow: 29.9 MGD  
Type of Waste: Industrial, domestic, stormwater, and landfill leachate  
Facility/Permit Status: Renewal  
County: Haywood

### **Miscellaneous**

Receiving Stream: Pigeon River  
Stream Classification: C  
303(d) Listed?: Yes. Biological impairment.  
Subbasin: 04-03-05  
Drainage Area (mi<sup>2</sup>): [calculated] 130 mi<sup>2</sup>  
Summer 7Q10 (cfs): 52 cfs at Canton and 120 cfs at Hepco  
Winter 7Q10 (cfs): 63 cfs at Canton and 183 cfs at Hepco  
30Q2 89.9 cfs at Canton  
Average Flow (cfs): 325 cfs at Canton and 677 cfs at Hepco  
IWC (%): 100% (See Text Below)  
Primary SIC Code: 2621  
Regional Office: Asheville  
USGS Topo Quad: Canton (E 7 SE – State Grid)  
Permit Writer: Sergei Chernikov  
Date: February 2, 2009

### **SUMMARY**

Blue Ridge Paper Products Inc. has requested renewal of their National Pollutant Discharge Elimination System (NPDES) discharge permit NC0000272 allowing discharge of industrial, stormwater, municipal and landfill leachate wastewaters to waters of the state. This fact sheet summarizes the rationale used to develop the limits and monitoring conditions for the draft permit. North Carolina Division of Water Quality (Division) also recommends renewal of the temperature variance and deletion of the color variance.

### **BACKGROUND**

The facility was established in 1908 to produce pulp for the Champion paper mill in Hamilton, Ohio. Blue Ridge paper acquired ownership of the mill in May of 1999 from Champion International. In 2007, the facility was purchased by the Rank Group and now operates as a subsidiary of Evergreen Packaging. The company currently employs about 1,500 people in North Carolina.

Blue Ridge Paper is an integrated, elemental chlorine free (ECF) bleached kraft pulp and paper mill with oxygen delignification, and bleach filtrate recycle in Canton, North Carolina. Processes at the mill include a pine bleach line; hardwood bleach line, paperboard and fine paper production lines. Pine and

hardwood chips are transported to the site via rail or truck and subsequently processed into pulp for paper or paperboard production.

In 1990, Champion International Corporation initiated a \$300 million dollar modernization project termed the Canton Modernization Project (CMP). This project eliminated the use of elemental chlorine and implemented significant changes to both the pine and hardwood bleaching lines.

The mill upgrade included two changes that significantly improved the mill's environmental performance. The first major change was the use of oxygen delignification. This process is used to separate the lignin from the fiber. This resulted in significant improvement in the mill's environmental performance. The second major change was the implementation of full-scale bleach filtrate recycle (BFR) on the pine bleach line and caustic extraction stage (E<sub>0</sub>) filtrate recycle (~20%) on the hardwood bleach line. For a more detailed description of the mill improvements, refer to the Canton Modernization Project Section.

The Canton Modernization Project greatly reduced the wastewater generated and eventually discharged to the Pigeon River. Even with these improvements, significant quantities of wastewater are generated in the production of pulp and paper and proper treatment prior to discharge is required.

Wastewater generated by the Canton Mill, along with the Town of Canton's domestic wastewater, is treated at Blue Ridge Paper's Wastewater Treatment Plant. The treatment plant is a 29.9 MGD wastewater treatment system consisting of the following unit processes:

- Grit Chamber
- Bar screens
- Lift pumps
- Polymer addition
- pH control (CO<sub>2</sub> injection or H<sub>2</sub>SO<sub>4</sub> backup)
- Three primary clarifiers (one normally off-line)
- Nutrient feed
- Aeration basins
- Three secondary clarifiers
- Residual belt presses
- Effluent flow measurement
- Cascade aeration (with oxygen injection)
- Oxygen injection facilities

Solids at this facility are deposited into a dedicated landfill. A portion of the energy at the facility is generated by burning coal. Coal ash is landfilled into a double-lined landfill, which is equipped with leachate collection. Leachate is treated at the wastewater treatment system.

The history of this mill has been controversial. Under Champion Paper, the environmental impacts of the Canton Mill were noted by concerned citizens, environmental groups, the State of Tennessee, State of North Carolina, and the United States Environmental Protection Agency (EPA). The issues raised by these individuals and groups contributed to the Canton Mill's improved environmental performance and resulted in a settlement agreement issued January 8, 1998. All the conditions in the settlement agreement have been met.

This permit has centered around four main issues associated with the mill's discharge: color, temperature, oxygen consuming waste and dioxin, and a brief synopsis follows.

### *Color*

On July 13, 1988, Champion Paper was granted a variance from North Carolina's narrative water quality standard for color, which the EPA interpreted to be 50 color units. The EPA subsequently issued a NPDES permit to Champion Paper facility.

In 1994, the EPA returned NPDES permitting authority for the Canton Mill back to North Carolina's Division of Water Quality. During the permit renewal the original color variance was modified, and both the permit and the variance were issued in December 1996. As outlined above, over the course of this variance the mill has initiated significant color improvements, which have markedly reduced the color loading and other effluent characteristics.

Though the mill has made significant strides, color continues to be the major issue surrounding this permit renewal. EPA chaired Technology Review Workgroup (TRW) has recommended additional color reduction for this permit renewal. The recommendations issued by the Technology Review Workgroup were based on the findings of a third party evaluation of Blue Ridge Paper's Canton mill and a report issued by the EPA Tech Team. The evaluation conducted by Dr. Norm Liebergott in 2001 was co-sponsored by Blue Ridge Paper and several environmental groups and provided valuable information for the TRW. The latest report of Dr. Liebergott was issued on July 7, 2006 and sponsored by Blue Ridge Paper. In addition to identifying areas for improvement and available technologies, Dr. Liebergott compared the Canton mill to 76 similar mills around the world. Dr. Liebergott concluded that the Canton mill's environmental performance is among the best in the world. The latest TRW recommendations were issued on February 25, 2008 and are incorporated into this permit renewal. Color limits for the permit are developed in accordance with the TRW recommendations.

### *Temperature*

The facility first requested and received a 316 (a) variance (approved by EPA) for temperature on August 6, 1985. This determination demonstrated that the effluent limitations relating to the thermal component of the Champion discharge were more stringent than necessary to assure protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife in the Pigeon River. Therefore, the 316(a) temperature variance was approved based on protection of the appropriate use classification of the Pigeon River. The temperature variance was reviewed and renewed as part of the Triennial Review in 1997.

