

**AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM**

In compliance with the provisions of the Federal Clean Water Act, as amended, (33 U.S.C. §§ 1251 et seq; the "CWA"),

Wausau Paper Printing & Writing, LLC

is authorized to discharge from a facility located at
10 Mechanic Street
Groveton, New Hampshire 03582

to receiving waters named
Connecticut River and Upper Ammonoosuc River (Hydrologic Unit Code 01080101)

in accordance with effluent limitations, monitoring requirements and other conditions set forth in the permit issued on September 14, 2005, including Attachment A and Part II, except as set forth herein and listed as follows:

This permit modification reflects the following changes, includes the entire permit with the modified and unmodified permit conditions to allow a re-pagination of the permit for convenience, and consists of 17 pages in Part I and two pages in Attachment B - Bench Scale Turbidity Testing Procedure: ***The effluent limitations for temperature in Part I.A.1, the intake structures requirements in Part I.C, and the reporting requirements in Part I.D have been revised. A new reopener condition for the CWIS monitoring requirements has been added in Part I.G.5. New thermal plume and temperature monitoring requirements have been added in Part I.H. A new limit for the temperature increase in the Connecticut River has been added in Part I.A.13. These permit modification changes appear in bold italics.***

This permit action modifies the permit issued on September 14, 2005, which became effective on May 18, 2006, with certain contested conditions stayed pending appeal. An earlier draft permit modification was submitted for public notice on November 13, 2006, and a final permit modification was issued on May 9, 2007. The scope of that permit modification was limited to certain requirements addressing turbidity, flow, and total residual chlorine. This permit action does not revise or affect the permit conditions addressed in that earlier permit modification.

This permit modification shall become effective January 1, 2008

This permit modification does not affect the expiration date of the permit. The original permit stated, "This permit and the authorization to discharge expires at midnight, (5) five years from the effective date". The permit became effective on May 18, 2006. Therefore, the original permit and this permit modification expire at midnight, May 18, 2011.

Signed this 8th day of November, 2007

/S/ SIGNATURE ON FILE

Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency (EPA)
Region I
Boston, Massachusetts

Part I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through the expiration date the permittee is authorized to discharge treated wastewater effluent from outfall serial number 017 (wastewater treatment plant) to the Connecticut River. This wastewater includes process wastewaters, non-contact cooling water, boiler blowdown, and the storm water that formerly discharged from Outfall 003. This discharge shall be limited and monitored by the permittee as specified below:

<u>Effluent Characteristics</u>	<u>Discharge Limitations</u>		<u>Monitoring Requirements</u>	
	<u>Average</u> <u>Monthly</u>	<u>Maximum</u> <u>Daily</u>	<u>Measurement Frequency</u>	<u>Sample Type</u>
Flow; mgd ¹	7.5	8.5	Continuous	Recorder
Total Phosphorus; mg/L		2.0	1/Week	24-Hour Composite
pH Range; Standard Units ²		6.5 to 8.0	Continuous	Recorder
Whole Effluent Toxicity				
LC50 ³ ; Percent	See Part I.A.4	100	4/Year	24-Hour Composite
C-NOEC ⁴ ; Percent	See Part I.A.4	≥ 5.6	4/Year	24-Hour Composite
<u>Escherichia coli</u> ⁵ ; Colonies per 100 ml	Report	Report	2/Month	Grab
Benzo(b)Fluoranthene ⁶ ; ug/L	Report		1/Month	Grab
Ammonia-Nitrogen as N; mg/L		Report	1/Month	24-Hour Composite
Nitrite plus Nitrate Nitrogen; mg/L		Report	1/Month	24-Hour Composite
Total Kjeldahl Nitrogen; mg/L		Report	1/Month	24-Hour Composite
Aluminum; mg/L		Report	1/Month	Grab
<u>During the period November 1 - April 30</u>				
BOD; lbs/day	3,400	5,100	3/Week	24-Hour Composite
TSS; lbs/day	4,470	6,830	3/Week	24-Hour Composite
Temperature; °F	73	82 ¹⁶	Continuous	Recorder
<u>During the period May 1 - October 31</u>				
BOD; lbs/day	2,750	4,125	3/Week	24-Hour Composite
TSS; lbs/day	3,610	5,520	3/Week	24-Hour Composite
Temperature; °F	89	94 ¹⁶	Continuous	Recorder
<u>During the period June 1 - October 31</u>				
Turbidity (Effluent) ^{7, 14} ; NTU	Report	Report	2/Month	Grab
Turbidity, Upstream ^{8, 14} ; NTU	Report	Report	2/Month	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: - Discharge from the mixing chamber to the outlet pipe leading to the Connecticut River, unless otherwise specified.

See Pages 5 and 6 for an Explanation of the Superscripts.

Part I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

2. During the period beginning on the effective date and lasting through the expiration date the permittee is authorized to discharge from outfall serial number 010 (Upper Ammonoosuc River intake filter bypass water and non-contact cooling water) to the Upper Ammonoosuc River during the period January 1 through May 31 of each year. These discharges shall be limited and monitored by the permittee as specified below:

<u>Effluent Characteristics</u>	<u>Discharge Limitations</u>		<u>Monitoring Requirements</u>	
	Maximum	Maximum Daily	Measurement Frequency	Sample Type
Flow; mgd		Report	2/Week	Estimate Total Daily
TSS; mg/L		Report	2/Week ¹¹	Grab
pH (Effluent); Standard Units ⁹		6.5 to 8.0	2/Week	Grab
pH (Ambient) Standard Units ⁹		Report	2/Week	Grab
Temperature; °F		68	3/Week	Grab
Discharge Event; days ¹⁰	Report	--	1/Month	Report Total Number of Days

The addition of any chemical to the Upper Ammonoosuc River intake bypass water or to the non-contact cooling water is not authorized. During maintenance, to drain the water intake line, the permittee is authorized to discharge intake pipe drain water and is not authorized to discharge non-contact cooling water. The effluent limitations above do not apply to this discharge which shall be monitored as specified above. Samples taken in compliance with the monitoring requirements specified above shall be taken at a location that provides a representative analysis of the discharge.

See Pages 5 and 6 for an Explanation of the Superscripts.

Part I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

3. During the period beginning on the effective date and lasting through the expiration date the permittee is authorized to discharge from outfall serial number 018 (sand filter backwash water) to the Upper Ammonoosuc River. These discharges shall be limited and monitored by the permittee as specified below:

<u>Effluent Characteristics</u>	<u>Discharge Limitations</u>		<u>Monitoring Requirements</u>	
	<u>Average</u> <u>Monthly</u>	<u>Maximum</u> <u>Daily</u>	<u>Measurement</u> <u>Frequency</u>	<u>Sample</u> <u>Type</u>
Flow; mgd ¹	1.5	Report	Continuous	Recorder
TSS; mg/L	Report	Report	2/Week	Grab
pH Range; Standard Units ²		6.5 to 8.0	2/Week	Grab
Aluminum; mg/L		Report	1/Month	Grab
Polymer Treated Filter Backwash Study	See Part I.B.			
<u>During the period June 1 - October 31</u> Turbidity (Effluent) ^{12, 14} ; NTU	Report	Report	2/Month	Composite ¹⁵
Turbidity, Upstream ^{12, 13, 14} ; NTU	Report	Report	2/Month	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at a location that provides a representative analysis of the discharge, unless otherwise specified.

See Pages 5 and 6 for an Explanation of the Superscripts.

EXPLANATION OF SUPERSSCRIPTS TO PARTS I.A.1, A.2, AND A.3 on pages 2, 3 AND 4:

