UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
1 CONGRESS STREET - SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

FACT SHEET

DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES

NPDES PERMIT NUMBER: **NH0000655**

PUBLIC NOTICE DATE:

NAME AND ADDRESS OF APPLICANT:

Fraser Papers N.H. LLC
650 Main Street
Berlin, N.H. 03570

NAME AND ADDRESS OF FACILITIES WHERE DISCHARGES OCCUR:

Fraser Papers N.H. LLC
Cascade Paper Mill
72 Cascade Flats
Gorham, N.H. 03581

RECEIVING WATER: **Androscoggin River**

CLASSIFICATION: **Class B**

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I. PROPOSED ACTION

Fraser Papers N.H. LLC (Fraser Papers) operates a paper mill in the Town of Gorham (Cascade paper mill). The paper mill, as shown in Attachment A, is located adjacent to the Androscoggin River, approximately two miles downstream of a former pulp mill, previously owned and operated by Fraser Papers, in the Town of Berlin. There are three outfalls associated with the paper mill which discharge treated process wastewater, non-contact cooling water, general housekeeping water, boiler blowdown, filter backwash, and excess treated intake water into the Androscoggin River. Fraser Papers has applied to the U.S. Environmental Protection Agency (EPA) for the re-issuance of a National Pollutant Discharge Elimination System (NPDES) permit to discharge wastewater from these outfalls to the Androscoggin River. Fraser Papers also

applied for and received a Multi-Sector General Permit (MSGP) from EPA for their storm water discharge from the Cascade paper mill (Permit No. NHR05A717). As a result of the MSGP, storm water discharges from the paper mill site are not discussed in this fact sheet.

II. DESCRIPTION OF THE DISCHARGE

A quantitative description of the discharge in terms of significant effluent parameters based on the discharge monitoring reports (DMRs) submitted by the facility during the time period of January 1999 through July 2007, is included in Attachment B.

III. SITE OVERVIEW

A. Permitting History

EPA issued a NPDES permit to the James River Company on June 10, 1992. Portions of the permit were appealed by the James River Company. A Settlement Agreement on the appeal was reached with the James River Company and the modified permit became effective on October 21, 1994 (referred to herein as the current or existing permit). The expiration date of the permit was October 21, 1999. The permit was modified on January 21, 1997, when the permit was transferred to the Crown Vantage Company. EPA received a permit renewal application dated April 6, 1999, from Crown Vantage Company prior to the permit expiration date of October 21, 1999. Since the permit renewal application was deemed both timely and complete by EPA, the permit has been administratively continued.

In July of 1999, the facility was purchased by Pulp & Paper of America LLC (Pulp & Paper). The permit was modified on June 29, 2000, to reflect the transfer of ownership to Pulp & Paper. On October 19, 2000, the New Hampshire Department of Environmental Services (NHDES) issued an Administrative Order to Pulp & Paper requiring the facility to take steps to reduce the turbidity levels in the discharge from the Cascade paper mill Wastewater Treatment Plant (WWTP) (Outfall 018). The paper mill and pulp mill were closed by Pulp & Paper in August and September of 2001, respectively, as a result of bankruptcy proceedings. The facility remained closed until it was purchased by Fraser Papers in May of 2002. The permit was modified to reflect the transfer of ownership to Fraser Papers on December 27, 2002.

There were a number of State and/or Federal environmental regulatory requirements (such as those identified in the Administrative Order issued by the NHDES) that could not be met immediately upon acquisition and startup of the facility by Fraser Papers. As a result, the EPA, the NHDES, and Fraser Papers entered into a Consent Agreement and Final Order (Docket No. CWA-01-2002-0028) on May 30, 2002. Under the Consent Agreement and Final Order, Fraser Papers agreed, among other items, to bring the operation of the facility into compliance with applicable State and Federal environmental legislation and regulations.

Discharges from the Cascade paper mill are currently authorized under the existing permit, which also authorizes discharges from the Burgess pulp mill. The pulp mill has since ceased pulping operations, and the Burgess pulp mill site was sold to North American Dismantling Company (NADC) on October 3, 2006. The pulp mill WWTP was sold to the Androscoggin Valley Regional Refuse Disposal District (AVRRDD) on October 16, 2007; however, Fraser remains the operator of the pulp mill WWTP under the current permit. AVRRDD applied for a separate NPDES permit (NH0023523) for discharge from the former pulp mill WWTP (Outfall 016) on April 17, 2008, and plans to operate the plant after finalization of this separate NPDES permit. Therefore, the authorization to discharge from the pulp mill WWTP is not included in this permit, although it is discussed in Section V.A.4 of this fact sheet concerning the TMDL allocation (which was originally written for the combined discharge from Fraser Papers, including Outfalls 018 and 016).

B. Facility Overview

The Cascade paper mill operates with four fine paper grade paper machines, one towel grade paper machine, and a steam plant which supplies process steam for the paper mill. The paper mill steam plant is composed of Boilers No. 1, 2, 3, 4, and a Temporary Package Boiler, which is used on boiler maintenance outages at the paper mill. At full paper production capacity, the mill is reported to produce approximately 654 tons/day of paper products as an annual average. The 2008 permit reapplication reported that the current average production is approximately 608 tons/day of paper products.

Discharges from the Cascade paper mill WWTP consist of process water, non-contact cooling water, general housekeeping water, and boiler blowdown, which are treated by the paper mill WWTP. Treatment at the paper mill WWTP consists of primary treatment by clarification and settling in lagoons, and a sludge handling system for removal of the sludge from the primary clarifier. The raw wastewater is collected in the paper mill process sewers where aluminum sulfate is often added for pH and turbidity control. The sewers converge at a lift station, where a bar rack removes the larger debris and the wastewater is then pumped to the primary clarifier for removal of settleable solids. The settled solids from the primary clarifier are pumped to a sludge handling system for subsequent treatment (with addition of cationic polymer and/or ferric sulfate as needed) and disposal at Mt. Carberry landfill. When necessary to control effluent pH, sodium hydroxide is added to the primary clarifier effluent. Also, when needed, polymer is added to the center well of the primary clarifier to help solids flocculate and settle. A floating scum baffle system located in the primary clarifier, which consists of a 12-inch skirt below water and a 6-inch float above water, provides secondary containment for any oil that may enter the process sewers at the paper mill. The clarified effluent from the primary clarifier discharges to an 11 MG horseshoe-shaped aerated lagoon which has four fixed 25 HP slow speed aerators, and then to a setting lagoon for stabilization. There is a floating, nylon scum baffle installed within the settling lagoon at the outflow of the channel from the aerated lagoon for additional capture of floating material. The effluent from the settling lagoon flows through a Parshall Flume where a composite sample is obtained and flow, temperature, and pH are measured and recorded. The

settling lagoon has overlapping log booms in a V design positioned in front of the outfall to keep floating debris from exiting through the Parshall Flume. The log booms self-adjust to the flow rates. A water based defoamer is added at the entrance of the Parshall Flume to help reduce air entrainment which occurs within the effluent pipe and to prevent foaming of the river at the outfall. The treated wastewater is then discharged to the Androscoggin River through Outfall 018 – Cascade paper mill WWTP. A flow diagram of the paper mill WWTP is included as Attachment C.

Cooling water and process water which are supplied to the paper mill are taken from the Androscoggin River at the "Gate House" (or pulp mill cooling water intake structure (CWIS)) located adjacent to the Great Lakes Hydroelectic Sawmill Dam upstream of the former pulp mill site. The water is filtered at the Filter House by sand filter beds and then used at the paper mill for process water, cooling water, and filter backwash.[1] Currently, the pulp mill CWIS withdraws several million gallons per day more water than is actually required by the paper mill's operations. During a site visit on October 10, 2007, EPA became aware that the paper mill's current practice is to discharge this "excess" filtered water at the historic pulp mill site (near the discharge from Outfall 010), through an elevated pipe which discharges excess treated water directly above the banks of an embayment along the Androscoggin River. It is labeled as Outfall 025 in this permit. Fraser estimates that it discharges approximately 4.5 MGD through Outfall 025. In the 2008 permit reapplication, Fraser noted the existence of a bypass value that allows water to bypass the Filter Plant, without treatment.

Fraser estimates that it withdraws an average of 14.7 million gallons per day (MGD) from the Androscoggin River through the pulp mill CWIS. Of this, approximately 4.5 MGD is returned to the river after filtration but without being used, as noted above; approximately 0.245 MGD of the remaining water is used for cooling, with 0.075 MGD used for cooling alone and 0.17 MGD used for cooling and then reused as process water. The remaining withdrawn water is used for various processes at the paper mill. Raw water from the river flows by gravity into the Gate House and through a set of inclined trash racks to remove large debris. From there, the water flows by gravity to the filter house where it is treated using sand filters to remove suspended solids. Typically, no chemicals are added to the filtering process; however, addition of cationic polymers to reduce water color has been permitted in the past and shall be allowed in this permit. However, additional monitoring and reporting is required upon use of cationic polymers, as outlined in Part I.A.3.c of the draft permit. When the efficiency of the filter media is reduced, the filters are backwashed (with filtered water) to rid the system of the accumulated solids. The filter backwash is discharged through Outfall 010 – Burgess Filter House Backwash Waters, into the Androscoggin River. Fraser estimates that it discharges approximately 1.5 MGD through Outfall 010.

A second intake structure, known as the paper mill CWIS, is located directly upstream of the Cascade paper mill adjacent to the hydroelectric dam. A 20-inch diameter pipe located in the

[1] Although the pulp mill CWIS is located near the former pulp mill, it is in fact used only by the paper mill.

forebay wall of the filter house has been used in the past to supply raw water to the paper mill in the event that water was unavailable from the pulp mill. However, this intake structure is not typically used by Fraser Papers.[2] Currently, EPA does not have sufficient information to determine whether this cooling water intake structure reflects the best technology available (BTA) for minimizing adverse environmental impacts. As such, the only intake structure approved for the withdrawal of cooling water is the pulp mill CWIS. However, the facility may request a permit modification for approval of use of the paper mill CWIS in the future. Any such request shall include sufficient information for EPA to make a BTA determination of the paper mill CWIS. Until such a request by Fraser and subsequent approval by EPA, use of the paper mill CWIS and all associated discharges, such as paper mill CWIS filter backwash, are prohibited by this permit.

C. Discharge Overview

Discharges which are authorized under this permit are from Outfall 018 (treated process water, NCCW, general housekeeping water, and boiler blowdown from the Paper Plant WWTP), Outfall 010a (Pulp Mill CWIS Filter Backwash - no chemicals added), Outfall 010b (Pulp Mill CWIS Filter Backwash - polymer added),[3] and Outfall 025 (excess filtered water intake from the pulp mill CWIS). Discharge through Outfall 017 (Paper Mill CWIS Filter Backwash) is prohibited by this permit since the use of the Paper Plant CWIS is also prohibited (as described above).

D. Discharge Location

1. Androscoggin River Classification

The Androscoggin River originates at the outlet of Umbagog Lake in Errol, New Hampshire, and empties into the Atlantic Ocean at Merrymeeting Bay in Brunswick, Maine. The river is one of the major New England river basins, extending from the Canadian border to the Atlantic Ocean and covering a 3,450 square mile section of eastern New Hampshire and southwestern Maine. The river flow is regulated from a series of dams in the upper watershed that store a significant amount of water. As a result, a minimum flow of water can be maintained throughout the river system.

Since the river flows from New Hampshire to Maine the water classifications of both states are pertinent and are discussed further below. New Hampshire has classified the main stem of the river above and below the paper mill as a Class B water body. Maine has classified the river from the Maine-New Hampshire border to its confluence with the Ellis River in Maine as a Class B water body. Beyond the Ellis River to its confluence with Merrymeeting Bay in Brunswick, Maine, the Androscoggin is classified as a Class C water body.

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[2] To be clear: the pulp mill CWIS provides the water intake for the paper mill, and the paper mill CWIS is unused.
[3] Outfall 010 is a single physical outfall. Its conceptual division into Outfalls 010a and 010b reflects the two different modes of operation.

New Hampshire law states:

"485-A:8,II - *Class B waters shall be of the second highest quality and shall have no objectionable physical characteristics, shall contain a dissolved oxygen content of at least 75 percent of saturation, and shall contain not more than either a geometric mean based on at least 3 samples obtained over a 60-day period of 126 Escherichia coli per 100 milliliters, or greater than 406 Escherichia coli per 100 milliliters in any one sample; and for designated beach areas shall contain not more than a geometric mean based on at least 3 samples obtained over a 60-day period of 47 Escherichia coli per 100 milliliters, or 88 Escherichia coli per 100 milliliters in any one sample; unless naturally occurring. There shall be no disposal of sewage or waste into said waters except those which have received adequate treatment to prevent the lowering of the biological, physical, chemical or bacteriological characteristics below those given above, nor shall such disposal of sewage or waste be inimical to aquatic life or to the maintenance of aquatic life in said receiving waters. The pH range for said waters shall be 6.5 to 8.0 except when due to natural causes. Any stream temperature increase associated with the discharge of treated sewage, waste or cooling water, water diversions, or releases shall not be such as to appreciably interfere with the uses assigned to this class. The waters of this classification shall be considered as being acceptable for fishing, swimming and other recreational purposes and, after adequate treatment, for use as water supplies . . . ."*

"485-A:8,VIII *- In prescribing minimum treatment provisions for thermal wastes discharged to interstate waters, the department shall adhere to the water quality requirements and recommendations of the New Hampshire fish and game department, the New England Interstate Water Pollution Control Commission, or the United States Environmental Protection Agency, whichever requirements and recommendations provide the most effective level of thermal pollution control."*

"***Env-Wq 1703.03(c)*** *- The following physical, chemical and biological criteria shall apply to all surface waters:*

(1) All surface waters shall be free from substances in kind or quantity which:

a. Settle to form harmful deposits;

b. Float as foam, debris, scum or other visible substances;

c. Produce odor, color, taste or turbidity which is not naturally occurring and would render it unsuitable for its designated uses;

d. Result in the dominance of nuisance species; or

e. Interfere with recreational activities;"

*"**Env-Wq 1703.07(b)** - Except as naturally occurs, or in waters identified in RSA 485-A:8,III, or subject to (c) below, class B waters shall have a dissolved oxygen content of at least 75% of saturation, based on a daily average, and an instantaneous minimum dissolved oxygen concentrations of at least 5 mg/L."*

*"**Env-Wq 1703.07(c)** - For the period from October 1st to May 14th, in areas identified by the fish and game department as cold water fish spawning areas of species whose early life stages are not directly exposed to the water, the 7 day mean dissolved oxygen concentration shall be at least 9.5 mg/L and the instantaneous minimum dissolved oxygen concentration shall be at least 8 mg/L. This period shall be extended to June 30 for a particular waterbody if the fish and game department determines it is necessary to protect spring spawners and late hatches of fall spawners, or both."*

Maine law states;

Maine law, 38 M.R.S.A. Section 414-A, requires that the effluent limitations prescribed for discharges require application of best practicable treatment, be consistent with the U.S. Clean Water Act, and ensure that the receiving waters attain the State Water Quality Standards as described in Maine's Surface Water Classification System. In addition, Maine law, 38 M.R.S.A., Section 420 and Department Regulation Chapter 530.5, *Surface Water Toxics Control Program*, requires the regulation of toxic substances at the levels set forth for Federal Water Quality Criteria as published by the U.S. Environmental Protection Agency pursuant to the Clean Water Act.

Class B – Class B waters shall be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; and navigation; and as habitat for fish and other aquatic life. The habitat shall be characterized as unimpaired.

The dissolved oxygen content of Class B waters shall be not less than 7 parts per million or 75% of saturation, whichever is higher, except that for the period from October 1st to May 14th, in order to ensure spawning and egg incubation of indigenous fish species, the 7-day mean dissolved oxygen concentration shall not be less than 9.5 parts per million and the 1-day minimum dissolved oxygen concentration shall not be less than 8.0 parts per million in identified fish spawning areas. Between May 15th and September 30th, the number of Escherichia coli bacteria of human origin in these waters may not exceed a geometric mean of 64 per 100 milliliters or an instantaneous level of 427 per 100 milliliters.

Discharges to Class B waters shall not cause adverse impact to aquatic life in that the receiving waters shall be of sufficient quality to support all aquatic species indigenous to the receiving water without detrimental changes in the resident biological community.

Class C – Class C waters shall be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; and navigation; and as a habitat for fish and other aquatic life.

The dissolved oxygen content of Class C waters may be not less than 5 parts per million or 60% of saturation, whichever is higher, except that in identified salmonid spawning areas where water quality is sufficient to ensure spawning, egg incubation and survival of early life stages, that water quality sufficient for these purposes must be maintained. In addition, in order to provide additional protection for growth of indigenous fish, dischargers that were issued final discharge licenses or water quality certificates prior to March 16, 2004 that are based on a 6.5 parts per million dissolved oxygen criterion must continue to be licensed using a temperature of 24 degrees centigrade or the ambient temperature of the water body, whichever is lower. Final discharge licenses and water quality certificates not based on a 6.5 parts per million dissolved oxygen criterion prior to March 16, 2004 must be based on a 6.5 parts per million dissolved oxygen criterion at a temperature of 22 degrees centigrade or the ambient temperature of the water body, whichever is lower. Between May 15th and September 30th, the number of Escherichia coli bacteria of human origin in these waters may not exceed a geometric mean of 142 per 100 milliliters or an instantaneous level of 949 per 100 milliliters. The board shall adopt rules governing the procedure for designation of spawning areas. Those rules must include provision for periodic review of designated spawning areas and consultation with affected persons prior to designation of a stretch of water as a spawning area.

Discharges to Class C waters may cause some changes to aquatic life, provided that the receiving waters shall be of sufficient quality to support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community.

2. Androscoggin River Flow Regime

In 1983, the critical low flow event was based on a flow of 1,550 cubic feet per second (cfs) at Berlin, New Hampshire. This flow rate was based upon a minimum flow maintenance agreement amongst the James River Paper Company, Rumford Falls Power Company, International Paper Company and the Union Water Company, which formed the Androscoggin Reservoir Company. That agreement called for a minimum flow of 1,550 cfs to be maintained in the Androscoggin River at Berlin, New Hampshire. Stored water was to be released so that one third (1/3) originates from Aziscohos Lake storage and the remaining two thirds (2/3) from the waters impounded by the Errol Middle, Upper and Rangeley Dams.

A USGS stream flow gauging station (#01054000) is maintained on the Androscoggin River near Gorham, New Hampshire (drainage area of 1,361 mi^2). The gauging station is located approximately 1,600 feet downstream of the outfall from the Cascade paper mill WWTP (Outfall 018). This station has been recording river flows since 1929. As a result of the termination of log drives along the river in 1962, only the post-1962 period of record was used for the purposes

of establishing a 7Q10 low river flow for the water quality-based criteria calculations for the previous permit. The NHDES recently re-estimated local 7Q10 for the Androscoggin River from Berlin to Gorham using the1963 to 2006 post log drive period of record at the USGS gage in Gorham. The 7Q10 just upstream of the Cascade paper mill was estimated to be 1,336 cfs (See Attachment I). These river flows form the basis for calculating the water quality-based criteria limits for the Androscoggin River in New Hampshire.

3. Androscoggin River Impoundments

The flow of the Androscoggin River is extensively regulated by numerous dams, both on the river itself and on its tributaries. The existing dams essentially control all but peak flows in the basin. Over 90 percent of the present storage capacity is in the headwaters of the basin above the outlet of Umbagog Lake at Errol, New Hampshire. The only other major storage impoundment on the river itself is the Gulf Island Pond (GIP) formed by Gulf Island Dam. The dam, which was built in 1928, is located near Lewiston, Maine. The GIP is used primarily for hydropower generation by Florida Power and Light (FPL). The pond has about 10 feet of usable head, but is usually operated in a manner such that weekly inflow equals outflow. FPL generally releases flow from the dam during the week while on weekends the flows are restricted to help rebuild storage capacity. During low flow periods, the discharge is also restricted at night. The pond backs up water for some 14 miles with a mean width of about one-third of a mile and a mean depth of 20 feet. However, depths in excess of 70 feet are found in the first several miles of the pond upstream of the Gulf Island Dam. GIP is located entirely within the portion of the Androscoggin River which is classified by the State of Maine as a Class C water body.

4. Historic Water Quality Assessment/Modeling

Fraser Papers is one of three large pulp and paper manufacturing facilities which discharge treated process wastewater to the Androscoggin River. The other two mills are the Rumford Paper Mill (formerly MeadWestvaco) in Rumford, Maine and the Verso Paper Mill (formerly International Paper) in Jay, Maine. The Rumford Paper Mill and the Verso Paper Mill are respectively located approximately 54 river miles and approximately 76 river miles downstream of Fraser Papers. All three mills, in addition to five smaller municipal sources (POTWs located in Berlin and Gorham, New Hampshire and Bethel, Rumford-Mexico, and Livermore Falls in Maine), as well as non-point sources along the river contribute to a summertime depressed dissolved oxygen (DO) condition in GIP. GIP is located approximately 108 miles downstream of Fraser Papers. The DO problem occurs in the lower depths of the GIP for approximately a four to five-mile stretch above the dam [river mile (RM) 31.4 to RM 26.6]. DO modeling of the river and GIP has been completed by the Maine Department of Environmental Protection (ME DEP). The modeling shows that upstream point source dischargers, which include Fraser Papers, are contributing to the pollutant loading and the non-attainment of the State of Maine's Class C standards for DO in GIP. However, the modeling also shows that non-attainment of the Class C standards for DO is still predicted in GIP during critical flow and temperature periods even if all of the point source discharges were to be eliminated. The reason is that a significant component

of the DO deficit in GIP is due to the existing oxygen demand which comes from sediments already deposited upstream of the dam.

