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"),

The Town of Merrimack, New Hampshire

is authorized to discharge from the Wastewater Treatment Plant located at

36 Mast Road
Merrimack, New Hampshire 03452

to receiving waters named

Merrimack River (Hydrologic Basin Code: 01070002)

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein including, but not limited to, conditions requiring the proper operation and maintenance of the Merrimack Wastewater Treatment Plant collection system.

This permit will become effective on the first day of the calendar month immediately following sixty days after signature.

The Town of Bedford is a co-permittee for activities required in Part I.B. (Unauthorized Discharges), Part I.C. (Operation and Maintenance of the Sewer System), and Part I.D. (Alternate Power Source). The responsible municipal department is:

Town of Bedford
Department of Public Works
24 North Amherst Road
Bedford, New Hampshire 03110

This permit and the authorization to discharge expire at midnight, five (5) years from the effective date.

This permit supersedes the permit issued on September 25, 2007 which became effective on December 1, 2007.

This permit consists of **Part I (**15 pages including effluent limitations and monitoring requirements); **Attachment A** (USEPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol, February 2011, 8 pages); **Attachment B** (USEPA Region 1 Reassessment of Technically Based Industrial Discharge Limits, 9 pages); **Attachment C** (USEPA Region 1 NPDES Permit Requirement for Industrial Pretreatment Annual Report, 2 pages) and **Part II (**25 pages including NPDES Part II Standard Conditions).

Signed this 20th day of March, 2014.

/S/ SIGNATURE ON FILE.

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Ken Moraff, 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 expiration, the permittee is authorized to discharge treated domestic, commercial and industrial wastewater from outfall serial number 001 to the Merrimack River. Such discharges shall be limited and monitored by the permittee, as specified below. Samples taken in compliance with the monitoring requirements specified below shall be taken at a location that provides a representative analysis of the discharge.

Effluent Characteristic	Discharge Limitations			Monitoring Requirements	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Flow, Merrimack WWTF; mgd	5.0	Report	Report	Continuous Recorder[1]	
Flow, Brewery Waste; mgd	Report	Report	Report	Continuous Recorder[1]	
BOD_5; lb/day (mg/l)	1,199 (Report)	Report (Report)	2,581 (Report)	2/Week[2]	24 Hour Composite
TSS; lb/day (mg/l)	1,473 (Report)	Report (Report)	3,255 (Report)	2/Week[2]	24 Hour Composite
pH Range[3]; Standard Units	6.5 to 9.0 (See I.I.5., State Permit Conditions)			1/Day	Grab
Total Residual Chlorine[4,5]; mg/l	0.85	---	1.0	1/Day	Grab
Escherichia coli[4,6]; Colonies/100 ml	126	---	406	3/Week	Grab
Phosphorus; lb/d (Applicable April 1 through October 31)	164.8	---	---	1/Week	24 Hour Composite
Whole Effluent Toxicity LC50 [7,8,9]; Percent	100			1/Year	24 Hour Composite
Hardness[10]; mg/l	---	---	Report	1/Year	24 Hour Composite
Ammonia Nitrogen as N[10]; mg/l	---	---	Report	1/Year	24 Hour Composite
Total Recoverable Aluminum[10]; mg/l	---	---	Report	1/Year	24 Hour Composite
Total Recoverable Cadmium[10]; mg/l	---	---	Report	1/Year	24 Hour Composite
Total Recoverable Copper[10]; mg/l	---	---	Report	1/Year	24 Hour Composite
Total Recoverable Nickel[10]; mg/l	---	---	Report	1/Year	24 Hour Composite
Total Recoverable Lead[10]; mg/l	---	---	Report	1/Year	24 Hour Composite
Total Recoverable Zinc[10]; mg/l	---	---	Report	1/Year	24 Hour Composite

See pages 3 and 4 for footnotes

FOOTNOTES

1. The effluent flow shall be continuously measured and recorded using a flow meter and totalizer.

2. Effluent sampling frequency. The influent shall be sampled twice per month using 24-hour composite samples to be reported as a monthly average.

3. State certification requirement.

4. Monitoring for *Escherichia coli* bacteria as described in footnote (6) below shall be conducted concurrently with the daily monitoring for total residual chlorine (TRC) as described in footnote (5) below.

5. Total residual chlorine shall be measured using any one of the following three methods listed in 40 CFR Part 136:
   a. Amperometric direct.
   b. DPD-FAS.
   c. Spectrophotometric, DPD.

6. The average monthly value for *Escherichia coli* shall be calculated as a geometric mean. *Escherichia coli* shall be tested using an approved method as specified in 40 Code of Federal Regulations (CFR) Part 136, List of Approved Biological Methods for Wastewater and Sewage Sludge.

7. LC50 (lethal concentration 50 percent) is the concentration of wastewater causing mortality to 50 % of the test organisms. Therefore, a 100 % limit means that a sample of 100 % effluent (no dilution) shall cause no greater than a 50 % mortality rate in that effluent sample.

8. The permittee shall conduct 48-hour static acute toxicity tests on effluent samples following the February 2011 USEPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol (**Attachment A**). The two species for these tests are the daphnid (*Ceriodaphnia dubia*) and the fathead minnow (*Pimephales promelas*). Toxicity test samples shall be collected and tests completed once per year during the third calendar quarter (July 1st through September 30th). Toxicity test results are to be postmarked by the 15th day of the month following the end of the quarter sampled (*i.e.*, October 15).

9. This permit shall be modified, or alternatively, revoked and reissued to incorporate additional toxicity testing requirements, including chemical specific limits such as for metals, 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 CFR Section 122.62(a)(2).

10. For each whole effluent toxicity test the permittee shall report on the appropriate discharge monitoring report, (DMR), the concentrations of the hardness, ammonia

nitrogen as nitrogen, total recoverable aluminum, cadmium, copper, lead, nickel, and zinc found in the 100 percent effluent sample. All these aforementioned chemical parameters shall be determined to at least the minimum quantification level shown in **Attachment A** on page 7 of 8, or as amended. Also the permittee should note that all chemical parameter results must still be reported in the appropriate toxicity report.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

2. The discharge shall not cause a violation of the water quality standards of the receiving water.

3. The discharge 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. It shall be adequately treated to insure that the surface waters remain free from pollutants 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.

4. The permittee's treatment facility shall maintain a minimum monthly average of 85 percent removal of both BOD_5 and TSS. The percent removal shall be calculated using the average monthly influent and effluent concentrations.

5. When the effluent discharged for a period of 3 consecutive months exceeds 80 percent of the 5.0 MGD design flow (4.0 MGD), the permittee shall submit to the permitting authorities a projection of loadings up to the time when the design capacity of the treatment facility will be reached, and a program for maintaining satisfactory treatment levels consistent with approved water quality management plans. Before the design flow will be reached, or whenever treatment necessary to achieve permit limits cannot be assured, the permittee may be required to submit plans for facility improvements.

6. The permittee shall not discharge into the receiving water any pollutant or combination of pollutants in toxic amounts.

7. All POTWs must provide adequate notice to both EPA-New England and the New Hampshire Department of Environmental Services, Water Division (NHDES-WD) of the following:

    a. Any new introduction of pollutants into the POTW from an indirect discharger in a primary industry category (see 40 CFR §122 Appendix A as amended) discharging process water; and

    b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

    c. For purposes of this paragraph, adequate notice shall include information on:

(1) the quantity and quality of effluent introduced into the facility; and

(2) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the facility.

8. Limitations for Industrial Users

a. Pollutants introduced into the POTW by a non-domestic source (user) shall not pass through the POTW or interfere with the operation or performance of the works.

b. The permittee shall submit to EPA and NHDES-WD the name of any Industrial User (IU) subject to Categorical Pretreatment Standards under 40 CFR § 403.6 and 40 CFR Chapter I, Subchapter N (Parts 405-415, 417-436, 439-440, 443, 446-447, 454-455, 457-461, 463-469, and 471 as amended) who commences discharge to the POTW after the effective date of this permit.

This reporting requirement also applies to any other IU who discharges an average of 25,000 gallons per day or more of process wastewater into the POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastewater which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the POTW; or is designated as such by the Control Authority as defined in 40 CFR § 403.12(a) on the basis that the industrial user has a reasonable potential to adversely affect the wastewater treatment facility's operation, or for violating any pretreatment standard or requirement (in accordance with 40 CFR § 403.8(f)(6)).

c. In the event that the permittee receives reports (baseline monitoring reports, 90-day compliance reports, periodic reports on continued compliance, etc.) from industrial users subject to Categorical Pretreatment Standards under 40 CFR § 403.6 and 40 CFR Chapter I, Subchapter N (Parts 405-415, 417-436, 439-440, 443, 446-447, 454-455, 457-461, 463-469, and 471 as amended), the permittee shall forward all copies of these reports within ninety (90) days of their receipt to EPA and NHDES-WD.