1. The effluent flow shall be continuously measured and recorded using a flow meter and totalizer.
2. State of New Hampshire certification Requirement; see Part I.E.1.a.
3. Acute toxicity tests shall follow the protocols in Attachment A. LC50 is the concentration of wastewater (effluent) causing mortality to 50 percent of the test organisms. The "100 percent" limit is defined as a sample which is composed of 100 percent effluent (See A.1 and A.3 on Page 2 and 4 of Part I and Attachment A of Part I). The limit is considered to be a maximum daily limit.
4. Chronic toxicity tests shall follow the protocols in Attachment A. C-NOEC is defined as the chronic no observed effect concentration which is the highest concentration of effluent to which organisms are exposed in a life cycle or partial life cycle test which causes no adverse effect on growth, survival, or reproduction where the test results (growth, survival and/or reproduction) exhibit a linear dose-response relationship. The "5.6 percent or greater" limit is defined as a sample which is composed of 5.6 percent effluent, the remainder being dilution water. (See A.1 and A.5 on Page 2 and 6 of Part I and Attachment A of test results do not exhibit a linear dose-response relationship, report the lowest effluent concentration where there is no observable effect.
5. The effluent from Outfall 017 shall be analyzed for Escherichia coli during the first 12 month period this permit is effective. The average monthly value for Escherichia coli shall be determined by calculating the geometric mean and the result reported. Escherichia coli shall be tested using test methods 9221-B.1 and 9221-F found in Standard Methods for the Examination of Water and Wastewater, 19th or subsequent Edition(s) or test method 1103.1 found in Test Methods for Escherichia coli and Enterococci in Water by the Membrane Filter Procedure, EPA /600/4-85/076 as amended by test method 9213 D.3. found in Standard Methods for the Examination of Water and Wastewater, 19th or subsequent Edition(s) as approved in 40 CFR 136.
6. The effluent from Outfall 017 shall be analyzed for Benzo(b)Fluoranthene using 40 CFR §136, Appendix A, Method 625 during the first 12 month period this permit is effective. The reportable concentration is based on the minimum level (ML) which is defined as 10 ug/L for this permit. This ML value may be reduced using a minor permit modification as more sensitive test methods are approved by EPA and the State. Any value below 10 ug/L shall be reported as NON-DETECT.
7. The effluent turbidity measurements shall be taken within the same 24-hour period as the Connecticut River turbidity measurements to obtain concurrent turbidity measurements.
8. The permittee shall measure the turbidity of the Connecticut River at a sampling site located upstream of the facility and selected to represent the naturally occurring conditions in the Connecticut River prior to mixing with any discharge from the facility. Within 30 days of the effective date of the final permit modification, the permittee shall submit in writing the location of the upstream sampling site to the EPA and New Hampshire Department of Environmental Services (NHDES) for review and approval. Turbidity sampling shall commence at the selected upstream sampling site and shall continue unless written notice providing a different sampling site is received from EPA or the NHDES.
9. The pH of the discharge shall be in the range of 6.5 to 8.0 Standard Units (S.U.) unless the upstream ambient pH in the Upper Ammonoosuc River is outside of this

range and is not altered by the facilities discharge or activities. If the permittee's discharge pH is lower than 6.5 S.U. the permittee may demonstrate compliance by showing that the discharge pH was either: (a) higher than, or (b) no more than 0.5 S.U. lower than the ambient upstream river water pH. If the permittee's discharge pH is higher than 8.0 S.U. the permittee may demonstrate compliance by showing that the discharge pH is either: (a) lower than, or (b) no more than 0.5 S.U. higher than the upstream river water pH. Sampling of upstream river water pH necessary to demonstrate compliance must be collected on the same day as the discharge pH. State of New Hampshire certification Requirement.

10. Discharge Event is the total number of days a discharge occurs during the month. The No Discharge Indicator Code (NODI) is entered on the monthly Discharge Monitoring Report (DMR) when there is no discharge.
11. During the first 12 month period this permit is effective, the measurement frequency is 2/Week. After this 12 month period, the measurement frequency is 2/Month.
12. The effluent turbidity measurements shall be taken within the same 24-hour period as the Upper Ammonoosuc River turbidity measurements to obtain concurrent turbidity measurements. If there is no discharge from Outfall 018 during the month, the upstream turbidity sampling in the Upper Ammonoosuc River is not required for that month.
13. The permittee shall measure the turbidity of the Upper Ammonoosuc River at a sampling site located upstream of the facility and selected to represent the naturally occurring conditions in the Upper Ammonoosuc River prior to mixing with any discharge from the facility. Within 30 days of the effective date of the final permit modification, the permittee shall submit in writing the location of the upstream sampling site to the EPA and NHDES for review and approval. Turbidity sampling shall commence at the selected upstream sampling site and shall continue unless written notice providing a different sampling site is received from EPA or the NHDES.
14. The permittee shall conduct turbidity testing of the discharges from Outfalls 017 and 018 following the procedures in Attachment B (Bench Scale Turbidity Testing Procedure) at the 2/Month measurement frequency. The turbidity testing results shall be reported as an attachment to the monthly DMR. If the discharge turbidity value for any Outfall effluent sample is less than 10 NTU, further turbidity testing (Bench Scale Turbidity Testing Procedure) for this particular Outfall sample is not required. If a discharge from Outfall 018 does not occur during the month, testing with the Bench Scale Turbidity Testing Procedure is not required for that month.
15. The composite sample is obtained throughout a representative backwash event of one sand filter bed. The composite sample consists of a series of grab samples collected during the sand filter bed backwash event.
16. ***The daily temperature value shall be determined by averaging the sample values recorded from 12:01 AM to midnight for each day of the month. The maximum daily discharge limitation is the highest allowable daily temperature value.***

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (Continued)

4. The permittee shall conduct acute and chronic toxicity tests on effluent samples from Outfall 017 using two species, Daphnid (Ceriodaphnia dubia) and Fathead

Minnow (Pimephales promelas) following the protocol in **Attachment A** (Freshwater Chronic Toxicity Test Procedure and Protocol dated December 1995). This test protocol includes the procedure to calculate an LC50 at the end of 48 hours for the two species.

The permittee shall only use an alternate dilution water for the chronic and modified acute Fathead Minnow (Pimephales promelas) tests with three controls: 1) alternate dilution water, 2) lab water, and 3) site water. The alternate dilution water must be of a known quality with water-quality characteristics such as organic carbon, total suspended solids, pH, specific conductivity, alkalinity and hardness similar to that of the Connecticut River. It is recommended that the permittee screen the alternate dilution water for suitability prior to toxicity testing.

Toxicity test samples shall be collected and tests completed during the calendar quarters ending March 31st, June 30th, September 30th, and December 31st each year. Toxicity test results are to be submitted by the 15th day of the month following the end of the quarter sampled. The chemical data for the alternate dilution water and the site water are to be submitted with the test results.

5. This permit shall be modified, or alternatively, revoked and reissued to incorporate additional toxicity testing requirements, including chemical specific limits, if the results of the toxicity tests indicate the discharge causes an exceedance of any State water quality criterion. Results from these toxicity tests are considered "New Information" and the permit may be modified as provided in 40 Code of Federal Regulations (CFR) §122.62(a)(2).
6. The discharge from Outfall 017, from Outfall 010, and from Outfall 018 shall be adequately treated to insure that the surface water remains free from pollutants in concentrations or combinations that settle to form harmful deposits, float as foam, debris, scum or other visible pollutants. These discharges shall be adequately treated to insure that the surface waters remains free from pollutants which produce odor, color, taste or turbidity in the receiving waters which is not naturally occurring and would render the receiving water unsuitable for its designated uses.
7. The permittee shall not utilize nor discharge pentachlorophenol or trichlorophenol.
8. The permittee shall notify the Director as soon as it knows or has reason to believe:
 - a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - (1) One hundred micrograms per liter (100 µg/l);
 - (2) Two hundred micrograms per liter (200 µg/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/l) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/l) for antimony;
 - (3) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR §122.21(g) (7); or
 - (4) Any other notification level established by the Director in

accordance with 40 CFR §122.44(f) and New Hampshire regulations.

- b. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant not currently limited in the permit or reported in the permit application in amounts that could cause or contribute to a violation of state water quality standards.
 - c. That any activity has occurred or will occur which would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"
 - (1) Five hundred micrograms per liter (500 $\mu\text{g/l}$);
 - (2) One milligram per liter (1 mg/l) for antimony;
 - (3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR §122.21(g)(7); or
 - (4) Any other notification level established by the Director in accordance with 40 CFR §122.44(f) and New Hampshire regulations.
 - d. That any activity has occurred or will occur which would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant not currently limited in the permit or reported in the permit application in amounts that could cause or contribute to a violation of state water quality standards.
 - e. That it has begun or expects to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant which was not reported in the permit application.
9. The discharge of toxic pollutants not currently limited in the permit or identified in the permit application in amounts that could cause or contribute to a violation of state water quality standards is prohibited.
10. This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable standard or limitation promulgated or approved under sections 301(b)(2)(C) and (d), 304(b)(2), 307(a)(2), and 316(b) of the Clean Water Act, if the effluent or intake standard or limitation so issued or approved:
- (i) Contains different conditions or is otherwise more stringent than any effluent limitation or intake standard in the permit; or
 - (ii) Controls any pollutants not limited in the permit.
- The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.
11. The permittee shall report any incidence of fish mortality in the Connecticut River associated with the thermal plume from Outfall 0017 following the requirements in Part I.C.7 of this permit.
12. The discharge from Outfall 017, from Outfall 010, and from Outfall 018 shall not cause a violation of the water quality standards of the receiving water. This is a State of New Hampshire certification Requirement.

13. *The temperature difference between a representative cross-sectional average water temperature at a Connecticut River location upstream of Outfall 017 and the cross-sectional average water temperature 400 meters downstream of Outfall 017 shall not exceed 1.6 °F at any time.*

B. POLYMER TREATED FILTER BACKWASH WATER STUDY FOR OUTFALL 018

1. During the first 18 month period this permit is effective, the permittee shall collect composite samples for Whole Effluent Toxicity testing consisting entirely of polymer treated filter backwash water during a typical spring and fall backwash event concurrent with a high flow and turbidity event in the Upper Ammonoosuc River. Chronic Toxicity testing shall be performed on these samples following the test procedure and protocol in Attachment A. The Residual Polymer shall be measured by BETZ Cationic Polymer QAC Tests Method, BPR 3763-PS 8/93, or an equivalent method. The quantity of unreacted polymer in the filter backwash water and the toxicity test results required to be submitted by Attachment A, Section VIII are to be reported by June 15, 2007.
2. As an alternative to the polymer study testing requirements in Part I.B.1, the available chronic toxicity test results and residual polymer levels obtained during the two events specified in Part I.B.1 may be submitted to meet the conditions in this Part.