5. Current Water Quality Assessment/Modeling

Under Section 303(d) of the Clean Water Act (CWA), states are required to develop information on the quality of their water resources and report this information to the EPA, the U. S. Congress, and the public. Two segments of the Androscoggin River have been identified by the State of Maine as being impaired (i.e., these sections do not attain Class C water quality standards). These two segments, which include the lower four miles of the GIP impoundment and the Livermore Falls impoundment are on Maine's 303(d) list for respectively not attaining the Class C standard for DO and the Class C standard for aquatic life criteria. Under the CWA, each state is required to develop a Total Maximum Daily Load (TMDL) for a water body once it is identified as impaired. A TMDL is essentially a pollution budget designed to restore the health of a water body. A TMDL typically identifies the source(s) of the pollutant from direct and indirect discharges, determines the maximum amount of pollutant, including a margin of safety, that can be discharged to a specific water body while maintaining water quality standards for designated uses, and outlines a plan to meet the goal. A TMDL was prepared by the ME DEP for the Androscoggin River in May of 2005 and this TMDL was approved by the EPA on July 18, 2005.

According to the TMDL, GIP does not attain Class C minimum and monthly average dissolved oxygen criteria in a four-mile segment directly above the GIP dam. The TMDL identified these areas of non-compliance as primarily being in the deeper areas of the water column (i.e., at depths of 30 to 80 feet). The TMDL also identified that algae blooms, which occur in the vicinity of the GIP as a result of excessive amounts of phosphorus discharged to the river, prevent the use of the water for primary contact recreation, one of the designated uses of the river. In addition, the TMDL identified that the Livermore Falls impoundment, which is located upstream of GIP just below the Verso Paper Mill in Jay, Maine, does not attain the aquatic life criteria for a Class C water body. Further information concerning the impacts of the TMDL are summarized below. However, individuals are encouraged to read the Androscoggin River TMDL (May 2005) prepared by the ME DEP for additional details.[4]

The pollutants of concern as identified in the TMDL are carbonaceous biochemical oxygen demand, ortho-phosphorus (ortho-P), total phosphorus (total-P), and total suspended solids (TSS). It should be noted that carbonaceous biochemical oxygen demand (CBOD) and biochemical oxygen demand (BOD) are used interchangeably in this fact sheet and the draft permit to represent the same effluent characteristic.[5] The 2002 Modeling Report prepared by ME DEP has indicated that the paper mills account for a majority of phosphorus and biochemical

[4] *See* http://mainegov-images.informe.org/dep/blwq/docmonitoring/impairedwaters/gipfinaltmdl.pdf

[5] Conservatively, the permit requires monitoring for BOD, which includes any CBOD which may be present in the discharge, since CBOD is a subpart of BOD.

oxygen demand inputs into GIP. The TMDL identifies that a reduction of phosphorus is needed to eliminate algae blooms in GIP. A reduction of CBOD, TSS, and phosphorus, is needed to help attain the Class C criteria for DO in GIP. In addition, the TMDL identifies that an instream oxygen injection system currently located five miles above GIP dam needs to be re-designed to inject an additional quantity of oxygen into the pond to help attain the Class C criteria for DO in the lower depths of the pond.

The 2002 Modeling Report identified sediment oxygen demand (SOD) as the largest source of dissolved oxygen depletion in the deeper areas of Gulf Island Pond, primarily from the settling and decay of algae, and to a lesser extent, the continuing discharge of TSS. Current point source discharges and the existence of the large GIP impoundment downstream of the discharges are the primary cause of the algal blooms. The modeling confirmed the importance of reducing pollutants that contribute to SOD (algae, TSS) and the need to continue with the injection of oxygen to help with the attainment of the Class C aquatic life criteria.

The TMDL also identified the paper mills located in Berlin, New Hampshire; Rumford, Maine; and Jay, Maine as the largest point source discharge of phosphorus to the Androscoggin River. These facilities account for about 70% of the total-P and 80% of the ortho-P entering the GIP. Verso Paper is the largest single source of phosphorus, accounting for 45% of the total-P and 57% of the ortho-P entering the pond. The Rumford Paper Company Mill is the second largest single source of phosphorus, accounting for about 14% of the total-P and 21% of the ortho-P. Of the paper mills, Fraser Papers accounts for the smallest amount of phosphorus entering the pond with about 11% of the total-P and 2% of the ortho-P. There are also several municipal point sources which are located along the Androscoggin River whose discharges contribute to the phosphorus loading of the river. These POTWs are located in Berlin and Gorham, New Hampshire; Bethel, Rumford-Mexico, and Livermore Falls, Maine. Of these municipal discharges, only the Livermore Falls POTW is considered a significant source of ortho-P and it is estimated that this facility accounts for approximately 13% of the ortho-P load entering the pond.

Maine's Water Quality Standards do not include numeric criteria for nutrients such as phosphorus. ME DEP has chosen chlorophyll-a as a surrogate for eutrophic conditions, because algal blooms are a direct result of eutrophic conditions, and chlorophyll-a is a measure of algal productivity. ME DEP has set the threshold for the phosphorus in the TMDL at a level designed to maintain the pond averaged chlorophyll-a concentration under 10 ppb.

The Gulf Island Dam contributes to non-attainment of DO criteria and the growth of algae blooms by creating an environment of low water movement and low vertical mixing within the water column. Non-attainment of Class C DO criteria in deeper portions of the pond is predicted by the water quality model even if point source discharges are eliminated due to sediment oxygen demand from natural and non-point sources of pollution. Accordingly, there is a need to continue with the use of the oxygen injection system to help attain the Class C DO criteria in the deeper portions of GIP.

6. Section 125.3 Demonstration

Federal regulations found at 40 C.F.R. §125.3(f) allow the use of non-treatment techniques (such as in-stream oxygen injection) to meet water quality-based limits if, among other things, the technology-based treatment requirements are not sufficient to achieve the standards, and the alternative selected has been demonstrated by the permittee to be a preferred environmental and economic alternative. In November of 1990, Boise Cascade (later MeadWestvaco, now Rumford Paper), International Paper (now Verso Paper) and the James River Paper Company (now Fraser Papers) jointly submitted a report prepared by Charles T. Main Inc., to satisfy the requirements of 40 C.F.R. §125.3(f). The report investigated several alternative methods for minimizing the DO deficit at GIP during critical conditions of warm weather and low flow. Of the various alternatives selected for evaluation, the report concluded, after considering technical, economic, and environmental issues, that the preferred alternative for achieving DO standards was to reduce BOD loadings from the mills in combination with injecting 27,000 pounds of dissolved oxygen over a 24-hour period of time directly into GIP at the Upper Narrows during the months of July, August and September of each year.

The Androscoggin River TMDL (May 2005) assumed that oxygen injection would be required and determined waste load allocations for the paper mills on that assumption:

> In the case of Gulf Island Pond, even if point sources are entirely removed, some degree of non-attainment of class C dissolved oxygen (DO) criteria is predicted to occur by the model (2002 Modeling Report). Hence attainment of water quality standards cannot be achieved solely through point source controls. Therefore this TMDL additionally requires the non-treatment alternative of oxygen injection to achieve water quality standards. The 125.3 demonstration will be submitted collectively by the paper mills discharges prior to the licensing process. The wasteload allocations are predicated on the implementation of an oxygen injection strategy. It is permissible to assign less stringent WLA's to point sources in reliance on the non-treatment techniques where there is reasonable assurance that the non-treatment techniques will be implemented. In this case DEP intends to impose the requirements to implement oxygen injection in the permitting process for point sources.

Androscoggin River TMDL, at 28. However, EPA's approval of the TMDL noted that, after review of the § 125.3 demonstration, actual permit limits might be set *more* stringently than the TMDL WLAs:

> For purposes of this TMDL approval, we agree that oxygen injection will be needed under any scenario, and we also believe it was reasonable for DEP to determine that the point source discharges would not be eliminated and that the dam would not be removed. Under those circumstances, DEP struck a reasonable balance between the general use of oxygen injection and WLAs. In the licensing process, however, DEP will still need to

> determine the appropriate level of pollutant controls beyond which oxygen injection becomes the preferred economic and environmental method for attaining WQS in satisfaction of §125.3(f). That might be the level at which the WLAs have been established, or, as some have commented, it might be at levels closer to the actual (lower) pollutant loads that the mills have discharged in recent years.[6]

In April 2005, the three paper mills submitted an updated § 125.3(f) Demonstration ("2005 Section 125.3 Demonstration").[7] The 2005 Section 125.3 Demonstration again proposed that an oxygen injection system (albeit one with more injection capacity than the original 1992 system) was the preferred environmental and economic method to achieve DO standards in GIP after consideration of alternatives such as advanced waste treatment, recycle and reuse, land disposal, changes in operating methods, and other available methods.

Specifically, Fraser Papers considered the following alternatives in the 2005 Section 125.3 Demonstration:

1. Advanced waste treatment. Fraser Papers identified a sand or cloth filter or Dissolved Air Flotation System (DAF) as an effective advanced waste treatment system. However, the capital costs of this system would be $10-$20 million and require $1 million/year operating costs, as well as installation of a pump station and pipeline.
2. Recycle and reuse of water.
3. Land disposal. Fraser Papers estimated that temporary storage of effluent water pending land application would require 275 acres of lagoons, and 22,500 to 35,000 acres of land for actual effluent application.
4. Changes in wastewater treatment operating methods.
5. Changes in mill production methods.
6. Operation of an oxygen injection system, similar to the one then in existence, but with the addition of a second oxygen diffuser.

Based on the water quality analyses conducted to date, including those developed for the TMDL, oxygen injection into GIP will be needed under any scenario to meet the State of Maine Class C DO standard. In general, EPA prefers pollution prevention rather than long term reliance on artificial mechanisms which are subject to breakdowns and carry the risk of adverse impacts to the aquatic organisms in the event of such breakdowns. However, in this case modeling shows

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[6] EPA New England's TMDL Review (Androscoggin River), p.16.

[7] The 2005 Section 125.3 Demonstration was submitted after the draft TMDL was issued, but before EPA approved the final TMDL. In its approval, EPA specifically stated:

> In approving the TMDL, EPA is not endorsing the §125.3(f) demonstration. That document was not available at the time of the draft TMDL and neither EPA nor the public had the opportunity to comment on it during the TMDL development process. We believe that the MEPDES licensing process for the mills is the appropriate forum for addressing the merits of the §125.3(f) demonstration, including whether sufficient alternatives were evaluated and what the appropriate level of pollutant discharge should be consistent with §125.3(f).

that pollution controls alone would not be sufficient to enable GIP to attain water quality standards. Therefore, reliance on instream aerators to supplement pollution controls is a reasonable approach. In recognition of the fact that elimination of the paper mill discharges would not result in dissolved oxygen compliance in Gulf Island Pond, oxygen injection is currently considered an integral part of the permits for the pulp and paper mills located along the Androscoggin River. See Part V.F of this fact sheet for a detailed discussion of the GIP oxygenation system.

IV. PERMIT BASIS AND EXPLANATION OF EFFLUENT LIMITATION DERIVATION

A. General Requirements

The CWA prohibits the discharge of pollutants to waters of the United States without a NPDES permit unless such a discharge is otherwise authorized by the CWA. The NPDES permit is the mechanism used to implement technology and water quality-based effluent limitations and other requirements including monitoring and reporting. This draft permit was developed in accordance with various statutory and regulatory requirements established pursuant to the CWA and any applicable State regulations. During development, EPA considered the most recent technology-based treatment requirements, water quality-based requirements, and all limitations and requirements in the existing permit. The regulations governing the EPA NPDES permit program are generally found at 40 C.F.R. Parts 122, 124, 125, and 136. The general conditions of the draft permit are based on 40 C.F.R. §122.41 and consist primarily of management requirements common to all permits. The effluent monitoring requirements have been established to yield data representative of the discharge under authority of Section 308(a) of the CWA in accordance with 40 C.F.R. §122.41(j), §122.44(i) and §122.48.

1. Technology-Based Requirements

Subpart A of 40 C.F.R. §125 establishes criteria and standards for the imposition of technology-based treatment requirements in permits under Section 301(b) of the CWA, including the application of EPA promulgated effluent limitations and case-by-case determinations of effluent limitations under Section 402(a)(1) of the CWA.

In general, technology-based effluent guidelines for non-POTW facilities must be complied with as expeditiously as practicable but in no case later than three years after the date such limitations are established and in no case later than March 31, 1989 [See 40 C.F.R. §125.3(a)(2)]. Compliance schedules and deadlines not in accordance with the statutory provisions of the CWA cannot be authorized by a NPDES permit. In the absence of technology-based effluent guidelines, the permit writer is authorized under Section 402(a)(1)(B) of the CWA to establish effluent limitations on a case-by-case basis using Best Professional Judgement (BPJ).

EPA has established National Effluent Limitation Guidelines (ELGs) for the pulp, paper, and paperboard manufacturing point source category (See 40 C.F.R. Part 430 – *Pulp, Paper and Paperboard Manufacturing Point Source Category*). The regulation for this point source category was revised on April 15, 1998 into what is commonly referred to as the Cluster Rules. The Cluster Rules reorganized 26 sub-categories of the pulp, paper, and paperboard industry found in the previous regulations into 12 new sub-categories by grouping mills with similar processes. The applicable Subparts of the new regulations for Fraser Papers based on the most recent production information submitted by the facility are:

Subpart J (40 C.F.R. §430.100), *Secondary Fiber Non-Deink Subcategory,*
Subpart K (40 C.F.R. §430.110), *Fine and Lightweight Papers from Purchased Pulp Subcategory*,
Subpart L (40 C.F.R. §430.120), *Tissue, Filter, Non-Woven and Paperboard from Purchased Pulp Subcategory*.

The ELGs establish applicable limitations for existing dischargers representing; 1) best practicable control technology currently available (BPT) for conventional pollutants, 2) best conventional pollutant technology economically achievable (BCT) for conventional pollutants, and 3) best available technology economically achievable (BAT) for toxic and non-conventional pollutants. The ELG regulations establish limitations and monitoring requirements on the final outfall to the receiving waterbody as well as internal waste stream(s) such as the bleach plant effluent associated with some pulping operations. The ELGs also establish limitations based on several methodologies including monthly average and/or daily maximum mass limits based on production of pulp and paper produced or concentration limitations based on BPT, BCT or BAT. The applicable ELGs are summarized in the table below:

Table 1. Effluent Limitation Guidelines (ELGs) applicable to Fraser Papers

40 C.F.R. § 430 Subpart	BOD5			TSS			pH
	Kg/kkg (or pounds per 1,000 lb) of product			Kg/kkg (or pounds per 1,000 lb) of product			Range
	Continuous dischargers		Non-Continuous dischargers (annual average days)	Continuous dischargers		Non-Continuous dischargers (annual average days)	
	Max for any 1 day	Average of daily values for 30 consecutive days		Max for any 1 day	Average of daily values for 30 consecutive days		
Subpart J	13.7	7.1	4.0	17.05	9.2	5.1	5.0-9.0
Subpart K (fine)	8.2	4.25	2.4	11.0	5.9	3.2	5.0-9.0
Subpart K (lightweight)	24.1	13.2	7.37	21.6	10.6	6.0	5.0-9.0
Subpart L	11.4	6.25	3.49	10.25	5.0	2.84	5.0-9.0

Mass-based ELGs are expressed as an allowable mass of pollutant discharge per unit of production and are directly related to a particular mill's production. The production rate is determined by dividing the annual production in tons by the number of operating days during that annual period and is reported in terms of tons per day (tons/day). On the January 14, 2008 Permit Re-application, Fraser Papers identified that the Cascade paper mill produced 608 tons/day of fine paper, lightweight paper, and tissue on average. The breakdown for these products is the following:

295 tons/day of non-integrated fine paper (ELG Subpart K - Fine)
189 tons/day of non-integrated lightweight paper (ELG Subpart K – Lightweight)
58 tons/day of non-integrated tissue papers (ELG Subpart L)
66 tons/day of tissue from waste paper (ELG Subpart J)
608 tons/day

The pulp and paper production values cited for each of the ELG subpart categories were utilized to calculate the permissible mass-based limits in the draft permit for conventional pollutants which include BOD and TSS. The calculated limits based on the applicable ELGs are summarized in the table below.

Table 2. Summary of Calculated ELG Limits for BOD and TSS for Fraser Papers[1]

40 C.F.R. § 430 Subpart	Production Data (tons/day)[2]	BOD Monthly Ave		BOD Daily Max		TSS Monthly Ave		TSS Daily Max	
		ELG Factor [3]	ELG[4]	ELG Factor [3]	ELG[4]	ELG Factor [3]	ELG[4]	ELG Factor [3]	ELG[4]
Subpart J	66	7.1	937	13.7	1808	9.2	1214	17.05	2251
Subpart K (fine)	295	4.25	2508	8.2	4838	5.9	3481	11	6490
Subpart K (lightweight)	189	13.2	4990	24.1	9110	10.6	4007	21.6	8165
Subpart L	58	6.25	725	11.4	1322	5	580	10.25	1189
Total (lbs/day)	**608**	**---**	**9160**	**---**	**17078**	**---**	**9282**	**---**	**18095**

1. Production Data is based on information submitted with Fraser Papers 2008 permit reapplication.
2. Production data is reported in terms of short tons, one short ton is equivalent to 2,000 pounds.

3. The ELG Factor is in units of lbs/1000 lbs.
4. The calculated ELG is in units of lbs/day.

Along with the 2008 permit reapplication, Fraser Papers also included production rates for projected machine speed increases at the plant. If the projected production rates are applied in the calculation of the ELG limits, the limits would be higher. However, this permit is based on current conditions, and therefore requires the effluent from Fraser Papers to meet the ELGs calculated for current production rates (See Table 2, above). Upon any change in production rates, Fraser Papers may submit a request to EPA for a permit modification to adjust the calculated ELGs for BOD and TSS. Fraser shall submit updated production data with the modification request. EPA believes that this change in operations would qualify as one of the defined exceptions under which relief from anti-backsliding provisions can be granted [See 40 C.F.R. 122.44(l)(i)], therefore the ELG limits could be modified.

2. Water Quality-Based Requirements

Water quality-based criteria are required in NPDES permits when EPA and the State determine that effluent limits more stringent than technology-based limits are necessary to maintain or achieve State or Federal Water Quality Standards (See Section 301(b) (1)(C) of the CWA). Water quality-based criteria consist of three parts: 1) beneficial designated uses for a water body or a segment of a water body; 2) numeric and/or narrative water quality criteria sufficient to protect the assigned designated use(s) of the water body; and 3) anti-degradation requirements to ensure that once a use is attained it will not be degraded. The Androscoggin River flows from New Hampshire to Maine. However, the discharge from Fraser Papers occurs entirely in New Hampshire. The New Hampshire Surface Water Quality Regulations, found in Chapter 1700 of the New Hampshire Code of Administrative Rules, include the three water quality based elements discussed above. The State Surface Water Quality Regulations limit or prohibit discharges of pollutants to surface waters and thereby assure that the surface water quality standards of the receiving water are protected, maintained, and/or attained. These standards also include requirements for the regulation and control of toxic constituents and require that EPA criteria, established pursuant to Section 304(a) of the CWA, be used unless a site-specific criteria is established. EPA regulations pertaining to permit limits based upon water quality standards and State requirements are contained in 40 C.F.R. §122.44(d).

EPA must also ensure that Fraser Papers' discharge satisfy Maine Water Quality Standards. *See* CWA § 301(b)(1)(C); 40 C.F.R. §§ 122.4(d), 122.44(d)(1)(i). Furthermore, section 401(a)(2) of the CWA and 40 C.F.R. §122.44(d)(4) require EPA to condition NPDES permits in a manner that will ensure compliance with the applicable water quality standards of a downstream affected state, in this case Maine. The statute directs EPA to consider the views of the downstream state concerning whether a discharge would result in violations of the state's water quality standards. If EPA agrees that a discharge would cause or contribute to such violations, EPA must condition the permit to ensure compliance with the water quality standards. If the downstream affected state believes that the permit fails to include such requirements, then it may appeal the permit (like any other interested person with proper standing).

As mentioned previously, the ME DEP has prepared a TMDL for the Androscoggin River which was approved by the EPA on July 18, 2005. This TMDL contains water quality-based waste load and load allocations, applicable during the time period of June 1st – September 30th. In preparing this TMDL, Maine assumed a waste load allocation for Fraser Papers (for the combined discharge from the paper mill and the then-operating pulp mill). Fraser Papers was notified of the TMDL development process, and commented on the draft TMDL.

As part of the TMDL approval, EPA stated:

> EPA believes that states have some flexibility to make assumptions about improvements in water quality beyond their jurisdictions. If they base a TMDL on such assumptions, states must clearly explain why the assumptions are reasonable. In this case, the WLAs for point sources located in New Hampshire which discharge to the Androscoggin River upstream of Livermore Falls Impoundment and Gulf Island Pond in Maine were derived from the same modeling effort as the WLAs for the dischargers located in Maine. The weekly BOD_5 WLA for Fraser Paper in Berlin, NH, was established to ensure that Maine's minimum class B DO criterion in the Androscoggin River is met at the state line and throughout the Class B segment to the confluence with the Ellis River. (page 32 Table 8, footnote 3, TMDL report).
>
> EPA is not approving the out-of state loads as formal allocations, since Maine does not have the authority to impose an allocation on an out-of-state source. On the other hand, EPA believes that these estimates of pollutant loads make sense and therefore is approving them as reasonable assumptions on which the in-state loads are based. Moreover, EPA is prepared to use its authorities when issuing NPDES permits to dischargers in New Hampshire, to establish facility-specific effluent limits for CBODu, total-P, ortho-P, and TSS that are consistent with the WLAs in the TMDLs.[8]

Thus, the waste load allocation assumed for Fraser Papers in Maine's Androscoggin River TMDL does not apply to Fraser Papers by virtue of the TMDL itself. Rather, EPA's obligation is more generally to ensure that Maine Water Quality Standards are attained. That said, in this case EPA finds that the waste load allocations assumed for Fraser Papers in the TMDL (as modified by the terms of EPA's approval) generally represent a reasonable analysis of the maximum BOD, TSS, and phosphorus that can be discharged by Fraser Papers consistent with the Maine WQS.