Blue Ridge Paper submitted a Balanced and Indigenous Species Study on the Pigeon River in May of 2006. The study was conducted by the University of Tennessee. DWQ scientists have reviewed the report and concluded that continuance of the temperature variance is appropriate. Therefore, the Division of Water Quality is recommending continuation of the temperature variance with reporting requirements consistent with the previous permits.

### *Oxygen Consuming Waste*

An EPA approved model predicted that even with a BOD<sub>5</sub> loading of 1209 lb/day (5.0 mg/L at 29 MGD) that the dissolved oxygen in the Pigeon River would not be protected. Since Blue Ridge Paper cannot comply with such stringent effluent limitations, an instream oxygen augmentation method was implemented to protect the dissolved oxygen in the receiving stream. For further discussion on this subject refer to the Oxygen Consuming Waste Pollutants section.

### *Dioxins*

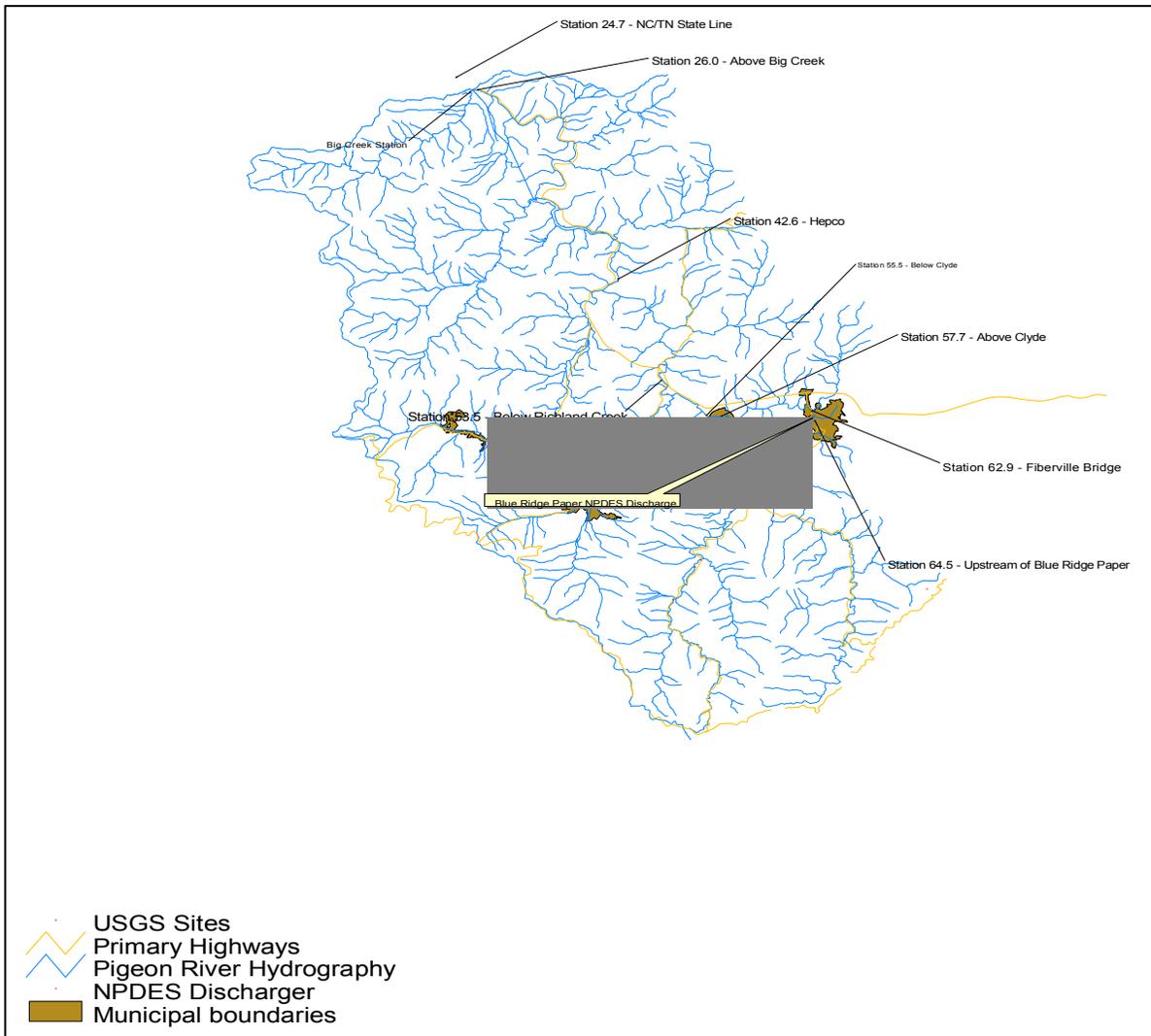
Elevated levels of dioxins were found in fish tissue in the Pigeon River (around the late 1980s). Subsequently, a fish consumption advisory was issued for sport fish, catfish, and carp. The Canton Mill has not discharged any detectable levels of 2,3,7,8 TCDD to the Pigeon River (since 1989) and dioxin in fish tissue continues to decline.

Most fish consumption advisories in North Carolina and Tennessee were removed in 1998 and 2002. The last fish advisory for Common Carp in Waterville Lake was removed on January 7, 2007. There are no fish advisories in the Pigeon River at this time.

## **INSTREAM MONITORING**

The current permit requires Blue Ridge Paper to conduct an extensive instream monitoring program consisting of 9 monitoring sites (1-upstream of mill in Pigeon River, and 7-downstream of mill in Pigeon River and 1-Big Creek; See Figure 1 and Table 1).

**Figure 1.** Instream Monitoring Stations for Blue Ridge Paper Products – Canton Mill.



*Instream Monitoring by Parameter*

Blue Ridge Paper is required to monitor **conductivity** upstream (at station UP) and downstream (at station DN1). The Division’s recommends that conductivity monitoring continue as required by 15A NCAC 2B .0508(d).

Blue Ridge Paper monitors **temperature** upstream at station UP and downstream at all monitoring stations except station DN6 and station BC. Review of the data from 01/01/2004 through 12/31/2008 indicated that the monthly average temperature of the Pigeon River did not exceed the permitted limits of 32 °C (summer) or 29 °C (winter).

Blue Ridge Paper monitors **dissolved oxygen (DO)** at all the instream stations except station DN6 and station BC. Over the period of review (01/01/2004-12/31/2008), daily average dissolved oxygen concentration did not drop below the North Carolina's standard of 5.0 mg/L for Class C streams at any of the instream monitoring locations. The lowest oxygen concentrations occurred at the DN2 monitoring stations.