C. BEST TECHNOLOGY AVAILABLE FOR COOLING WATER INTAKE STRUCTURES

Each cooling water intake structure (CWIS) shall be designed, maintained, and operated by the permittee to meet the following requirements, which reflect the Best Technology Available (BTA) for minimizing adverse environmental effects at this particular facility. The permit conditions in this provision apply to the CWIS up to and including the sand filter beds. For the purpose of this provision, "adult and juvenile fish" includes adult fish and juvenile fish, but not eggs or larvae.

The facility uses two cooling water intake structures: 1)the penstock intake, known as the primary CWIS, and 2)the fire water intake, known as the back-up CWIS. When not used as a cooling water source, the back-up CWIS may withdraw water for fire emergencies or routine flushing or testing of the fire system. If the primary CWIS is inoperable, the back-up CWIS may also be used for process water, including as cooling water. During such time, the intake of the back-up CWIS shall not exceed the maximum design capacity of the primary CWIS. The maximum design capacity of the primary CWIS is 8.9 mgd. All requirements listed for the primary CWIS in Part I.C. shall apply to the back-up CWIS whenever the back-up CWIS is withdrawing cooling water.

1. *All live adult and juvenile fish and other aquatic organisms impinged, entrained or trapped on or in the CWISs 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 will be removed from the trash racks and will not be discharged to the water.*
2. *The through-screen intake velocity of the primary CWIS, as measured or calculated at the existing bar rack, shall not exceed 0.5 ft/s at any time. The through-screen intake velocity of the back-up CWIS, as measured or calculated at the existing bar*

rack, shall not exceed 0.5 ft/s at any time that the back-up CWIS is used for the withdrawal of cooling water.

3. 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 CWISs throughout the year. All locations in the CWISs where fish could potentially be impinged or trapped shall be included as sampling sites. These sites shall include all of the sand filter beds in operation. As of February 1, 2007, there are 19 individual sand filter beds, 14 of which are generally in operation. Monitoring shall take place a minimum of five days each week and shall take place only when the CWIS is in use. On a day when monitoring is required, the inspections shall take place: (a) On days when there is only non-continuous backwashing, once a day in the morning, prior to starting the backwash cycle for that day, and (b) When any continuous backwashing of the filter beds occurs, twice a day with a minimum of an eight (8) hour separation between the two inspections within the same day. Monitoring shall be for all fish species. Monitoring logs shall include the following: date; time; mode of filter plant operation (non-continuous or continuous backwash); observer/operator; the CWIS intake that is withdrawing the water; filter bed number where fish are found; 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.
4. 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 in Part I.C.3, as well as a summary of the data. The initial Annual CWIS Biological Monitoring Report will contain monitoring and sampling information for the period from the effective date of this permit modification through December 31 of the same calendar year, and shall be due on February 15 of the following calendar year. Each subsequent report shall contain monitoring and sampling information for the period January 1 through December 31, and shall be due on February 15 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 CWISs that were monitored (filter bed number or other area), the specific sampling methods used, the date and time of sampling, the backwash mode (continuous or non-continuous), 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 CWISs on each date sampled, as well as any excursions from the CWIS Monitoring Program or plant 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.
5. The permittee shall submit a copy of all the reports required in this Part to EPA, NHDES, the U.S. Fish and Wildlife Service, and the New Hampshire Fish and Game Department (NHFGD) at the addresses listed in Part I.D.
6. The permittee shall give advance written notice to EPA and the Director of the Water Division of the New Hampshire Department of Environmental Services as soon as possible of any planned physical alterations, additions, or proposed changes to the location, design, or capacity of the facility's CWIS(s), including construction of a new bar rack in front of the existing bar rack. In this context, a proposed change

in "capacity" would include a proposed increase in the volume of water to be withdrawn, the rate of water withdrawal, and/or the velocity of water withdrawal through the facility's CWIS(s). Any such proposed changes in the location, design, or capacity of the intake structures will require the advance, written approval of EPA consistent with the requirements of 40 C.F.R. §§ 122.62, 122.63 and 124.5.

7. Any incidence of unusual numbers of fish impinged, which is defined as 24 or more fish observed in a 24 hour period, on the sand filter beds shall be reported to the EPA, the NHFGD, and the NHDES within 24 hours by telephone report as required in Part II.D.1.e of this permit. The written-confirmation report should include the following information:

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

D. MONITORING AND REPORTING

Monitoring results obtained during the previous one month shall be summarized for each month and reported on separate Discharge Monitoring Report Form(s) postmarked no later than the 15th day of the month following the completed reporting period. The first report is due on the 15th day of the month following the effective date of the permit.

Signed and Dated original DMRs and all other reports required herein, shall be submitted to the Director at the following address:

U.S. Environmental Protection Agency
Water Technical Unit (SEW)
P.O. Box 8127
Boston, Massachusetts 02114-8127

Duplicate signed copies of all reports and information required herein shall be submitted to the State at:

New Hampshire Department of Environmental Services
Water Division, Wastewater Engineering Bureau
29 Hazen Drive, P.O. Box 95
Concord, New Hampshire 03302-0095

The reports required in Part I.C shall also be submitted to the U.S. EPA Region I, the U.S. Fish and Wildlife Service, and the New Hampshire Fish and Game Department at the following addresses:

Manager Industrial Permits Branch
U.S. Environmental Protection Agency
Region 1, Office of Ecosystem Protection
1 Congress Street, Suite 1100 (CIP)
Boston, Massachusetts 02114-2023

Supervisor
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, New Hampshire 03301

Assistant Director
New Hampshire Fish and Game Department
11 Hazen Drive
Concord, New Hampshire 03301

New Hampshire Fish and Game
Department, Region I
629B Main Street
Lancaster, New Hampshire 03584

E. STATE PERMIT CONDITIONS

1. The permittee shall comply with the following conditions which are included as State Certification requirements.
 - a. The pH range of 6.5-8.0 Standard Units (S.U.) must be achieved in the final effluent unless the permittee can demonstrate to NHDES-WD: (1) that the range should be widened due to naturally occurring conditions in the receiving water or (2) that the naturally occurring receiving water pH is not significantly altered by the permittee's discharge. The scope of any demonstration project must receive prior approval from NHDES-WD. In no case, shall the above procedure result in pH limits less restrictive than applicable federal effluent limitation guidelines.
 - b. This NHDES Discharge Permit is issued by the EPA under Federal and State law. Upon final issuance by the EPA, the NHDES-WD may adopt this permit, including all terms and conditions, as a State permit pursuant to RSA 485-A:13. Each Agency shall have the independent right to enforce the terms and conditions of this Permit. Any modification, suspension or revocation of this Permit shall be effective only with respect to the Agency taking such action, and shall not affect the validity or status of the Permit as issued by the other Agency, unless and until each Agency has concurred in writing with such modification, suspension or revocation.

F. SPECIAL CONDITIONS

Whole Effluent Toxicity Test Frequency Adjustment

The permittee may submit a written request to the EPA requesting a reduction in the frequency (to not less than once per year) of required toxicity testing, after completion of a minimum of four (4) successive toxicity tests of effluent, all of which must be valid tests and demonstrate compliance with the permit limit(s) for whole effluent toxicity. Until written notice is received by certified mail from the EPA indicating that the Whole Effluent Testing requirement has been changed, the permittee is required to continue testing at the frequency specified in the respective permit.

pH Limit Adjustment

The permittee may submit a written request to the EPA requesting a change in the permitted pH limit range to be not less restrictive than 6.0 to 9.0 Standard Units found in the applicable National Effluent Limitation Guideline (The Pulp, Paper, and Paperboard Point Source Category, in 40 CFR Part 430) for this facility. The permittee's written request must include the State's approval letter containing an original signature (no copies). The State's letter shall state that the permittee has demonstrated to the State's satisfaction that as long as discharges to the receiving water from a specific outfall are within a specific numeric pH range the naturally occurring receiving water pH will be unaltered. That letter must specify for each outfall the associated numeric pH limit range. Until written notice is received by certified mail from the EPA indicating the pH limit range has been changed, the permittee is required to meet the permitted pH limit range in the respective permit.

G. REOPENER CONDITIONS

1. This Permit may be modified, or alternatively, revoked and reissued to include Aluminum, Benzo(b) Fluoranthene, and Escherichia coli limitations if the additional monitoring data indicate the discharge causes or contributes to an exceedance of the State's numeric water quality criteria for any of these pollutants. This Permit

maybe modified to include Turbidity limitations if the additional monitoring data indicate the discharge causes or contributes to an exceedance of the State's narrative water quality criterion.