To be sure, even if Fraser Papers complies with BOD effluent limits drawn from the TMDL's waste load allocations, the DO standard will not be attained in GIP. (In fact, according to Maine's modeling, even if all point source discharges on the Androscoggin River were

[8] EPA New England's TMDL Review (Androscoggin River), p.16.

completely eliminated, GIP would still not attain the DO standard.) EPA thus examined the issue of whether CWA § 301(b)(1)(C) would require (i) BOD effluent limits for Fraser Papers more stringent than the waste load allocations identified in the TMDL, (ii) operation of an oxygen injection system under 40 C.F.R. § 125.3(f), or (iii) both of the above. After reviewing the 2005 Section 125.3 Demonstration, EPA agrees with Fraser Papers that an oxygen injection system (albeit one with more injection capacity than the original 1992 system) is an effective environmental and economic method to achieve DO standards in GIP after consideration of alternatives such as advanced waste treatment, recycle and reuse, land disposal, changes in operating methods, and other available methods. However, after a review of the remaining BOD loading for the paper mill and former pulp mill, EPA believes a modest reduction in BOD loading below the waste load allocation identified in the TMDL also is appropriate. Specifically, EPA has decided to require Fraser Papers to engage in oxygenation as proposed in the demonstration and to require water quality based effluent limits 10% below the levels identified as waste load allocations for Fraser Papers in the TMDL, where these limits are more stringent than technology-based limits. This 10% reduction is consistent with EPA's TMDL Review[9] and upholds the principle that water quality requirements should be met by reducing effluent limits when possible, as opposed to the use of "non-treatment" techniques (40 C.F.R. §125.3(f)). Fraser is expected to meet these reduced effluent limits based on past performance levels since closure of the pulp mill. Therefore, with a single exception explained below, in determining the maximum amount of BOD, TSS, and phosphorus that Fraser may discharge and still comply with Maine WQS, EPA has relied on the amounts identified in the TMDL's waste load allocations, reduced by 10%.

The exception derives from the conditions of EPA's approval of the TMDL. The approval document identified one necessary change in the waste load allocations for BOD:

> The WLAs for BOD_5 are established as a 7 day average. It is EPA's understanding that the 7 day average represents a loading that is intended to meet a daily minimum instream DO of 5.0 ppm on average over seven days (see discussion on page 30 of the final TMDL report). The loadings were adjusted to assure attainment of the instantaneous DO criteria by applying a daily and diurnal adjustment factor to the model output as explained on page 30, footnote 9, of the TMDL report. However, since Maine's DO criterion of 5.0 ppm is expressed as a minimum value, not a seven day average, *the 7 day average loadings should be implemented in licensing as daily maximum loadings/daily maximum permit limits.* In addition, the alternative of increasing the 7 day average loadings by multiples greater than one to obtain daily maximum loadings, as presented under "Licensing Recommendations" in Table 8, is therefore not appropriate and should not be used.[10]

[9] EPA New England's TMDL Review (Androscoggin River), p.16
[10] EPA New England's TMDL Review (Androscoggin River), p.15 (emphasis in original).

Table 3. Summary of TMDL Waste Load Allocations for Fraser Papers (Pulp & Paper Mill) (June 1 – Sept 30)

BOD (lbs/day)			TSS (lbs/day)		Total Phosphorus (lbs/day)
Monthly Average	Weekly Average	Daily Maximum	Annual Average	60-Day Average	Monthly Average
10,180	11,500	11,500	18,959	16,600	135

Additionally, portions of the Androscoggin River in the vicinity of the discharge from Fraser Papers are on the New Hampshire 303(d) list. These portions of the Androscoggin River are listed as impaired for fish consumption by dioxin and mercury, impaired for primary contact recreation by E-coli, impaired for aquatic life by aluminum, lead, and pH, and potential non-support of aquatic life by copper.

3. Anti-Backsliding

EPA's anti-backsliding provision as identified in Section 402(o) of the Clean Water Act and at 40 C.F.R. §122.44(l) prohibits the relaxation of permit limits, standards, and conditions unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued. Anti-backsliding provisions apply to effluent limits based on technology, water quality, BPJ and State Certification requirements. Relief from anti-backsliding provisions can only be granted under one of the defined exceptions [See 40 C.F.R. §122.44(l)(i)].

4. Anti-Degradation

The State of New Hampshire's Anti-Degradation Policy is found at Env-Ws 1708. All existing instream uses and the level of water quality necessary to protect the existing uses of the Androscoggin River shall be maintained and protected. Class B water body's in the State of New Hampshire are considered as being acceptable for fishing, swimming, and other recreational purposes and, after adequate treatment, for use as water supplies. This draft permit is being reissued with allowable effluent limits as stringent as or more stringent than the previous permit and accordingly will continue to protect the existing uses of the Androscoggin River.

V. PROPOSED EFFLUENT LIMITATIONS AND CONDITIONS

A. Outfall 018 - Cascade Paper Mill WWTP (treated process water, non-contact cooling water, general housekeeping water, and boiler blowdown)

1. Flow

The existing permit did not establish any flow limitations for Outfall 018. Fraser Papers has reported that the monthly average design flow rate of the Cascade paper mill WWTP is approximately 15 MGD and the residence time is approximately 2.6 days. A review of the 2008 application for the NPDES permit renewal indicates that based on 365 data points, the long term average flow was 8.5 MGD and the daily maximum flow rate was 11.5 MGD. A review of the DMR data from January 1999 through July 2007 shows that the highest average monthly flow from the WWTP was 13.8 MGD and the highest maximum daily flow was 19.2 MGD. Since the limits for Outfall 018 are mass-based, there is no need to limit the flow in order to regulate the amount of pollutants discharged (which would not be the case for concentration based limits). Alternately, the permit requires the facility to monitor and report the monthly average and daily maximum flow rates for Outfall 018, as did the previous permit.

2. Dilution Factor

EPA calculated the dilution factor for the discharge from Outfall 018 to use in calculating the whole effluent toxicity limits (See Part V.A.7 of this fact sheet). The acute and chronic dilution factor calculations for the discharge through Outfall 018 based on the maximum daily flow (11.5 MGD) and the average flow (8.7 MGD), respectively, and a 7Q10 value of 1,336 cfs, are as follows:

$$\text{Dilution Factor} = \frac{\text{River Flow (cfs)(Conv. Factor)}}{\text{Plant Flow (MGD)}} \times 0.9$$

$$\text{Acute Dilution Factor} = \frac{(1{,}336 \text{ cfs})(0.6464)}{11.5 \text{ MGD}} \times 0.9 = 68 : 1$$

$$\text{Chronic Dilution Factor} = \frac{(1{,}336 \text{ cfs})(0.6464)}{8.7 \text{ MGD}} \times 0.9 = 89 : 1$$

The State of New Hampshire reserves 10 percent of a receiving water's assimilative capacity (See RSA 485-A:13,I,a. and NHDES rule Env-Ws 1705.01) to ensure that there is sufficient assimilative capacity for all dischargers into a water body. Accordingly, the dilution factor calculation above incorporates a factor of 0.9 to reserve the 10 percent capacity in the receiving water. Further details regarding the derivation of the 7Q10 flow utilized in the calculation above can be found in Section III.D.2 of this fact sheet.

3. pH Range

The National ELGs for the pulp and paper industry require effluent pH limits of 5.0 to 9.0 standard units (SU). See 40 C.F.R. 430.102(a), 430.112, 430.122. However, the New Hampshire Water Quality Standards require more stringent effluent pH limits of 6.5 to 8.0 standard units. *See* N.H. Rev. Stat. Ann. 485-A:8,II. Consequently, the draft permit requires pH limits of 6.5 to 8.0 SU.

These effluent limitations, and the monitoring requirements in the draft permit, remain unchanged from the existing permit. This is in accordance with anti-backsliding requirements found in 40 C.F.R. §122.44(l) and the expected State of New Hampshire Section 401 Water Quality Certification.

The language in the Special Conditions Section of the draft permit (See Part I.G.3) which allows for a change in pH limit(s) under certain conditions was partly revised. The draft permit contains language similar to the existing permit which allows EPA to consider a change to the pH limits if the permittee can demonstrate to the satisfaction of NHDES that the in-stream pH standard will be protected when the permittee's discharge is outside the permitted range of 6.5 to 8.0 SU. Under such conditions, the permittee or NHDES may request in writing that the pH permit limit(s) be modified by EPA to incorporate the results of the demonstration.

Anticipating the situation where the permittee has completed such a demonstration, and subsequently the NHDES has granted formal approval to changing the pH limit(s), EPA has added a provision to the draft permit which allows EPA to modify the pH limit(s) via a certified letter sent to the permittee. The change would be contingent upon the permittee demonstrating that the revised pH limit range does not alter the naturally occurring receiving water pH and does not exceed the allowable pH range identified in the National ELGs (5.0 to 9.0 SU) for the pulp and paper industry.

Such a change in the permit pH limit(s) would not be in violation of anti-backsliding requirements because the modification would be based on new information not available at the time of the issuance of the existing permit [See 40 C.F.R. §122.44(l)(2)(i)(B)]. EPA anticipates that the limit(s) determined from the demonstration study as approved by the NHDES will satisfy all effluent requirements for this source category and will comply with the New Hampshire Surface Water Quality Regulations.

4. Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS)

The draft permit requires the permittee to comply with monthly average and daily maximum BOD and TSS limits (mass-based) for the discharge from Outfall 018. The BOD and TSS limits for Outfall 018 derive from a combination of the ELG and the TMDL. See Table 4, below, for a summary of the effluent limitations for BOD and TSS at Outfall 018. Additionally, the permit requires reporting of average monthly and maximum daily BOD and TSS concentration values. The previous permit required seasonal mass-based BOD and TSS limits and monitoring for concentration based average monthly and maximum daily values for the combined discharge from Outfalls 016 and 018. Monitoring frequency for both mass and concentration values is once per day (1/day) during the periods of June 1st to September 30th and October 1st to May 31st.[11]

[11] This is the same frequency in the current permit for the discharge from combined Outfalls 016 and 018.

EPA recognizes that the TMDL allocation for Fraser was based on operation of both the paper mill and the former pulp mill, although only the paper mill is currently operating. The footnotes in Table 4, below, explain the division of the TMDL allocations for Outfall 018, Outfall 010, and Outfall 016, since the discharge from Outfall 016 is no longer included in this permit as explained in Part III.A of this fact sheet. The discharge from Outfall 016 and associated TMDL allocations shall be included in NPDES Permit NH0023523. The discharges of BOD, TSS and phosphorus from Outfall 025 were considered negligible in the TDML allocation considerations, since this discharge consists solely of treated river water.

For TSS, EPA used the flow information from the landfill leachate to convert the ELG concentration based limits to mass-based limits, and used these values as the effluent limits for discharge through Outfall 016. EPA used the flow limit (10 MGD) and TSS limit (60 mg/L) from the current permit, along with the relationship between the TSS ELG limits calculated for Outfall 018, to calculate the mass-based TSS allocations for Outfall 010. The calculated allocations for Outfalls 016 and 010 were then subtracted from the total TMDL allocation for TSS. This allocation was further reduced by a factor of 10%, consistent with the principle that the water quality requirements at Gulf Island Pond (GIP) in the TMDL should be met by reducing effluent limits whenever possible, as opposed to the use of "non-treatment" techniques such as the GIP oxygenation system (40 C.F.R. §125.3(f)). The remaining allocation was assigned to Fraser as the TMDL allocation for TSS for Outfall 018, as shown in Table 4, below.

For BOD and phosphorus, EPA used the flow information from the landfill leachate to convert the ELG concentration based limits to mass-based limits, and used these values as the effluent limits for discharge through Outfall 016. The calculated allocations for Outfalls 016 were then subtracted from the total TMDL allocation. The discharge of BOD from Outfall 010 was considered negligible in the TMDL allocation considerations, since this discharge of filter backwash is not expected to impact BOD loading. This allocation was further reduced by a factor of 10%, for the same reasoning described above in the TMDL allocation for TSS. The remaining allocation was assigned to Fraser as the TMDL allocations for BOD and phosphorus for Outfall 018, as shown in Table 4, below.

The limits summarized in the table are a compilation of technology-based and water quality based effluent limitations from Table 2 and Table 3, above. The more stringent of the two limits are the effluent limitations for Outfall 018.

Based on past performance at the paper mill since closure of the pulp mill, EPA believes that Fraser should be able to meet the TMDL allocations assigned. EPA expects that the TMDL allocation may be revised in the future; however, it has not been revised at this time. Therefore, EPA shall consider the TMDL allocation in both this permit for Fraser Papers, as well as in the permit for the discharge from Outfall 016 (NPDES Permit No. NH0023523).

Table 4. Summary of Calculated ELG Limits and TMDL Allocations for Outfall 018

Limits	Total Phosphorus (lbs/day)	BOD (lbs/day)		TSS (lbs/day)			
	Monthly Average	Monthly Average	Daily Max	Monthly Average	Daily Max	Annual Average	60-day Average
Calculated ELG for Outfall 018		9,160	17,078	9,282	18,095	---	---
TMDL WLA for total discharge from Fraser Papers and AVRRDD WWTP[9] (June 1 – Sept 30)	148[2]	10,180	11,500	---	---	18,959	13,200[1]
ELGs for Internal Outfall of Landfill Leachate (AVRRDD)[8]		37 mg/L	140 mg/L	27 mg/L	88 mg/L		
Effluent Limitations for Outfall 016	5[10] (June 1-Sept 30)	15[3]	58[3]	11[3]	37[3]	---[7]	---[7]
TMDL allocation for Outfall 010	---	---	---	2,568[4]	5,007[4]		
TMDL allocation for Outfall 018	129[5]	9,149[5]	10,298[5]	9,559[6,7]	---	---[7]	---[7]
Effluent Limitations for Outfall 018 (June 1 – Sept	**129 (TMDL)**	**9,149 (TMDL)**	**10,298 (TMDL)**	**9,282 (ELG)**	**18,095 (ELG)**	---	---
Effluent Limitations for Outfall 018 (Oct 1 – May 31)	---	**9,160 (ELG)**	**17,078 (ELG)**	**9,282 (ELG)**	**18,095 (ELG)**	---	---

1 The TSS 60-day Average (13,200 lbs/day) is lower than the default value identified for this parameter in the TMDL (16,600 lbs/day). The TMDL explicitly allows trading of WLAs between facilities identified in the

TMDL, according to specified trading rules. See TMDL, page 5. The default values in the Fraser Papers and the Verso Paper permits were adjusted based on the allowable pollution trading ratios identified in the TMDL. Based on these trading ratios, Fraser Papers' TSS 60-day average limit was lowered by 3,400 lbs/day while Verso Paper's corresponding limit was increased by 1,700 lbs/day. This change is in accordance with the allowable trading conditions identified in the TMDL (i.e., the waste load allocation for this pollutant parameter is still satisfied and the public is provided with an opportunity to comment on the revised allocation through the issuance of this draft permit). Since Maine has already adjusted Verso Paper's TSS limit based on a reduced assumed waste load from Fraser Papers, EPA has adopted the revised assumed waste load for Fraser Papers as the basis for calculating the limit necessary to satisfy the Maine WQS.

2 This total phosphorus value is higher than the default value of 135 lbs/day identified in the TMDL. Fraser Papers as well as Mead WestVaco's (now Rumford Paper) default total phosphorus numbers in the TMDL were adjusted upwards to reflect a decrease in the allowable amount of total phosphorus discharged from Verso Paper Company facility in Jay, Maine. This change was made in accordance with the allowable trading conditions identified in the TMDL (i.e., the waste load allocation for this pollutant parameter is still satisfied and the public is provided with an opportunity to comment on the revised allocation through the issuance of this draft permit). Since Maine has already adjusted Rumford Paper's limit based on an increased assumed waste load from Fraser Papers, EPA has adopted the revised assumed waste load for Fraser Papers as the basis for calculating the limit necessary to satisfy the Maine WQS.

3 EPA used the flow information from the landfill leachate (average flow of 0.043 MGD rounded to 0.05 MGD to account for flow variation) to convert the ELG concentration-based limits for Outfall 016 (found at 40 CFR §445.21 – see previous line in table, ELGs for Internal Outfall of Landfill Leachate (AVRRDD)) to mass-based limits.

4 To calculate the TMDL allocation for TSS for Outfall 010, the flow limit (10 MGD) and maximum daily TSS limit (60 mg/L) were used to calculate the mass-based loading expected from Outfall 010. This mass-based loading was set as the maximum daily TSS allocation for Outfall 010, and used in combination with the relationship between the monthly average and daily maximum ELGs for Outfall 018 to calculate the monthly average TSS allocation for Outfall 010.

5 The calculated BOD and phosphorus allocations for Outfall 016 were subtracted from the total TMDL allocation and the results were further reduced by a factor of 10%, as described in detail, above, and then assigned to Fraser as the TMDL allocations for BOD and phosphorus for Outfall 018.

6 The calculated TSS allocations for Outfalls 016 and 010 were subtracted from the total TMDL allocation for TSS (the 60-day average was used in this calculation, since the TMDL does not specify a monthly average) and the results were further reduced by a factor of 10%, as described in detail, above, and assigned to Fraser as the TMDL allocation for TSS for Outfall 018.

7 Since the TSS monthly average ELG of 9,282 lbs/day is lower than the annual average of 18,959 lbs/day and the 60-day average of 13,200 lbs/day proposed by the TMDL, compliance with the monthly average ELG limit will ensure compliance with the annual average and 60-day average TMDL limits. This is true even when the monthly average value calculated for Outfalls 016 and 010 are subtracted from the total TMDL allocations and this is further reduced by 10%; therefore, the annual average and 60-day average TMDL limits shall not be required in the draft permit as they shall be met by requiring the lower monthly average ELG limitation. Thus, the average monthly and daily maximum limits based on ELGs of 9,282 lbs/day and 18,095 lbs/day, respectively, will ensure compliance with both ELG and TMDL limits.

8 Additional ELGs for the internal outfall consisting of landfill leachate at the AVRRDD WWTP can be found at 40 C.F.R. § 445.21 and include effluent limitations for pH, Ammonia (as N), α – Terpineol, Aniline, Benzoic Acid, Naphthalene, ρ – Cresol, Phenol, Pyridine, Arsenic, Chromium, Zinc. These limits, along with the listed limits for BOD and TSS, will be required in the draft permit for the internal outfall consisting of

landfill leachate at the AVRRDD WWTP.

9 EPA has determined that these TMDL limits are protective of water quality at the point of discharge of Fraser Papers. The TMDL was written in a way such to assure that the concentrations of BOD and TSS in the receiving water are protective of water quality at the point of discharge of Fraser Papers, in addition to protecting water quality at GIP. Also, assuming 100 ug/L as the target phosphorus concentration in the receiving water, which EPA uses to interpret the State narrative standards, EPA has determined that the TMDL phosphorus limit is protective of the local water quality.

10 The mass-based phosphorus limit for Outfall 016 was calculated using AVRRDD's permit re-application value for total phosphorus in the WWTP effluent (0.73 mg/L) and the average discharge from the WWTP (0.33 MGD). This calculated to about 2.01 lbs/day. To ensure that the phosphorus TMDL value is not exceeded, since this allocation is based on only one sample, the permit allocates 5 lbs/day phosphorus to AVRRDD for Outfall 016.

5. Temperature

The life associated with the aquatic environment in any location has its species composition and activity regulated by water temperature. Since essentially all of these organisms are so called "cold blooded", the temperature of the water regulates their metabolism and ability to survive and reproduce effectively (EPA, 1986). The Androscoggin River is known to be the home of several indigenous cold water species including brook trout and landlocked salmon.

New Hampshire law, as discussed in Section III.D.1 of this fact sheet, includes narrative water quality-based criteria for temperature. EPA and the NHDES have reviewed the temperature data collected as part of the existing permit and other information available at the time of the drafting of this permit. Based on a review of DMR data from January 1999 through July 2007, the highest of the maximum daily discharge temperature through Outfall 018 was 93°F and the average of the maximum daily values was 71.6°F. The highest of the average monthly temperatures was 90.2°F and the average of these values was 66.0°F. The previous permit required monitoring for average monthly and maximum daily temperature at a frequency of 2/month.

a. Water Quality Based Limits Consideration

EPA calculated the approximate change in temperature associated with the discharge from Outfall 018, using adverse-case input conditions and additional conservative assumptions. The assumed adverse-case input conditions included the maximum recorded water temperature (93.02°F for May through October) and flow (19.2 MGD, or 29.707 cfs) discharged from Outfall 018, and high ambient river temperatures (77°F) and low river flows (1,336 cfs) based on historical data from the USGS Gorham gauging station (#01054000). EPA used the 7Q10 (which includes a factor of 0.9 as described above in Part V.A.2 of this fact sheet, based on NH Surface Water Quality Regulations[12]) and then further reduced the flow by half in order to

[12] PART Env-Ws 1705 FLOW STANDARDS, Env-Ws 1705.01 Assimilative Capacity: "Except for combined sewer overflows where 99 percent of the assimilative capacity shall be used to determine compliance, not less than 10 percent of the assimilative capacity of the surface water shall be held in reserve to provide for future needs."

represent conservative mixing conditions. Based on these assumptions, the river would experience approximately a 0.7° F increase in temperature.