**Table 1.** Instream Monitoring Requirements According to the 1997 NPDES Permit and Color Variance.

<b>Stream Designation</b>	<b>Mile Marker</b>	<b>Location Description</b>	<b>Parameter</b>	<b>Frequency</b>
UP	63.8	Pigeon River upstream of the waste treatment plant outfall (prior to mixing with the discharge)	Temperature	Daily
			D.O.	Daily
			BOD <sub>5</sub>	1/Week
			Conductivity	Daily
			Color	2/Week
			Flow	Daily
			Fecal coliform	1/Week
DN1	62.9	Pigeon River at Fiberville Bridge	Temperature	Daily
			D.O.	Daily
			Conductivity	Daily
			Fecal Coliform	1/Week
			Color	2/Week
DN2	57.7	Pigeon River Above Clyde	Temperature	Daily
			D.O.	Daily
DN3	55.5	Pigeon River Below Clyde	Temperature	1/Week
			D.O.	1/Week
			Color	2/Week
DN4	53.5	Pigeon River at NCSR 1625 bridge	Temperature	1/Week
			D.O.	1/Week
			Color	2/Week
DN5	42.6	Pigeon River at Hepco	Temperature	1/Week
			D.O.	1/Week
			Color	1/Week
			Flow	Daily
DN6	26.0	Pigeon River prior to mixing with Big Creek	Color	1/Week
BC	~ 26.0	Mouth of Big Creek prior to mixing with the Pigeon River	Color	1/Week
DN7	24.7	Pigeon River at Browns Bridge (~ NC/TENNESSEE State Line)	Temperature	1/Week
			D.O.	1/Week
			BOD <sub>5</sub>	1/Week
			Color	1/Week

During the 1997-2001 permit cycle, an EPA-approved computer model indicated that BOD<sub>5</sub> limits were required to protect North Carolina's instream dissolved oxygen standard of 5 mg/L for Class C waters. An economically feasible end-of-pipe technology capable of consistently treating to levels necessary to meet the limits specified by the model did not exist. North Carolina agreed with the continuation of the requirement that Blue Ridge Paper meet the instream dissolved oxygen standard by use of sidestream oxygen injection facilities. Blue Ridge Paper maintained these oxygen injection facilities at the effluent and at approximately 0.9, and 2.1 miles downstream of the discharge.

To ensure compliance with the above requirement, the average daily instream dissolved oxygen levels at stations DN1, DN2 and DN3 were required to equal or exceed 5.0 mg/L and the minimum instantaneous instream values were required to be greater than or equal to 4.0 mg/L. If dissolved oxygen drops below the prescribed values, Blue Ridge Paper shall utilize the instream dissolved oxygen injection stations to increase the dissolved oxygen in the river.

The oxygen injection facilities will continue to be maintained at the effluent, 0.9, and 2.1 miles downstream, and used as necessary to maintain an instream dissolved oxygen level of 5 mg/L. The condition to maintain the instream dissolved oxygen stations shall remain a condition of the permit until such time that the permitted loading of oxygen consuming waste to the Pigeon River is less than or equal to that proposed by an appropriate water quality model.

If dissolved oxygen at station 57.7 drops below 5.0 mg/L, the facility is required to monitor dissolved oxygen at river mile 55.5 and 53.5.

Instream monitoring continues to be required in order to assess Blue Ridge Paper's impact on the Pigeon River and to ensure that the dissolved oxygen standard is maintained within the river.

### **Compliance Summary**

The facility has a good compliance history. During the review period (01/01/2004 through 12/31/2008) the following NOV's (notices of violation) have been issued: 08/24/2006 – failure of the whole effluent toxicity test; 10/21/2005 and 10/22/2005 – violation of the BOD daily maximum limit.

The Compliance Evaluation Inspection conducted on 01/08/2009 found the facility to be in compliance. Previous inspections had identical findings.

### **Permitting Rationale – Toxicity Testing**

The facility has consistently passed the chronic toxicity test at 90% effluent during the previous 5 years (19 of 20 tests passed). Therefore, chronic toxicity is not an issue. The permit renewal retains the same chronic toxicity test limit. The draft permit retains the Quarterly Chronic Toxicity limit @ 90% effluent.

### **Permitting Rationale – Color**

The annual average color limit of 39,000 lb/day was established in accordance with the TRW recommendations. The company will have to achieve a new stricter limit of 37,000 lb/day by the end of the permit cycle.

The monthly average color limit of 52,000 lb/day was established in accordance with the TRW recommendations

The newly established daily maximum color limit is 105,250 lb/day. This limit is based on best professional judgment. The established number is within 3 standard deviations from the mean during the period from 1/1/1998 through 12/31/2009.

### **Permitting Rationale – Toxicants**

Using the self-monitoring data required per the NPDES permit for Outfall 001, reasonable potential analyses were conducted on the following toxicants: dioxin, zinc, cadmium, selenium and silver. The standards used for the analyses are consistent with North Carolina standards for a class C waterbody.

**Cadmium** – Based on the Division's analysis of self-monitoring data, this discharge does not pose a reasonable potential to cause a violation of the North Carolina stream standard for cadmium. Effluent monitoring of cadmium will be removed because all the values were below detection level.

**Silver** - Effluent monitoring of silver will be removed because all the values were below detection level.

**Selenium** – Based on the Division's analysis of self-monitoring data, this discharge does not pose a reasonable potential to cause a violation of the North Carolina stream standard for selenium. Therefore, the selenium limit will be removed and the effluent monitoring will be reduced to annual.

**Zinc** - Based on the Division's analysis of self-monitoring data, this discharge does pose a reasonable potential to cause an exceedence of the North Carolina's Action Level Standard for zinc. However, numerical limits for zinc are not being included since zinc is an action level water quality standard and the whole effluent toxicity requirements are adequate to control toxicity due to the presence of zinc in the facility effluent. Though no limit is proposed, if the facility experiences chronic toxicity violations the discharge will be re-evaluated and a zinc limit may be implemented according to the Division's Action

Level Policy. Monitoring requirements will be reduced to semi-annual due to the very good toxicity record.