2. This Permit may be modified, or alternatively, revoked and reissued to incorporate revised effluent limitations for the oxygen demanding pollutants, and to include additional limitations based on the Total Maximum Daily Load (TMDL) study or other pollution control or abatement measures developed by the NHDES or EPA concerning the Dissolved Oxygen and Aluminum water quality criteria exceedances in the Moore Reservoir impoundment.
3. The permittee may submit a written request to the EPA requesting a permit modification to reduce the turbidity sampling frequency, or to eliminate the turbidity sampling requirement entirely, after completion of a minimum of 20 sampling events. A turbidity sampling event consists of the complete set of effluent and upstream receiving water sampling results, and bench scale testing results.
4. The results from this TMDL study or the other identified actions, and the pollutant specific monitoring data are considered "New Information" and the permit may be modified as provided in 40 Code of Federal Regulations (CFR) §122.62(a) (2).
5. *The permittee may submit a written request to the EPA requesting a permit modification to reduce the frequency of CWIS monitoring, or to eliminate the CWIS monitoring requirement entirely, after completion of a minimum of one full year of CWIS monitoring and submission of the Annual CWIS Biological Monitoring Report that includes the data from that full year of CWIS monitoring.*

H. THERMAL DISCHARGE

1. Thermal Plume Monitoring

The permittee shall conduct thermal plume monitoring during at least one summer period following the thermal plume monitoring requirements in this part.

In order to verify the characteristics of the thermal plume from the facility during the warmest days of the year, the following thermal monitoring shall be performed during the first year that the permit is in effect within the time period specified. The permittee shall conduct field measurements to delineate the horizontal, vertical, and downstream extent, temperature and relative increase above ambient temperature of the thermal plume discharged from Outfall 017.

- a. All thermal plume field measurements described in section H.2 shall be obtained on a single day when the following criteria are met:
 1. Within the first time period of July 15 - August 31 after the effective date of this permit modification.

Field measurements must not be taken before 1:00 pm and all measurements must be collected by 5:00 pm, to the extent practicable. If measurements are not completed by 5:00 pm, temperature readings shall be retaken at all stations and depths identified at the CT Upstream Transect (defined in Part I.H.b.) once temperature measurement have been recorded at all stations. In addition, if measurements are not completed by 5:00 pm, the permittee shall

explain in the thermal plume monitoring report required in Part I.H.1.e the reason(s) why it was not practicable to complete the measurements by 5:00 pm.

2. On both the day preceding the thermal plume field measurement and the actual day of thermal plume field measurement, the Connecticut River flow, as measured at the North Stratford, NH gaging station (US Geological Survey gaging station number 01129500), is approximately 400 cfs.
 3. During a time period when the facility is discharging from Outfall 017 under operating conditions when the maximum daily flow equals or exceeds 4.5 mgd and the maximum daily temperature equal or exceeds 86 °F. The discharge flow and temperature shall be as constant as practical when field measurements are taken.
 4. On a day when ambient air temperatures are at or near representative high summer temperatures based on available weather data.
 5. If one or more of the above criteria cannot be met within the first July 15 - August 31 time period after the effective date of this permit modification, then the specified field measurements will be conducted within the next following July 15 - August 31 time period when all criteria are met.
- b. The permittee shall establish four bank-to-bank transects that are perpendicular to the flow of the river. One transect shall be located just upstream of the confluence of the Connecticut River and the Upper Ammonoosuc River on the Connecticut River (CT Upstream Transect); one transect shall be located 200 meters downstream of Outfall 017 (CT 200 Downstream Transect); one transect shall be located 400 meters downstream of Outfall 017 (CT Downstream Transect), which the permittee has predicted to be the closest distance downstream where the plume is fully mixed; and one transect shall be located just upstream of the confluence of the Connecticut River and the Upper Ammonoosuc Rivers on the Upper Ammonoosuc River (Upper Ammonoosuc Transect). The CT Upstream Transect shall be located far enough upstream to show no influence from the Upper Ammonoosuc River. The Upper Ammonoosuc Transect shall be located far enough upstream to contain no influence from the Connecticut River.

Each transect shall be made up of five temperature measurement stations, spaced equally along the transect. The edge of the river along each bank will not be part of the measurement stations. The location of the stations along the transect may be estimated in the field. The stations shall be labeled 1 to 5, with Station 1 closest to the left bank facing upstream (Vermont bank) and Station 5 closest to the right bank facing upstream (New Hampshire bank) for the Connecticut River Transects and 1 to 5, with Station 1 closest to the left bank facing upstream and Station 5 closest to the right bank facing upstream at the Upper Ammonoosuc River Transect.

At each station, temperature measurement values to the nearest 0.5 degrees Fahrenheit shall be recorded in degrees Fahrenheit at a near-surface depth (approximately 0.5 meters below the surface), a near-bottom depth (approximately 0.5 meters above the bottom), and three equally spaced depths in-between. If any station has a water depth of two meters or less, then

temperatures shall be recorded at only three depths, a near-surface, a mid-depth, and a near-bottom location.

- c. The CT Upstream Transect shall first be established. Station 1 of the CT Upstream Transect shall be the first station where temperature measurements are taken. When temperatures at the required depths have been recorded at the first station of the CT Upstream Transect, the next station to be measured shall be the CT 200 Downstream Transect Station 1. When all temperature depths have been recorded at this station, the next station to be measured shall be the CT Downstream Transect Station 1. When all temperature depths have been recorded at this station, the next station to be measured shall be the CT Upstream Transect Station 2. When all temperature depths have been recorded at this station, the next station to be measured shall be the CT 200 Downstream Transect Station 2 and then CT Downstream Transect Station 2. This sequence shall be repeated for Stations 3, 4 and 5 on the Connecticut River. Once all measurements are taken on the Connecticut River, then all five Upper Ammonoosuc River Transect Stations shall be measured in sequence.
- d. The following information shall be recorded:
1. Water surface elevation in the Connecticut River in the vicinity of the confluence of the Connecticut River and the Upper Ammonoosuc River. Water surface elevation shall be recorded twice, once before monitoring begins and once after all field measurements have been taken.
 2. The distance of the four transects from Outfall 017.
 3. The distance between stations along each of the four transects.
 4. The time, depth, transect and station location for each temperature measurement taken, along with the water temperature at each specified depth.
 5. Outfall 017 discharge flow and temperature every 15 minutes beginning at least four hours before field measurements are taken and ending after field measurements are concluded.
 6. Ambient air temperature every 15 minutes beginning at least four hours before field measurements are taken and ending after field measurements are concluded (if possible).
 7. Connecticut River flow in the vicinity of the facility, as calculated from the nearest upstream USGS Connecticut River gauge. River flow shall be calculated for 15 minute intervals beginning at least two days before field measurements are taken and ending after measurements are concluded (if possible).
- e. A report shall be submitted to EPA, NHDES, and NHFGD within 30 days of the field event. The report shall include river profiles at each transect with distances, shorelines, water levels, and temperatures identified. The report also will include all data collected as well as a delta T calculation, comparing the temperatures taken at corresponding transect stations and depth locations at the CT Upstream Transect, the CT 200 Downstream Transect, and CT Downstream Transect. A delta T calculation will also be done by comparing corresponding transect stations depth

locations from the Upper Ammonoosuc River Transect with the CT 200 Downstream Transect and the CT Downstream Transect. If additional temperature data was collected during the late afternoon at the CT Upstream Transect, compare this data with temperatures measured at the same transect earlier to determine changes in the river temperature and make appropriate adjustments to the overall dataset. The report also shall include an assessment of whether or not the sampling conditions on the day of the field measurements represented typical or worst case thermal conditions in the Connecticut River, the discharge, and the air temperature.

2. Continuous Temperature Monitoring

The continuous temperature monitoring shall be conducted annually by the permittee during the period May 1 to September 30 following the continuous temperature monitoring requirements in this part.