B. UNAUTHORIZED DISCHARGES

The permit only authorizes discharges in accordance with the terms and conditions of this permit and only from the Outfall listed in Part I.A.1. of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs), are not authorized by this permit and shall be reported to EPA and NHDES in accordance with Part II, Section D.1.e. of the General Requirements of this permit (twenty four hour reporting).

C. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

Operation and maintenance of the sewer system shall be in compliance with the General Requirements of Part II and the following terms and conditions. The permittee and co-permittee

are required to complete the following activities for the collection system which it owns:

1. Maintenance Staff

   The permittee and co-permittee shall provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit. This requirement shall be described in the Collection System O & M Plan required pursuant to Section C.5. below.

2. Preventative Maintenance Program

   The permittee and co-permittee shall maintain an ongoing preventative maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure. The program shall include an inspection program designed to identify all potential and actual unauthorized discharges. This requirement shall be described in the Collection System O & M Plan required pursuant to Section C.5. below.

3. Infiltration/Inflow

   The permittee and co-permittee shall control infiltration and inflow (I/I) into the sewer system as necessary to prevent high flow related unauthorized discharges from their collection systems and high flow related violations of the wastewater treatment plant's effluent limitations. Plans and programs to control I/I shall be described in the Collection System O & M Plan required pursuant to Section C.5. below.

4. Collection System Mapping

   In accordance with the requirements in the 2007 permit, the permittee and co-permittee prepared and submitted maps of the sewer collection systems they own. The collection system maps shall be kept up-to-date and available for review by federal, state, or local agencies. Such map(s) shall include, but not be limited to the following:

   a. All sanitary sewer lines and related manholes;
   b. All combined sewer lines, related manholes, and catch basins;
   c. All combined sewer regulators and any known or suspected connections between the sanitary sewer and storm drain systems (e.g. combined manholes);
   d. All outfalls, including the treatment plant outfall(s), CSOs, combined manholes, and any known or suspected SSOs;
   e. All pump stations and force mains;
   f. The wastewater treatment facility(ies);
   g. All surface waters (labeled);
   h. Other major appurtenances such as inverted siphons and air release valves;
   i. A numbering system which uniquely identifies manholes, catch basins, overflow points, regulators and outfalls;
   j. The scale and a north arrow; and
   k. The pipe diameter, date of installation, type of material, distance between manholes, and the direction of flow.

5. Collection System Operation and Maintenance Plan

In accordance with the requirements in the 2007 permit, the permittee and co-permittee prepared and submitted Collection System Operation and Maintenance Plans. The plans shall be kept up-to-date and available for review by federal, state, or local agencies. The plans shall include the information listed below. The bolded language is information that has been added to the 2007 permit requirements.

a. **A description of the collection system management goals, staffing, information management, and legal authorities;**
b. A preventative maintenance and monitoring program for the collection system;
c. Sufficient staffing to properly operate and maintain the sanitary sewer collection system;
d. Sufficient funding and the source(s) of funding for implementing the plan;
e. Identification of known and suspected overflows **and back-ups**, including combined manholes, a description of the cause of the identified overflows **and back-ups**, and a plan for addressing the overflows **and back-ups** consistent with the requirements of this permit;
f. **A description of the permittee's and co-permittee's program for preventing I/I related effluent violations and all unauthorized discharges of wastewater, including overflows and by-passes** and the ongoing program to identify and remove sources of I/I. The program shall include an inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts; and
g. An educational public outreach program for all aspects of I/I control, particularly private inflow.

6. Annual Reporting Requirement

The permittee and co-permittee shall submit a summary report of activities related to the implementation of its Collection System O & M Plan during the previous calendar year. The report shall be submitted to EPA and NHDES **annually by March 31**. The summary report shall, at a minimum, include:

a. A description of the staffing levels maintained during the year;
b. A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year;
c. Expenditures for any collection system maintenance activities and corrective actions taken during the previous year;
d. A map with areas identified for investigation/action in the coming year;
e. If treatment plant flow has reached 80% of the 5.0 mgd design flow (4.0 mgd) based on the daily flow for three consecutive months or there have been capacity related overflows, submit a calculation of the maximum daily, weekly, and monthly infiltration and the maximum daily, weekly, and monthly inflow for the reporting year; and

f. A summary of unauthorized discharges during the past year and their causes and a report of any corrective actions taken as a result of the unauthorized discharges reported pursuant to the Unauthorized Discharges section of this permit.

D. ALTERNATE POWER SOURCE

In order to maintain compliance with the terms and conditions of this permit, the permittee and co-permittee shall provide an alternate power source with which to sufficiently operate the wastewater facility, as defined at 40 C.F.R. § 122.2, which references the definition at 40 C.F.R. § 403.3(o). Wastewater facility is defined by RSA 485A:2.XIX as the structures, equipment, and processes required to collect, convey, and treat domestic and industrial wastes, and dispose of the effluent and sludge.

E. INDUSTRIAL USER CONDITIONS

1. Limitations for Industrial Users:

   a. A user may not introduce into a POTW any pollutant(s) which cause pass through or interference with the operation or performance of the treatment works. The terms "user", "pass through", and "interference" are defined in 40 C.F.R. § 403.3.

   b. The permittee shall develop and enforce specific effluent limits (local limits) for Industrial Users(s) and all other users as necessary, which together with appropriate changes in the POTW Treatment Plant's facilities or operation, are essential to ensure continued compliance with the POTW's NPDES permit or sludge use or disposal practices. Specific local limits shall not be developed and enforced without individual notice to persons or groups who have requested such notice and an opportunity to respond. Within 90 days of the effective date of this permit, the permittee shall prepare and submit a written technical evaluation to the EPA analyzing the need to revise local limits. As part of this evaluation, the permittee shall assess how the POTW performs with respect to influent and effluent pollutants, water quality concerns, sludge quality, sludge processing concerns/inhibition, biomonitoring results, activated sludge inhibition, worker health and safety, and collection system concerns. In preparing this evaluation, the permittee shall complete and submit the attached form (see **Attachment B** – Reassessment of Technically Based Industrial Discharge Limits) with the technical evaluation to assist in determining whether existing local limits need to be revised. Justifications and conclusions should be based on actual plant data if available and should be included in the report. Should the evaluation reveal the need to revise local limits, the permittee shall complete the revisions within 120 days of notification by EPA and submit the revisions to EPA for approval. The Permittee shall carry out the local limits revisions in accordance with EPA's Local Limit Development Guidance (July 2004).

2. Industrial Pretreatment Program

a. The permittee shall implement the Industrial Pretreatment Program in accordance with the legal authorities, policies, procedures, and financial provisions described in the permittee's approved Pretreatment Program and the General Pretreatment Regulations, 40 C.F.R. § 403. At a minimum, the permittee must perform the following duties to properly implement the Industrial Pretreatment Program (IPP):

(1) Carry out inspection, surveillance, and monitoring procedures which will determine, independent of information supplied by the industrial user, whether the industrial user is in compliance with the Pretreatment Standards. At a minimum, all significant industrial users shall be sampled and inspected at the frequency established in the approved IPP, but in no case less than once per year, and maintain adequate records.

(2) Issue or renew all necessary industrial user control mechanisms within 90 days of their expiration date or within 180 days after the industry has been determined to be a significant industrial user.

(3) Obtain appropriate remedies for noncompliance by any industrial user with any pretreatment standard and/or requirement.

(4) Maintain an adequate revenue structure for continued implementation of the Pretreatment Program.

b. The permittee shall provide the EPA and the NHDES-WD with an annual report describing the permittee's pretreatment program activities for the twelve month period ending 60 days prior to the due date in accordance with 40 C.F.R. § 403.12(i). The annual report shall be consistent with the format described in **Attachment C** (NPDES Permit Requirement for Industrial Pretreatment Annual Report) and shall be submitted no later than August 1st of each year.

c. The permittee must obtain approval from EPA prior to making any significant changes to the industrial pretreatment program in accordance with 40 C.F.R. § 403.18(c).

d. The permittee must assure that applicable National Categorical Pretreatment Standards are met by all categorical industrial users of the POTW. These standards are published in the Federal Regulations at 40 C.F.R. § 405 et. seq.

e. The permittee must modify its pretreatment program to conform to all changes in the Federal Regulations that pertain to the implementation and enforcement of the Industrial Pretreatment Program. The permittee must provide EPA, in writing, within 180 days of the effective date of this permit, proposed changes to the permittee's pretreatment program deemed necessary to assure conformity with current Federal Regulations. At a minimum, the permittee must address in its written submission the following areas: (1) enforcement response plan; (2) revised

sewer use ordinances; (3) slug control evaluations. The permittee will implement these proposed changes pending EPA's approval under 40 C.F.R. § 403.18.

F. SLUDGE CONDITIONS

1. The permittee shall comply with all existing federal & state laws and regulations that apply to sewage sludge use and disposal practices and with the CWA Section 405(d) technical standards.

2. The permittee shall comply with the more stringent of either the state (Env-Ws 800) or federal (40 CFR Part 503) requirements.