**Dioxin** – Based on the Division’s analysis of self-monitoring data, this discharge does not pose a reasonable potential to cause a violation of the North Carolina stream standard for dioxin. However, the dioxin limit will be maintained because of the EPA requirement. Effluent monitoring will be reduced to annual because the facility had no dioxin detection in its effluent since 1989. Currently, Blue Ridge Paper is required to monitor dioxin and dibenzofuran isomers from the influent, sludge, landfill leachate, and effluent. Based on an evaluation of the data, the Division is recommending that the monitoring frequency in the draft permit be maintained

Annual dioxin **fish tissue analysis** shall continue through 2009 in accordance with the recommendations of the Division’s biologists.

### **Permitting Rationale – Oxygen Consuming Waste Pollutants**

A site-specific Best Available Technology (BAT) based limit was calculated for the 2001 permit to determine the **monthly average 5 - day biochemical oxygen demand (BOD<sub>5</sub>) limit**. A site-specific BAT approach was used because North Carolina’s Division of Water Quality continues to agree that an economically feasible end-of-pipe technology capable of reliably meeting the water quality limit specified by the existing model does not exist at this time and no violations of the dissolved oxygen standard in the river have been observed in recent years.

The North Carolina Division of Water Quality’s recommendation for the 2001 permit BOD<sub>5</sub> limit was established based on the demonstrated level of performance for the existing treatment plant. Data on treatment plant performance and influent loading from the Canton Mill (1998 through 2000) was evaluated and examined for outliers. The maximum influent loading and lowest treatment plant performance were used to develop the monthly average BOD<sub>5</sub> limit. The data set was sufficient to account for the day to day variability of the treatment system.

Over the time period evaluated, the treatment plant has performed extremely well. The lowest percent removal was 96.9% and the highest influent loading was 414.9 mg/L. Based on this analysis, North Carolina’s Division of Water Quality recommends to retain a monthly average BOD<sub>5</sub> loading of 3205.0 lbs/day in the draft permit

Because Blue Ridge Paper has oxygen injection facilities in place to maintain the instream dissolved oxygen standard should instream dissolved oxygen dictate a need, Blue Ridge Paper complies with the conditions set forth by 40 CFR 125.3 (f).

The methodology used for the **daily maximum 5 - day biochemical oxygen demand (BOD<sub>5</sub>) limit** was developed during the 1997 permit cycle. A site-specific daily maximum to monthly average multiplier was used for determination of the recommended daily maximum limit. Using this methodology and reviewing data since the Canton Modernization Project (1998 – 2/2001) the recommended daily maximum limit was based on a multiplier of 3.4 (daily maximum/monthly average) is 10897 lb/day. The draft Permit retains the existing BOD<sub>5</sub> daily maximum limit.

**Ammonia** monitoring requirements are retained in the draft permit to provide data concerning levels of ammonia discharged to the Pigeon River (which may affect instream dissolved oxygen).

Effluent **dissolved oxygen** is limited at no less than 6 mg/L based on the above discussion. Daily monitoring is required based on 15A NCAC 2B .0508 (d), Paper and Allied Products, Class IV facility. **Chemical Oxygen Demand (COD)** monitoring is required to assess the potential impact of chemical oxygen demand from the Blue Ridge Paper wastewater effluent. Neither federal effluent guidelines nor North Carolina water quality standards require a limit for COD. Though no limit is proposed, the EPA has reserved COD for potential future limits. Therefore, COD monitoring will be continued.

## Permitting Rationale – Nutrients

**Total phosphorus and total nitrogen** monitoring is required by 15A NCAC 2b .0508 (d) (2) (A). Monthly monitoring is required to assess the contribution of nutrients from Blue Ridge Paper and the potential impact to Waterville Reservoir.

## Permitting Rationale –Conventional Pollutants

The **total suspended solids (TSS)** limits were calculated using the EPA promulgated Effluent Guidelines for the Pulp, Paper, and Paperboard Point Source Category - 40 CFR 430 Subpart B and compared to existing limits . The TSS limits contained in the current NPDES permit are more stringent than the calculated federal effluent guidelines since the current limits are based on the **1993** proposed guidelines for the oxygen delignification process. The existing TSS limits remain unchanged for this permit renewal.

North Carolina does not have a numeric standard for TSS. The rules specifically regulate floating solids, settleable solids, and sludge deposits [ref. 15A NCAC 2B .0211(3)(c)]. The draft permit restricts floating solids.

The **temperature** requirement is based on a Section 316 (a) temperature variance determination issued by the NC Environmental Management Commission October 11, 1984 and approved by EPA August 6, 1985.

In making the recommendation to retain the current 316(a) temperature variance, DWQ staff evaluated Blue Ridge Paper's Balanced and Indigenous Species Report and concluded that temperature was not prohibiting a Balanced and Indigenous population. In addition, DWQ staff reviewed existing temperature data and concluded that Blue Ridge Paper still cannot meet the North Carolina temperature requirement. Therefore, DWQ is recommending that the 316(a) temperature variance continue, with Blue Ridge Paper conducting a Balanced and Indigenous Species Study prior to the next permit renewal.

The **flow** limit is based on Blue Ridge Paper's current flow values and post-CMP production, and includes 0.9 MGD for the Town of Canton's wastewater. This flow limit remains unchanged.

Limitations for **fecal coliform** are based on the contribution of domestic wastewater from the Town of Canton and the requirements of 15A NCAC 2B .0211 (b) (3) (E).

**Conductivity** monitoring is required based on 15A NCAC 2B .0508 (d), Paper and Allied Products (Water Quality Limited Facilities), for a Class IV facility.

Limitations for **pH** 6.0 –9.0 are based on 15A NCAC 2B .0211 (b) (3) (G).

## Permitting Rationale – EPA Effluent Guidelines

The facility is subject to the Cluster Rules (40 CFR 430 Subpart B). The Pulp and Paper Cluster Rule was established by EPA to protect human health and the environment by reducing toxic releases to the air and water from U.S. pulp and paper mills.

**Adsorbable Organic Halides (AOX).** Weekly effluent monitoring and limits for AOX is required. AOX is an overall test for adsorbable organic halides, which includes chlorinated organics. Trends in concentration changes have been observed between AOX and specific pollutants (dioxins, chlorinated organics) at pulp and paper mills. Therefore, any decrease in AOX may also indicate a decrease in chlorinated organics.

**Chloroform.** Chloroform limits for bleach plants have been recalculated for the proposed permit. Limits contained in the NPDES permit on the bleach plant effluent are based on the EPA promulgated

Effluent Guidelines for the Pulp, Paper, and Paperboard Point Source Category. Since Blue Ridge Paper operates two separate fiber lines, there shall be two compliance points for chloroform as stipulated in the sampling plan.