- a. Beginning on May 1 and continuing through September 30 each year, the permittee shall deploy continuous temperature monitors at three locations in the vicinity of the Wausau Paper facility and collect and report continuous in-stream temperatures from each location.
- b. One monitor shall be placed upstream of Outfall 017 in the Connecticut River near the location of the CT Upstream Transect. One monitor shall be placed in the Upper Ammonoosuc River near the location of the Upper Ammonoosuc Transect, and one monitor shall be placed 400 meters downstream of Outfall 017, at a location near the Vermont side of the Connecticut River within the CT Downstream Transect, which is where the permittee has predicted the thermal plume from the facility to be fully mixed. Each monitor shall be placed in a location expected to sample a representative river temperature and must be positioned at a depth of at least one meter. Each monitor shall record and store a temperature in degrees Fahrenheit at least once every thirty minutes.
- c. The monitors shall be calibrated, maintained and used in accordance with the manufacturer's specifications.
- d. If on May 1 of any year the water level in either the Upper Ammonoosuc River or the Connecticut River would make deployment of the continuous temperature monitors unsafe, the permittee may wait until water level conditions are safe to deploy these monitors. If the permittee is unable to deploy these monitors by June 1 in any year due to water level conditions, the permittee shall: notify EPA in writing by the third business day after June 1 that it was unable to deploy the monitors by June 1; deploy the monitors as soon as it is safe to do so; and notify EPA in writing by the third business day after it has deployed the monitors. The requirements in sections a. to d. of this part are applicable following deployment of the continuous temperature monitors.
- e. Within 10 days after a month where continuous temperature data has been collected, the raw temperature data collected in the previous month shall be submitted to EPA, NHDES and NHFGD in an electronic format compatible with Microsoft Excel. By October 31 each year, a report shall be submitted to EPA, NHDES and NHFGD containing a graphical representation of the continuous data collected at the three locations from May 1 through September 30. The raw temperature data shall also be submitted in an electronic format compatible with Microsoft Excel.

Information on the published accuracy and precision of the temperature monitoring instruments used, along with any explanation of missing data, suspect data, or excluded data shall also be included in the report.

For purposes of this section, the raw temperature data in an electronic format compatible with Microsoft Excel shall be submitted to the following addresses:

Manager Industrial Permits Branch
Attn: John H. Nagle
U.S. Environmental Protection Agency
Region 1, Office of Ecosystem Protection
1 Congress Street, Suite 1100 (CIP)
Boston, Massachusetts 02114-2023

New Hampshire Fish and Game Department
Attn: John Magee
11 Hazen Drive
Concord, New Hampshire 03301

New Hampshire Department of Environmental Services
Attn: Dan Dudley
Water Division, Wastewater Engineering Bureau
29 Hazen Drive, P.O. Box 95
Concord, New Hampshire 03302-0095

- f. As part of the second year's continuous temperature data collection report specified in Part I.H.2.d, the permittee shall propose monitoring studies and biological studies necessary to determine the impact of the thermal discharge on biological communities. Alternatively, the permittee may submit a written report explaining why, in its view, such studies are not necessary at that time, based on a demonstration of thermal impacts using existing data and a comparison between the observed temperatures and those required for aquatic life in the river.
- g. Based on a review of the continuous temperature monitoring data, the permittee, NHDES, or NHFGD may submit a written request to EPA, requesting a change of the location and/or depth of a monitor or monitors to better measure the representative river temperature in the area(s) described above. EPA may direct the permittee to change the location and/or depth of a monitor or monitors based on this written request or on EPA's review of these temperature monitoring data.
3. If the results of the thermal plume monitoring or continuous temperature monitoring indicate that the discharge causes or contributes to an exceedance of any State water quality criterion, then those results may be considered "New Information" under 40 CFR 122.62(a)(2). In that event, this permit may be modified, or alternatively, revoked and reissued to incorporate additional and or revised requirements, including requirements for further study and/or revised effluent limitations under Part I.A.1 of this permit.

ATTACHMENT B

Bench Scale Turbidity Testing Procedure

I. General Requirements

The permittee shall conduct turbidity testing of the discharges from Outfalls 017 and 018 in accordance with the Bench Scale Testing Procedure described below. The turbidity test results shall be reported as described in Section IV.

II. Bench Scale Turbidity Testing Procedure For Outfall 017

1. The effluent and the upstream Connecticut River samples are collected as specified in Part I.A.1 of the permit. These samples are also used to conduct the Bench Scale Turbidity Testing.
2. Combine the Outfall 017 effluent sample and the upstream Connecticut River sample to obtain the 1.0 dilution value sample. The volumes of the Connecticut River and effluent to prepare the sample for the Bench Scale Turbidity Procedure are calculated using the following equation:

$$\text{River Flow} = 17.7 (\text{Dilution Value}) (\text{Effluent Flow}) - \text{Effluent Flow}$$

where:

Dilution Value is 1.0.

Effluent Flow is the predetermined effluent volume such as 20 milliliters.

River Flow is the sample volume of the Connecticut River to combine with the effluent sample for the turbidity analysis.

The volumes of the Connecticut River and effluent to prepare the sample are provided in Table 1.

Table 1. Bench Scale Turbidity Testing Sample Volumes for Outfall 017

Dilution Value	Volume of Outfall 017 Effluent Sample (ml)	Volume of Connecticut River Sample (ml)
1.0	20	334

3. Measure and record the turbidity in Nephelometric Turbidity Units (NTUs) for the 1.0 dilution value.

III. Bench Scale Turbidity Testing Procedure For Outfall 018

1. The effluent and the upstream Upper Ammonoosuc River samples are collected as specified in Part I.A.3 of the permit. These samples are also used to conduct the Bench Scale Turbidity Testing.

ATTACHMENT B

2. Combine the Outfall 018 effluent sample and the upstream Upper Ammonoosuc River sample to obtain the 1.0 dilution value sample. The volumes of the Upper Ammonoosuc River and effluent to prepare the sample for the Bench Scale Turbidity Procedure are calculated using the following equation:

$$\text{River Flow} = 19.1 (\text{Dilution Value}) (\text{Effluent Flow})$$

where:

Dilution Value is 1.0.

Effluent Flow is the predetermined effluent volume such as 20 milliliters.

River Flow is the sample volume of the Upper Ammonoosuc River to combine with the effluent sample for the turbidity analysis.

The volumes of the Upper Ammonoosuc River and effluent to prepare the samples are provided in Table 2.

Table 2. Bench Scale Turbidity Testing Sample Volumes for Outfall 018

Dilution Value	Volume of Outfall 018 Effluent Sample (ml)	Volume of Upper Ammonoosuc River Sample (ml)
1.0	10	191

3. Measure and record the turbidity in Nephelometric Turbidity Units (NTUs) for the 1.0 dilution value.

IV. Bench Scale Turbidity Test Reporting

The turbidity test results are reported for Outfalls 017 and 018 and will include the following:

- Description of the sample collection process and the site description.
- Any observations of test or site conditions affecting the test results.
- Report the turbidity readings as follows:

<u>Turbidity Range, NTU</u>	<u>Report to the Nearest NTU</u>
0-1.0	0.05
1-10	0.1
10-40	1
40-100	5
100-400	10
400-1000	50
>1000	100

- Tabulation of the turbidity results with the dilution value indicated and the results provided for each set of outfall and receiving water samples collected during the month.

RESPONSE TO COMMENTS
ISSUANCE OF MODIFICATION FOR NPDES PERMIT NO. NH0001562
WAUSAU PAPER PRINTING & WRITING, LLC
GROVETON, NEW HAMPSHIRE

The U.S. Environmental Protection Agency (EPA) and the New Hampshire Department of Environmental Services, Water Division (NHDES-WD) solicited public comments from August 16, 2007 through September 14, 2007, on the draft National Pollutant Discharge Elimination System (NPDES) permit modification to be issued to Wausau Paper Printing & Writing, LLC (Wausau) formerly named Wausau Papers of New Hampshire, Inc. This permit modification authorizes revisions to the temperature limits for the discharge of treated process wastewaters into the Connecticut River (Outfall 017), intake structures requirements, and reporting requirements. This permit modification authorizes the following new requirements: a permit reopener condition for the CWIS monitoring requirements, thermal plume and temperature monitoring requirements, and a temperature increase limit in the Connecticut River.

During the public comment period, the permittee, National Marine Fisheries Service, and New Hampshire Fish and Game Department submitted comments on the draft permit modification. Following is a response to these comments, including identification and explanation of those provisions of the draft permit modification which have changed in the final permit modification.

These responses and associated comments complement the statement of basis and the draft permit modification. The statement of basis was prepared to support the draft permit modification. The "Response To Comments" is a response to each significant written comment received by EPA. The reader will need to be familiar with the draft permit modification and statement of basis, the applicable federal NPDES permit regulations, and the State of New Hampshire's surface water quality standards regulations and State Statutes to understand the responses and associated comments. The New Hampshire water quality standards establish designated uses for the State's waters and contain narrative and numeric criteria to protect such uses - see RSA § 485-A:8 and the N.H. Code of Administrative Rules, Env-Ws 1700-1709 (December 1999).

The original comments form a part of the NPDES Permit file and are summarized and condensed in this document.

EPA's decision-making for this permit has benefited from the comments submitted. The information and arguments submitted in the comments resulted in a number of improvements to the permit. In addition, EPA noted some errors in the permit which were corrected. Changes from the Draft Permit Modification, summarized below, are reflected in the Final Permit Modification. These changes do not represent significant changes from the Draft Permit Modification.