As noted above, the New Hampshire Water Quality Standards do not contain numeric water quality criteria for temperature, but rather require application of "the water quality requirements and recommendations of the New Hampshire Fish and Game Department, the New England Interstate Water Pollution Control Commission, or the United States Environmental Protection Agency, whichever requirements and recommendations provide the most effective level of thermal pollution control." N.H. Rev. Stat. Ann. § 485-A:8, VIII.

As part of the development of the expired permit, the New Hampshire Fish and Game Department determined that a temperature increase (delta T) of 2° F in the summer and 4° F in the winter would be adequately protective. The calculated increase of 0.7° F would be well below these recommendations. EPA also consulted the New England Interstate Water Pollution Control Commission's *Interstate Water Quality Standards Matrix*[13] and determined that an increase of 0.7° F would not exceed the delta T limits applicable in any of the New England states. Finally, EPA consulted the EPA *Gold Book*, and determined that avoidance of a thermal plume by most species of fish is not generally expected until warmer temperatures exceed preferred temperatures by 1.8º F to 5.4 ºF. An increase of 0.7º F would not exceed the recommended temperatures there either.

Therefore, EPA does not believe there is a reasonable potential for the discharge to exceed water quality standards for temperature, with dilution.

However, the draft permit requires Fraser to monitor the upstream and discharge temperature in order to calculate the Predicted River Temperature Increase (PRTI) to determine the actual change in temperature from ambient, to determine if there is potential to exceed water quality standards (see description in Part IV.B.6 of this fact sheet) in the future.

The draft permit includes a reopener condition if the results of the temperature monitoring requirements indicate the discharge causes, has the reasonable potential to cause, or contributes to an exceedance of any State water quality criterion. These results may be considered new information under 40 C.F.R. § 122.62(a)(2) and the permit may be modified, or alternatively, revoked and reissued to require further study or revised effluent limitations.

b. Technology Based Limits Consideration

Technology-based limits may be developed using the performance of Fraser's wastewater treatment facility during the specified time period. This approach is consistent with the development of Best Professional Judgment (BPJ) based technology-based limits on a case-by-case basis. BPJ limits are established where an Effluent Limit Guideline is not available or does not regulate the pollutant of concern. Development of the BPJ-based technology limits considers the statistical methods and information provided in the U.S. EPA NPDES Permit Writer's

[13] Available at http://www.neiwpcc.org/mercury/mercury-docs/i_wqs_matrix04.pdf.

Manual, December 1996, EPA-833-B-003 (Permit Manual) and in the Technical Support Document for Water Quality-based Toxics Control, March 1991, EPA/505/2-90-001 (TSD).

In accordance with 40 C.F.R. § 125.3(d)(3), the following Best Available Technology (BAT) factors were considered in setting the BPJ limits: the age of the equipment and facilities involved; the processes employed; the engineering aspects of the application of various types of control techniques; process changes; the cost of achieving such effluent reduction; and, non-water quality environmental impact (including energy requirements). Here, EPA determined that the site-specific BAT for temperature is the facility's existing system, but operated at the best available performance levels.

To calculate the temperatures achievable by operating the existing system according to the best available performance levels, the seasonal temperature quarterly monitoring data from November 2002 to March 2008 has been used to compute selected statistical values that could potentially constitute BAT effluent limits. The statistical method approach to determine the BPJ technology-based temperature limits follows the methods in the previously referenced TSD and Permit Manual. The results of the following statistical methods were considered to determine the temperature limits: lognormal distribution, maximum expected value, and maximum value. A summary of the average monthly and maximum daily temperature values for Outfall 018 are provided in Table 5, below.

Lognormal distribution: This statistical method is provided in the TSD, Appendix E, Lognormal Distribution and Permit Limit Derivations. The available temperature data are fitted to a lognormal distribution using the equations provided in the TSD to determine the average monthly and maximum daily temperature limits for the time periods of October through May and June through September. The 95th and 99th percentiles of the lognormal distribution provide the average monthly and maximum daily limits, respectively. This analysis results in proposed maximum daily and average monthly limits for October through May of 80.17°F and 66.69°F, respectively. This analysis results in proposed maximum daily and average monthly limits for June through September of 96.97°F and 87.36°F, respectively.

Maximum expected value: The maximum expected daily value is derived using the coefficient of variation and the maximum observed value from the data set with the TSD, Table 3-1 to determine the 99th percentile (see TSD, page 56). For the maximum expected monthly value, the monthly data and TSD Table 3-2 is used in a similar computation to determine a 95th percentile value. This analysis results in proposed maximum daily and average monthly limits for October through May of 95.9°F and 81.8°F and June through September of 111.6°F and 99.2°F, respectively.

Maximum Value: The maximum daily value is the maximum value for each season (June through September and October through May) using all data measurements taken from May 2003 through October 2007. The maximum monthly value is the maximum value of the monthly average values that are calculated from the daily values measured during each month. This analysis results in proposed maximum daily and average monthly limits for October through

May of 79.88°F and 74.4°F and June through September of 93.02°F and 90.2°F, respectively.

Table 5. Summary of Calculated Proposed Effluent Limitations for Outfall 018

Method	Temperature (October – May)		Temperature (June – September)	
	Max Daily (°F)	Average Monthly (°F)	Max Daily (°F)	Average Monthly (°F)
Lognormal Distribution	80.17	66.69	96.97	87.36
Maximum Expected Value	95.9	81.8	111.6	99.2
Maximum Value	79.88	74.4	93.02	90.2

c. Determination of BPJ Temperature Limit

EPA evaluated the results of the statistical methods from the TSD and Permit Manual and the maximum observed value method to determine the BPJ limit. EPA considered the statistical methods in the TSD and Permit Manual; however, as explained below, these methods do not reflect conditions that could reasonably be achieved, in terms of BAT/BPJ, at the Fraser Papers facility. Instead, EPA selected the maximum observed values (the 100th percentile), which by definition are achievable, since the temperature values computed using the maximum value method are based on past demonstrated performance at Fraser Papers. EPA notes that the maximum value method generates the most stringent maximum daily value.

Results using the maximum expected value estimate are eliminated from further consideration because the values are considered unreasonably lenient. Specifically, for all four parameters, the maximum expected value estimate method generates proposed effluent limitations that are substantially higher (i.e., less stringent) than what the facility already achieves.

Results using the lognormal distribution are eliminated from further consideration because the calculated monthly average temperature values (particularly for October-May) are considered unreasonable for purposes of this determination. It is worth noting that for two of the four parameters (summer and winter maximum daily temperature), this method generates the lowest (most stringent) temperatures of the three methods, and for a third parameter (summer monthly average temperature), it generates a temperature only slightly less stringent than the most stringent of the three methods (lognormal distribution). Although the maximum value method does result in a winter monthly average temperature notably higher than that generated by the lognormal distribution method, EPA determined that it would be inappropriate to "mix and match" by selecting individual effluent limitations generated by different statistical methods.

Therefore, the draft permit requires the permittee to meet seasonal temperature limits at the end-of-pipe sampling location from Outfall 018 as follows (monitored at a frequency of 1/week):

Time Period	Temperature (°F)	
	Average Monthly	Maximum Daily

October 1 –May 31	74.4	79.9
June 1 – September 30	90.2	93.0

Additionally, the draft permit also requires the permittee to: 1) measure the upstream ambient temperature of the discharge from Outfall 018; 2) measure the discharge temperature from Outfall 018 at the end-of-pipe location; and 3) calculate the Predicted River Temperature Increase (PRTI) in the Androscoggin associated with the discharge through Outfall 018. The monitoring location for Outfall 018 and the upstream location are explained further below and the calculation of the PRTI is explained in Part V.A.5.d of this fact sheet, below. If the results of the monitoring indicate that there is a reasonable potential for the discharge from this outfall to exceed the State Ambient Water Quality Criteria (AWQC) for temperature, then EPA may modify the permit to include additional requirements such as more stringent effluent temperature limitations.

The temperature samples shall be taken at an end-of-pipe location for Outfall 018 and at an upstream location for ambient measurements. The sampling location for Outfall 018 shall be defined as the end-of-pipe sampling location of the effluent from Outfall 018. When the outfall pipe is partially or completely submerged by the Androscoggin River, the end-of-pipe sample is obtained at the end of the outfall pipe. This sample will thus represent some degree of mixing with the River. When the outfall pipe is not submerged, the end-of-pipe is obtained prior to mixing with the Androscoggin River. Fraser Papers shall submit in writing to EPA and the NHDES the location of the Outfall 018 sampling site for review and approval within 30 days of the effective date of the final permit. Temperature sampling at this location is to commence when the final permit is effective.

Upstream temperature samples shall be representative of upstream or naturally occurring conditions in the Androscoggin River, and shall be taken upstream of the paper mill and prior to mixing with any discharges from the mill. Fraser Papers shall submit in writing to EPA and the NHDES the location of the upstream temperature sampling site for review and approval within 30 days of the effective date of the final permit. Temperature sampling at this location is to commence when the final permit is effective. Monitoring for upstream temperature shall occur once per week and shall occur as close in time as possible, but not greater than 1 hour from the time during which the samples from Outfall 018 are obtained. The facility shall report the upstream river temperature that corresponds to the daily maximum discharge temperature reported for Outfall 018. Additionally, the permittee shall report the average monthly value of the upstream river temperatures.

EPA recognizes the need for Fraser Papers to provide sampling locations that ensure employee safety. High flow conditions in the Androscoggin River or extreme weather conditions may preclude access to the end-of-pipe sampling location. EPA will also consider alternate sampling locations or methods (such as fixed temperature sensors) that meet the preceding requirements. There are appropriate No Data Indicator codes (NODI) for use when submitting the discharge monitoring results on those occasions when sampling is not possible. These codes are provided in the annual NPDES Permit Program Instructions for the Discharge Monitoring Report Forms

(DMRs), (see Attachment E to these DMR instructions). The annual Discharge Monitoring Report Instructions are available at the Region's web site: http://www.epa.gov/ne/enforcementandassistance/dmr.html.

For thermal discharges, EPA may also consider granting a variance under CWA §316(a) from either or both technology-based effluent limitations and water quality-based effluent limitations, if less stringent variance-based limitations will nevertheless be sufficient to "assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife" (BIP) in and on the water body receiving the discharge. To date, no variance has been issued and the permittee has not submitted a request for such a variance.

d. Predicted River Temperature Increase (PRTI)

New Hampshire Surface Water Quality Regulations for Class B waters ***(RSA 485-A:8,II)*** states, *"...any stream temperature increase associated with the discharge of treated sewage, waste or cooling water, water diversions, or releases shall not be such as to appreciably interfere with the uses assigned to this class."* RSA 485-A:III also states: "*In prescribing minimum treatment provisions for thermal wastes discharged to interstate waters, the department shall adhere to the water quality requirements and recommendations of the New Hampshire fish and game department, the New England Interstate Water Pollution Control Commission, or the United States Environmental Protection Agency, whichever requirements and recommendations provide the most effective level of thermal pollution control*."

Based upon the State's water quality temperature criteria, EPA has included a requirement in the draft permit for the permittee to calculate the predicted river temperature increase (PRTI) associated with the thermal discharge from the paper mill. The PRTI is to be calculated year round in order to identify whether there are any cumulative impacts associated with the thermal loading from this outfall to the Androscoggin River.

The following is an example of how the PRTI would be calculated using the design flow (since flow limits have not been included in the draft permit) and temperature which reflects current operations at the facility with respect to thermal discharges through Outfall 018 (the end-of-pipe location). The PRTI calculation shown below assumes instantaneous mixing of the thermal plume once it enters the Androscoggin River.[14] The calculation shown below also assumes certain critical flow conditions (i.e., the upstream receiving water is at a temperature of 66ºF and low flow or 7Q10 conditions exist in the river).

The 7Q10 value of 1,336 cfs is used below in the example calculation of the PRTI at the Cascade paper mill. The values used for the PRTI calculation are as follows:

	Flow	Temperature

[14] In reality, the thermal discharge does not mix instantaneously, but rather travels in a plume. However, the assumption of instantaneous mixing is an adequate proxy for the purpose of this reporting requirement. Based on this simplification, the calculated PRTI is not a true value, but a theoretical value useful in estimating the relative impact to the receiving water.

Outfall 018 (end-of pipe process water) 15 MGD 93ºF

The PRTI determined for the paper mill in this example calculation would be:

$$\text{PRTI} = \frac{[(15\ \text{MGD})(93^{\circ}\text{F} - 66^{\circ}\text{F})]}{1{,}336\ \text{cfs}\ (0.6464\ \text{MGD/cfs})} = 0.47^{\circ}\text{F}$$

For purposes of the PRTI, the permittee shall use data representative of actual discharge through Outfall 018 along with concurrent ambient river conditions as the basis of the calculation to be submitted to EPA and the NHDES. Accordingly, measured daily maximum discharge flow rates (required in Part I.A.1 of the permit), measured daily maximum discharge temperatures (required in Part I.A.1 of the permit), measured daily ambient upstream river water temperatures that are taken within 1-hour of the daily maximum temperature of the discharge (required in Part I.A.1 of the permit), and reported daily minimum river flow rates (the flow rate identified at Gorham USGS gauging station) shall be obtained and used for the calculation and reporting of the PRTI.

6. Total Phosphorus & Ortho-Phosphorus

The draft permit requires seasonal monitoring, from June 1st –September 30th, and reporting requirements for total phosphorus and ortho-phosphorus based on the recommendations in the TMDL. The new requirements are intended to eliminate the algae blooms in GIP that contribute to the sediment oxygen demand found there.

The TMDL assumes that Fraser Papers will meet a final monthly average total phosphorus mass limitation of 148 lbs/day for the combined discharge from Outfalls 018 and 016, per the TMDL. However, this TMDL was allocated based on discharges from both the paper and pulp mill. Therefore, EPA has divided the TMDL allocation for phosphorus between Outfall 018 and 016 as outlined in Table 4, above. The discharges from Outfalls 025 and 010 were considered negligible in this TMDL allocation consideration, since filter backwash and excess treated river water are not expected to contribute phosphorus to the receiving water. The mass-based phosphorus limit for Outfall 016 was calculated using AVRRDD's permit re-application value for total phosphorus in the WWTP effluent (0.73 mg/L) and the average discharge from the WWTP (0.33 MGD). This calculated to about 2.01 lbs/day. In order to account for flow variation and to ensure the phosphorus TMDL value is not exceeded, the permit allocates 5 lbs/day phosphorus to AVRRD for Outfall 016. The remaining allocation was further reduced by a factor of 10%, consistent with the principle that the TMDL should be met by reducing effluent limits whenever possible, as opposed to the use of "non-treatment" techniques such as the GIP oxygenation system (40 C.F.R. §125.3(f)). The remaining allocation of 129 lbs/day was then assigned to Fraser for Outfall 018, as a monthly average.

It should be noted that the total phosphorus value for the combined discharge is different from the default value of 135 lbs/day identified in the TMDL. As noted above, the TMDL explicitly allows trading of WLAs between facilities identified in the TMDL, according to specified trading rules (see TMDL, page 5). Fraser Papers', as well as Mead WestVaco's (now Rumford

Paper), default total phosphorus numbers in the TMDL were adjusted upwards to reflect a decrease in the allowable amount of total phosphorus discharged from International Paper Company (now Verso Paper) facility in Jay, Maine. This change was made in accordance with the allowable trading conditions identified in the TMDL (i.e., the waste load allocation for this pollutant parameter is still satisified and the public is provided with an opportunity to comment on the revised allocation through the issuance of this draft permit).

The permittee is also required to report the daily maximum mass and monthly average and daily maximum concentration of total phosphorus, as well as both the daily maximum and monthly average mass and concentration values of ortho-phosphorus for Outfall 018, monitored at a frequency of once per month (1/Month). The previous permit did not require any monitoring of phosphorus for the discharge from Outfall 018 (although the previous permit did require monitoring for phosphorus at Outfall 016).

7. Whole Effluent Toxicity (WET) Testing

New Hampshire State rules and regulations maintain that, "all classes of waters shall be free from toxic pollutants or chemical constituents in concentrations or combination that injure or are inimical to plants, animals, humans, or aquatic life." Whole effluent toxicity (WET) testing can be used to assess whether or not certain discharges produce a toxic effect in the receiving water. If there is evidence that a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative criterion within an applicable State Water Quality Standard, then the permit must contain effluent limits for whole effluent toxicity [See 40 C.F.R. §122.44(d)(1)(v)].

The previous permit included a requirement to monitor and report the results for acute and chronic WET testing of the discharge from Outfall 018 once per quarter (1/quarter). The quarterly acute and chronic WET testing results were to be reported without limits. These WET tests were performed with an alternate dilution water for both test species.

EPA has reviewed the acute and chronic toxicity testing data submitted by Fraser Papers over the last several years for the Cascade paper mill and has noted that there is evidence of a chronic toxicity problem associated with the discharge from Outfall 018. As can be see from the toxicity data summarized in Attachment D, there have been a number of occasions in the past few years with evidence that the effluent from the facility is having an adverse effect on the survival and reproduction of the Daphnid (Ceriodaphnia dubia) test organisms and the survival and growth of the Fathead Minnow (Pimpephales promelas) test species.

The typical approach for identifying a Chronic- No Observed Effect Concentration (C-NOEC) limit for a discharge is to set a limit based on the receiving water concentration after accounting for the dilution factor. In the case of the Cascade paper mill, if a C-NOEC limit were to be required, the receiving water concentration and therefore the C-NOEC limit would be 1.1 percent (i.e., the reciprocal of the new chronic dilution factor of 89:1). A C-NOEC limit of 1.1

percent would mean that any adverse effects on growth, survival or reproduction detected in the test organisms when exposed to a sample containing 1.1 percent effluent or less would be a permit violation.

C-NOEC affects have been observed at the Cascade paper mill in samples containing less than 1.1 percent effluent (i.e., the level at which a permit limit would be established for this parameter) on several occasions. As a result, the draft permit contains a C-NOEC limit of 1.1 percent (i.e., C-NOEC $\geq$ 1.1 %) and an acute toxicity limit of 100 percent (i.e., LC_{50} of 100 %) for Outfall 018. The testing and reporting of these parameters will continue on a quarterly basis using the species Daphnid (Ceriodaphnia dubia) and Fathead Minnow (Pimpephales promelas) in accordance with the test procedure and protocol (Freshwater Chronic Toxicity Test Procedure and Protocol dated May 2007) which is provided as Attachment 1 to the draft permit. This Test Procedure and Protocol contains the appropriate chronic (and modified acute) toxicity test protocols.

The WET tests required for the existing permit have been performed using a synthetic soft reconstituted water prepared by the lab as the diluent water. A review of the recent WET test results indicated comparable test results were obtained for these same tests using the Androscoggin River as the control water. Therefore, the WET tests required for this draft permit are to be performed with the Androscoggin River as the diluent water. The WET tests shall be performed at a frequency of 1/quarter.

8. Turbidity and Visible Plume

There are several sections in the New Hampshire Surface Water Quality Regulations which control and limit the amount of turbidity which may be discharged into a receiving water. According to New Hampshire's State law N.H. RSA 485-A:8, II, there shall be no disposal of waste into Class B waters except those which have received adequate treatment to prevent objectionable physical characteristics. Disposal of waste shall not be harmful to aquatic life or to the maintenance of aquatic life in said receiving water. Further, Class B waters shall be acceptable for swimming, fishing and other recreational purposes. New Hampshire's Code of Administrative Rules, Env-Ws 1703.03(c) (1) (c) contains a narrative water quality criterion which states that all surface waters shall be free of substances that "[p]roduce odor, color, taste or turbidity which is not naturally occurring and would render it unsuitable for its designated uses." Finally, Env-Ws 1703.11 establishes a numeric water quality criterion for turbidity which states that Class B waters shall not exceed naturally occurring conditions by more than 10 nephelometric turbidity units (NTUs).

There is a long history at the Cascade paper mill (extending well before Fraser Papers purchased the facility) of the discharge from Outfall 018 contributing to turbidity problems in the Androscoggin River. The turbidity problems, which have included a number of violations of the States surface water quality criteria for turbidity, have been documented by the NHDES over the years. These violations and the problems noted in the Androscoggin River, formed the basis of

the NHDES issuing an Administrative Order to Pulp and Paper of America LLC (Administrative Order No. WD00-29) on October 19, 2000. Based on the Administrative Order, Pulp and Paper of America was required to take certain steps to investigate and implement corrective actions to reduce the discharge of turbidity to the Androscoggin River.

The turbidity problems were never fully resolved before Pulp and Paper of America declared bankruptcy in 2001 and as a result many of the problems still existed when Fraser Papers began operating the paper mill in 2002. As a result of these pre-existing conditions the EPA, NHDES, and Fraser Papers entered into a Consent Agreement and Final Order (Docket No. CWA-01-2002-0028) on May 30, 2002. Under the Consent Agreement and Final Order, Fraser Papers agreed, among other items, to commit to use significant resources to bring the operation of the facility into compliance with applicable State and Federal environmental legislation and regulations.