**Dioxin.** In addition to the dioxin conditions stated in the “Permitting Rationale – Toxicants” section, dioxins shall be limited and monitored on the effluent from the each bleach plant. 2,3,7,8 TCDD and 2,3,7,8 TCDF limits are based on the EPA promulgated Effluent Guidelines for the Pulp, Paper, and Paperboard Point Source Category.

**Chlorinated Phenolics.** Per 40 CFR 430.24, the daily maximum limits for 12 chlorinated phenolics are "less than Minimum Level" (<ML as specified in 40 CFR 430.01.

**Trichlorophenol/Pentachlorophenol** limits and monitoring are not required. The permittee has certified that chlorophenolic biocides are not used at the facility. This certification eliminates the requirement to include effluent limits for these two parameters based on 40 CFR 430. However, if the facility changes future operations to include chlorophenolic biocides, limits and monitoring will be required. Limits for these parameters were recalculated to reflect the current level of the production (please see attached).

**Best Management Practices (BMPs)** requirements for spent pulping liquors, turpentine, and soap have been maintained in the permit. At this time, Blue Ridge Paper is in compliance with the best management practices stipulated in the EPA promulgated Effluent Guidelines for the Pulp, Paper, and Paperboard Point Source Category.

Blue Ridge Paper has not joined the Voluntary Advanced Technology Incentives Program (VATIP) for existing direct or new direct dischargers as outlined in 40 CFR 430 Subpart B. The VATIP program was set up for new or existing direct dischargers whereby mills agree to accept enforceable effluent limitations and conditions in their NPDES permits that are more stringent than the BAT limitations, in exchange for regulatory and enforcement related rewards and incentives.

Blue Ridge Paper will use steam stripping to treat process condensates, rather than hard piping to the WWTP; thus interface with the Division of Air Quality is not necessary.

## **SUMMARY - PROPOSED PERMIT CHANGES**

- 1) Section A. (8.) Requirements for Color Analysis and Compliance Special Condition of the permit has been updated in accordance with the latest EPA Technology Review Workgroup (TRW) recommendations.
- 2) Annual average color limit has been reduced from 42,000 lb/day to 39,000 lb/day in accordance with the latest TRW recommendations (Outfall 001), and will be reduced to 37,000 lb/day based on the performance of the facility but no later than 4 years after permit effective date. See A. (8.) Color Analysis and Compliance Special Condition.
- 3) Monthly average color limit has been reduced from 55,000 lb/day to 52,000 lb/day (Outfall 001).
- 4) The daily maximum color limit of 105,250 lb/day has been added to the permit in accordance with the latest TRW recommendations (Outfall 001). This limit is based on the analysis of the color discharge data from Outfall 001.
- 5) Section A. (12.) Waterville Reservoir Sampling Special Condition was removed from the permit due to the elimination of the Color Variance and all fish consumption advisories in North Carolina and Tennessee. The application to remove the Color Variance has been filed.
- 6) Color monitoring at the following stations have been reduced to weekly (summer and winter) due to the improved stream conditions: DN5, DN6, BC, and DN7.
- 7) Chloroform limits have been recalculated to reflect the current production level (Outfalls 002 and 003).
- 8) Monitoring frequencies for chloroform have been reduced to quarterly (Outfalls 002 and 003).

- 9) AOX (adsorbable organic halides) limits have been recalculated to reflect the current production level (Outfall 001).
- 10) Monitoring frequency for AOX has been reduced to weekly (Outfall 001).
- 11) Pentachlorophenol and trichlorophenol limits have been recalculated to reflect the current production level (Outfall 001).
- 12) Low flow condition requiring that facility will not plan any outages during the low flow periods was added to the permit (Section A. (8.)).
- 13) The daily maximum limit for selenium was removed from the permit based on a statistical analysis of the effluent data (Outfall 001).
- 14) Monitoring frequency for selenium has been reduced to annual due to the removal of the limit (Outfall 001).
- 15) Monitoring frequency for pentachlorophenol has been reduced to quarterly (Outfalls 002 and 003).
- 16) The daily maximum limit for dioxin was re-calculated based on the average flow in the receiving stream. (Outfall 001).
- 17) Monitoring frequency for dioxin has been reduced to annual because this parameter was consistently below detection level during the past permit cycle. (Outfall 001).
- 18) Monitoring frequency for dioxin has been reduced to annual (Outfalls 002 and 003).
- 19) Monitoring for cadmium has been removed from the permit based on a statistical analysis of the effluent data (Outfall 001).
- 20) Monitoring for silver has been removed from the permit based on a statistical analysis of the effluent data (Outfall 001).

## **Rationale for Temperature Variance Renewal**

Blue Ridge Paper submitted the latest Balanced and Indigenous Species Study on the Pigeon River in May of 2006. The study was conducted by the University of Tennessee. DWQ biologists have reviewed the report and concluded that continuance of the temperature variance is appropriate. Therefore, the Division of Water Quality is recommending continuation of the temperature variance with reporting requirements consistent with the previous permits. The facility will be required to provide a new Balanced and Indigenous Species Study prior to the next permit renewal.

## **Color Variance Removal Rationale**

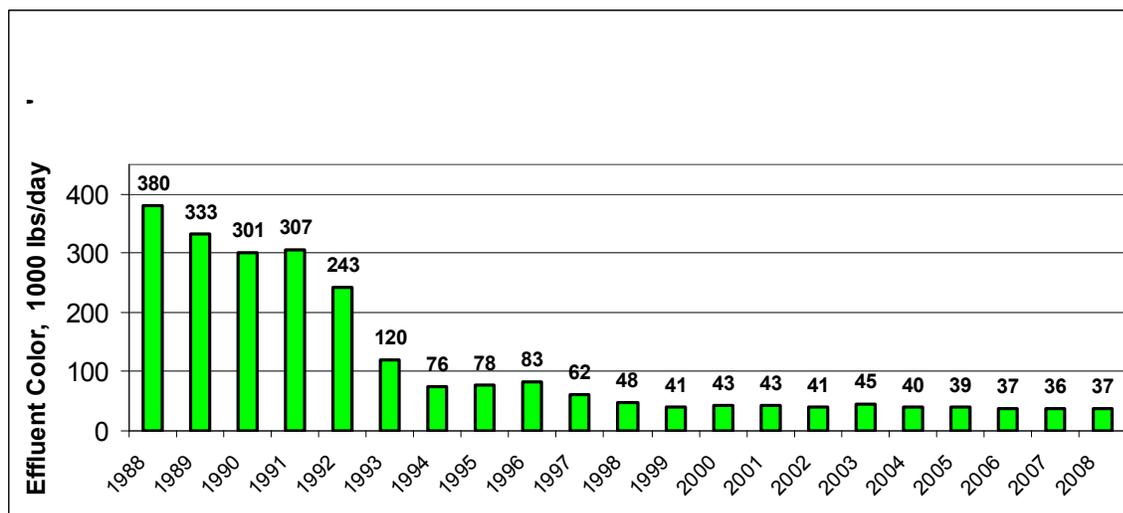
On July 13, 1988, Champion Paper was granted a variance from North Carolina's narrative water quality standard for color. The Color Variance was last renewed in 2001, and the variance requirements were implemented as a Special Condition in the NPDES permit issued in 2001. A goal of this Color Special Condition was to achieve color reductions identified by the TRW and lay the foundation for removal of the Color Variance prior to the next permit renewal. Blue Ridge Paper is requesting removal of the Color Variance, based on improvements in effluent color and instream conditions.