Changes Made in the Final Permit

1. Part I.C.2 has been changed to specify that the intake velocity limit must be attained at the existing bar rack.

2. Part I.C.6 has been changed to clarify that construction of a new bar rack is among the changes to the CWIS that would require advance written approval from EPA.
3. Part I.H.1 has been changed to include an additional Connecticut River transect in the thermal plume field measurement program.
4. Part I.H.1.e has been changed to allow the thermal plume field measurement program to extend beyond 5:00 pm if it is not practicable to complete all measurements by 5:00 pm, with additional requirements that must be met if in fact measurements are not completed by 5:00 pm.
5. Part I.H.2 has been changed to allow for adjustment of the placement of the temperature monitors following a review of previous data.
6. Part I.H.2 has been changed to require submission of the monthly continuous temperature data to EPA, NHDES-WD, and NHFGD within ten days of the end of the month.

Wausau Paper Printing & Writing, LLC

COMMENT NO. 1: Wausau Paper Printing & Writing appreciates the fact that many of the changes we requested have been incorporated into this permit modification concerning the Cooling Water Intake Structure (CWIS) and the Thermal Discharge.

RESPONSE NO. 1: EPA acknowledges Wausau's comments based on EPA's modification of certain conditions of Wausau's NPDES permit issued in 2005. The statement of basis for the second permit modification discusses Wausau's permit modification request and explains the development of the permit provisions in the draft permit modification that was on public notice through September 14, 2007.

COMMENT NO. 2: The draft permit (Part I.C.2, page 9) indicates that the through-screen intake velocity of the primary CWIS be measured or calculated "at the bar rack". Wausau requests that the maximum through screen velocity limit be imposed not at the bar rack but rather at the surface of the sand filters, which is the only location where impingement of fish could occur in the system. This change would reflect the scientific basis¹ for the 0.5 ft/sec "through-screen velocity" limit as well as the definitions and concepts developed in the 316(b) rulemaking process.

For reference, pertinent definitions provided in the 316(b) rulemaking process are provided below:

Design intake velocity (Phase I Proposed Rule, 65 FR 49088) is defined as "the value assigned during the design phase of a cooling water intake structure to the average speed at which intake water passes through the open area of the intake screen or other device against which organisms might be impinged or through which they might be entrained. This is equivalent to the through-screen or through-technology velocity."

Impingement: The Phase II Rule (69 FR 41586) states "Impingement takes place when organisms are trapped against intake screens by the force of the water being drawn through the cooling water intake structure. The velocity of the water withdrawal by the cooling water intake structure may prevent proper gill movement, remove fish scales, and cause other physical harm or death of affected organisms through exhaustion, starvation, asphyxiation, and descaling. Death from impingement ("impingement mortality") can occur immediately or subsequently as an individual succumbs to physical damage upon its return to the waterbody."

¹ From 66 FR65274: "To develop an appropriate minimum velocity requirement at cooling water intake structures that will be effective in contributing to the overall reduction in impingement, EPA reviewed available literature, State and Federal guidance, and regulatory requirement. EPA found that an approach velocity of 0.5 ft/s has been used as guidance in at least three Federal documents. (refs 32 33 34 – see 66FR65274) The 0.5 ft/s approach velocity threshold recommended in the Federal documents is based on a study of fish swimming speeds and endurance performed by Sonnichsen et al. (1973).\35\ This study was based on an unknown number of individuals from about 30 different species of fish and eels, with many of the data for adult fish. The three Federal documents recommending a 0.5 ft/s intake velocity often referred to one another or had no references. The lack of abundant and diverse data led EPA to adopt a safety factor to ensure an appropriate level of protection for aquatic organisms. This study concluded that appropriate velocity thresholds should be based on the fishes' swimming speeds (which are related to the length of the fish) and endurance (which varies seasonally and is related to water quality). The data presented showed that the species and life stages evaluated could endure a velocity of 1.0 ft/s. To develop a threshold that could be applied nationally and is effective at preventing impingement of most species of fish at their different life stages, EPA applied a safety factor of two to the 1.0 ft/s threshold to derive a threshold of 0.5 ft/s."

Entrainment: The Phase II Rule (69 FR 41586) states “Entrainment occurs when organisms are drawn through the cooling water intake structure into the cooling system. Organisms that become entrained are typically relatively small, aquatic organisms, including early life stages of fish and shellfish. Many of these small, fragile organisms serve as prey for larger organisms higher on the food chain which are commercially and recreationally desirable species. As entrained organisms pass through a facility's cooling system they may be subject to mechanical, thermal, and at times, chemical stress. Sources of such stress include physical impacts in the pumps and condenser tubing, pressure changes caused by diversion of the cooling water into the plant or by the hydraulic effects of the condensers, sheer stress, thermal shock in the condenser and discharge tunnel, and chemical toxic effects from antifouling agents such as chlorine. Similar to impingement mortality, death from entrainment can occur immediately or subsequently as the individual succumbs to the damage from the stresses encountered as it passed through the cooling water system once it is discharged back into the waterbody.”

It should be noted that there is no through-screen or through-technology velocity that has been established for or would cause adverse impact due to entrainment. In fact, entrainable organisms in the Upper Ammonoosuc River most likely experience naturally occurring water velocities in the river that are greater than the maximum velocities experienced in the Wausau water intake system.

Secondly, the potential impingement surface in the Wausau water system is the sand filter bed. During normal operations, a water depth of at least 6 inches is maintained above the sand filter surface, and the velocity through the sand beds (i.e. between the sand particles) is less than 0.05 ft/sec, a factor of 10 below the 0.5 ft/sec guideline. Therefore, there is virtually no likelihood that a healthy, free-swimming fish that enters the system will be impinged against the surface of the sand filter bed, and no physical stresses on fish are likely.

Furthermore, if a 0.5 ft/sec velocity limit is imposed at the bar rack, an acceptable technology solution would be to construct a larger bar rack in front of the existing bar rack. However, such a solution would result in no change in the potential for impingement and entrainment impacts; that is, a free-swimming fish that could fit through the new bar racks would be subject to the existing conditions once it had reached the current location of the bar rack.

In summary, Wausau requests that the location of the 0.5 ft/sec through-screen velocity limit be the surface of the sand filter beds, the only place where impingement could occur in the system.

RESPONSE NO. 2: EPA does not agree with the permittee that the compliance point for the 0.5 ft/sec through-screen velocity limit should be moved from the existing bar rack of the CWIS to the surface of the sand filters. One objective of requiring a 0.5 ft/sec limit at the existing bar rack is to minimize the impingement of larger fish against the bar rack, the function suggested in the permittee's comment. However, another objective of requiring a 0.5 ft/sec limit at the existing bar rack is to minimize the entrainment of adult and juvenile fish through the bar rack. Such entrainment removes these organisms from their natural habitat in the Upper Ammonoosuc River and places them in the environment of the CWIS and sand filter beds, which in turn, jeopardizes their survival as described below. This second objective is consistent with the description of “design intake velocity” (from the Phase I Proposed Rule, 65 FR 49088) referenced in the permittee's Comment No. 2. The preamble to the Proposed Phase I Rule

(which, like the now-suspended Phase II Rule, is not applicable to this facility) specifically identifies entrainment as one impact of excessive through-screen velocity, and a through-screen velocity limit is appropriate for this best technology available determination to minimize adverse environmental impacts. A through-screen velocity limit of 0.5 ft/sec at the existing bar rack will allow most smaller adult and juvenile fish to resist the intake flow of the facility and allow fish that do move past the bar rack to swim back through the bar rack to the river.

EPA recognizes that the existing configuration of the CWIS at Wausau does not expose most adult and juvenile fish to a more common form of adverse environmental impact, where organisms are impinged against a structure through which they cannot pass and from which they cannot readily escape. (For example, at many facilities, adult and juvenile fish may be impinged on a ¼ inch mesh rotating screen in close proximity to a bar rack and are then removed from the screen by a low pressure spray wash and returned to the water body via a fish return trough.) Instead, at the Wausau CWIS, fish that are drawn by the intake flow between the bar racks may be unable to swim against the intake flow at the bar rack, when intake velocities exceed 0.5 ft/sec and go as high as 0.58 ft/sec. Under these elevated velocity conditions, many fish are not expected to be able to swim back to the river. These fish are likely to ultimately be drawn into the facility and become trapped and collected at the sand filter beds. That is why EPA identified the sand filter beds as an appropriate monitoring point for impingement surveillance. The sand filter beds are not, however, an appropriate location to establish the through screen velocity limit of 0.5 ft/sec. A fish that reaches a sand filter bed has first experienced a through-screen velocity of as much as 0.58 ft/sec at the initial intake point of the bar racks and then has been transported into the facility by a flow as great as 1.45 ft/sec at the 42 inch intake pipe located at the bottom of the intake well. The 45 inch pipe travels underground for approximately 350 feet before it reduces to a 36 inch diameter pipe that is approximately 600 feet long, with a calculated velocity as great as 1.96 ft/sec (e-mail message from Paul Bugeau of Wausau to John Nagle of EPA, October 25, 2007). Establishing a protective velocity limit of 0.5 ft/sec only at the sand filter beds, which are “downstream” of these higher intake flows, would not protect against fish being drawn deep into the CWIS in the first place.