To date, Fraser Papers has reportedly made some progress in reducing the flows and changing the processes which contribute to the elevated turbidity levels found in the discharge of the Cascade paper mill. Attachment E contains a summary of the turbidity data which Fraser Papers has collected since it began operating the paper mill. A majority of the sampling results do not exceed the State's turbidity criterion. However, as discussed further in the paragraph below, effluent samples for turbidity are currently being obtained by Fraser Papers at a significant distance downstream of the paper mill outfall. As a result, it is unclear whether the reduced turbidity levels reported by Fraser Papers reflect an overall reduction in the turbidity levels in the discharge from the paper mill, reflect the effects of mixing and dilution provided by the Androscoggin River, or are a combination of both factors.

The existing permit does not contain turbidity monitoring, reporting, and effluent limitation conditions. However, the existing permit does contain a narrative permit condition (Part I.A.7) indicating the effluent shall not impact turbidity which would cause those waters to be unsuitable for the designated uses. Fraser Papers has been monitoring the upstream and downstream turbidity conditions as a result of the earlier order issued by the NHDES. Turbidity samples representative of naturally occurring conditions (i.e., upstream sampling point) are collected by Fraser Papers above the mill, nearby the forebay of the Cascade Hydroelectric dam. Downstream turbidity samples were previously taken on the western bank of the Androscoggin River approximately 1,500 feet below Outfall 018. The downstream sampling location was reportedly selected by Fraser Papers based on access issues and safety considerations.

The New Hampshire Code of Administrative Rules, in Part Env-Ws 1707, contains language concerning the establishment of a mixing zone. For Class B waters, the NHDES can designate a limited area or volume of surface water as a mixing zone if the applicant provides sufficient scientifically valid documentation to allow the department to independently determine that all criteria in Env-Ws 1707.02 have been met. Under Env-Ws 1707.02, mixing zones shall be subject to site specific criteria that, as a minimum, includes: 1) meeting the criteria in Env-Ws 1703.03(c)(1); 2) not interfering with biological communities or populations of indigenous species; 3) not interfering with existing and designated uses of the surface water; and 4) not

resulting in the mortality of any plants, animals, humans, or aquatic life within the mixing zone. The mixing zone criteria under Env-Ws 1703.03(c)(1) indicate all surface waters shall be free from substances which produce odor, color, taste or turbidity which is not naturally occurring; and free form substances which interfere with recreational activities. The NHDES is currently working on providing additional guidance on the implementation of this mixing zone policy.

Observations by EPA staff indicate the discharge from the Cascade paper mill treatment plant creates a distinct plume along the shore of the Androscoggin River. This plume was visible during the EPA Compliance Sampling Inspection conducted on January 19, 2006. The inspection report includes five photographs depicting this plume (NPDES Compliance Sampling Inspection report, Nexfor Fraser Papers, Inc. NPDES Permit NH0000655, M. Looney and D. Granz, Jan. 19, 2006). A plume was also observed in the River the previous year during the facility site visit as shown in the two photographs taken on February 23, 2005 (D. Webster and N. Handler, site visit photographs, Feb. 23, 2005). The Sampling Inspection report from the Jaunary 19, 2006 inspection notes "The discharge is highly aerated and causes a visible effluent plume along the shore of the river." Regarding the final effluent at Outfall 018, the following information was provided in this report: the effluent "appeared 'clear' in color. However, upon close observation there were some whitish colored colloidal particles. The turbidity analysis data of 34.1 NTU for the sample confirmed the turbidity observation." The visible plume restricts the required uses for swimming and other recreational purposes in the Androscoggin River. Accordingly, the New Hampshire Administrative Rules discussed above do not allow a mixing zone to be designated below the Cascade Mill's outfall pipe in the Androscoggin River.

EPA is establishing new turbidity sampling locations in view of the historical evidence gathered by the NHDES which documents that the discharge from Outfall 018 does not meet the State minimum criteria for establishing a mixing zone because the discharge: 1) interferes with biological communities and populations of indigenous species (See NHDES Administrative Order No. WD00-29); 2) results in the mortality of aquatic life within the mixing zone (See NHDES Administrative Order No. WD00-29); and 3) produces turbidity which is not naturally occurring and would render the river unsuitable for its designated uses. EPA has therefore concluded that for the purposes of measuring and reporting the turbidity, the permittee shall be required to measure turbidity at several locations. EPA has not included numerical turbidity limits in the draft permit since there is not enough information to determine if the source of the visible plume is indeed turbidity. Instead of requiring effluent limitations for turbidity, the draft permit requires monitoring for turbidity, along with a requirement to identify and remove the source of the visible plume, as described in more detail below.

Specifically, the draft permit requires obtaining samples at two locations to provide turbidity measurements at the end-of-pipe sampling location for Outfall 018, and at the upstream location (under ambient conditions). Additionally, the turbidity difference shall be calculated, using the concurrent turbidity measurements for Outfall 018 and the upstream site, as the Outfall 018 turbidity minus the upstream turbidity. Monitoring for turbidity shall occur once per week (1/Week) at the two sampling locations (upstream site and end-of-pipe of Outfall 018) and shall

occur as close in time as possible, but not greater than 1 hour apart, to obtain the concurrent turbidity measurements.

The turbidity sampling location for Outfall 018 shall be defined as the end-of-pipe sampling location of the effluent of Outfall 018. When the outfall pipe is partially or completely submerged by the Androscoggin River, the end-of-pipe sample is obtained at the end of the outfall pipe. This sample will thus represent some degree of mixing with the River. When the outfall pipe is not submerged, the end-of-pipe is obtained prior to mixing with the Androscoggin River. Fraser Papers shall submit in writing to EPA and the NHDES the location of the Outfall 018 sampling site for review and approval within 30 days of the effective date of the final permit. Turbidity sampling at this location is to commence when the final permit is effective. Monitoring for Outfall 018 turbidity shall occur once per week, as close in time as possible, but not greater than 1 hour from the time during which the turbidity samples from the upstream location are measured and reported, to obtain concurrent temperature measurements. The facility shall report the average weekly and maximum daily turbidity values collected at the end-of-pipe sampling location of Outfall 018.

Upstream turbidity samples shall be representative of upstream or naturally occurring conditions in the Androscoggin River, and shall be taken upstream of the paper mill and prior to mixing with any discharges from the mill. Fraser Papers shall submit in writing to EPA and the NHDES the location of the upstream turbidity sampling site for review and approval within 30 days of the effective date of the final permit. Turbidity sampling at this location is to commence when the final permit is effective. Monitoring for upstream turbidity shall occur once per week and shall occur as close in time as possible, but not greater than 1 hour from the time during which the turbidity and temperature samples from Outfall 018 are measured and reported, to obtain concurrent temperature measurements. The facility shall report the average weekly and the maximum daily turbidity values collected at the upstream sampling location.

EPA recognizes the need for Fraser Papers to provide sampling locations that ensure employee safety. High flow conditions in the Androscoggin River or extreme weather conditions may preclude access to the end-of-pipe sampling location. EPA will also consider alternate sampling locations or methods that meet the preceding requirements. There are appropriate No Data Indicator codes (NODI) for use when submitting the discharge monitoring results on those occasions when sampling is not possible. These codes are provided in the annual NPDES Permit Program Instructions for the Discharge Monitoring Report Forms (DMRs), (see Attachment E to these DMR instructions). The annual Discharge Monitoring Report Instructions are available at the Region's web site: http://www.epa.gov/ne/enforcementandassistance/dmr.html.

The visible plume continues to be problematic and has not been resolved in the years since the 2000 Administrative Order to Pulp and Paper of America, and the 2002 Consent Agreement and Final Order to Fraser Paper. As noted above, the visible plume restricts the required uses for swimming and other recreational purposes in the Androscoggin River. It is unclear as to what is the exact cause of the visible plume which is interfering with recreational activities in the receiving water; however, EPA believes the cause may be a combination of turbidity, color,

and/or aeration. Further, as described previously, EPA has noted evidence of a chronic toxicity problem associated with the discharge from Outfall 018 over the last several years. Consequently, to meet water quality standards, the draft permit requires the permittee to identify and remove the source of the visible plume from the paper mill's treatment plant discharge to the Androscoggin River (See Special Conditions Section, Part I.G.4 of the draft permit).

As discussed in the State surface water quality rules, the permittee may also, at any time, undertake and submit new scientifically valid documentation satisfying the mixing zone criteria specified in Env-Ws 1707 to demonstrate how ambient conditions in the river have changed since the issuance of the NHDES Administrative Order. Based upon such new scientifically valid documentation and the establishment that all criteria in Env-Ws 1707.02 have been met, the NHDES may identify an appropriate mixing zone. Upon written notification to EPA by the NHDES of the establishment of such a mixing zone, EPA may modify the permit to identify new compliance sampling location(s).

B. OUTFALL 010a – Former Pulp Mill Filter House Backwash Water (when no chemicals are added)

1. Flow

The previous permit required monitoring of Outfall 010, when no chemicals are added, reported as a daily maximum at a frequency of 1/month. Outfall 010 when no chemicals are added shall be referred to in this fact sheet and permit as Outfall 010a. The draft permit requires similar flow monitoring for Outfall 010a, reported as both a monthly average and a daily maximum. Flow shall be estimated in the draft permit, as it was in the previous permit.

2. pH

The National ELGs for the pulp and paper industry require effluent pH limits of 5.0 to 9.0 standard units (SU). See 40 C.F.R. §§ 430.102(a), 430.112, 430.122. However, the New Hampshire Water Quality Standards are more stringent, and require effluent pH limits of 6.5 to 8.0 standard units. *See* N.H. Rev. Stat. Ann. 485-A:8,II. Consequently, the draft permit requires pH limits of 6.5 to 8.0 SU.

The pH limits of 6.5 to 8.0 standard units (SU) and the sampling frequency of 1/month for Outfall 010a in the draft permit remains unchanged from the existing permit. The limitations identified in the draft permit for pH are in accordance with the anti-backsliding requirement found in 40 C.F.R. §122.44(l) and the expected State of New Hampshire Section 401 Water Quality Certification. However, the sampling type has been changed from "4 Grabs" to "Grab." EPA believes that one grab sample is sufficient to measure the effluent pH.

The draft permit also contains additional language in the Special Conditions Section (See Part I.G.3) as to when this range may be exceeded due to naturally occurring conditions. The draft permit allows for the pH limits to be exceeded when the ambient pH in the Androscoggin River

is outside of the required range and the pH of the discharge is not altered by the facilities activities. The permittee's discharge must be within 0.5 SU of the naturally occurring pH of the receiving water upstream of the facility for demonstrating compliance with this new condition in the draft permit. The upstream or background sampling location identified by the facility shall be approved by EPA and NHDES prior to the initiation of sampling. For the purposes of the compliance demonstration, the upstream and downstream sampling is to occur as close in time as possible, but not greater than 1 hour apart. The upstream pH monitoring and difference calculation is required only when the effluent pH is outside the pH effluent limitation range, as specified in the draft permit.

3. Total Suspended Solids (TSS)

The previous permit established a daily maximum concentration limit of 60 milligrams per liter (mg/L) for total suspended solids (TSS) based on best professional judgment (BPJ). The filters are backwashed approximately 1-2 times per day, although they are backwashed more often in the winter to prevent icing. The backwashing frequency is a best management practice (BMP) which enables Fraser to meet the TSS limit of 60 mg/L. This limit and the monitoring frequency of 1/month shall remain the same in the permit for Outfall 010a based on anti-backsliding requirements found in 40 C.F.R. §122.44(l). No mass limitations were established for this parameter in the previous permit. A review of the 2008 application for NPDES permit renewal indicates that based on 365 data points, the long term average for TSS was 27.5 mg/L and the daily maximum for TSS was 60 mg/L.

4. Turbidity

As discussed earlier in Section V.A.8 of this fact sheet, there are several sections in the New Hampshire Surface Water Quality Regulations which control and limit the amount of turbidity which may be discharged into a receiving water. The filter backwash discharged through Outfall 010a may contain excess suspended matter removed from the raw water. The suspended matter has the potential to cause excessive turbidity in the backwash water to be discharged. To determine whether turbidity limits may be necessary for this outfall, EPA has included turbidity monitoring requirements in the draft permit.

Specifically, the draft permit requires obtaining samples at two locations to provide turbidity measurements at Outfall 010a and at the upstream location (under ambient conditions). Additionally, the turbidity difference shall be calculated, using the concurrent turbidity measurements for Outfall 010a and the upstream site, as the Outfall 010a turbidity minus the upstream turbidity. Monitoring for turbidity shall occur once per week (1/Week) at the two sampling locations (upstream site and Outfall 010a) and shall occur as close in time as possible, but not greater than 1 hour apart, to obtain the concurrent turbidity measurements.

Upstream turbidity samples shall be representative of upstream or naturally occurring conditions in the Androscoggin River, and shall be taken upstream of Outfall 010a and prior to mixing with any other discharges. Fraser Papers shall submit in writing to EPA and the NHDES the location

of the upstream turbidity sampling site for review and approval within 30 days of the effective date of the final permit. Turbidity sampling at this location is to commence when the final permit is effective.

C. Outfall 010b – Former Pulp Mill Filter House Backwash Water (when polymer is added)

1. Flow

The previous permit established flow limitations for Outfall 010, when cationic polyelectrolytes have been added, of 8.0 MGD and 10.0 MGD, respectively for the monthly average and the daily maximum conditions. The discharge from Outfall 010 when polymer (e.g. cationic polyelectrolytes) is added shall be referred to in this fact sheet and permit as Outfall 010b. The flow limits were established in the existing permit primarily as the result of potential concerns associated with the facility using a synthetic polymer to treat the filter water. The permittee would like to have the option to use polymer in the future. Therefore this draft permit includes the 10.0 MGD daily maximum and 8.0 MGD monthly average limits from the current permit, taken when polymer is in use at the facility.

2. pH

The National ELGs for the pulp and paper industry require effluent pH limits of 5.0 to 9.0 standard units (SU). See 40 C.F.R. §§ 430.102(a), 430.112, 430.122. However, the New Hampshire Water Quality Standards are more stringent, and require effluent pH limits of 6.5 to 8.0 standard units. *See* N.H. Rev. Stat. Ann. 485-A:8,II. Consequently, the draft permit requires pH limits of 6.5 to 8.0 SU.

The pH limits of 6.5 to 8.0 standard units (SU) and the sampling frequency of 1/month for Outfall 010b (when cationic polyelectrolytes are added) in the draft permit remains unchanged from the existing permit. The limitations identified in the draft permit for pH are in accordance with the anti-backsliding requirement found in 40 C.F.R. §122.44(l) and the expected State of New Hampshire Section 401 Water Quality Certification. However, the sampling type has been changed from "4 Grabs" to "Grab." EPA believes that one grab sample is sufficient to measure the effluent pH.

The draft permit also contains additional language in the Special Conditions Section (See Part I.G.3) as to when this range may be exceeded due to naturally occurring conditions. The draft permit allows for the pH limits to be exceeded when the ambient pH in the Androscoggin River is outside of the required range and the pH of the discharge is not altered by the facilities activities. The permittee's discharge must be within 0.5 SU of the naturally occurring pH of the receiving water upstream of the facility for demonstrating compliance with this new condition in the draft permit. The upstream or background sampling location identified by the facility shall be approved by EPA and NHDES prior to the initiation of sampling. For the purposes of the compliance demonstration, the effluent and upstream sampling shall occur as close in time as

possible, but not greater than 1 hour apart. The upstream pH monitoring and difference calculation is required only when the effluent pH is outside the pH effluent limitation range, as specified in the draft permit. Sampling shall occur at a frequency of 1/month.

3. Iron

The previous permit included monthly average and daily maximum mass and concentration limits for total iron. The limits were based on best professional judgement on the anticipated effects on the use of a polymer on iron levels (i.e., doubling of iron levels) in the discharge. The draft permit includes the same mass and concentration based limits from the previous permit for iron at Outfall 010b (when polymer is added) in accordance with the anti-backsliding requirement found in 40 C.F.R. §122.44(l). The mass-based limits consist of 267 lb/day monthly average and 400 lb/day daily maximum and the concentration based limits consist of 4.0 mg/L monthly average and 6.0 mg/L daily maximum measured at a frequency of 2/month.

The requirement to sample iron as four grab samples within four hours has been changed to a composite sample taken over a 24-hour period consisting of a minimum of four grab samples collected at equal intervals of no more than sixty (60) minutes and combined proportionally to flow, or a composite sample continuously collected over a full operating day proportionally to flow.

4. Color

New Hampshire's Surface Water Quality Regulations, Env-Ws 1703.03(c)(1)c. states that "All surface waters shall be free from substances in kind or quantity which produce odor, color, taste or turbidity in the receiving waters which is not naturally occurring and would render it unsuitable for its designated uses."

The current permit requires monitoring for color as a monthly average at a frequency of 2/month. Since the facility has not been using polymer, minimal data has been collected for color in the discharge through Outfall 010b. Therefore, the permittee shall continue to monitor color at Outfall 010b when polymer is in use.

5. Total Suspended Solids (TSS)

The previous permit established a daily maximum concentration limit of 60 milligrams per liter (mg/L) for total suspended solids (TSS) based on best professional judgment (BPJ). The filters are backwashed approximately 1-2 times per day, although they are backwashed more often in the winter to prevent icing. The backwashing frequency is a best management practice which enables Fraser to meet the TSS limit of 60 mg/L. This limit and the monitoring frequency of 1/month shall remain the same in the permit for Outfall 010b, in accordance with the anti-backsliding requirement found in 40 C.F.R. §122.44(l).

In order to assist in determining the TMDL load allocation for TSS through Outfall 018, the maximum expected mass loading of TSS from this outfall was calculated using the 60 mg/L TSS limit and 10 MGD flow limit, as 5007 lbs/day. This mass loading was used to determine the TMDL allocation for TSS for the discharge from Outfall 018, as described in Part V.A.4 of this fact sheet.

6. Residual Free Cationic Polymer

The previous permit included limitations for residual free cationic polymer based on BPJ of what was needed to characterize the effluent from Outfall 010b. The WET testing and polymer limitations were incorporated into the previous permit based on the permittee's use of cationic polyelectrolytes to enhance the removal of color and iron from the raw water during periods of high river flow. The permittee has indicated that the use of the polymer has been discontinued, but it would like to have the option to use polymer in the future. Therefore, EPA is requiring monitoring of Outfall 010b for cationic polymer, with limits, when polymer is added. The draft permit includes the same concentration limits from the previous permit for residual free cationic polymer at Outfall 010b, in accordance with the anti-backsliding requirement found in 40 C.F.R. §122.44(l), of 0.5 mg/L monthly average and 0.8 mg/L daily maximum, both monitored at a frequency of 2/month. Additionally, the permit requires that the amount of polymer used not exceed the specific manufacturer recommendation.

The requirement to sample cationic polymer as four grab samples within four hours has been changed to a composite sample taken over a 24-hour period consisting of a minimum of four grab samples collected at equal intervals of no more than sixty (60) minutes and combined proportionally to flow, or a composite sample continuously collected over a full operating day proportionally to flow.

7. WET Testing

The previous permit included limitations for whole effluent toxicity (WET) testing based on BPJ of what was needed to characterize the effluent from Outfall 010b. The WET testing and polymer limitations were incorporated into the previous permit based on the permittee's use of cationic polyelectrolytes to enhance the removal of color and iron from the raw water during periods of high river flow. Therefore, the draft permit includes similar WET testing requirements for Outfall 010b, in accordance with the anti-backsliding requirement found in 40 C.F.R. §122.44(l).

The Acute NOEC limit of ≥80% shall remain in the permit, monitored at a frequency of 1/quarter as a daily maximum. The requirement to sample as four grab samples within four hours has been changed to a composite sample taken over a 24-hour period consisting of a minimum of four grab samples collected at equal intervals of no more than sixty (60) minutes and combined proportionally to flow, or a composite sample continuously collected over a full operating day proportionally to flow.

8. Turbidity

As discussed earlier in Part V.A.8 of this fact sheet, there are several sections in the New Hampshire Surface Water Quality Regulations which control and limit the amount of turbidity which may be discharged into a receiving water. The requirements for Outfall 010b when polymer is added shall be the same as when no chemicals are added, as discussed above in Part V.C.4. Therefore, the permittee is required to monitor and report turbidity levels in the effluent and at an upstream location, at a frequency of once per week (1/Week). Additionally, the turbidity difference shall be calculated, using the concurrent turbidity measurements for Outfall 010b and the upstream site, as the Outfall 010b turbidity minus the upstream turbidity. Monitoring for turbidity shall occur once per week (1/Week) at the two sampling locations (upstream site and Outfall 010b) and shall occur as close in time as possible, but not greater than 1 hour apart, to obtain concurrent turbidity measurements.

Upstream turbidity samples shall be representative of upstream or naturally occurring conditions in the Androscoggin River, and shall be taken upstream of Outfall 010b and prior to mixing with any other discharges. Fraser Papers shall submit in writing to EPA and the NHDES the location of the upstream turbidity sampling site for review and approval within 30 days of the effective date of the final permit. Turbidity sampling at this location is to commence when the final permit is effective.

D. Outfall 025 – Excess Filtered Water

Currently Outfall 025 is a suspended pipe from which excess filtered water falls approximately 20 feet to an inlet of the Androscoggin River in the vicinity of Outfall 010. To EPA's knowledge, the potential adverse effects of this discharge configuration have not been evaluated or addressed. In the draft permit (see Part I.A.4), EPA is requiring the permittee to evaluate the potential erosion, habitat, and water quality effects of the discharge configuration and the vertical drop at Outfall 025 (excess filtered water from the former Pulp Mill Filter House) and design and construct an outfall configuration that minimizes adverse effects to the bank and River.

1. Flow

The previous permit did not require any monitoring for Outfall 025. The facility reported in the 2008 permit re-application that the current flow through Outfall 025 is approximately 4.5 MGD. The draft permit requires monitoring, without limits, the monthly average and daily maximum flow through Outfall 025.