3. The requirements and technical standards of 40 CFR Part 503 apply to facilities which perform one or more of the following use or disposal practices.

   a. Land application - the use of sewage sludge to condition or fertilize the soil.
   b. Surface disposal - the placement of sewage sludge in a sludge only landfill.
   c. Sewage sludge incineration in a sludge only incinerator.

4. The 40 CFR Part 503 conditions do not apply to facilities which place sludge within a municipal solid waste landfill. These conditions do not apply to facilities which do not dispose of sewage sludge during the life of the permit, but rather treat the sludge (lagoons-reed beds), or are otherwise excluded under 40 CFR Section 503.6.

5. The permittee shall use and comply with the NPDES Permit Sludge Compliance Guidance, November 1999, to determine appropriate conditions. This guidance document is available upon request from EPA Region 1 and may also be found at: http://www.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf. Appropriate conditions contain the following elements:

   - General requirements
   - Pollutant limitations
   - Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)
   - Management practices
   - Record keeping
   - Monitoring
   - Reporting

   Depending upon the quality of material produced by a facility, all conditions may not apply to the facility.

6. The permittee shall monitor the pollutant concentrations, pathogen reduction and vector attraction reduction for the permittee's chosen sewage sludge use or disposal practices at the following frequency. This frequency is based upon the volume of sewage sludge generated at the facility in dry metric tons per year.

• less than 290	1/Year
• 290 to less than 1,500	1/Quarter
• 1,500 to less than 15,000	6/Year
• 15,000 plus	1/Month

7. The permittee shall sample the sewage sludge using the procedures detailed in 40 CFR Section 503.8.

8. The permittee shall submit an annual report containing the information specified in the attached Sludge Compliance Guidance document. Reports are **due annually by February 19th**. Reports shall be submitted to both addresses (EPA-New England and NHDES-WD) contained in the reporting section of the permit.

G. SPECIAL CONDITIONS

1. pH Limit Adjustment

The permittee may submit a written request to the EPA-New England 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 (Secondary Treatment Regulations in 40 CFR Part 133) 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-New England indicating the pH limit range has been changed, the permittee is required to meet the permitted pH limit range in the respective permit.

H. MONITORING AND REPORTING

1. **For a period of one year from the effective date of the permit,** the permittee may either submit monitoring data and other reports to EPA in hard copy form or report electronically using NetDMR, a web-based tool that allows permittees to electronically submit Discharge Monitoring Reports (DMRs) and other required reports via a secure internet connection. **Beginning no later than one year after the effective date of the permit,** the permittee shall begin reporting using NetDMR, unless the facility is able to demonstrate a reasonable basis that precludes the use of NetDMR for submitting DMRs and reports. Specific requirements regarding submittal of data and reports in hard copy form and for submittal using NetDMR are described below:

a. Submittal of Reports Using NetDMR

NetDMR is accessed from: http://www.epa.gov/netdmr. **Within one year of the effective date of this permit**, the permittee shall begin submitting DMRs and reports required under this permit electronically to EPA using NetDMR, unless

the facility is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for submitting DMRs and reports ("opt-out request").

DMRs shall be submitted electronically to EPA no later than the 15th day of the month following the completed reporting period. All reports required under the permit shall be submitted to EPA, including the NHDES Monthly Operating Reports (MORs), as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of DMRs or other reports to EPA or to NHDES.

b. Submittal of NetDMR Opt-Out Requests

Opt-out requests must be submitted in writing to EPA for written approval at least sixty (60) days prior to the date a facility would be required under this permit to begin using NetDMR. This demonstration shall be valid for twelve (12) months from the date of EPA approval and shall thereupon expire. At such time, DMRs and reports shall be submitted electronically to EPA unless the permittee submits a renewed opt-out request and such request is approved by EPA. All opt-out requests should be sent to the following addresses:

Attn: NetDMR Coordinator
U.S. Environmental Protection Agency, Water Technical Unit
5 Post Office Square, Suite 100 (OES04-4)
Boston, MA 02109-3912

And

Attn: Compliance Supervisor
New Hampshire Department of Environmental Services (NHDES)
Water Division
Wastewater Engineering Bureau
P.O. Box 95
Concord, New Hampshire 03302-0095

c. Submittal of Reports in Hard Copy Form

Monitoring results shall be summarized for each calendar month and reported on separate hard copy DMRs postmarked no later than the 15th day of the month following the completed reporting period. All reports required under the permit, including NHDES MORs, shall be submitted as an attachment to the DMRs. Signed and dated original DMRs and all other reports (with the exception of pretreatment reports) or notifications required herein or in Part II shall be submitted to the Director at the following address:

U.S. Environmental Protection Agency
Water Technical Unit (OES04-SMR)
5 Post Office Square - Suite 100
Boston, MA 02109-3912

All pretreatment reports shall be submitted to:

US Environmental Protection Agency
Attn: Justin Pimpare
Regional Pretreatment Coordinator
5 Post Office Square - Suite 100
OE P06-03
Boston, MA 02109-3912

Duplicate signed copies of all reports or notifications required above shall be submitted to the State at the following address:

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

Any verbal reports, if required in **Parts I** and/or **II** of this permit, shall be made to both EPA-New England and to NHDES-WD.

I. STATE PERMIT CONDITIONS

1. The permittee shall not at any time, either alone or in conjunction with any person or persons, cause directly or indirectly the discharge of waste into the said receiving water unless it has been treated in such a manner as will not lower the legislated water quality classification or interfere with the uses assigned to said water by the New Hampshire Legislature (RSA 485-A:12).

2. This NPDES discharge permit is issued by EPA under federal and state law. Upon final issuance by EPA, the New Hampshire Department of Environmental Services-Water Division (NHDES-WD) may adopt this permit, including all terms and conditions, as a state permit pursuant to RSA 485-A:13.

3. EPA shall have the right to enforce the terms and conditions of this permit pursuant to federal law and NHDES-WD shall have the right to enforce the permit pursuant to state law, if the permit is adopted. 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.

4. Pursuant to New Hampshire Statute RSA 485-A13,I(c), any person responsible for a bypass or upset at a *wastewater facility* shall give immediate notice of a bypass or upset

to all public or privately owned water systems drawing water from the same receiving water and located within 20 miles downstream of the point of discharge regardless of whether or not it is on the same receiving water or on another surface water to which the receiving water is tributary. Wastewater facility is defined at RSA 485-A:2XIX as the structures, equipment, and processes required to collect, convey, and treat domestic and industrial wastes, and dispose of the effluent and sludge. The permittee shall maintain a list of persons, and their telephone numbers, who are to be notified immediately by telephone. In addition, written notification, which shall be postmarked within 3 days of the bypass or upset, shall be sent to such persons.

5. The pH range of 6.5 to 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 outside the range of 6.0 – 9.0 S.U., which is the federal effluent limitation guideline regulation for pH for secondary treatment and is found in 40 CFR 133.102(c).

   For this permit issuance, the permittee has already gone through the procedure outlined above to adjust the pH range to 6.5 to 9.0 S.U. This demonstration will need to be performed for each permit issuance.

6. Pursuant to New Hampshire Code of Administrative Rules, Env-Wq 703.07(a):

   a. Any person proposing to construct or modify any of the following shall submit an application for a sewer connection permit to the department:

      (1) Any extension of a collector or interceptor, whether public or private, regardless of flow;

      (2) Any wastewater connection or other discharge in excess of 5,000 gpd;

      (3) Any wastewater connection or other discharge to a WWTP operating in excess of 80 percent design flow capacity based on actual average flow for 3 consecutive months;

      (4) Any industrial wastewater connection or change in existing discharge of industrial wastewater, regardless of quality or quantity; and

      (5) Any sewage pumping station greater than 50 gpm or serving more than one building.

7. For each new or increased discharge of industrial waste to the POTW, the permittee shall submit, in accordance with Env-Ws 904.14(e) an "Industrial Wastewater Discharge Request Application" approved by the permittee in accordance with 904.13(a). The

"Industrial Wastewater Discharge Request Application" shall be prepared in accordance with Env-Ws 904.10.

8. Pursuant to Env-Ws 904.17, at a frequency no less than every five years, the permittee shall submit to NHDES:

   a. A copy of its current sewer use ordinance. The sewer use ordinance shall include local limits pursuant to Env-Ws 904.04 (a).

   b. A current list of all significant indirect dischargers to the POTW. At a minimum, the list shall include for each significant indirect discharger, its name and address, the name and daytime telephone number of a contact person, products manufactured, industrial processes used, existing pretreatment processes, and discharge permit status.

   c. A list of all permitted indirect dischargers; and

   d. A certification that the municipality is strictly enforcing its sewer use ordinance and all discharge permits it has issued.