As discussed in Response to Wausau Paper Comment No. 3, EPA does not agree with the suggestion that no physical stresses on fish are likely to occur from their transport through the piping and valves of a facility at a velocity as great as 1.45 ft/sec in the 42 inch pipe and 1.96 ft/sec in the 36 inch pipe and their deposition onto a six inch film of water covering an industrial sand filter bed. Contact with the piping and valves at velocities of between 1.45 ft/sec and 1.96 ft/sec may prevent proper gill movement, remove fish scales, and cause other physical harm or death of affected organisms through exhaustion and descaling.

The commenter also suggested that an acceptable technology solution to achieve a 0.5 ft/sec through-screen velocity limit would be to construct a larger bar rack at the intake. Doing so, however, would not represent the best technology available for minimizing adverse environmental impact (BTA) under CWA 316(b) at Wausau. When EPA evaluated the existing Wausau CWIS, the very low impingement rate and minimal potential for ichthyoplankton entrainment were used to support the determination that an extensive construction modification of the intake structure was likely not necessary. EPA then determined that for the configuration of this existing CWIS, the most feasible and meaningful compliance point for a through-screen velocity limit was at the existing bar rack. The limit is for the existing bar rack, which is the nearest practical compliance point to where maximum velocity is achieved in the CWIS.

If a new CWIS were to be proposed, EPA would factor the age of the equipment into a new BTA determination and consider BTA requirements in line with a redesign of the CWIS. This would include an evaluation of a more restricted opening size for the intake screen (such as ¼ inch), new screen designs and locations, increased accessibility to portions of the CWIS, and the most appropriate compliance point for achieving a 0.5 ft/sec through screen velocity. As one alternative, EPA would evaluate the relocation of the velocity compliance point from the bar rack to the opening of the 42 inch intake pipe or the 36 inch pipe in the lower portion of the intake structure, where access is now limited. Using the 42 inch pipe as a compliance point, the maximum velocity at this location would be reduced from a maximum of 1.45 ft/sec to 0.5 ft/sec. Using the 36 inch pipe as a compliance point, the maximum velocity at this location would be reduced from a maximum of 1.96 ft/sec to 0.5 ft/sec. This alternative might be more appropriate under some CWIS redesign plans, but it also may be harder to access and demonstrate compliance. If the permittee submits a formal request to conduct a major redesign of the CWIS, EPA will consider these options as the process moves forward. The permit provision in Part I.C.6 of the Final Permit ensures that this reevaluation of BTA takes place prior to redesigning the CWIS, such as adding another screen. To clarify this point, “construct a new bar rack in front of the existing bar rack” has been added to Part I.C.6 of the Final Permit as an example of a change that would trigger this provision. In addition, Part I.C.3 has been modified to clarify that the 0.5 ft/sec through screen velocity limit applies to the existing bar rack.

Finally, Wausau claims that entrainable organisms in the Upper Ammonoosuc River most likely experience naturally occurring water velocities in the river greater than the maximum velocities experienced in the Wausau water intake system. EPA is not persuaded that this assertion is accurate, and even if it were true, it would carry little weight in the determination of the appropriate intake velocity limits. First, Wausau has provided no data to support that this area of the Upper Ammonoosuc River, which is regulated by two dams in the vicinity of the intake, experiences velocities of up to 1.96 ft/sec. But even assuming that fish do experience natural river velocities greater than 1.96 ft/sec in the Upper Ammonoosuc River, the fish are likely able to freely adjust their position and seek an area of the river with a current velocity better suited to their swimming capabilities. By contrast, fish that are pulled into the CWIS are unable to adjust their position. They are trapped in a dark, man-made water conveyance system, subjected to forceful contact with interior pipe walls, pipe bends and valves, and deposited onto a six inch film of water overlying the sand filter bed. These two scenarios are not comparable.

In conclusion, EPA has retained the 0.5 ft/sec through screen velocity limit at the existing bar rack of the Wausau CWIS. Changes have been made in the Final Permit to clarify this requirement. Part I.C.2 of the Final Permit has been changed to read

The through-screen intake velocity of the primary CWIS, as measured or calculated at the existing bar rack, shall not exceed 0.5 ft/s at any time. The through-screen intake velocity of the back-up CWIS, as measured or calculated at the existing bar rack, shall not exceed 0.5 ft/s at any time that the back-up CWIS is used for the withdrawal of cooling water.

. In addition, Part I.C.6 of the Final Permit has been changed to read

The permittee shall give advance written notice to EPA and the Director of the Water Division of the New Hampshire Department of Environmental Services as soon as possible of any planned physical alterations, additions, or proposed changes to the location, design, or capacity of the facility's CWIS(s), including construction of a new bar rack in front of the existing bar rack. In this context, a proposed change in "capacity" would include a proposed increase in the volume of water to be withdrawn, the rate of water withdrawal, and/or the velocity of water withdrawal through the facility's CWIS(s). Any such proposed changes in the location, design, or capacity of the intake structures will require the advance, written approval of EPA consistent with the requirements of 40 C.F.R. §§ 122.62, 122.63 and 124.5.

COMMENT NO. 3: Part I.C.7.(e), on page 11, states that the incident report should include “the remedial action the permittee will take to prevent, or reduce the likelihood of, a recurrence of the incident, to the maximum extent practicable.” Because of the very low “through-screen” velocity at the sand filter bed surface (less than 0.05 ft/sec), a fish that enters the system will not likely be physically impinged against the sand bed surface. Also, as required by condition Part I.C.1, Wausau will capture and return such fish to the river “by means designed to maximize their survival”.

Therefore, Wausau requests that such an incident be evaluated with regard to the potential adverse impact, if any, of the incident. Wausau requests that Part I.C.7.(e) be modified as follows:

“(e) The disposition and expected survival of the impinged fish. If less than 100% survival is reported, then the permittee shall include the remedial action to be taken to reduce impingement mortality and/or to prevent or reduce the likelihood of a recurrence of the incident, to the maximum extent practicable.”

RESPONSE NO. 3:

1. The provision of the permit being challenged by Wausau is routinely included in NPDES permits to alert EPA and state agencies (in this case, NHDES-WD and the New Hampshire Fish and Game Department (NHFGD)) if an unexpected, unusual impingement incident occurs. The purpose is to alert the agencies and allow for the evaluation of impingement events, not solely impingement mortality events. Even if there is no readily observed mortality when the fish are pulled into the facility through piping and valves and deposited on the sand filter beds, they are removed from their natural environment, and it is likely that the removal of fish from the river and their deposition on the sand filter bed would result in some amount of stress and injury to the fish. See also Response No. 2. This removal and transport of the fish, along with the associated stress or injury, in and of itself, is an adverse impact, and it is appropriate to take remediation action to minimize reoccurrence of this adverse impact.

2. The permittee’s assessment of impingement at the facility as well as the impingement monitoring data the permittee submitted to EPA were taken into consideration when EPA judged that the potential for impingement was likely very low at Wausau. As noted in the Statement of Basis, Wausau conducted a limited impingement study in 2006 that documented only two live

fish impinged against the sand filter beds over the course of seven months. See Statement of Basis at 12. This low observed impingement rate constituted part of the basis for EPA's determination that the existing CWIS at Wausau, with certain modifications and operational limitations described in the permit modification, represents BTA. An incident wherein 24 fish were impinged over the course of 24 hours would represent substantially more impingement than that reported to EPA and taken into consideration in developing this permit modification. If a substantial impingement event were to occur, Wausau would be required to take action to prevent a recurrence of an incident that, according to the information that Wausau submitted to EPA and upon which EPA (in part) based its determination, should not occur.

3. Finally, EPA notes that simply observing that a fish is still alive when removed from the sand filter bed is not a credible assessment that survival is achieved. The fish would have to be placed in a holding tank for some period of time and monitored to better judge the effects of its transport to the sand filter beds. Rather than prescribe a detailed study of the lethal and sub-lethal effects of an unusual impingement event, EPA has taken the more conservative approach of requiring the permittee to identify measures that will prevent a recurrence of the event in the first place.

Based on this analysis, EPA has retained Part I.C.7.(e) of the permit with no modifications. No change has been made to the Final Permit.

COMMENT NO. 4: Wausau has every intention to complete the field measurement program by 5:00 pm; however, unforeseen delays could occur during the field program, which could extend the measurement period slightly. Wausau requests that the words "to the extent practicable" be added to the permit condition in Part H.1.a.2 on page 13.

RESPONSE NO. 4: The objective of the one-time thermal plume measurement field event is to document the change in temperature of the Connecticut River resulting from the facility's thermal discharge. The measurements will be conducted under field conditions that present a number of environmental variables (some of which are stated in a memorandum submitted to Wausau Paper by ENSR, dated February 28, 2007, and subsequently provided to EPA by Wausau) that may interfere with the characterization of the thermal plume. A number of these interfering variables cannot be controlled or minimized during the field measurement event. Consequently, it is very important to complete the field measurement program in a short time frame in order to limit the variable of temperature change caused by the natural diel change in ambient water temperature of the river. This natural change in river temperature over time occurs in the summer during conditions that approach worst-case, as defined by the permit (relatively high ambient air temperature and low river flow).