2. pH

The National ELGs for the pulp and paper industry require effluent pH limits of 5.0 to 9.0 standard units (SU). See 40 C.F.R. §§ 430.102(a), 430.112, 430.122. However, the New

Hampshire Water Quality Standards are more stringent, and require effluent pH limits of 6.5 to 8.0 standard units. *See* N.H. Rev. Stat. Ann. 485-A:8,II.

The draft permit establishes pH limits of 6.5 to 8.0 standard units (SU), at a frequency of 1/month for Outfall 025. The limitations identified in the draft permit for pH are in accordance with the expected State of New Hampshire Section 401 Water Quality Certification.

The draft permit also contains additional language in the Special Conditions Section (See Part I.G.3) as to when this range may be exceeded due to naturally occurring conditions. The draft permit allows for the pH limits to be exceeded when the ambient pH in the Androscoggin River is outside of the required range and the pH of the discharge is not altered by the facilities activities. The permittee's discharge must be within 0.5 SU of the naturally occurring pH of the receiving water upstream of the facility for demonstrating compliance with this new condition in the draft permit. The upstream or background sampling location identified by the facility shall be approved by EPA and NHDES prior to the initiation of sampling. For the purposes of the compliance demonstration, the upstream and effluent sampling shall occur as close in time as possible, but not greater than 1 hour apart. The upstream pH monitoring and difference calculation is required only when the effluent pH is outside the pH effluent limitation range, as specified in the draft permit.

3. Total Suspended Solids (TSS)

Since there is currently no data available regarding the presence of absence of TSS in the discharge from Outfall 025, the draft permit requires monitoring for TSS, at a frequency of 1/month, reported as a daily maximum. The monitoring data collected will be used by EPA to determine the need for effluent limitations in the future, if necessary.

E. Gulf Island Pond (GIP) Oxygen Injection System

Based on the 1990 Section 125.3 Demonstration, a partnership known as the Gulf Island Pond Oxygenation Project ("GIPOP") (consisting of Fraser Papers, the other two paper mills on the Androscoggin River, and the GIP Dam operator) has been operating an oxygen injection system at River Mile (RM) 31.4 on the Androscoggin River, approximately 5 miles above the GIP dam, in a location called the Upper Narrows. The Upper Narrows is one of the two hydrologic constrictions located on GIP. In the 2005 Section 125.3 Demonstration, Fraser Papers proposed to partly meet its obligation to satisfy downstream water quality standards via operation of an upgraded GIP oxygen injection system.

Modeling data submitted by GIPOP and field monitoring data gathered by ME DEP since 1993 indicate a significant improvement in the dissolved oxygen levels within the GIP as a result of the installation and operation of the oxygen injection system. However, ME DEP has also found that a seasonal (July 1st – September 30th) steady state injection of oxygen into the river (regardless of river flow or river temperature) resulted in excessive amounts of oxygen being injected when either the river flow was low and/or the ambient river temperature was low or

insufficient amounts of oxygen being injected when the river flow was high and/or the ambient river temperatures were high.

The record therefore indicates that improvements to the existing oxygenation system are necessary. The facilities' joint 2005 Section 125.3 Demonstration analyzed 20 different alternative upgrade scenarios, and found that six of the 20 would result in compliance with DO standards in GIP to the thermocline. The demonstration concluded (p. 4-23):

> All of the options available to the mills include in-stream oxygenation. None of the options that include major point source reductions achieve compliance with water quality DO standards to the thermocline without the addition of a second oxygen diffuser. Consequently, a redesigned oxygenation system is the preferred environmental and economic solution.

The demonstration did not select from among the six oxygenation alternatives that would result in attainment of DO standards, nor propose specific commitments or requirements for operating the oxygen injection system, either collectively or for any individual facility. However, in February 2008, the ME DEP issued orders to the other two paper mills and the dam operator "requir[ing] upgrades to the existing oxygenation system now while providing a compliance schedule that delays installation of an additional oxygen injection system until further monitoring has been undertaken to determine the benefit to dissolved oxygen levels from these upgrades."[15,16,17] These orders require the three Maine-based GIPOP partners (the two Maine paper mills and the dam operator) to meet a specific schedule for complying with Maine WQS.

In fulfillment of these orders, on May 30, 2008, the GIPOP (of which Fraser Papers is a partner) submitted to the ME DEP a plan to upgrade the existing GIPOP injection system to increase the oxygen transfer efficiency of the system in order to increase DO levels in Gulf Island Pond. The GIPOP proposed to replace the existing in-stream oxygenation diffuse system with a line diffuser system. As of the date of this draft permit, the plan was still under review at the Maine DEP. Pursuant to the ME DEP orders, the GIPOP proposed to install the upgraded system in the spring of 2009 so that it could be operational by June 1, 2009.

To implement the non-treatment technique proposed in Fraser Papers' § 125.3 Demonstration in a manner consistent with the requirements applicable to the two Maine facilities that joined in the § 125.3 Demonstration (and the Maine-based dam operator that Maine also requires to participate in the oxygenation system), EPA has included in the Special Conditions Section (I.G.1) of the draft permit a requirement for Fraser, independently or in cooperation with FPL Energy Maine Hydro LLC, Verso Paper, and Rumford Paper Company, or their successors-in-

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[15] Department of Environmental Protection Board Order in the Matter of Verso Paper (formerly International Paper), #ME0001937 and #W000623-5N-F-R.
[16] Department of Environmental Protection Board Order in the Matter of Rumford Paper Company, #ME0002054 and #W000955-5N-G-R.
[17] Department of Environmental Protection Board Order in the Matter of FPL Energy Maine Hydro LLC, #L-17100-33-O-N.

interest, to operate an upgraded oxygen injection system at Upper Narrows and an additional oxygen injection system at Lower Narrows in Gulf Island Pond, according to a plan approved by the Maine DEP. This system shall provide sufficient oxygenation in the appropriate area to address dissolved oxygen in GIP.

The draft permit also contains a reopener clause stating that if EPA receives information that the GIPOP oxygenation system is not installed and operated pursuant to the plan and schedule approved by the ME DEP, EPA may reopen the permit pursuant to 40 C.F.R. §122.62, reevaluate whether oxygenation remains the preferred alternative under § 25.3(f), and decide whether Fraser Papers should be required to achieve further effluent reductions.

F. Environmental Studies & Monitoring

1. Ambient Water Quality Monitoring of Gulf Island Pond (GIP)

In the TMDL, ME DEP explicitly acknowledged that its modeling and data contained uncertainty that would benefit from further monitoring, and stated:

> There is some uncertainty in water quality modeling and the assignment of various parameter rates. In addition, there is some uncertainty involved in the determination of the water quality target of chlorophyll-a levels used to describe the threshold level of an algae bloom that are specific to Gulf Island Pond. . . . The goal of establishing the water quality threshold using 2004 water quality data was difficult as critical conditions of low flow and high water temperatures were not reached. As such additional ambient monitoring of Gulf Island Pond will likely add confidence to the estimate of the present chlorophyll-a threshold that is specific to Gulf Island Pond.

Androscoggin River TMDL, at 6. The TMDL recommended "[w]eekly sampling from June to September at five locations (Twin Bridges, Upper and Lower Narrows, GIP4, Deep Hole) for chlorophyll-a, total and ortho-P, DO, temperature, and secchi depth," *id.* at 6, and that Fraser Papers' permit require it to participate in this monitoring. *See id.* at 32, 34.

In June 2004, Fraser Papers and the two Maine paper mills jointly submitted to ME DEP a document entitled *Androscoggin River and Gulf Island Pond Water Quality Monitoring Plan 2004*.[18] In this plan, Fraser and the other paper mills proposed to sample a variety of water quality parameters (including total phosphorus, ortho-phosphorus, chlorophyll a, secchi disc readings, and dissolved oxygen/temperature profiles at one-meter increments) once per week at each of five sampling stations (designated as Twin Bridges, Upper Narrows, Lower Narrows, Gulf Island Pond 4, and Deep Hole). In its approval of the Androscoggin River TMDL, EPA stated that it was "pleased to see that ME DEP has provided a monitoring plan used successfully

[18] *Available at* http://mainegov-images.informe.org/dep/blwq/topic/gip/Three%20mill%20Androscoggin%20River%20Sampling%20Plan%2006-09-04.pdf (June 8, 2004).

in 2004 which will obtain information for updating the TMDL, as needed." EPA Androscoggin River TMDL Approval, at 19.

Therefore, this permitting action requires the permittee to participate in weekly monitoring of five sampling stations in Gulf Island Pond (See *Ambient Water Quality Monitoring of Gulf Island Pond* in Part I.D.1 of the draft permit). Sampling must initially be consistent with the protocols proposed by Fraser Papers and the other facilities in the *Androscoggin River and Gulf Island Pond Water Quality Monitoring Plan 2004*, but the permit requires Fraser Papers to submit updated monitoring plans each year. See Part I.D.1 of the draft permit for a description of the GIP ambient water quality requirements.

2. Resident Fish Monitoring

The previous permit contained a requirement to annually monitor fish tissue in the Androscoggin River for dioxin (2,3,7,8 TCDD) and furan (2,3,7,8 TCDF). Although Fraser Papers ceased use of chlorine several years ago, EPA has continued to include this requirement in the draft permit because the fish consumption advisory related to dioxin is still in effect in New Hampshire**.** NHDES has indicated that it is in the process of re-evaluating the need for this fish advisory and that the advisory may be lifted in the future. The facility may request a permit modification to eliminate this monitoring requirement in the future if the advisory is lifted and the facility continues to use bleaching processes which do not form dioxin and furan compounds.

VI. DERIVATION OF COOLING WATER INTAKE REQUIREMENTS UNDER SECTION 316(b) OF THE CLEAN WATER ACT

A. Introduction and Regulatory Background

With any NPDES permit issuance or reissuance, EPA evaluates compliance with applicable standards, including those stated in CWA § 316(b) regarding cooling water intake structures (CWISs). CWA § 316(b) applies if the discharger requesting a permit seeks to withdraw cooling water from a water of the United States. To satisfy § 316(b), the permit applicant must demonstrate to the satisfaction of the EPA that the location, design, construction, and capacity of the facility's CWISs must reflect the Best Technology Available (BTA) for minimizing adverse environmental impacts. CWA § 316(b) applies to this permit due to the presence and operation of a cooling water intake structure at the Fraser Papers facility, coupled with the facility's pollutant discharges.

The operation of CWISs can cause or contribute to a variety of adverse environmental effects, such as killing or injuring fish larvae and eggs by entraining them in the water withdrawn from a water body and sending them through the facility's cooling system, or by killing or injuring fish and other organisms by impinging them against the intake structure's screens or other structures.

EPA has promulgated three sets of regulations (or Rules) under CWA § 316(b) that apply to certain CWISs. However, none of the three Rules contains national categorical compliance standards applicable to Fraser Papers.[19] In the absence of such applicable standards, NPDES permitting authorities establish section 316(b) requirements on a case-by-case, Best Professional Judgment (BPJ) basis. *See* CWA § 402(a)(1), 33 U.S.C. § 1342(a)(1); 40 C.F.R. §§ 122.43(a) ("In addition to conditions required in all permits . . . [EPA] shall establish conditions, as required on a case-by-case basis, to provide for and assure compliance with all applicable requirements of CWA and regulations."), 125.90(b) ("Existing facilities that are not subject to requirements under this or another subpart of this part must meet requirements under section 316(b) of the CWA determined by the Director on a case-by-case, best professional judgment (BPJ) basis."); National Pollutant Discharge Elimination System—Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase III Facilities, 71 Fed. Reg. 35,006, 35,008 (June 16, 2006) ("Existing Phase III facilities, including manufacturing facilities, . . . are not subject to the national categorical requirements of this final rule. These facilities will continue to be regulated on a case-by-case basis using a permit director's best professional judgment."). Thus, BTA permit conditions under § 316(b) are set for existing facilities with CWISs, such as the Fraser Papers facility, based on BPJ.

Neither the CWA nor EPA regulations dictate a specific methodology for developing BPJ-based limits under § 316(b). What is clear is that the elements specified in the statute—namely, that CWIS limits should reflect the best technology available for minimizing adverse environmental impacts—must be satisfied. The BTA standard requires that permit limits ensure that the design, location, capacity and construction of CWISs reflect the best technology available for minimizing the adverse impacts of CWIS operation. In most cases, the most significant of these adverse impacts are the entrainment and impingement of aquatic organisms. Minimizing these adverse impacts means to reduce them as much as possible. *See* American Heritage Dictionary (2d ed. 1982) (defining "minimize" as "reduc[ing] to the smallest possible amount, extent, size, or degree."); *Decision of the General Counsel No. 63 (In re Central Hudson Gas & Elec. Corp., et al.),* at 371, 381 (July 29, 1977); *In re Pub. Serv. Co. of N.H., et al. (Seabrook Station, Units 1 & 2)*, 10 Env't Rep. Cas. (BNA) 1257, 1260 (EPA June 17, 1977); *Decision of the General Counsel No. 41 (In re Brunswick Steam Elec. Plant)*, at 197, 203 (June 1, 1976). The BTA standard also requires that the technology be "available," which means "practicable" (i.e., "feasible") from a technological and economic standpoint. Finally, the BTA standard requires that the specified technology be the "best," which in this context means that it reduces the adverse impacts of entrainment and impingement to the greatest degree. *See* American Heritage Dictionary (2d ed. 1982) (defining "best" as "surpassing all others in excellence, achievement, or quality"). Based on the language and structure of CWA § 316(b), EPA has also determined that CWISs must reflect the BTA for minimizing adverse environmental impacts, whether or not those adverse impacts are considered to be significant. *Decision of the General Counsel No. 41*, at 203 ("The [cooling water intake] structures must reflect the best technology available for

[19] The "Phase I Rule," codified at 40 C.F.R. part 125 subpart I, sets categorical standards for new facilities.. The "Phase II Rule," codified at 40 C.F.R. part 125 subpart J, but currently suspended, set categorical standards for large, existing electrical generation plants. The "Phase III Rule," codified at 40 C.F.R. part 125 subpart N, sets categorical standards for new offshore oil and gas extraction facilities.

minimizing . . . adverse environmental impact – significant or otherwise.") (emphasis in original); *Decision of the General Counsel No. 63*, at 381-82 ("Under Section 316(b), EPA may impose the best technology available . . . in order to minimize . . . adverse environmental impacts – significant or otherwise.").

At the same time, determining the BTA under CWA § 316(b) for CWISs—as with the development of national technology standards for effluent discharge—also entails consideration of adverse, non-water environmental effects and energy effects. If serious enough, these effects could provide a reason to reject a technology that would otherwise constitute the BTA. Moreover, EPA has never defined "minimization" necessarily to mean the complete elimination of all impacts. In other words, EPA has read CWA § 316(b) to intend that entrainment and/or impingement should be regarded as an "adverse impact" that must be minimized through the application of the BTA, but that this need not necessarily require the complete elimination of all such impacts in a given case.

The above considerations apply to identifying the BTA based on the terms of CWA § 316(b) itself—i.e., that it be the "best" technology that is "available" for "minimizing" adverse environmental impacts. In addition, EPA may look by analogy to the factors considered in the BPJ development of effluent limitations for guidance regarding additional factors to be considered in making a BTA determination under CWA § 316(b). Among those factors are the age of equipment and facilities involved, the process employed, the engineering aspects of applying various types of control techniques, process changes, cost, non-water quality environmental impacts (including energy requirements), and such other factors as EPA deems appropriate. *Cf.* 33 U.S.C. § 1314(b). These issues, as well as the permit conditions arising from the CWA § 316(b) analysis, are addressed in Part E below.

State legal requirements, including state water quality standards, also may apply to the development of permit conditions for cooling water intake structures. State water quality standards set designated uses for water bodies within the State and specify narrative and numeric criteria that the water bodies must satisfy. The limits in EPA-issued NPDES permits that address cooling water intake structures must satisfy both CWA § 316(b) and any applicable State requirements, such as water quality standards. *See* CWA §§ 301(b)(1)(C), 401(a)(1) and (d), and 510; 40 C.F.R. §§ 122.4(d), 122.44(d); *cf. id.* § 125.84(e).

The New Hampshire Water Quality Standards specifically apply to "water withdrawals" and require maintenance of a "balanced, integrated, and adaptive community of organisms." NH Env-Ws §§ 1701.02(b), 1703.19. The NHDES has primary responsibility for determining the permit limits that are necessary to achieve compliance with State law requirements. Since the NPDES permit that EPA expects to issue to Fraser Papers will be subject to State certification under CWA § 401, the permit will also need to satisfy any NHDES conditions of such a certification. *See* 40 C.F.R. §§ 124.53 and 124.55. EPA anticipates that the NHDES will provide this certification before the issuance of the final permit. Therefore, the limits in EPA-issued NPDES permits that address CWISs must satisfy: (1) the BTA standard of CWA § 316(b); (2) the requirements of state water quality standards, under CWA § 301(b)(1)(C), and (3) any

applicable conditions of a state certification under CWA § 401. *See* 33 U.S.C. §§ 1341(a)(1) and (d).

B. Waterbody Characteristics

From its source (Umbagog Lake) to the sea, the Androscoggin River runs for 170 miles and the drainage basin covers 3,450 square miles. A total of 28 dams on the Androscoggin River produce power for public and industrial consumption. In the vicinity of the facility, the river is heavily managed for hydroelectric power and other industrial uses. No provisions have been made for either upstream or downstream fish passage at any of these dams.

The CWIS at Fraser is gravity fed from an intake canal that diverts water from the Androscoggin River. Silty sand and gravel are the dominant substrate in the canal, with lesser amounts of cobble from rip-rapped banks, and some woody debris. The banks of the canal are heavily vegetated and may provide cover and structure for fish. These conditions are more characteristic of impounded or low gradient streams or rivers than faster flowing systems.

C. Local Biological Information

There is a limited amount of information available concerning the fish resources present in the Androscoggin River near the Fraser Papers facility. This is in part due to the perception that historic water quality conditions rendered this reach of the river uninhabitable for game fish, and in part because urban and industrial development along the river in this area has limited public access for recreation.[20] Much of the information that has been collected was generated on behalf of the hydroelectric facilities located along the river as part of their licensing efforts. During one such sampling event conducted by Kleinschmidt Associates in June of 1987, the impoundment adjacent to the CWIS appeared to be dominated by fallfish, common shiner, and white sucker. These species are common to ponded environments throughout northern New England. The New Hampshire Fish and Game Department is reported to stock other game fish species upstream of the facility including brook trout, brown trout, and landlocked salmon (Kleinschmidt Associates, 1988).

As mentioned above, the inlet to Fraser Papers' CWIS is located adjacent to one of the many hydroelectric dams along the Androscoggin River. There are six (6) dams located downstream of and within one mile of the facility and one (1) dam located approximately 8 miles upstream. No provisions (e.g., fish ladders) have been made for either the upstream or downstream fish passage at any of these dams. As such there are no naturally occurring anadromous fish expected in the vicinity of the CWIS. Therefore, the impingement or entrainment of *naturally occurring* anadromous fish or anadromous fish eggs and larvae at the CWIS is believed to be extremely unlikely. However, areas of the river upstream of the facility are stocked with brook trout, brown

[20] Kleinschmidt Associates, Report on Fish Resources in the Androscoggin River in Berlin, Gorham and Shelburne, New Hampshire, written for the James River Paper Company, Inc., Berlin, New Hampshire, July, 1998 [hereafter "Kleinschmidt Report"].

trout, and landlocked salmon. Movement patterns of these fish into the impoundments nearby the Fraser Papers facility are unknown, but may be related to high flow events that wash the fish down from upstream reaches of the river. Accordingly, it may be possible for some of these game fish as well as the other fish species noted in earlier hydroelectric related studies to become entrained and/or impinged by Fraser Papers' CWIS.

No site-specific ichthyoplankton data appears to be available for an overall assessment of the local fish population. The suitability of the local environment as a spawning and/or nursery area was evaluated to assess indirectly the presence or absence of species and life stages in the area. A species list from a 2003 Androscoggin River fish community survey was provided by the New Hampshire Fish and Game Department, Region 1 Office. Pertinent life history information was assembled for each species on the list and is included in Attachment F to this fact sheet (316(b) Site Evaluation Report Fraser Papers, Berlin, NH, Tetra Tech, April 2006, Table 1). The information on potential fish communities in the Androscoggin near Fraser, and relevant aspects of their life histories, were derived from this information.

The physical nature of the river in the vicinity of the CWIS and associated canal (i.e., shallow and supporting macrophyte growth), may provide suitable spawning and nursery habitat. Species in the families Ictaluridae, Esocidae, Gadidae, Moronidae, Centrarchidae, and Percidae typically spawn in habitat similar to that provided by the canal system (Attachment F). Most of the fish that potentially occur in the Androscoggin in the vicinity of the Fraser CWIS spawn in the spring and early summer between March and July. However, some fish do spawn in the fall and winter months (e.g., brook and brown trout and burbot).

Most of the species noted to be present in the vicinity of Fraser, however, have demersal (i.e., benthic), adhesive eggs (Attachment F). This reduces the likelihood of egg entrainment, especially at a facility such as Fraser, which has a low intake velocity. Larvae of some species (e.g., Cyprinidae) may use the canal as nursery habitat and/or exhibit schooling behavior in the canal. If present, such larvae would be at greater risk of being entrained.