During the last 30 years Blue Ridge Paper has made significant improvements to the facility in order to reduce effluent color load and improve its overall environmental performance. As a result, the annual average effluent color loading has been reduced from 380,000 lb/day in 1988 to 38,000 lb/day today (Fig. 2). Since 1997 the color in the effluent has decreased from 60,000 lbs/day to 38,000 lbs/day.

In order to achieve this result, the mill has spent over \$526 million in expenditures on environmental process improvement since 1990. One of the major accomplishments was

development of a unique technology – BFR (bleach filtrate recycling process). BFR removes color from the effluent. It was installed in 1998 at a capital cost of \$30 million.

Fig. 2. Annual Average Effluent True Color  
Blue Ridge Paper, 1988 through 2008



According to the latest report of consultant Dr. Liebergott (issued on July 7, 2006) the mill is ranked # 1 in the world in regards to the BOD, COD, and color removal. Dr. Liebergott was originally hired in 2001 by the consortium of environmental groups to evaluate the facility for color reduction options. Dr. Liebergott also concluded, after evaluating data from 76 similar mills around the world, that BRPP is ranked # 2 in the world in regards to the TSS and AOX (adsorbable organic halides) removal.

During the period from 2001 through 2006 (last permit term) the mill spent almost \$6 million dollars to undertake 35 separate color reduction initiatives. Some for these initiatives were recommended by the TRW, and some of them were independently identified by the BRP staff.

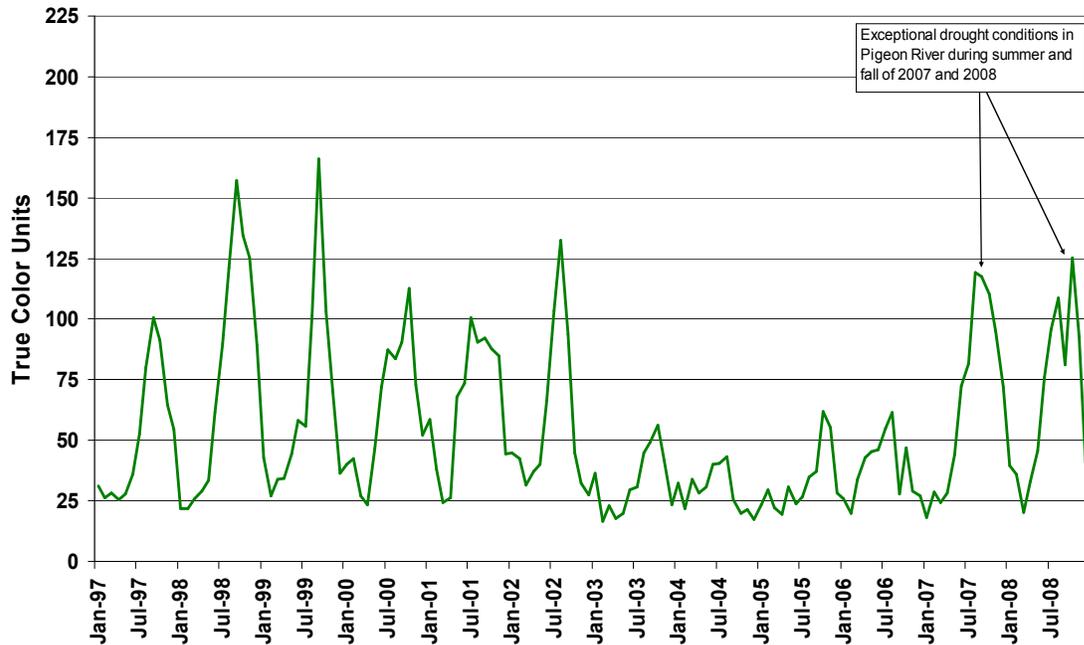
During the last permit term the permit color limit was reduced from 48,000 lb/day to 42,000 lb/day. This draft renewal will require the end of the pipe limit of 39,000 lb/day, decreasing to 37,000 lb/day after 4 years.

A biological study conducted by the University of Tennessee in 2005 concluded that the Pigeon River has a “balanced and indigenous fish community”. This study also found a diverse and healthy macroinvertebrate community in the Pigeon River. Although, according to the North Carolina indicators, the benthic community in the Pigeon River is currently deemed “impaired” and is listed on the state’s 303(d) list. The Division believes that this impairment is not caused by the color constituents in the mill discharge, it is likely a combination of many factors. Scientific studies indicate that stream color concentrations below 100 color units have no effect on health of aquatic organisms (NCASI Special Report 9407, Human Perception and Biological Impacts of Kraft Mill Effluent Color, June 1994).

According to the information the Division received from the state of Tennessee, the River Run Walleye has returned to the Pigeon River. This is a very sensitive species that indicate high water quality. The Pigeon River has also become a trophy smallmouth bass fishery and the number of rafters in Tennessee has increased from ~21,000 in 1995 to almost 150,000 in 2007.