9. In addition to submitting DMRs, monitoring results shall also be summarized for each calendar month and reported on separate Monthly Operations Report Form(s) (MORs) postmarked or submitted electronically using NetDMR no later than the 15th day of the month following the completed reporting period. Signed and dated MORs, which are not submitted electronically using NetDMR shall be submitted to:

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

USEPA REGION 1 FRESHWATER ACUTE TOXICITY TEST PROCEDURE AND PROTOCOL

I. GENERAL REQUIREMENTS

The permittee shall conduct acceptable acute toxicity tests in accordance with the appropriate test protocols described below:

- **Daphnid (Ceriodaphnia dubia) definitive 48 hour test.**
- **Fathead Minnow (Pimephales promelas) definitive 48 hour test.**

Acute toxicity test data shall be reported as outlined in Section VIII.

II. METHODS

The permittee shall use 40 CFR Part 136 methods. Methods and guidance may be found at:

http://water.epa.gov/scitech/swguidance/methods/wet/index.cfm#methods

The permittee shall also meet the sampling, analysis and reporting requirements included in this protocol. This protocol defines more specific requirements while still being consistent with the Part 136 methods. If, due to modifications of Part 136, there are conflicting requirements between the Part 136 method and this protocol, the permittee shall comply with the requirements of the Part 136 method.

III. SAMPLE COLLECTION

A discharge sample shall be collected. Aliquots shall be split from the sample, containerized and preserved (as per 40 CFR Part 136) for chemical and physical analyses required. The remaining sample shall be measured for total residual chlorine and dechlorinated (if detected) in the laboratory using sodium thiosulfate for subsequent toxicity testing. (Note that EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection.) Grab samples must be used for pH, temperature, and total residual chlorine (as per 40 CFR Part 122.21).

Standard Methods for the Examination of Water and Wastewater describes dechlorination of samples (APHA, 1992). Dechlorination can be achieved using a ratio of 6.7 mg/L anhydrous sodium thiosulfate to reduce 1.0 mg/L chlorine. If dechlorination is necessary, a thiosulfate control (maximum amount of thiosulfate in lab control or receiving water) must also be run in the WET test.

All samples held overnight shall be refrigerated at 1- 6^{o}C.

IV. DILUTION WATER

A grab sample of dilution water used for acute toxicity testing shall be collected from the receiving water at a point immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location. Avoid collection near areas of obvious road or agricultural runoff, storm sewers or other point source discharges and areas where stagnant conditions exist. In the case where an alternate dilution water has been agreed upon an additional receiving water control (0% effluent) must also be tested.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable, an alternate standard dilution water of known quality with a hardness, pH, conductivity, alkalinity, organic carbon, and total suspended solids similar to that of the receiving water may be substituted **AFTER RECEIVING WRITTEN APPROVAL FROM THE PERMIT ISSUING AGENCY(S)**. Written requests for use of an alternate dilution water should be mailed with supporting documentation to the following address:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency-New England
5 Post Office Sq., Suite 100 (OEP06-5)
Boston, MA 02109-3912

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
5 Post Office Sq., Suite 100 (OES04-4)
Boston, MA 02109-3912

Note: USEPA Region 1 retains the right to modify any part of the alternate dilution water policy stated in this protocol at any time. Any changes to this policy will be documented in the annual DMR posting.

See the most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/enforcementandassistance/dmr.html for further important details on alternate dilution water substitution requests.

It may prove beneficial to have the proposed dilution water source screened for suitability prior to toxicity testing. EPA strongly urges that screening be done prior to set up of a full definitive toxicity test any time there is question about the dilution water's ability to support acceptable performance as outlined in the 'test acceptability' section of the protocol.

V. TEST CONDITIONS

The following tables summarize the accepted daphnid and fathead minnow toxicity test conditions and test acceptability criteria:

EPA NEW ENGLAND EFFLUENT TOXICITY TEST CONDITIONS FOR THE DAPHNID, CERIODAPHNIA DUBIA 48 HOUR ACUTE TESTS[1]

1.	Test type	Static, non-renewal
2.	Temperature (^{o}C)	20 $\pm$ 1^{o}C or 25 $\pm$ 1^{o}C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hour light, 8 hour dark
5.	Test chamber size	Minimum 30 ml
6.	Test solution volume	Minimum 15 ml
7.	Age of test organisms	1-24 hours (neonates)
8.	No. of daphnids per test chamber	5
9.	No. of replicate test chambers per treatment	4
10.	Total no. daphnids per test concentration	20
11.	Feeding regime	As per manual, lightly feed YCT and Selenastrum to newly released organisms while holding prior to initiating test
12.	Aeration	None
13.	Dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q^{R} or equivalent deionized water and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC
15.	Number of dilutions	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution series.

16.	Effect measured	Mortality-no movement of body or appendages on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples must first be used within 36 hours of collection.
19.	Sample volume required	Minimum 1 liter

Footnotes:

1. Adapted from EPA-821-R-02-012.
2. Standard prepared dilution water must have hardness requirements to generally reflect the characteristics of the receiving water.

EPA NEW ENGLAND TEST CONDITIONS FOR THE FATHEAD MINNOW (PIMEPHALES PROMELAS) 48 HOUR ACUTE TEST[1]

1.	Test Type	Static, non-renewal
2.	Temperature (^{o}C):	20 $\pm$ 1 ^{o} C or 25 $\pm$ 1^{o}C
3.	Light quality:	Ambient laboratory illumination
4.	Photoperiod:	16 hr light, 8 hr dark
5.	Size of test vessels:	250 mL minimum
6.	Volume of test solution:	Minimum 200 mL/replicate
7.	Age of fish:	1-14 days old and age within 24 hrs of each other
8.	No. of fish per chamber	10
9.	No. of replicate test vessels per treatment	4
10.	Total no. organisms per concentration:	40
11.	Feeding regime:	As per manual, lightly feed test age larvae using concentrated brine shrimp nauplii while holding prior to initiating test
12.	Aeration:	None, unless dissolved oxygen (D.O.) concentration falls below 4.0 mg/L, at which time gentle single bubble aeration should be started at a rate of less than 100 bubbles/min. (Routine D.O. check is recommended.)
13.	dilution water:[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q^{R} or equivalent deionized and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC

15.	Number of dilutions	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution series.
16.	Effect measured	Mortality-no movement on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples are used within 36 hours of collection.
19.	Sample volume required	Minimum 2 liters

Footnotes:

1. Adapted from EPA-821-R-02-012
2. Standard dilution water must have hardness requirements to generally reflect characteristics of the receiving water.

VI. CHEMICAL ANALYSIS

At the beginning of a static acute toxicity test, pH, conductivity, total residual chlorine, oxygen, hardness, alkalinity and temperature must be measured in the highest effluent concentration and the dilution water. Dissolved oxygen, pH and temperature are also measured at 24 and 48 hour intervals in all dilutions. The following chemical analyses shall be performed on the 100 percent effluent sample and the upstream water sample for each sampling event.

Parameter	Effluent	Receiving Water	ML (mg/l)
Hardness[1,]	x	x	0.5
Total Residual Chlorine (TRC)[2, 3]	x		0.02
Alkalinity	x	x	2.0
pH	x	x	--
Specific Conductance	x	x	--
Total Solids	x		--
Total Dissolved Solids	x		--
Ammonia	x	x	0.1
Total Organic Carbon	x	x	0.5
Total Metals			
Cd	x	x	0.0005
Pb	x	x	0.0005
Cu	x	x	0.003
Zn	x	x	0.005
Ni	x	x	0.005
Al	x	x	0.02
Other as permit requires			

Notes:

1. Hardness may be determined by:
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     -Method 2340B (hardness by calculation)
     -Method 2340C (titration)

2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     -Method 4500-CL E Low Level Amperometric Titration
     -Method 4500-CL G DPD Colorimetric Method

3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing

VII. TOXICITY TEST DATA ANALYSIS

LC50 Median Lethal Concentration (Determined at 48 Hours)

Methods of Estimation:

- Probit Method
- Spearman-Karber
- Trimmed Spearman-Karber
- Graphical

See the flow chart in Figure 6 on p. 73 of EPA-821-R-02-012 for appropriate method to use on a given data set.

No Observed Acute Effect Level (NOAEL)

See the flow chart in Figure 13 on p. 87 of EPA-821-R-02-012.

VIII. TOXICITY TEST REPORTING

A report of the results will include the following:

- Description of sample collection procedures, site description
- Names of individuals collecting and transporting samples, times and dates of sample collection and analysis on chain-of-custody
- General description of tests: age of test organisms, origin, dates and results of standard toxicant tests; light and temperature regime; other information on test conditions if different than procedures recommended. Reference toxicant test data should be included.
- All chemical/physical data generated. (Include minimum detection levels and minimum quantification levels.)
- Raw data and bench sheets.
- Provide a description of dechlorination procedures (as applicable).
- Any other observations or test conditions affecting test outcome.

Attachment B

EPA - New England

Reassessment of Technically Based Industrial Discharge Limits

Under 40 CFR §122.21(j)(4), all Publicly Owned Treatment Works (POTWs) with approved Industrial Pretreatment Programs (IPPs) shall provide the following information to the Director: a written evaluation of the need to revise local industrial discharge limits under 40 CFR §403.5(c)(1).