With regard to juvenile and adult fish, species such as the lake chub, common shiner, golden shiner, spottail shiner, blacknose dace, longnose dace, creek chub, and fallfish will school in low velocity habitats similar to that provided by the intake canal (Attachment F). Moreover, juveniles and adults of the families Percidae, Centrarchidae, Moronidae, Gadidae, and Esocidae commonly occur in habitats similar to those provided by the intake canal, though they have a low propensity to form schools. Of the fishes found in the Androscoggin River, those in the families Catostomidae and Salmonidae exhibit local spawning migrations. Spawning adults in these families have larger body sizes (typically >20cm) (Attachment F).

In conclusion, the potential for entrainment and/or impingement of the above discussed species at the Fraser Papers' CWIS has been taken into consideration in the derivation of the permit's CWIS requirements, as discussed further in Part V.D, below.

D. Biological Impacts of Cooling Water Intake Structures

Section 316(b) of the Clean Water Act addresses the adverse environmental impact of cooling water intake structures at facilities requiring NPDES permits. Adverse environmental impacts of CWISs generally result from the entrainment of fish eggs and larvae and other small aquatic organisms through the plant's cooling system, and from the impingement of adult and juvenile fish and other larger forms of aquatic life on the intake screens. This entrainment and impingement can contribute to reductions of local species of commercial and/or recreational importance, locally important forage species, and local threatened or endangered species. In addition, any of these losses could contribute to a decrease in the balance and diversity of the ecosystem. *See* National Pollutant Discharge Elimination System: Regulations Addressing Cooling Water Intake Structures for New Facilities, 66 Fed. Reg. 65256, 65262-65 (Dec. 18, 2001) (Phase I Rule).[21]

Entrainment of organisms occurs when a facility withdraws water into the CWIS from an adjacent water body. Eggs and larvae are typically small enough to pass through the intake screens and become entrained within the facility. Depending on the CWIS design, entrained eggs and larvae generally can be exposed to shear forces, physical stress, injury, and in some cases, elevated temperatures and/or high concentrations of chlorine or other biocides. These organisms can be killed or otherwise harmed as a result of entrainment. The construction and location of the intake structure can have a major influence on the extent to which aquatic organisms are entrained. Also, different types of ecosystems may have greater or lesser concentrations of entrainable fish eggs and larvae. Generally, the quantity of entrained organisms is a function of the volume of cooling water flow through the facility and the concentration of organisms in the source water that are small enough to pass through the intake structure's screening system. The extent of entrainment can be affected by the location of the intake structure, the character of the biological community present in the water body, which may vary by season, and the nature of any intake screening system or other entrainment reduction equipment used by the facility. *See* 66 Fed. Reg. at 65,263.

Impingement of organisms occurs when a facility draws water through its CWIS and resident organisms that are too large to pass through the screens, but unable to swim away, become trapped against the screens and other parts of the intake structure. The quantity of organisms impinged is a function of the intake structure's location, the velocity at which water is drawn into the entrance of the intake structure (approach velocity) and through the screens (through-screen velocity), the seasonal abundance of organisms of various species in the general vicinity of the cooling water intake structures, and the size of various fish relative to the size of the mesh in any intake barrier system (e.g., screens). *See* 66 Fed. Reg. at 65,263.

In the case of Fraser Papers, organisms entrained through the CWIS will likely be impinged on the sand filter before they can be transported to the paper plant in the water used for production and cooling. Therefore, physical stresses will likely be the predominant impact for any entrained

[21] Of course, the Phase I Rule is not applicable to Fraser Papers. EPA cites the preamble to the Phase I Rule (and certain technical information developed for the now-suspended Phase II Rule) *only* for the underlying scientific research and analysis included there.

organisms at the Fraser Papers facility.

The entrainment and impingement impacts due to the CWISs at Fraser Papers are described in an investigation by Tetra Tech for EPA (316(b) Site Evaluation Report Fraser Papers, Berlin, NH, Tetra Tech, April 2006, 10 p) and summarized below. According to the permittee, impingement has not been observed at the intake structure at the river although a formal impingement monitoring program at the intake has never been implemented. EPA is not aware of environmental studies that directly document impingement and/or entrainment at Fraser Papers facility. Fraser noted in its December 5, 2007 response to EPA's November 1, 2007 Section 308 Information Request that "Fraser does not have any record of fish impingement. However, in the past 5 years, there has [sic] been a few observations by filter plant operators of small live fish over the filter media, which have been returned to the river via the filter backwash. There have not been any fish observed by operators on the screens from the filter house collection box [penstock]."

Absent a systematic sampling program assessing the level of impingement and/or entrainment at the Fraser Papers facility, EPA has used indirect evidence of potential impingement and/or entrainment losses due to facility operations, along with CWIS characteristics, to determine that there is an adverse environmental effect due to the CWIS. Based on available information, it appears that this adverse environmental impact is low. Indirect information of this adverse impact includes the presence of fish of various life stages in the local environment. With few features in the present CWIS design to prevent the entrainment and impingement of these organisms, adult and juvenile finfish are likely lost to impingement, and icthyoplankton are likely lost to entrainment, both as a result of Fraser Papers' withdrawal of large volumes of water from the Androscoggin River. The potential components of BTA to minimize adverse impacts from impingement and entrainment for the Fraser Papers CWIS are assessed below in Part E.

E. CWIS Technologies: Evaluation of BTA Requirements

The previous section determined the presence of an adverse environmental impact due to the CWIS. CWA §316(b) requires "that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." The following summarizes EPA's BPJ assessment of the location, design and capacity of the existing CWIS at Fraser Paper's former Burgess pulp mill in Berlin and potential for alternative CWIS locations, designs, and capacities as BTA.

1. Location

Fraser Papers is located on the Androscoggin River, a freshwater river that originates in Errol, NH, at the outlet of the Umbagog Lake and eventually empties into Merrymeeting Bay and the Atlantic Ocean. The facility historically operated two intakes to withdraw Androscoggin River water for use in its processes and for cooling. One intake, referred to here as the paper mill CWIS, is located at the paper mill in Gorham, on the hydroelectric dam adjacent the paper mill. This CWIS is able to divert a portion of the water removed by the power company for

hydropower and direct the withdrawn water to a set of sand filters for water treatment and subsequent use in the paper mill. This CWIS and set of sand filters are no longer in use and shall therefore be prohibited from use in the draft permit. The remainder of this description pertains to the current intake located at the former pulp mill site (pulp mill CWIS), which currently provides process water and cooling water to the paper plant in Gorham.

The facility's current intake is located adjacent to the Sawmill Hydroelectric dam, slightly upstream of the former Burgess pulp mill in Berlin. A small inlet diverts water to the CWIS, just upstream of the Sawmill Dam. The intake structure is located in a portion of the Androscoggin River which is heavily managed for hydroelectric power and contains six dams within a mile downstream of the intake canal and another dam approximately 8 miles upriver of the CWIS. As a result of the impoundment behind the Sawmill Hydroelectric dam, the water level in the river and the intake canal is typically maintained at a specific level. The Sawmill Hydroelectric dam creates an impoundment which is approximately 1 mile in length, and generally ranges from 200 feet to 600 feet in width.[22] The bypass channel for the dam is located on the opposite side (west side) of the river from the CWIS. Based on soundings taken along transects, channel depth ranges from eight feet to slightly over ten feet. Shoal areas, five feet or less in depth, occur along the banks of the upper half-mile of the impoundment. However, the lower part of the impoundment (nearest the intake structure) is more steep-sided. Channel substrate consists of a mixture of silty sand and gravel.

The intake structure is located nearby the northeast corner of the Sawmill dam at the end of a small inlet canal off the main stem of the Androscoggin River in what Fraser Papers refers to as the "Gate House." The inlet canal leading to the Gate House is approximately 150 feet long and 30 feet wide. Because of its location, the inlet canal leading to the Gate House creates a small narrow stretch of quiescent low energy "backwater", which is likely to be less attractive to certain cold water fish species including brook trout and landlocked salmon for spawning and/or foraging.[22]

As a general matter, one way to minimize the potential adverse impacts of a CWIS is to locate the intake in an area where impacts are likely to be less severe. When possible, impacts can be reduced by locating an intake in relatively less sensitive or less biologically productive areas and/or areas where low approach velocities can be attained. Relocating the CWIS to another location on the Androscoggin River, however, may not reduce adverse environmental impacts, and in certain locations, might even increase certain impacts. Thus, relocating the CWIS does not appear to offer any clear environmental advantage and poses construction hurdles (such as construction of an entire new intake structure) when compared to the current intake location. The draft permit does not require relocation of the CWIS as a component of BTA.

2. Design

[22] Kleinschmidt Associates, Report on Fish Resources in the Androscoggin River in Berlin, Gorham and Shelburne, New Hampshire, written for the James River Paper Company, Inc., Berlin, New Hampshire, July, 1998 [hereafter "Kleinschmidt Report"].

The design river elevation for the Gate House is 1,093.48 feet. The normal range for the river elevation is 1,094.5 feet ± 0.5 feet. A surface boom across the intake structure at water level functions to reduce floating debris from entering the CWIS in the Gate House. The surface boom also may diminish the approach velocity of the near-surface water. The opening of the CWIS spans nearly the entire width and depth of the canal at its downstream (southern) end. According to Fraser, the bottom of the intake structure is slightly elevated above the bottom of the inlet canal where water is withdrawn from the intake canal. However, it is unclear whether the bottom of the intake leading up to the raised sill has silted in. To meet BTA, the draft permit requires that the CWIS shall be designed, constructed, operated, and maintained with the intake elevated above the bottom of the river inlet to prevent and/or reduce entrainment of demersal eggs (eggs which sink to or are deposited on the bottom) and benthic organisms that may be present in the vicinity of the CWIS. This will require the permittee to perform periodic inspections of the bottom of the CWIS to determine whether the intake remains above the bottom. Maintenance shall also be performed at the bottom of the intake, when necessary, in order to remove any sediment buildup judged to be diminishing the benthic protection provided by the raised sill.

Water entering the Gate House currently flows through a fixed, inclined trash rack designed to prevent large debris from entering the intake pipe and sand filters. The trash rack consists of 2 inch deep by 1/4 inch wide steel bars which are slightly inclined, at approximately a 76% angle, with approximately a 1.5 inch opening between the steel bars. The distance between the bars is expected to keep most larger fish from entering the intake pipe. The total wetted surface of the racks (i.e., portion of the rack which is submerged) is approximately 9 feet high by 14 feet wide for a total surface area of approximately 126 square feet. Subtracting the surface area of the bars from the total surface area leaves an effective through-screen area of approximately 110 square feet.

According to the facility, Fraser operators inspect the trash rack daily and manually clean the rack with a rake on an as needed basis. Debris removed from the trash rack typically consists of branches, logs, leaves, pine needles and occasionally plastic containers. The CWIS has no other screens or other barriers at the Gate House. The facility's CWIS does not have a fish return system at the Gate House or the filter plant.

Through-screen intake velocity can be calculated using the mathematical relationship where the discharge rate (Q) is equal to the through-screen velocity (V) times the cross sectional area through which flow is occurring (A). EPA has identified a through-screen intake velocity threshold of 0.5 fps or less as likely to prevent impingement of adults and juveniles of a number of fish species. *See* National Pollutant Discharge Elimination System: Regulations Addressing Cooling Water Intake Structures for New Facilities, 65 Fed. Reg. 49060, 49087-88 (Aug. 10, 2000), and sources cited therein. As mentioned above, the through-screen area (A) of the bar rack at the Gate House is approximately 110 square feet while the current average intake flow through the filter plant, or Q, is 14.7 MGD. (See more detailed discussion of intake flows, below, in the discussion of the CWIS's capacity.) This yields a through-screen intake velocity of 0.21 feet per second (fps). This velocity is lower than the 0.5 fps through-screen velocity considered

to be adequately protective to reduce impingement of adult and juvenile fish. Even if the high end intake flow range of 20 MGD is used, the calculated intake velocity of 0.3 fps is still well below the 0.5 fps intake velocity determined to minimize impingement. Finally, using the design flow rate through the filter plant of 37.5 MGD, which Fraser states it runs well under, the calculated intake velocity of 0.53 fps barely exceeds the 0.5 fps limit determined to minimize impingement. Therefore, the calculated intake velocity under design flow conditions slightly exceeds the 0.5 fps intake velocity determined to minimize impingement, but the intake velocity under actual recent operating conditions is below that velocity. See Table 1, below, for a summary of the intake flow rates and the calculated intake velocities.

Table 1. Intake Flow Rates and Calculated Velocities [23]

INTAKE	Flow (MGD)	Velocity (fps)
Design	37.5	0.53
Maximum Reported	20	0.3
Average	14.7	0.21

River water, passing through the trash rack, enters the opening of the Gate House intake pipe, or penstock, by gravity flow. The penstock consists of a 6 foot diameter wooden pipe. The invert elevation of the penstock where water discharges from the Gate House structure is 1,085 feet. The penstock connects to the filter plant, which supplies both cooling and process water to the paper plant. The Gate House includes a slide gate that can be adjusted to restrict the flow through the penstock; however, this slide gate is always kept in fully-open position to ensure that a positive pressure is continuously maintained in the penstock.

From the Gate House the water flows by gravity through the 6-foot diameter penstock over a distance of approximately 2,800 feet via underground piping to the filter plant where the water is treated by sand filter beds (composed of a layer of sand and anthracite) to remove the suspended solids. Fraser reports that the process in the filter plant is entirely gravity driven. Prior to treatment, the water flows through another penstock. Flow to the filters is regulated by a slide gate, similar to that at the Gate House. According to Fraser, it is possible to lower the gate in order to reduce flow to the filter beds so that there is no overflow at the stand pipe (Outfall 025). Under these conditions, with the gate operated at 9 inches, the flow to the paper mill is 6,000 gpm (8.6 MGD), and the backwash flow is 2,200 gpm (3.2 MGD).[24]

At the filter plant, where the 6 foot diameter intake pipe enters the penstock, there is a second bar rack to screen water. This filter plant bar rack has vertical steel bars with openings of about 1.5 inches. The bar rack is not perpendicular to the flow, but rather angled, with the two halves of the bar rack forming a V of about 30 degrees. From the penstock, water enters the filter plant building through two parallel canals (the east canal and the west canal). From these canals, water is transferred to one of several sand filter beds. According to Fraser there are 48 filter beds in the filter plant, of which about 25 are currently functional. According to Fraser, the anthracite filter media was last replaced in the 1990's. Each bed has a nominal filtration capacity of 1,000

[23] Fraser's January 16, 2008 Response to EPA 308 Information Request of November 1, 2007.
[24] Fraser's December 5, 2007 Response to EPA 308 Information Request of November 1, 2007.

gpm, or 1.4 MGD. On that basis, the design capacity of the filter plant would be 48,000 gpm, or 69 MGD. However, with only 25 beds operable, the effective design capacity is approximately 25,000 gpm, or 37.5 MGD.[25] Additionally, with greatly reduced water needs since the closure of the pulp mill, the filter plant is run well below this design capacity.

When the efficiency of the filter media is reduced, the filters are backwashed using filtered river water to rid the system of accumulated solids. The filter backwash is discharged without further treatment through Outfall 010 (Former Burgess Filter House Backwash Waters) into the Androscoggin River. Fraser Papers estimates that it historically discharged approximately 8 MGD of filter backwash water on average through Outfall 010. Since the pulp mill has ceased operating, Fraser estimates that the current average filter backwash discharge is approximately 1.5 MGD.

From the above description it would appear that any fish and/or other organisms small enough to fit through the 1.5 inch openings of the trash rack at the Gate House and the 1.5 inch openings of the bar rack at the filter plant would be caught in the sand filters rather than enter the pipe which provides process water and cooling water to the paper plant. Such fish and/or organisms would be discharged with the filter backwash water. It is unlikely that they would survive the physical stresses imposed by being caught in the sand filters or being backwashed out of them. Therefore, EPA has determined that the current design of the CWIS does not meet the BTA to minimize adverse environmental impacts. To meet the design BTA, the permittee shall install a screen or mesh barrier at the Gate House, prior to the penstock, with a mesh size of 3/8 inch or smaller, to preclude the passage of adult and juvenile fish expected in the intake water. Further, to minimize impingement mortality of adult and juvenile fish the permit requires the following: (1) the through-screen intake velocity of the CWIS, as measured or calculated at the new screen or mesh barrier at the Gate House shall not exceed 0.5 ft/s at any time,[26] and (2) all live adult and juvenile fish and other aquatic organisms impinged, entrained, or trapped on or in the CWIS shall be returned to the river by means designed to maximize their survival. Further, all solid materials except for naturally occurring materials such as leaves, branches, and grass shall be removed from the trash rack and will not be discharged to the river.

EPA's BPJ assessment of the design features was guided by the specific factors listed in 40 C.F.R. §125.3(d)(3) by analogy from BAT to BTA. The following six factors were considered in the assessment: (1) the age of equipment and facilities involved; (2) The process employed; (3) The engineering aspects of the application of various types of control techniques; (4) Process changes; (5) The cost of achieving such effluent reduction; and (6) Non-water quality environmental impact (including energy requirements)."[27]

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[25] 25,000 GPM is the equivalent of 36 MGD. To be consistent with previous estimates, 37.5 was used as the design flow rate in Fraser's analysis, although since the closure of the pulp mill the maximum intake has been 20 MGD.

[26] Sometimes, adding a mesh barrier can reduce the effective surface area and therefore increase the through-screen velocity. Here, however, there is no conflict between the requirement of installation of 3/8-inch mesh and maintenance of through-screen velocity at or below 0.5 ft/s. Assuming a typical commercially available mesh width of 0.08 inches, installation of 3/8-inch mesh would not decrease the area such that the velocity would exceed 0.5 ft/s at the maximum flow rate of 20 MGD.

[27] 40 C.F.R. 125.3(d)(3).

With the exception of installation of a screen or mesh barrier, EPA does not specify that Fraser must implement a specific technology to achieve the design requirements of the draft permit (elevated intake and intake velocity less than 0.5 fps). Therefore, EPA took into consideration the age of equipment and facility involved in the assessment, in that it does not directly require that Fraser make specific changes to the facility currently in place or install new technology (with the exception of the screen or mesh barrier). Additionally, providing this flexibility helps to ensure that there is minimal interference with the processes employed at the facility. The draft permit also does not specify in advance that Fraser must perform specific engineering tasks in order to meet the design requirements. Finally, no process changes are expected to occur at the facility due to implementation of the required design features, the costs associated with such design requirements are expected to be reasonable, and the non-water quality environmental impact is expected to be minimal.

The Gate House appears to EPA to be the most effective location for a screen or mesh barrier that minimizes adverse environmental impact (AEI). At this location, the velocity entering the CWIS is low compared to elsewhere in the CWIS, penstock, and filter plant and fish prevented from entering the Gate House penstock avoid stressful transport through the penstock. EPA invites comment on alternative locations for the screen or mesh barrier with a maximum through-screen velocity of 0.5 fps to preclude the passage of adult and juvenile fish expected in the intake water.

No process changes are expected to occur at the facility due to implementation of the required CWIS design and operational requirements. Furthermore, the costs associated with such requirements are expected to be low and bearable by the facility, and the non-water quality environmental impact, if any, is expected to be minimal.

3. Capacity

The "capacity" of the CWIS refers to the volume of cooling water that it withdraws. Reductions in the CWIS flow proportionally reduce any entrainment and also reduce impingement. In the case of the Fraser Papers facility, the amount withdrawn (volume) has varied over the last several years due to the shut down and start up of the facility. However, there has been an overall trend of volume reduction at the facility through improved process efficiencies, recycling, and reuse initiatives.

The annual mean flow of the Androscoggin River as reported by the facility in the *Detailed Industry Questionnaire: Phase II Cooling Water Intake Structure* submitted to EPA on April 21, 2000 is 2,460 cfs. The largest potential intake flow rate at the Fraser Papers facility (37.5 MGD) represents less than 2.4% of the mean annual flow of the Androscoggin River. Using U.S. Geological Survey stream flow data from the nearest upstream and downstream gauging stations, the intake is capable of withdrawing approximately 3% of the mean annual flow of the Androscoggin River.

The filter plant can treat upwards of 37.5 MGD (58 cfs) of river water through the filter beds, and therefore, this flow rate has been used to represent the maximum design intake flow (DIF). This design intake flow also has been used in the maximum through-screen intake velocity calculation to represent the largest potential intake flow rate. On a site visit on October 10, 2007, Fraser reported that since the closure of the pulp mill the flow of water to be treated at the filter plant has ranged from 12 MGD to 20 MGD.

Currently, the total water withdrawn through the intake averages 14.7 MGD (based on the requirements of the paper mill). The estimated average water use at the paper mill is 8.7 MGD. Of the 8.7 MGD, approximately 0.245 MGD is used for non-contact cooling water. Of the 0.245 MGD used for cooling, 0.17 MGD is reused as heated water in the processes at the paper plant. The remaining 0.075 MGD is used only for cooling and is not reused in the paper plant processes.[28]

A considerable amount of withdrawn water that is treated at the filter plant is not used and is discharged to the river on the former pulp mill site from an overhead pipe (Outfall 025), which was not included in the previous permit. During a site visit by EPA and NHDES on October 10, 2007, this discharge was observed from an overhead pipe falling approximately 20 feet to an inlet of the Androscoggin River in the vicinity of Outfall 010. Fraser estimates that since the closure of the pulp mill, the average flow from Outfall 025 is 4.5 MGD. As mentioned previously, Fraser estimates the average flow from the filter house backwash (Outfall 010) is 1.5 MGD. See Table 2, below, for a summary of the Outfall Flows. See Attachment G for a flow diagram of the intake.