For example, hourly ambient river data collected in the Connecticut River near West Springfield, Massachusetts between July 15 and August 31, 2006, document an increase in water temperature from 1:00 pm to 5:00 pm of as much as 0.4 °F (July 17 and 18; August 2 and 16, 2006). While this is not a large increase in temperature over time, it is noteworthy when compared with the delta T of 1.6 °F modeled by the permittee that is being verified by the thermal plume study required at Wausau. Allowing the field measurement program at Wausau to extend past 5:00 pm would likely introduce a problematic diel temperature change.

EPA believes that one way to manage this variable to the extent practicable is to conduct the sampling in as tight a time frame as reasonably possible. EPA stresses that the objective of the

field program is to complete all temperature measurements well before 5:00 pm. In order to complete the measurements in a timely manner it may be necessary for more than one temperature monitoring field crew to be used.

Despite the concern discussed above, EPA understands that some flexibility is appropriate when field work in the river is conducted. Consequently, EPA has added to Part I.H.1.a.1 the phrase “to the extent practicable,” along with three additional requirements. The first requirement is that if measurements are not completed by 5:00 pm, temperature readings shall be retaken at all stations and depths identified at the CT Upstream Transect, once temperature measurement have been recorded at all stations. (See Part I.H.1.a.1.) The second requirement is that the permittee explain in the thermal plume monitoring report required in Part I.H.1.e the reason(s) why it was not practicable to complete the measurements by 5:00 pm. (See Part I.H.1.a.1.) The third requirement is that temperature data from this late afternoon measurement at the CT Upstream Transect shall be compared with temperatures measured at the same transect earlier to determine changes in the river temperature and make appropriate adjustments to the overall dataset. (See Part I.H.1.e.)

National Marine Fisheries Service

COMMENT NO. 1: The Protected Resources Division (PRD) of the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) provided these comments in response to the public notice (Public Notice NH-19-07 dated August 16, 2007) of the draft NPDES permit modification for the Wausau Paper Printing & Writing facility in Groveton, New Hampshire. The receiving waters for the discharge are the Connecticut River and Upper Ammonoosuc River.

A population of the federally endangered shortnose sturgeon occurs in the Connecticut River downstream of the Turners Falls Dam. No listed species are known to occur in the Upper Ammonoosuc River. If the discharge from the Wausau facility is likely to affect water quality in this reach of the Connecticut River, EPA should initiate consultation pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, as amended, regarding the effects of this discharge on shortnose sturgeon. If water quality effects will be limited to waters where no listed species are known to occur, no further coordination with NMFS, PFD is necessary.

RESPONSE NO. 1: EPA acknowledges receipt of these comments submitted by the National Marine Fisheries Service, Protected Resources Division in a letter dated August 20, 2007. These comments and the original letter are filed in the administrative record for this final permit in NPDES permit file NH0001562.

As stated in the Fact Sheet, “While documented in the Connecticut River, the shortnose sturgeon is not thought to be found any further upstream than the Turners Falls Dam in Massachusetts. This restriction to upstream movement of the shortnose sturgeon is located over 150 river miles downstream of the facility. There are other dams located on the Connecticut River between the facility and the Turners Falls Dam, further limiting any upward migration of anadromous species.” Therefore, the discharge from Wausau Paper is not likely to affect water quality in the Connecticut River in the vicinity of the Turners Falls Dam. Since water quality effects will be limited to waters where no listed species are known, no consultation pursuant to Section 7 is required.

New Hampshire Fish and Game Department

COMMENT NO. 1: The New Hampshire Fish and Game Department (NHFGD) mentions that the thermal plume extent and characteristics in the Connecticut River should be more accurately defined. The same data required in Part I.H.1 (Thermal Plume Monitoring) should be required at a fourth cross section located in the Connecticut River about 200 meters downstream of outfall 017.

RESPONSE NO. 1: In order to define the extent and characteristics of the Wausau thermal plume, the permittee submitted CORMIX modeling results and a heat balance analysis using historical data (ENSR, February 28, 2007). EPA shares the concern of NHFGD that this information alone does not accurately define the thermal plume. It was this uncertainty that led EPA to require in the permit that the one-time thermal plume measurement program be conducted at three transects under conditions approaching worst-case.

NHFGD, which is familiar with stream conditions in the Connecticut River, has commented that, in order to define the thermal plume more accurately, one additional transect should be required at approximately the halfway point (200 meters downstream of Outfall 017) of the CT Downstream Transect (400 meters downstream of Outfall 017). Temperature data obtained from this mid-way transect would add information necessary to define the length of the thermal plume in the event that the CT Downstream Transect location 400 meter downstream does not represent the first location below the discharge where the thermal plume is fully mixed as predicted. As a result of this comment, EPA has reconsidered the likely variability in temperatures at various distances downstream of the discharge, and EPA has determined that there is sufficient uncertainty to warrant the additional transect. As part of this determination, EPA reconsidered information submitted by the permittee and further discussed in a conference call on June 12, 2007, when EPA and the permittee reviewed in-stream thermal predictions assembled by the permittee. During that call, a representative of the permittee acknowledged that the thermal plume model and heat balance analysis submitted by the permittee did not factor in the effect of the physical characteristics of the Connecticut River downstream of the discharge on the thermal plume. EPA has considered NHFGD's expertise in the physical characteristics of the Connecticut River and determined that the addition of one transect during the one-time thermal plume field measurement event is needed to better characterize the thermal plume. EPA does not view this addition as a significant additional burden to the field measurement program.

Therefore, EPA has modified Part I.H.1 to include the additional Connecticut River transect in the thermal plume field measurement program.

COMMENT NO. 2: Because there are currently no data to document the thermal conditions in the Connecticut and Upper Ammonoosuc Rivers, the NHFGD proposes that the permit (Part I.H.2) should allow for the flexibility to adjust the vertical and/or horizontal locations of the temperature monitors based on the data collected in the previous year. This will allow the permittee to more accurately document the thermal conditions of the Connecticut and Upper Ammonoosuc Rivers.

RESPONSE NO. 2: In consideration of this comment, EPA recognizes that no mechanism was included in the Draft Permit to allow the permittee, EPA, NHDES-WD, or NHFGD to address

the placement of one or more continuous temperature monitors, if data analysis determines that the location(s) selected does (do) not appear representative of temperature conditions in the river. EPA made a change to the Final Permit to address this situation by providing the flexibility necessary to obtain representative river temperatures considering the uncertainty of placing monitors in “untested” locations.

Based on this comment, EPA has revised Part I.H.2 to add a new paragraph that provides for adjusting the placement of the temperature monitors following a review of the temperature data.

COMMENT NO. 3: The NHFGD suggests that the permittee should submit to EPA the actual electronic data for the continuous monitors within 10 days of the end of each month for the months of June, July, August, and September. This will ensure that the monitors are working correctly and will allow the permittee to replace any non-functioning or lost monitors in a timely manner.

RESPONSE NO. 3: EPA agrees with this comment. The monitors will be placed in an active riverine environment from May through September of each year. If not checked periodically, any problems with the instruments (battery failure, leakage, movement downstream or loss) might possibly not be detected until the end of the monitoring season in September. Under this scenario, several months of data could be lost or determined to be suspect at one or more locations. Since only three monitors are required to be deployed for five months, any loss of useful temperature data would be especially problematic. The monthly download of raw data from the instruments and transmittal of the electronic temperature data to EPA, NHDES-WD, and NHFGD is reasonable and appropriate under the circumstances and will help ensure that meaningful temperature data are collected by the permittee and received by the agencies.

Based on this comment, EPA has revised Part I.H.2 to include submission of the monthly continuous temperature data, in a format compatible with Microsoft Excel, to EPA, NHDES-WD, and NHFGD.

CLARIFICATION: During the final permit issuance process for this second modification, it was brought to EPA’s attention by Wausau Paper Printing & Writing that the upstream turbidity requirement for outfall 018 in Part I.A.3 of the Permit does not specifically reference superscript no. 12. That superscript states:

The effluent turbidity measurements shall be taken within the same 24-hour period as the Upper Ammonoosuc River turbidity measurements to obtain concurrent turbidity measurements. If there is no discharge from Outfall 018 during the month, the upstream turbidity sampling in the Upper Ammonoosuc River is not required for that month.

Due to a scrivener’s error, the requirement of upstream turbidity sampling for outfall 018 in Part I.A.3 does not expressly cross-reference superscript no. 12. Although the text of superscript no. 12 is clear on this point, in order to avoid any possible confusion, a reference to superscript no. 12 has been added to the upstream turbidity sampling requirement in Part I.A.3. See 40 C.F.R. § 122.62.