Below is a form designed by the U.S. Environmental Protection Agency (EPA - New England) to assist POTWs with approved IPPs in evaluating whether their existing Technically Based Local Limits (TBLLs) need to be recalculated. The form allows the permittee and EPA to evaluate and compare pertinent information used in previous TBLLs calculations against present conditions at the POTW.

Please read direction below before filling out form.

ITEM I.

* In Column (1), list what your POTW's influent flow rate was when your existing TBLLs were calculated. In Column (2), list your POTW's present influent flow rate. Your current flow rate should be calculated using the POTW's average daily flow rate from the previous 12 months.

* In Column (1) list what your POTW's SIU flow rate was when your existing TBLLs were calculated. In Column (2), list your POTW's present SIU flow rate.

* In Column (1), list what dilution ratio and/or 7Q10 value was used in your old/expired NPDES permit. In Column (2), list what dilution ration and/or 7Q10 value is presently being used in your new/reissued NPDES permit.

  The 7Q10 value is the lowest seven day average flow rate, in the river, over a ten year period. The 7Q10 value and/or dilution ratio used by EPA in your new NPDES permit can be found in your NPDES permit "Fact Sheet."

* In Column (1), list the safety factor, if any, that was used when your existing TBLLs were calculated.

* In Column (1), note how your bio-solids were managed when your existing TBLLs were calculated. In Column (2), note how your POTW is presently disposing of its biosolids and how your POTW will be disposing of its biosolids in the future.

ITEM II.

* List what your existing TBLLs are - as they appear in your current Sewer Use Ordinance (SUO).

ITEM III.

* Identify how your existing TBLLs are allocated out to your industrial community. Some pollutants may be allocated differently than others, if so please explain.

ITEM IV.

* Since your existing TBLLs were calculated, identify the following in detail:

  (1) if your POTW has experienced any upsets, inhibition, interference or pass-through as a result of an industrial discharge.

  (2) if your POTW is presently violating any of its current NPDES permit limitations - include toxicity.

ITEM V.

* Using current sampling data, list in Column (1) the average and maximum amount of pollutants (in pounds per day) received in the POTW's influent. Current sampling data is defined as data obtained over the last 24 month period.

  All influent data collected and analyzed must be in accordance with 40 CFR §136. Sampling data collected should be analyzed using the lowest possible detection method(s), e.g. graphite furnace.

* Based on your existing TBLLs, as presented in Item II., list in Column (2), for each pollutant the Maximum Allowable Headwork Loading (MAHL) values derived from an applicable environmental criteria or standard, e.g. water quality, sludge, NPDES, inhibition, etc. For more information, please see EPA's Local Limit Guidance Document (July 2004).

Item VI.

* Using current sampling data, list in Column (1) the average and maximum amount of pollutants (in micrograms per liter) present your POTW's effluent. Current sampling data is defined as data obtained during the last 24 month period.

(Item VI. continued)

All effluent data collected and analyzed must be in accordance with 40 CFR §136. Sampling data collected should be analyzed using the lowest possible detection method(s), e.g. graphite furnace.

* List in Column (2A) what the Water Quality Standards (WQS) were (in micrograms per liter) when your TBLLs were calculated, please note what hardness value was used at that time. Hardness should be expressed in milligram per liter of Calcium Carbonate.

  List in Column (2B) the current WQSs or "Chronic Gold Book" values for each pollutant multiplied by the dilution ratio used in your new/reissued NPDES permit. For example, with a dilution ratio of 25:1 at a hardness of 25 mg/l - Calcium Carbonate (copper's chronic WQS equals 6.54 ug/l) the chronic NPDES permit limit for copper would equal 156.25 ug/l.

ITEM VII.

* In Column (1), list all pollutants (in micrograms per liter) limited in your new/reissued NPDES permit. In Column (2), list all pollutants limited in your old/expired NPDES permit.

ITEM VIII.

* Using current sampling data, list in Column (1) the average and maximum amount of pollutants in your POTW's biosolids. Current data is defined as data obtained during the last 24 month period. Results are to be expressed as total dry weight.

  All biosolids data collected and analyzed must be in accordance with 40 CFR §136.

  In Column (2A), list current State and/or Federal sludge standards that your facility's biosolids must comply with. Also note how your POTW currently manages the disposal of its biosolids. If your POTW is planing on managing its biosolids differently, list in Column (2B) what your new biosolids criteria will be and method of disposal.

In general, please be sure the units reported are correct and all pertinent information is included in your evaluation. If you have any questions, please contact your pretreatment representative at EPA - New England.

REASSESSMENT OF TECHNICALLY BASED LOCAL LIMITS (TBLLs)

POTW Name & Address : _____

NPDES PERMIT # : _____

Date EPA approved current TBLLs : _____

Date EPA approved current Sewer Use Ordinance : _____

ITEM I.

In Column (1) list the conditions that existed when your current TBLLs were calculated. In Column (2), list current conditions or expected conditions at your POTW.		
	Column (1) EXISTING TBLLs	Column (2) PRESENT CONDITIONS
POTW Flow (MGD)		
Dilution Ratio or 7Q10 (from NPDES Permit)		
SIU Flow (MGD)		
Safety Factor		N/A
Biosolids Disposal Method(s)		

ITEM II.

EXISTING TBLLs			
POLLUTANT	NUMERICAL LIMIT (mg/l) or (lb/day)	POLLUTANT	NUMERICAL LIMIT (mg/l) or (lb/day)

ITEM III.

Note how your existing TBLLs, listed in Item II., are allocated to your Significant Industrial Users (SIUs), i.e. uniform concentration, contributory flow, mass proportioning, other. Please specify by circling.

ITEM IV.

Has your POTW experienced any upsets, inhibition, interference or pass-through from industrial sources since your existing TBLLs were calculated?
If yes, explain.

_____
_____

Has your POTW violated any of its NPDES permit limits and/or toxicity test requirements?

If yes, explain.
_____
_____

ITEM V.

Using current POTW influent sampling data fill in Column (1). In Column (2), list your Maximum Allowable Headwork Loading (MAHL) values used to derive your TBLLs listed in Item II. In addition, please note the Environmental Criteria for which each MAHL value was established, i.e. water quality, sludge, NPDES etc.				
Pollutant	Column (1) Influent Data Analyses Maximum (lb/day)	Average (lb/day)	Column (2) MAHL Values (lb/day)	Criteria
Arsenic				
Cadmium				
Chromium				
Copper				
Cyanide				
Lead				
Mercury				
Nickel				
Silver				
Zinc				
Other (List)				

ITEM VI.

Using current POTW effluent sampling data, fill in Column (1). In Column (2A) list what the Water Quality Standards (Gold Book Criteria) were at the time your existing TBLLs were developed. List in Column (2B) current Gold Book values multiplied by the dilution ratio used in your new/reissued NPDES permit.				
Pollutant	Column (1) Effluent Data Analyses Maximum (ug/l)	 Average (ug/l)	Columns (2A) (2B) Water Quality Criteria (Gold Book) From TBLLs Today (ug/l) (ug/l)	
Arsenic				
*Cadmium				
*Chromium				
*Copper				
Cyanide				
*Lead				
Mercury				
*Nickel				
Silver				
*Zinc				
Other (List)				

*Hardness Dependent (mg/l - $CaCO_3$)

ITEM VII.

In Column (1), identify all pollutants limited in your new/reissued NPDES permit. In Column (2), identify all pollutants that were limited in your old/expired NPDES permit.			
Column (1) NEW PERMIT Pollutants Limitations (ug/l)		Column (2) OLD PERMIT Pollutants (ug/l)	Limitations

ITEM VIII.

Using current POTW biosolids data, fill in Column (1). In Column (2A), list the biosolids criteria that was used at the time your existing TBLLs were calculated. If your POTW is planing on managing its biosolids differently, list in Column (2B) what your new biosolids criteria would be and method of disposal.

Pollutant	Column (1) Biosolids Data Analyses Average (mg/kg)	Columns (2A) (2B) Biosolids Criteria From TBLLs New (mg/kg)	(mg/kg)
Arsenic			
Cadmium			
Chromium			
Copper			
Cyanide			
Lead			
Mercury			
Nickel			
Silver			
Zinc			
Molybdenum			
Selenium			
Other (List)			

NPDES PERMIT REQUIREMENT
FOR
INDUSTRIAL PRETREATMENT ANNUAL REPORT

The information described below shall be included in the pretreatment program annual reports:

1. An updated list of all industrial users by category, as set forth in 40 C.F.R. 403.8(f)(2)(i), indicating compliance or noncompliance with the following:
   - baseline monitoring reporting requirements for newly promulgated industries
   - compliance status reporting requirements for newly promulgated industries
   - periodic (semi-annual) monitoring reporting requirements,
   - categorical standards, and
   - local limits;

2. A summary of compliance and enforcement activities during the preceding year, including the number of:
   - significant industrial users inspected by POTW (include inspection dates for each industrial user),
   - significant industrial users sampled by POTW (include sampling dates for each industrial user),
   - compliance schedules issued (include list of subject users),
   - written notices of violations issued (include list of subject users),
   - administrative orders issued (include list of subject users),
   - criminal or civil suits filed (include list of subject users) and,
   - penalties obtained (include list of subject users and penalty amounts);

3. A list of significantly violating industries required to be published in a local newspaper in accordance with 40 C.F.R. 403.8(f)(2)(vii);

4. A narrative description of program effectiveness including present and proposed changes to the program, such as funding, staffing, ordinances, regulations, rules and/or statutory authority;

5. A summary of all pollutant analytical results for influent, effluent, sludge and any toxicity or bioassay data from the wastewater treatment facility. The summary shall include a comparison of influent sampling results versus threshold inhibitory concentrations for the Wastewater Treatment System and effluent sampling results versus water quality standards. Such a comparison shall be based on the sampling program described in the paragraph below or any similar sampling program described in this Permit.