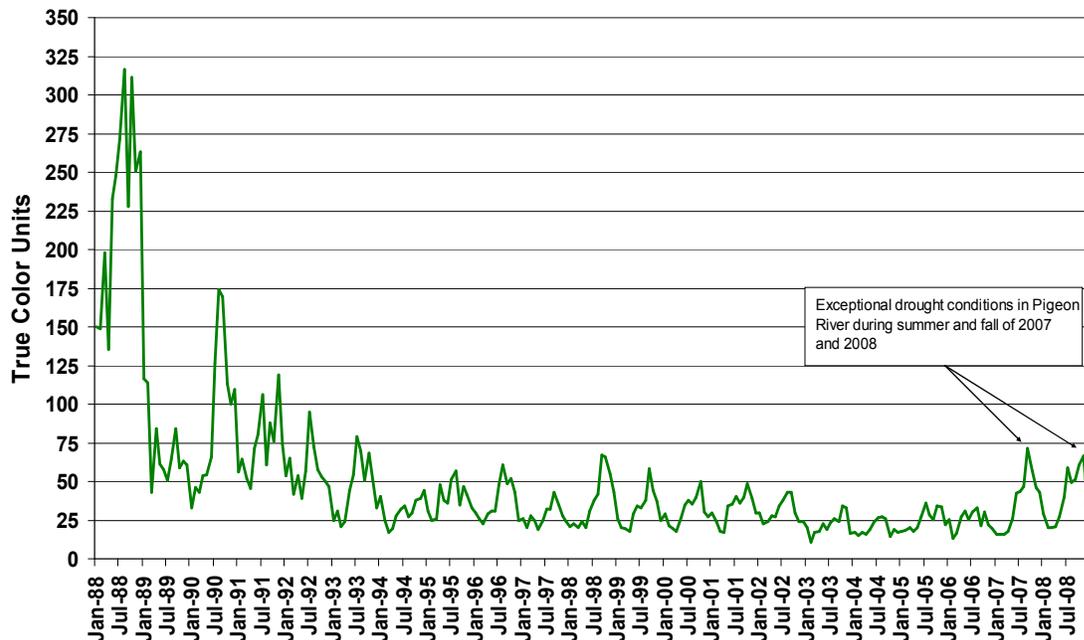
Figures 3 through 5 demonstrate trends in the color conditions of the receiving stream. It is necessary to mention that the exceptional drought of 2007- 2008 made a significant negative impact on the color conditions in the Pigeon River.

Fig. 3. Monthly Average True Color in the Pigeon River at Fiberville  
January 1997 through December 2008



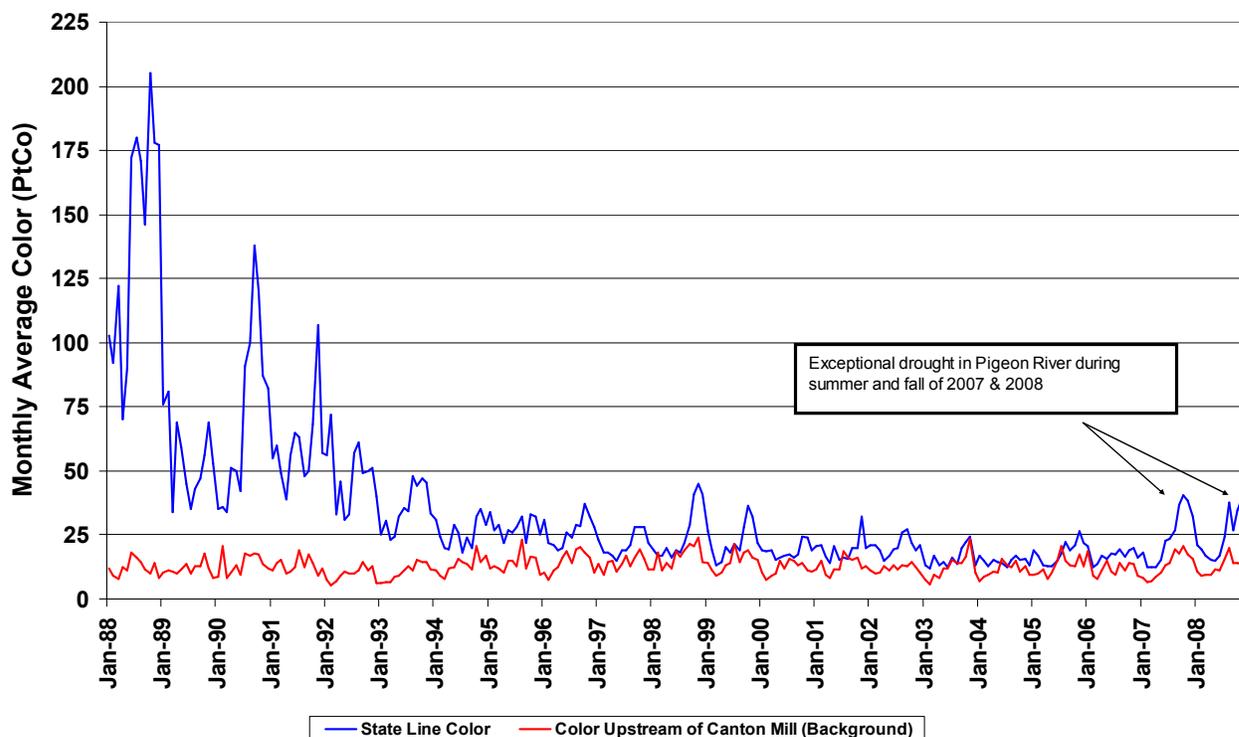
During the 3 years beginning December 2002, monthly average color at Fiberville (0.4 miles below discharge) has been 31 true color units. The exceptional drought that began in 2007 has shifted the general downward color trend, and color values have increased substantially.

Fig. 4. Monthly Average True Color in the Pigeon River at Hepco  
January 1988 through December 2008



Monthly average color at HEPCO (20 miles below discharge) during the last Permit term beginning December 2001 has averaged 24 true color units.

Fig. 5. Pigeon River Color Upstream of the Canton Mill and at Brown's Bridge (~NC/TN State Line): 1988 thru 12/17/2008



Monthly average color at the North Carolina/Tennessee line during the last Permit term has averaged 17 true color units, which is significantly below the value that was interpreted by EPA as the color water quality standard agreed upon by both states – 50 color units. Figure 5 indicates there is no significant difference between color concentration upstream of the mill and at the state line. Review of the data for the period beginning on 01/01/2004 through 12/31/2008 indicates that monthly average limit of 50 at the state line was never exceeded, there were only two daily maximum exceedences during extreme drought: 09/26/2007 – 52 color units, 08/27/2008 – 65 color units. This drought (2007-2008) was so severe that the water flow in the Pigeon River was below 7Q10 for 6 weeks, and below 30Q2 for 32 weeks.