Table 2. Outfall Flows[29]

OUTFALLS	Average Flows (MGD)
010	1.5
018	8.7
025	4.5

In assessing potentially available technological alternatives for ensuring that the capacity of the CWIS at Fraser Papers reflects the BTA for minimizing adverse environmental impacts as required by CWA § 316(b), EPA considered engineering, environmental, economic and other issues related to these alternatives. As discussed in Part VI.F of this fact sheet, below, EPA is establishing BTA in this permit in Part I.A.C based on BPJ. EPA evaluated the technologies and best management practices to reduce the excess intake capacity, focusing on the degree to which technologies or operational measures could minimize the adverse impacts of CWISs: namely, entrainment and impingement. EPA also assessed additional applicable considerations, focusing on the factors that are considered by EPA in the analogous exercise of determining BAT effluent standards.

The efforts by Fraser to recycle, reuse, and overall reduce the volume of intake water used at the

[28] Fraser's January 16, 2008 Response to EPA 308 Information Request of November 1, 2007.
[29] Fraser's Permit Re-Application dated January 14, 2008.

facility has a direct impact on the potential for impingement and entrainment. Of the 37.5 MGD design capacity of the gravity-fed Androscoggin River intake structure, only about 0.245 MGD is used for cooling. This represents about 0.7% of the design capacity of the intake and about 1.7% of the current actual intake (14.7 MGD according to Fraser). Of this maximum 0.245 MGD of water withdrawn for cooling, almost 70% (0.17 MGD) is reused in the paper plant processes after it has been heated. This reused water is directed from six separate heat exchange units listed in Attachment H (along with the estimated water use of each unit). Only the remaining 30% (0.07 MGD) is used only for cooling in a series of relatively small, once-through cooling systems. The 0.245 MGD is distributed widely around the paper plant, providing cooling for 18 separate mechanical heat exchange units which are identified in Attachment H (along with the estimated water use of each unit).

As part of this BPJ determination of BTA, one technology assessed by EPA to reduce the capacity of the CWIS intake structure was closed-cycle cooling. Closed-cycle cooling would entail retrofitting the 18 heat exchangers with one or more closed-cycle cooling system. Closed-cycle cooling systems recycle the cooling water rather than directly discharging it, as a once-through system does. Generally, freshwater closed-cycle cooling results in a capacity reduction of approximately 96-98%.[30]

Using the general reduction of 96% and assuming no reuse of cooling water in productions, a closed-cycle cooling system at Fraser Paper could potentially reduce cooling water use from the current value of 0.245 MGD to 0.0098 MGD. (Installation of a closed-cycle cooling system would not reduce the facility's *process* water usage.) This reduction in CWIS intake capacity, in turn, corresponds to a proportional reduction in entrainment, as well as an impingement reduction.

However, as stated above, Fraser Papers currently reuses about 70% (0.17 MGD) of the cooling water in its paper production processes. Absent this reuse, Fraser would need to withdraw an additional 0.17 MGD from the Androscoggin River.

Therefore, the net effect of retrofitting Fraser Paper with closed-cycle cooling would be to reduce the total water withdrawal from the current design value of 37.5 to 37.43 MGD, a 0.19% reduction (See calculations below).

Total intake = 37.5 MGD
Total used for cooling = 0.245 MGD
Reduction of cooling water using closed-cycle cooling = 0.96 x 0.245 = 0.2352 MGD

[30] For the traditional steam electric utility industry, facilities located in fresh water areas that have closed-cycle recirculating cooling water systems can, depending on the quality of the make-up water, reduce water use by 96-98% from the amount they would use if they had once-through cooling water systems. National Pollutant Discharge Elimination System: Regulations Addressing Cooling Water Intake Structures for New Facilities, 66 Fed. Reg. 65, 256, 65,273 (Dec. 18, 2001). For purpose of this analysis, EPA assumes that the reductions in cooling water achievable at Fraser Papers by use of closed-cycle cooling would be comparable to those achievable at steam electric power plants.

Additional water needed to use in production process = 0.17 MGD

Total water reduction using closed-cycle cooling = 37.5 MGD – 0.2352 MGD + 0.17 MGD = 37.43 MGD.

Based on the actual average water usage at Fraser Papers, even if 100% of the 0.245 MGD used for cooling could be eliminated through the use of once closed-cycle cooling, the CWIS capacity would be reduced by only 0.5% (14.7 – 0.245 + 0.17 = 14.625; 14.7 – 14.625 = 0.075; 0.075/14.7 x 100% = 0.5%). This represents the maximum effectiveness achievable through the use of a retrofit closed-cycle cooling technology for Fraser Papers.

However, EPA has identified another, more effective means of reducing intake capacity. Since the CWIS is gravity-fed, reducing the CWIS capacity can be most readily achieved by utilizing the existing gate mechanisms to reduce withdrawals. If, on the other hand, the existing gate is not functioning adequately to perform this function, the gate could be repaired or the CWIS could be retrofitted with a working flow restricting device. Based on the use of flow restricting devices at other facilities, this is an available technology in the industry, and in fact, is already employed at the Fraser Papers' gate adjacent the Sawmill Dam. EPA notes that the mechanism used to reduce the capacity must not increase the through-screen approach velocity above 0.5 fps.

At Fraser Papers, another opportunity for curtailing water use and therefore further reducing the capacity of the intake structure is the significant reduction or elimination of the discharge of treated water from Outfall 025. The reduction or elimination of the discharge of treated water from Outfall 025 is one available application of an intake reduction technology. On the site visit of October 10, 2007, a plant representative indicated that the purposes of Outfall 025 are to (1) provide operators with a quick visual check on whether the CWIS is withdrawing more than enough water to meet the capacity limitation of the pipe from the former pulp mill to the paper mill and (2) to prevent freezing in the penstock by maintaining a high flow of water. The reason for Outfall 025 was again described in the discussion of the water intake provided in response to EPA's 308 request. In this document, Fraser claims the discharge is necessary "to assure the paper mill of an adequate water volume and head."[31]

EPA has determined that there are alternate, available means of achieving these functions, attainable with a significant reduction or elimination of the discharges of treated water from Outfall 025. Alternate means to assure that the gravity flow to the paper mill is operational include implementation of a visual check that the water in the filter bed feeding the penstock is higher than that of the penstock and/or installation of a float activated sensor in the filtration plant. Installation of a flow meter is an alternate mean to assure that the process water needs of the paper mill are met. The elimination of the flow through Outfall 025, which is not connected to any of the facility's processes, represents an available method to reduce the CWIS intake.

A capacity reduction equivalent to the average flow of unused water through Outfall 025 (i.e.,

[31] Fraser's January 16, 2008 Response to EPA 308 Information Request of November 1, 2007.

4.5 MGD) would reduce the capacity of the intake by almost 31%. This is approximately sixty times greater than the maximum 0.5% capacity reduction achievable with closed-cycle cooling. In the case of Fraser Papers, then, minimizing adverse environmental effects of the CWIS capacity via elimination of significant reduction of discharges through Outfall 025 and restricting the gravity-feed intake of water, is more effective than reducing CWIS capacity by retrofitting multiple once-through cooling units with closed-cycle cooling. Therefore, closed-cycle cooling technology is not the Best Technology Available for minimizing adverse environmental impacts of the Fraser Papers CWIS under CWA § 316(b). Instead, BTA at Fraser Papers consists of capacity reduction via operational practices such as some combination of water conservation, reducing or eliminating the discharge through Outfall 025, and/or restricting the gravity feed intake of water. (Combining the two options – i.e., operational practices to reduce capacity *and* closed-cycle cooling – would achieve essentially the same results as the operational practices alone, but at substantially greater cost, and is therefore not BTA because it is not cost-effective.)

As part of this BPJ determination of BTA, EPA has considered several other factors in this determination. Without a detailed cost assessment, EPA believes that Fraser Papers could reasonably bear the cost of instituting any of the above-described operational practices (water conservation, reducing or eliminating the discharge through Outfall 025, and/or restricting the gravity feed intake of water). Further, retrofitting with closed-cycle cooling typically is accompanied by some environmental impacts such as noise and the increase energy use needed to operate the cooling tower fans. While these non-water quality environmental impacts have not been fully evaluated by EPA in this BPJ determination of BTA, it is clear that alternative capacity reductions through the above-described operational practices would present less of these particular non-water quality environmental impacts. As an example, the elimination of the discharge through Outfall 025 would far exceed the flow reduction achievable with closed-cycle cooling (and at a lower cost), and involve fewer (if any) changes in the processes used at the facility, minimal upgrade to the current system, and fewer (if any) non-water quality environmental impacts. Therefore, site-specific operational practices (such as water conservation, reducing or eliminating the discharge through Outfall 025, and/or restricting the gravity feed intake of water) to reduce and minimize CWIS intake capacity are components of required BTA.

The draft permit conditions require that the capacity of the CWIS reflect this BTA. However, rather than specify implementation of any particular operational practice(s), the draft permit imposes a capacity limitation, which the facility may achieve by whatever means it chooses. According to Fraser Papers, the design capacity of the CWIS is 37.5 MGD, the average use at the paper mill is 8.7 MGD, the average water intake since the pulp mill closure has been 14.7 MGD, and the maximum water intake of water to be treated at the treatment plant has been 20 MGD since the pulp mill closure. All these water intake numbers include an average of 4.5 MGD of unused filtered water which is discharged through Outfall 025. Subtracting this 4.5 MGD of unused water from the maximum water intake of 20 MGD, EPA finds that the water intake should not exceed a maximum daily of 15.5 MGD in order to reflect BTA for minimizing the adverse impact of the CWIS. [32] Therefore, as a component of BTA, the permit requires

[32] In this case, to represent actual operations at the CWIS, EPA believes that the maximum recorded water intake

minimizing the intake of water at the CWIS to the maximum extent practicable, with the intake not to exceed 15.5 MGD on any day. This intake flow requirement is achievable based on implementation of any of the options (or combination of options) discussed above, and may be supplemented with other operational practices such as water conservation to reduce the water intake to only that which is necessary.

F. 316(b) Determination and Summary

This section presents EPA's determination with respect to the application of CWA §316(b), 33 U.S.C. §1326(b) to the NPDES permit for Fraser Papers. CWA §316(b) requires that the design, capacity, location and construction of cooling water intake structures reflect the BTA for minimizing adverse environmental impacts. Entrainment and impingement of aquatic life are the two key adverse environmental impacts potentially associated with cooling water intake structure operations at the facility. Based on current operations and information available at this time, EPA concludes that the present CWIS creates adverse environmental impact. EPA regards the adverse environmental impacts of the CWIS at Fraser Papers to be low, considering the location of the CWIS, the low maximum intake velocity, and the water reuse.

In making this §316(b) determination, EPA considered the adverse environmental effects from operation of the facility's CWIS and technology options for minimizing these adverse effects by altering the CWIS's location, design, construction, and capacity. In addition, EPA finds that when operated with the BTA requirements described in Part VI.F, above, there is no evidence that the CWIS water withdrawals cause or contribute to violations of the New Hampshire Water Quality Standards.

This site-specific determination of BTA in the draft permit is based on BPJ and consists of the following components:

a. The CWIS shall be designed, constructed, operated, and maintained with the intake elevated above the bottom of the river inlet to prevent and/or reduce entrainment of demersal eggs (eggs which sink or are deposited on the bottom) and larvae or other benthic organisms that may be present in the vicinity of the CWIS.

b. The permittee shall minimize the intake of water at the CWIS to the maximum extent practicable, with the flow through the intake not to exceed 15.5 MGD maximum daily.

c. The permittee shall install a screen or mesh barrier at the Gate House, prior to the penstock, with a mesh size of 3/8 inch or smaller, to prevent the entrainment of juvenile and adult fish into the filtration system.

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since pulp plant closure of 20 MGD is the appropriate CWIS capacity from which to apply minimization measures, rather than the average paper plant use, the average CWIS intake, or the design capacity from the combined pulp and paper plant operations.

d. The through-screen intake velocity of the CWIS, as measured or calculated at the intake screen or mesh barrier at the Gate House, shall not exceed 0.5 ft/s at any time.

e. All live adult and juvenile fish and other aquatic organisms impinged, entrained, or trapped on or in the CWIS shall be returned to the river by means designed to maximize their survival. All solid materials except for naturally occurring materials such as leaves, branches, and grass shall be removed from the trash rack and will not be discharged to the river.

EPA has determined on a BPJ basis for the draft permit that this above suite of technology measures will satisfy CWA § 316(b) at Fraser Papers and comply with New Hampshire Water Quality Standards. While the above measures represent the BPJ determination of BTA for the Fraser Papers facility based on current and available information, EPA acknowledges that additional information regarding the CWIS and its adverse environmental effects could lead to modification of this BTA determination in future permits. Because of unavoidable uncertainty about exactly how these technologies will perform at Fraser Papers, the following BTA related biological monitoring will be required to assess technological performance.

a. The permittee shall implement a CWIS Monitoring Program to determine, as a baseline, the number of adult and juvenile fish of all species being impinged on or within the CWIS throughout the year. All locations in the CWIS where fish could potentially be impinged or trapped shall be included as sampling sites. Monitoring shall take place a minimum of three days each week. Monitoring shall be for all fish species. Monitoring logs shall include the following: date; time; observer/operator; number of fish; and for each fish observed, the fish length, species, condition (whether the fish was alive when collected), and whether the fish was returned to the river.

b. Each year, the permittee shall prepare and submit to EPA an Annual CWIS Biological Monitoring report. This Annual CWIS Biological Monitoring Report shall include all data from the monitoring logs collected in the previous year's CWIS Monitoring Program described above in Part (f), as well as a summary of the data. The initial Annual CWIS Biological Monitoring Report shall contain monitoring and sampling information for the period from the effective date of the permit through December 31st of the same calendar year, and shall be due on February 15th of the following calendar year. In each such report, monitoring and sampling results shall be recorded and summarized for each month. The report shall include the locations in the CWIS that were monitored, the specific sampling methods used, the date and time of sampling, the length of any fish observed (in inches), the species of any fish observed, the condition (whether the fish was alive when collected), and whether the fish was returned to the river. The average daily flows for the CWIS on each date sampled, as well as any excursions from the CWIS Monitoring Program or plan operations shall be reported. The Annual CWIS Biological Monitoring Report also shall describe the measures taken to ensure that those involved in planning and conducting the monitoring have the necessary knowledge and ability to (1) ensure sampling accuracy and effectiveness, including the ability to identify all fish

found in this area to the species level, and (2) return trapped organisms to the river by means designed to maximize their survival.

c. The permittee shall submit a copy of all the reports required in this Part to EPA, NHDES, and the U. S. Fish and Wildlife Service (USFWS), and the New Hampshire Fish and Game Department (NHFGD) at the addresses listed in Part I.F of the permit, Monitoring and Reporting.

d. Any unusual impingement event must be reported to the EPA, the NHDES, and the NHFGD within 24 hours by telephone. If the permittee observes four (4) or more fish on the CWIS during any one of the following situations, this would qualify as an unusual impingement event, warranting notification: 1) during a required impingement monitoring program observation event, 2) at any time the CWIS is viewed, or 3) when the cumulative number of individual fish observed on the CWIS totals four or more based on multiple observations over the course of any 24-hour period. The 24-hour notice must be followed with a written report.

The written report, to be submitted within ten working days of the event, shall include the following information:

i.) The species, sizes, and approximate number of fish involved in the incident.
ii.) The time and date of the occurrence.
iii.) The operating mode of the facility, including the estimated volume of intake water.
iv.) The permittee's opinion as to the reason the incident occurred.
v.) The remedial action the permittee will take to prevent or reduce the likelihood of a recurrence of the incident, to the maximum extent practicable.

VII. ENDANGERED SPECIES ACT

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA) grants authority to and imposes requirements upon Federal agencies regarding endangered or threatened species of fish, wildlife, or plants ("listed species") and habitat of such species that has been designated as critical (a "critical habitat"). The ESA requires every Federal agency, in consultation with and with the assistance of the Secretary of Interior, to insure that any action it authorizes, funds, or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The United States Fish and Wildlife Service (USFWS) typically administer Section 7 consultations for bird, terrestrial, and freshwater aquatic species.

EPA has reviewed the Federal endangered or threatened species of fish, wildlife, or plants to see if any such listed species might potentially be impacted by the issuance of this NPDES permit. Due to the absence of effective fish passage at the dams downstream of the facility, it is highly unlikely

that protected anadromous fish species would be present in the vicinity of the facility. Based on this assessment, consultation under Section 7 of the ESA with NMFS is not required.

The review focused primarily on freshwater aquatic species, since the intake and discharge are on the Androscoggin River. Based on the normal distribution of listed freshwater species, it is highly unlikely that any species of concern would be present in the vicinity of the facility. Therefore, consultation under Section 7 of the ESA with USFWS is not required.

VIII. ESSENTIAL FISH HABITAT (EFH)

Under the 1996 Amendments (PL 104-297) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq. (1998)), EPA is required to consult with National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) if EPA's actions, or proposed actions that EPA funds, permits, or undertakes, "may adversely impact any essential fish habitat." 16 U.S.C. §1855(b). The Amendments broadly define essential fish habitat as, "... those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." 16 U.S.C. §1802(10). Adverse effect means any impact which reduces the quality and/or quantity of EFH. 50 C.F.R. §600.910(a). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

EFH is only designated for species for which Federal Fisheries Management Plans exist (16 U.S.C. § 1855(b)(1)(A)). EFH designations were approved for New England by the U.S. Department of Commerce on March 3, 1999.

The Androscoggin River is designated EFH for Atlantic salmon (*Salmo salar).* According to New Hampshire Fish and Game Department (NHFGD), there is presently no Atlantic salmon stocking effort in the New Hampshire waters of the Androscoggin River, and there are no plans for stocking in the near future. The river is heavily managed for hydroelectric power. There are six dams located downstream of and within one mile of the facility. No provisions have been made for upstream or downstream fish passage at any of these dams. There has been no salmon habitat evaluation conducted to date by the NHFGD in the vicinity of the Fraser Papers facility.

The presence of the numerous impoundments in the vicinity of the mill provides for limited spawning habitat for any landlocked salmon found in the vicinity of the facility. The nearest area of suitable spawning habitat (i.e., areas of cobble and gravel) is in the vicinity of Shelburne, New Hampshire, approximately 10 miles downstream of the facility. Surplus salmon fry are stocked in upstream sections of the Androscoggin River and connected lakes in order to provide a landlocked salmon sport fishery. It is unlikely that many of the landlocked salmon will succeed in migrating to the sea and it is even less of a possibility that such fish could migrate back to spawn given the lack of viable upstream fish passage.

Permit requirements identified in the draft permit meet the best technology available for the CWIS and are designed to be protective of cold water aquatic species, including Atlantic salmon.

EPA believes the draft permit adequately protects Androscoggin River EFH, and therefore additional mitigation is not warranted. A formal EFH consultation with NMFS is not required. If adverse effects to EFH do occur as a result of this permitting action, or if new information becomes available that changes the basis for this determination, then NMFS will be notified and a consultation will be promptly initiated. EPA will provide this fact sheet and the draft permit to the NMFS habitat division.

IX. STATE CERTIFICATION REQUIREMENTS

EPA may not issue a permit unless the State Water Pollution Control Agency with jurisdiction over the receiving water(s) either certifies that the effluent limitations and/or conditions contained in the permit are stringent enough to assure, among other things, that the discharge will not cause the receiving water to violate State Water Quality Standards or the Agency waives its right to certify as set forth in 40 C.F.R. §124.53. The NHDES is the certifying authority within the State of New Hampshire. EPA has discussed this draft permit with staff at the NHDES and anticipates that the draft permit will be certified by the State.

Upon public noticing of this draft permit, EPA is formally requesting that the NHDES make a written determination concerning certification. The State will be deemed to have waived its right to certify unless certification is received within 60 days of receipt of this request.

X. GENERAL CONDITIONS AND DEFINITIONS

The remaining general and special conditions of the draft permit are based on the NPDES regulations, 40 C.F.R. Parts 122 through 125, and consist primarily of management requirements common to all permits.

XI. COMMENT PERIOD, HEARING REQUESTS, AND PROCEDURES FOR FINAL DECISIONS

All persons, including applicants, who believe any condition of this draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to **Nicole Kowalski, EPA New England - Region I, 1 Congress Street - Suite 1100 (CIP), Boston, Massachusetts 02114 and Jeff Andrews, N.H. Department of Environmental Services, Water Division, P.O. Box 95, Concord, New Hampshire 03302.** Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held if the criteria stated in 40 C.F.R. §124.12 are satisfied. In reaching a final decision on the draft permit, the EPA will respond to all significant comments and make these responses available to the public at EPA's Boston office.

Following the close of the comment period, and after any public hearings, if such hearings are held, the EPA will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice. Within 30

days following the notice of the final permit decision, any interested person may submit a petition for review of the permit to EPA's Environmental Appeals Board consistent with 40 C.F.R. §124.19.

XII. EPA CONTACT

Documents used in the preparation of this draft permit and fact sheet will be included in an administrative record available for review at EPA's office during the public comment period. Arrangements for review of the administrative record may be made, and additional information concerning the draft permit may be obtained, between the hours of 9:00 A.M. and 5:00 P.M., Monday through Friday, excluding holidays, by contacting:

Nicole Kowalski
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Telephone: (617) 918-1746
Fax: (617) 918-0746
E-mail: kowalski.nicole@epa.gov

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Date

Stephen S Perkins, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency

XIII. ATTACHMENTS

A. Site Map
B. Summary of DMR Data
C. Paper Mill WWTP Flow Diagram
D. WET Testing Results
E. Turbidity Sampling Results
F. Fish Life History for 2003 from the Androscoggin
G. Water Flow and Balance Sheet
H. Mill Heat Exchangers Using Water
I. 7Q10 Estimate Summary