At a minimum, annual sampling and analysis of the influent and effluent of the Wastewater Treatment Plant shall be conducted for the following pollutants:

a.) Total Cadmium	f.) Total Nickel
b.) Total Chromium	g.) Total Silver
c.) Total Copper	h.) Total Zinc
d.) Total Lead	i.) Total Cyanide
e.) Total Mercury	j.) Total Arsenic

The sampling program shall consist of one 24-hour flow-proportioned composite and at least one grab sample that is representative of the flows received by the POTW. The composite shall consist of hourly flow-proportioned grab samples taken over a 24-hour period if the sample is collected manually or shall consist of a minimum of 48 samples collected at 30 minute intervals if an automated sampler is used. Cyanide shall be taken as a grab sample during the same period as the composite sample. Sampling and preservation shall be consistent with 40 CFR Part 136.

6. A detailed description of all interference and pass-through that occurred during the past year;

7. A thorough description of all investigations into interference and pass-through during the past year;

8. A description of monitoring, sewer inspections and evaluations which were done during the past year to detect interference and pass-through, specifying parameters and frequencies;

9. A description of actions being taken to reduce the incidence of significant violations by significant industrial users; and,

10. The date of the latest adoption of local limits and an indication as to whether or not the permittee is under a State or Federal compliance schedule that includes steps to be taken to revise local limits.

NPDES PART II STANDARD CONDITIONS
(January, 2007)

TABLE OF CONTENTS

PART II. A. GENERAL REQUIREMENTS

1. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

a. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirements.

b. The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any of such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402 (a)(3) or 402 (b)(8) of the CWA is subject to a civil penalty not to exceed $25,000 per day for each violation. Any person who negligently violates such requirements is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both. Any person who knowingly violates such requirements is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both.

c. Any person may be assessed an administrative penalty by the Administrator for violating Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.

Note: See 40 CFR §122.41(a)(2) for complete "Duty to Comply" regulations.

2. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or notifications of planned changes or anticipated noncompliance does not stay any permit condition.

3. Duty to Provide Information

The permittee shall furnish to the Regional Administrator, within a reasonable time, any information which the Regional Administrator may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Regional Administrator, upon request, copies of records required to be kept by this permit.

4. Reopener Clause

The Regional Administrator reserves the right to make appropriate revisions to this permit in order to establish any appropriate effluent limitations, schedules of compliance, or other provisions which may be authorized under the CWA in order to bring all discharges into compliance with the CWA.

For any permit issued to a treatment works treating domestic sewage (including "sludge-only facilities"), the Regional Administrator or Director shall include a reopener clause to incorporate any applicable standard for sewage sludge use or disposal promulgated under Section 405 (d) of the CWA. The Regional Administrator or Director may promptly modify or revoke and reissue any permit containing the reopener clause required by this paragraph if the standard for sewage sludge use or disposal is more stringent than any requirements for sludge use or disposal in the permit, or contains a pollutant or practice not limited in the permit.

Federal regulations pertaining to permit modification, revocation and reissuance, and termination are found at 40 CFR §122.62, 122.63, 122.64, and 124.5.

5. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from responsibilities, liabilities or penalties to which the permittee is or may be subject under Section 311 of the CWA, or Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

6. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges.

7. Confidentiality of Information

a. In accordance with 40 CFR Part 2, any information submitted to EPA pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 CFR Part 2 (Public Information).

b. Claims of confidentiality for the following information will be denied:

(1) The name and address of any permit applicant or permittee;
(2) Permit applications, permits, and effluent data as defined in 40 CFR §2.302(a)(2).

c. Information required by NPDES application forms provided by the Regional Administrator under 40 CFR §122.21 may not be claimed confidential. This includes information submitted on the forms themselves and any attachments used to supply information required by the forms.

8. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after its expiration date, the permittee must apply for and obtain a new permit. The permittee shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Regional Administrator. (The Regional Administrator shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

9. State Authorities

Nothing in Part 122, 123, or 124 precludes more stringent State regulation of any activity covered by these regulations, whether or not under an approved State program.

10. Other Laws

The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, nor does it relieve the permittee of its obligation to comply with any other applicable Federal, State, or local laws and regulations.

PART II. B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of storm water pollution prevention plans. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Need to Halt or Reduce Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

4. Bypass

a. Definitions

(1) *Bypass* means the intentional diversion of waste streams from any portion of a treatment facility.

(2) *Severe property damage* means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can be reasonably expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Bypass not exceeding limitations

The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provision of Paragraphs B.4.c. and 4.d. of this section.

c. Notice

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.
(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph D.1.e. of this part (Twenty-four hour reporting).

d. Prohibition of bypass

Bypass is prohibited, and the Regional Administrator may take enforcement action against a permittee for bypass, unless:

(1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
(2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and
(3) i) The permittee submitted notices as required under Paragraph 4.c. of this section.
ii) The Regional Administrator may approve an anticipated bypass, after considering its adverse effects, if the Regional Administrator determines that it will meet the three conditions listed above in paragraph 4.d. of this section.

5. Upset

a. Definition. *Upset* means an exceptional incident in which there is an unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of paragraph B.5.c. of this section are met. No determination made during

administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permittee can identify the cause(s) of the upset;
(2) The permitted facility was at the time being properly operated;
(3) The permittee submitted notice of the upset as required in paragraphs D.1.a. and 1.e. (Twenty-four hour notice); and
(4) The permittee complied with any remedial measures required under B.3. above.

d. Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

PART II. C. MONITORING REQUIREMENTS

1. Monitoring and Records

a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

b. Except for records for monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application except for the information concerning storm water discharges which must be retained for a total of 6 years. This retention period may be extended by request of the Regional Administrator at any time.

c. Records of monitoring information shall include:

(1) The date, exact place, and time of sampling or measurements;
(2) The individual(s) who performed the sampling or measurements;
(3) The date(s) analyses were performed;
(4) The individual(s) who performed the analyses;
(5) The analytical techniques or methods used; and
(6) The results of such analyses.

d. Monitoring results must be conducted according to test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, unless other test procedures have been specified in the permit.

e. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by

imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

2. Inspection and Entry

The permittee shall allow the Regional Administrator or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location.

PART II. D. REPORTING REQUIREMENTS

1. Reporting Requirements

a. Planned Changes. The permittee shall give notice to the Regional Administrator as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is only required when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR§122.29(b); or
(2) The alteration or addition could significantly change the nature or increase the quantities of the pollutants discharged. This notification applies to pollutants which are subject neither to the effluent limitations in the permit, nor to the notification requirements at 40 CFR§122.42(a)(1).
(3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition or change may justify the application of permit conditions different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

b. Anticipated noncompliance. The permittee shall give advance notice to the Regional Administrator of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

c. Transfers. This permit is not transferable to any person except after notice to the Regional Administrator. The Regional Administrator may require modification or revocation and reissuance of the permit to change the name of the permittee and

incorporate such other requirements as may be necessary under the CWA. (See 40 CFR Part 122.61; in some cases, modification or revocation and reissuance is mandatory.)

d. Monitoring reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(1) Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Director for reporting results of monitoring of sludge use or disposal practices.

(2) If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of the monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Director.

(3) Calculations for all limitations which require averaging or measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.

e. Twenty-four hour reporting.

(1) The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances.

A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

(2) The following shall be included as information which must be reported within 24 hours under this paragraph.

(a) Any unanticipated bypass which exceeds any effluent limitation in the permit. (See 40 CFR §122.41(g).)
(b) Any upset which exceeds any effluent limitation in the permit.
(c) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Regional Administrator in the permit to be reported within 24 hours. (See 40 CFR §122.44(g).)

(3) The Regional Administrator may waive the written report on a case-by-case basis for reports under Paragraph D.1.e. if the oral report has been received within 24 hours.

f. Compliance Schedules. Reports of compliance or noncompliance with, any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

g. Other noncompliance. The permittee shall report all instances of noncompliance not reported under Paragraphs D.1.d., D.1.e., and D.1.f. of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in Paragraph D.1.e. of this section.

h. Other information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Administrator, it shall promptly submit such facts or information.

2. Signatory Requirement

a. All applications, reports, or information submitted to the Regional Administrator shall be signed and certified. (See 40 CFR §122.22)

b. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 2 years per violation, or by both.