In order to evaluate the color compliance we need to review the color narrative water quality standard definition from the North Carolina Administrative code. 15A NCAC 2B.0211 Fresh Surface Water Quality Standards for Class C Waters:

***Oils, deleterious substances; color or other wastes: only such amounts as shall not render the waters injurious to public health, secondary recreation or to aquatic life and wildlife or adversely affect the palatability of fish, aesthetic quality or impair the waters for any designated uses ....***

Therefore, the narrative color standard consists of several components, and each of the components has to be evaluated:

- 1) Public Health - There has never been a public health advisory related to color in North Carolina.
- 2) Aquatic Life and Wildlife - The University of Tennessee biological study conducted in 2005 concluded that the Pigeon River has a “balanced and indigenous fish community in the Pigeon River below the mill’s discharge”. The facility is also consistently passing WET tests during the last 5 years and for an extended time period before that. Therefore, the benthic macroinvertebrate impairment is not believed to be associated with the color discharge.
- 3) Palatability of Fish – Color is not a parameter associated with fish palatability.
- 4) Secondary Recreation - Pigeon River in North Carolina continues to be used for secondary recreation. Division’s employees from the central office and the regional office have observed people fishing below the discharge on numerous occasions.
- 5) Aesthetic Quality- NC has generally viewed color as primarily an aesthetic issue, and the interpretation of color as an aesthetic impact is subjective. Similar to odor issues, the number of complaints received serves as one means to gauge public perception of color impact. The NC DWQ regional office in Asheville has received only one color complaint in recent years. Aside from actual color complaints, the most definitive color perception research on pulp mill color discharges has been conducted by Dr. Prestrude of Virginia Tech Department of Psychology. His research was funded in part by the State of Tennessee, and included color perception studies in both Tennessee and North Carolina waters (Pigeon River). Prestrude (July 1996) reported that the vast majority of persons participating in the research projects considered water quality color in the receiving stream as aesthetically acceptable in the 100-110 PCU color range. This instream color range is generally achieved by Blue Ridge Paper over the past seven years, except under extreme low flow conditions:
  - Instream Color at Fiberville (0.4 miles below Blue Ridge Paper discharge). Between CY2002-08, there were 64 of 592 individual instream samples (10.8%) that exceeded 100 PCU. The majority of values exceeding 100 PCU occurred during extreme drought conditions in 2002 and 2007-2008, when instream flows fell below 30Q2 and sometimes below 7Q10. In more typical water years, there were no individual values >100 PCU in 2003 and 2004, and only 1 value >100 PCU in 2005 and 2006.
  - Instream Color at HEPCO (20 miles below Blue Ridge Paper discharge). Between CY2002-08, there were 3 of 592 individual instream samples (0.5%) that exceeded 100 PCU.
  - Instream Color at NC/TN state line (38 miles below Blue Ridge Paper discharge). Between CY2002-08, there were 0 individual instream samples that exceeded 100 PCU. The instream color at the state line was compliant with the 50 PCU instream color standard for 577 of 579 individual samples (a 99.6% compliance rate), despite extreme drought conditions and no consideration for background color.

Based on actual instream color measured between 2002-08, DWQ believes that compliance with the effluent color limits established in the 2001 permit were protective of NC’s narrative water quality color standard. Only under extreme drought conditions (below 30Q2/7Q10 flows) were instream color values reported to exceed the Prestrude aesthetic threshold of 100 PCU, and NC regulations do not consider aesthetic color standards violated by the permittee when stream flows fall below 30Q2 design flow.

Further downstream at the NC/TN state line, the instream color limit of 50 PCU has been consistently met despite extreme low stream flows and no consideration of background color. DWQ believes the Draft 2009 permit, which proposes even more stringent effluent color limits, will continue to be protective of NC's narrative color water quality standard, as well as the 50 PCU color limit established at the NC/TN line for protection of Tennessee's color standard. In the future, NC DWQ will continue to evaluate aesthetic color impact based on color complaints received by the Asheville Regional Office, in tandem with color perception guidelines established by the Prestrude color studies conducted in Tennessee and Pigeon River.

- 6) Designated Uses - The Pigeon River is classified as "Class C waters" - aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. All designated uses are currently being met, benthic macroinvertebrate impairment in some segments of the Pigeon River cannot be attributed to color discharges and is likely the result of habitat degradation and NPS pollution.

Based on the evidence presented, the Division believes that the current discharge does not cause violation of the North Carolina Color Standard and the Color Variance should be removed from the permit. The facility will continue to implement color reduction measures identified by the TRW. The facility will also continue to investigate feasibility of the new technologies that will reduce color in the effluent and implement them (if economically achievable).

#### **ADDITIONAL INFORMATION**

##### **CANTON MODERNIZATION PROJECT**

Prior to 1993, knotting hardwood brownstock was washed through one of two brownstock washer lines. After washing brownstock was screened using a two-stage fine screening process and bleached in one of the two bleaching lines. The two bleaching lines were operated independently for 'low' brightness and 'high' brightness.

Since 1993, the hardwood fiberline has incorporated numerous modifications designed to increase mill performance from both an environmental and product quality standpoint. Currently, the hardwood fiberline consist of two stage knotting followed by pre-oxygen delignification washers. After pulp is processed through the oxygen delignification unit, it is washed again prior to the four stage pressurized fine screening. After screening, the pulp is bleached through one medium consistency bleach line.

Prior to 1992, pine (softwood) pulp was processed through one brownstock washing line prior to the two stage screening process. After screening, pulp was processed through one of the two bleaching lines. Similar to the hardwood fiberline, the softwood fiberline bleaching was operated independently for 'low' brightness and 'high' brightness.

Like the hardwood fiberline, the softwood fiberline has incorporated numerous modifications in order to enhance product quality and environmental performance. Currently, the softwood fiberline process consists of two stage knotting followed by a brownstock pre-oxygen delignification line. After the initial washing the pulp is processed through the oxygen delignification unit followed by another washing. After the second washing pulp is screened using four stage pressurized fine screen before entering a medium consistency bleach line.

In addition to the improvements noted, the facility has implemented full scale bleach filtrate recycle of the pine bleach line and partial caustic extraction stage (Eo) recycle on the hardwood bleach line.

## **PROPOSED SCHEDULE FOR PERMIT ISSUANCE**

This fact sheet represents North Carolina's recommendations. The Division will review all pertinent comments received during the public comment period and the public hearing. After reviewing all public comments, the Director of the Division of Water Quality and the NPDES Committee of the Environmental Management Commission will make their recommendations.

Public Notice Draft Permit, temperature variance, color variance and Public Hearing  
Public Hearing

### **State Contact**

If you have any questions on any of the above information or on the attached permit, please contact Sergei Chernikov at (919) 807-6393.