3. Availability of Reports.

Except for data determined to be confidential under Paragraph A.8. above, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State water pollution control agency and the Regional Administrator. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statements on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the CWA.

PART II. E. DEFINITIONS AND ABBREVIATIONS

1. Definitions for Individual NPDES Permits including Storm Water Requirements

Administrator means the Administrator of the United States Environmental Protection Agency, or an authorized representative.

Applicable standards and limitations means all, State, interstate, and Federal standards and limitations to which a "discharge", a "sewage sludge use or disposal practice", or a related activity is subject to, including "effluent limitations", water quality standards, standards of performance, toxic effluent standards or prohibitions, "best management practices", pretreatment standards, and "standards for sewage sludge use and disposal" under Sections 301, 302, 303, 304, 306, 307, 308, 403, and 405 of the CWA.

Application means the EPA standard national forms for applying for a permit, including any additions, revisions, or modifications to the forms; or forms approved by EPA for use in "approved States", including any approved modifications or revisions.

Average means the arithmetic mean of values taken at the frequency required for each parameter over the specified period. For total and/or fecal coliforms and Escherichia coli, the average shall be the geometric mean.

Average monthly discharge limitation means the highest allowable average of "daily discharges" over a calendar month calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

Average weekly discharge limitation means the highest allowable average of "daily discharges" measured during the calendar week divided by the number of "daily discharges" measured during the week.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Best Professional Judgment (BPJ) means a case-by-case determination of Best Practicable Treatment (BPT), Best Available Treatment (BAT), or other appropriate technology-based standard based on an evaluation of the available technology to achieve a particular pollutant reduction and other factors set forth in 40 CFR §125.3 (d).

Coal Pile Runoff means the rainfall runoff from or through any coal storage pile.

Composite Sample means a sample consisting of a minimum of eight grab samples of equal volume collected at equal intervals during a 24-hour period (or lesser period as specified in the section on Monitoring and Reporting) and combined proportional to flow, or a sample consisting of the same number of grab samples, or greater, collected proportionally to flow over that same time period.

Construction Activities - The following definitions apply to construction activities:

(a) Commencement of Construction is the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction activities.

(b) Dedicated portable asphalt plant is a portable asphalt plant located on or contiguous to a construction site and that provides asphalt only to the construction site that the plant is located on or adjacent to. The term dedicated portable asphalt plant does not include facilities that are subject to the asphalt emulsion effluent limitation guideline at 40 CFR Part 443.

(c) Dedicated portable concrete plant is a portable concrete plant located on or contiguous to a construction site and that provides concrete only to the construction site that the plant is located on or adjacent to.

(d) Final Stabilization means that all soil disturbing activities at the site have been complete, and that a uniform perennial vegetative cover with a density of 70% of the cover for unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

(e) Runoff coefficient means the fraction of total rainfall that will appear at the conveyance as runoff.

Contiguous zone means the entire zone established by the United States under Article 24 of the Convention on the Territorial Sea and the Contiguous Zone.

Continuous discharge means a "discharge" which occurs without interruption throughout the operating hours of the facility except for infrequent shutdowns for maintenance, process changes, or similar activities.

CWA means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub. L. 92-500, as amended by Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483, and Pub. L. 97-117; 33 USC §§1251 et seq.

Daily Discharge means the discharge of a pollutant measured during the calendar day or any other 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Director normally means the person authorized to sign NPDES permits by EPA or the State or an authorized representative. Conversely, it also could mean the Regional Administrator or the State Director as the context requires.

Discharge Monitoring Report Form (DMR) means the EPA standard national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by permittees. DMRs must be used by "approved States" as well as by EPA. EPA will supply DMRs to any approved State upon request. The EPA national forms may be modified to substitute the State Agency name, address, logo, and other similar information, as appropriate, in place of EPA's.

Discharge of a pollutant means:

(a) Any addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source", or

(b) Any addition of any pollutant or combination of pollutants to the waters of the "contiguous zone" or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation (See "Point Source" definition).

This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead

to a treatment works; and discharges through pipes, sewers, or other conveyances leading into privately owned treatment works.

This term does not include an addition of pollutants by any "indirect discharger."

Effluent limitation means any restriction imposed by the Regional Administrator on quantities, discharge rates, and concentrations of "pollutants" which are "discharged" from "point sources" into "waters of the United States", the waters of the "contiguous zone", or the ocean.

Effluent limitation guidelines means a regulation published by the Administrator under Section 304(b) of CWA to adopt or revise "effluent limitations".

EPA means the United States "Environmental Protection Agency".

Flow-weighted composite sample means a composite sample consisting of a mixture of aliquots where the volume of each aliquot is proportional to the flow rate of the discharge.

Grab Sample – An individual sample collected in a period of less than 15 minutes.

Hazardous Substance means any substance designated under 40 CFR Part 116 pursuant to Section 311 of the CWA.

Indirect Discharger means a non-domestic discharger introducing pollutants to a publicly owned treatment works.

Interference means a discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

(a) Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and

(b) Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act (CWA), the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resources Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of the SDWA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection Research and Sanctuaries Act.

Landfill means an area of land or an excavation in which wastes are placed for permanent disposal, and which is not a land application unit, surface impoundment, injection well, or waste pile.

Land application unit means an area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for treatment or disposal.

Large and Medium municipal separate storm sewer system means all municipal separate storm sewers that are either: (i) located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and 40 CFR Part 122); or (ii) located in the counties with unincorporated urbanized

populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships, or towns within such counties (these counties are listed in Appendices H and I of 40 CFR 122); or (iii) owned or operated by a municipality other than those described in Paragraph (i) or (ii) and that are designated by the Regional Administrator as part of the large or medium municipal separate storm sewer system.

Maximum daily discharge limitation means the highest allowable "daily discharge" concentration that occurs only during a normal day (24-hour duration).

Maximum daily discharge limitation (as defined for the Steam Electric Power Plants only) when applied to Total Residual Chlorine (TRC) or Total Residual Oxidant (TRO) is defined as "maximum concentration" or "Instantaneous Maximum Concentration" during the two hours of a chlorination cycle (or fraction thereof) prescribed in the Steam Electric Guidelines, 40 CFR Part 423. These three synonymous terms all mean "a value that shall not be exceeded" during the two-hour chlorination cycle. This interpretation differs from the specified NPDES Permit requirement, 40 CFR § 122.2, where the two terms of "Maximum Daily Discharge" and "Average Daily Discharge" concentrations are specifically limited to the daily (24-hour duration) values.

Municipality means a city, town, borough, county, parish, district, association, or other public body created by or under State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or an Indian tribe or an authorized Indian tribe organization, or a designated and approved management agency under Section 208 of the CWA.

National Pollutant Discharge Elimination System means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318, and 405 of the CWA. The term includes an "approved program".

New Discharger means any building, structure, facility, or installation:

(a) From which there is or may be a "discharge of pollutants";

(b) That did not commence the "discharge of pollutants" at a particular "site" prior to August 13, 1979;

(c) Which is not a "new source"; and

(d) Which has never received a finally effective NPDES permit for discharges at that "site".

This definition includes an "indirect discharger" which commences discharging into "waters of the United States" after August 13, 1979. It also includes any existing mobile point source (other than an offshore or coastal oil and gas exploratory drilling rig or a coastal oil and gas exploratory drilling rig or a coastal oil and gas developmental drilling rig) such as a seafood processing rig, seafood processing vessel, or aggregate plant, that begins discharging at a "site" for which it does not have a permit; and any offshore rig or coastal mobile oil and gas exploratory drilling rig or coastal mobile oil and gas developmental drilling rig that commences the discharge of pollutants after August 13, 1979, at a "site" under EPA's permitting jurisdiction for which it is not covered by an individual or general permit and which is located in an area determined by the Regional Administrator in the issuance of a final permit to be in an area of biological concern. In determining whether an area is an area of biological concern, the Regional Administrator shall consider the factors specified in 40 CFR §§125.122 (a) (1) through (10).

An offshore or coastal mobile exploratory drilling rig or coastal mobile developmental drilling rig will be considered a "new discharger" only for the duration of its discharge in an area of biological concern.

New source means any building, structure, facility, or installation from which there is or may be a "discharge of pollutants", the construction of which commenced:

(a) After promulgation of standards of performance under Section 306 of CWA which are applicable to such source, or

(b) After proposal of standards of performance in accordance with Section 306 of CWA which are applicable to such source, but only if the standards are promulgated in accordance with Section 306 within 120 days of their proposal.

NPDES means "National Pollutant Discharge Elimination System".

Owner or operator means the owner or operator of any "facility or activity" subject to regulation under the NPDES programs.

Pass through means a Discharge which exits the POTW into waters of the United States in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation).

Permit means an authorization, license, or equivalent control document issued by EPA or an "approved" State.

Person means an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof.

Point Source means any discernible, confined, and discrete conveyance, including but not limited to any pipe ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff (see 40 CFR §122.2).

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. §§2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. It does not mean:

(a) Sewage from vessels; or

(b) Water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil and gas production and disposed of in a well, if the well is used either to facilitate production or for disposal purposes is approved by the authority of the State in which the well is located, and if the State determines that the injection or disposal will not result in the degradation of ground or surface water resources.

Primary industry category means any industry category listed in the NRDC settlement agreement (Natural Resources Defense Council et al. v. Train, 8 E.R.C. 2120 (D.D.C. 1976), modified 12 E.R.C. 1833 (D. D.C. 1979)); also listed in Appendix A of 40 CFR Part 122.

Privately owned treatment works means any device or system which is (a) used to treat wastes from any facility whose operation is not the operator of the treatment works or (b) not a "POTW".

Process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.

Publicly Owned Treatment Works (POTW) means any facility or system used in the treatment (including recycling and reclamation) of municipal sewage or industrial wastes of a liquid nature which is owned by a "State" or "municipality".

This definition includes sewers, pipes, or other conveyances only if they convey wastewater to a POTW providing treatment.

Regional Administrator means the Regional Administrator, EPA, Region I, Boston, Massachusetts.

Secondary Industry Category means any industry which is not a "primary industry category".

Section 313 water priority chemical means a chemical or chemical category which:

(1) is listed at 40 CFR §372.65 pursuant to Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) (also known as Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986);

(2) is present at or above threshold levels at a facility subject to EPCRA Section 313 reporting requirements; and

(3) satisfies at least one of the following criteria:

(i) are listed in Appendix D of 40 CFR Part 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols), or Table V (certain toxic pollutants and hazardous substances);
(ii) are listed as a hazardous substance pursuant to Section 311(b)(2)(A) of the CWA at 40 CFR §116.4; or
(iii) are pollutants for which EPA has published acute or chronic water quality criteria.

Septage means the liquid and solid material pumped from a septic tank, cesspool, or similar domestic sewage treatment system, or a holding tank when the system is cleaned or maintained.

Sewage Sludge means any solid, semisolid, or liquid residue removed during the treatment of municipal wastewater or domestic sewage. Sewage sludge includes, but is not limited to, solids removed during primary, secondary, or advanced wastewater treatment, scum, septage, portable toilet pumpings, Type III Marine Sanitation Device pumpings (33 CFR Part 159), and sewage sludge products. Sewage sludge does not include grit or screenings, or ash generated during the incineration of sewage sludge.

Sewage sludge use or disposal practice means the collection, storage, treatment, transportation, processing, monitoring, use, or disposal of sewage sludge.

Significant materials includes, but is not limited to: raw materials, fuels, materials such as solvents, detergents, and plastic pellets, raw materials used in food processing or production, hazardous substance designated under section 101(14) of CERCLA, any chemical the facility is required to report pursuant to EPCRA Section 313, fertilizers, pesticides, and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges.

Significant spills includes, but is not limited to, releases of oil or hazardous substances in excess of reportable quantities under Section 311 of the CWA (see 40 CFR §110.10 and §117.21) or Section 102 of CERCLA (see 40 CFR § 302.4).

Sludge-only facility means any "treatment works treating domestic sewage" whose methods of sewage sludge use or disposal are subject to regulations promulgated pursuant to Section 405(d) of the CWA, and is required to obtain a permit under 40 CFR §122.1(b)(3).

State means any of the 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Trust Territory of the Pacific Islands.

Storm Water means storm water runoff, snow melt runoff, and surface runoff and drainage.

Storm water discharge associated with industrial activity means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant. (See 40 CFR §122.26 (b)(14) for specifics of this definition.

Time-weighted composite means a composite sample consisting of a mixture of equal volume aliquots collected at a constant time interval.

Toxic pollutants means any pollutant listed as toxic under Section 307 (a)(1) or, in the case of "sludge use or disposal practices" any pollutant identified in regulations implementing Section 405(d) of the CWA.

Treatment works treating domestic sewage means a POTW or any other sewage sludge or wastewater treatment devices or systems, regardless of ownership (including federal facilities), used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated for the disposal of sewage sludge. This definition does not include septic tanks or similar devices.

For purposes of this definition, "domestic sewage" includes waste and wastewater from humans or household operations that are discharged to or otherwise enter a treatment works. In States where there is no approved State sludge management program under Section 405(f) of the CWA, the Regional Administrator may designate any person subject to the standards for sewage sludge use and disposal in 40 CFR Part 503 as a "treatment works treating domestic sewage", where he or she finds that there is a potential for adverse effects on public health and the environment from poor sludge quality or poor sludge handling, use or disposal practices, or where he or she finds that such designation is necessary to ensure that such person is in compliance with 40 CFR Part 503.

Waste Pile means any non-containerized accumulation of solid, non-flowing waste that is used for treatment or storage.

Waters of the United States means:

(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of tide;

(b) All interstate waters, including interstate "wetlands";

(c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands", sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

(1) Which are or could be used by interstate or foreign travelers for recreational or other purpose;

(2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

(3) Which are used or could be used for industrial purposes by industries in interstate commerce;

(d) All impoundments of waters otherwise defined as waters of the United States under this definition;

(e) Tributaries of waters identified in Paragraphs (a) through (d) of this definition;

(f) The territorial sea; and

(g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in Paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds as defined in 40 CFR §423.11(m) which also meet the criteria of this definition) are not waters of the United States.

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Whole Effluent Toxicity (WET) means the aggregate toxic effect of an effluent measured directly by a toxicity test. (See Abbreviations Section, following, for additional information.)

2. Definitions for NPDES Permit Sludge Use and Disposal Requirements.

Active sewage sludge unit is a sewage sludge unit that has not closed.

Aerobic Digestion is the biochemical decomposition of organic matter in sewage sludge into carbon dioxide and water by microorganisms in the presence of air.

Agricultural Land is land on which a food crop, a feed crop, or a fiber crop is grown. This includes range land and land used as pasture.

Agronomic rate is the whole sludge application rate (dry weight basis) designed:

(1) To provide the amount of nitrogen needed by the food crop, feed crop, fiber crop, cover crop, or vegetation grown on the land; and

(2) To minimize the amount of nitrogen in the sewage sludge that passes below the root zone of the crop or vegetation grown on the land to the ground water.

Air pollution control device is one or more processes used to treat the exit gas from a sewage sludge incinerator stack.

Anaerobic digestion is the biochemical decomposition of organic matter in sewage sludge into methane gas and carbon dioxide by microorganisms in the absence of air.

Annual pollutant loading rate is the maximum amount of a pollutant that can be applied to a unit area of land during a 365 day period.

Annual whole sludge application rate is the maximum amount of sewage sludge (dry weight basis) that can be applied to a unit area of land during a 365 day period.

Apply sewage sludge or sewage sludge applied to the land means land application of sewage sludge.

Aquifer is a geologic formation, group of geologic formations, or a portion of a geologic formation capable of yielding ground water to wells or springs.

Auxiliary fuel is fuel used to augment the fuel value of sewage sludge. This includes, but is not limited to, natural gas, fuel oil, coal, gas generated during anaerobic digestion of sewage sludge, and municipal solid waste (not to exceed 30 percent of the dry weight of the sewage sludge and auxiliary fuel together). Hazardous wastes are not auxiliary fuel.

Base flood is a flood that has a one percent chance of occurring in any given year (i.e. a flood with a magnitude equaled once in 100 years).

Bulk sewage sludge is sewage sludge that is not sold or given away in a bag or other container for application to the land.

Contaminate an aquifer means to introduce a substance that causes the maximum contaminant level for nitrate in 40 CFR §141.11 to be exceeded in ground water or that causes the existing concentration of nitrate in the ground water to increase when the existing concentration of nitrate in the ground water exceeds the maximum contaminant level for nitrate in 40 CFR §141.11.

Class I sludge management facility is any publicly owned treatment works (POTW), as defined in 40 CFR §501.2, required to have an approved pretreatment program under 40 CFR §403.8 (a) (including any POTW located in a state that has elected to assume local program responsibilities pursuant to 40 CFR §403.10 (e) and any treatment works treating domestic sewage, as defined in 40 CFR § 122.2,

classified as a Class I sludge management facility by the EPA Regional Administrator, or, in the case of approved state programs, the Regional Administrator in conjunction with the State Director, because of the potential for sewage sludge use or disposal practice to affect public health and the environment adversely.

Control efficiency is the mass of a pollutant in the sewage sludge fed to an incinerator minus the mass of that pollutant in the exit gas from the incinerator stack divided by the mass of the pollutant in the sewage sludge fed to the incinerator.

Cover is soil or other material used to cover sewage sludge placed on an active sewage sludge unit.

Cover crop is a small grain crop, such as oats, wheat, or barley, not grown for harvest.

Cumulative pollutant loading rate is the maximum amount of inorganic pollutant that can be applied to an area of land.

Density of microorganisms is the number of microorganisms per unit mass of total solids (dry weight) in the sewage sludge.

Dispersion factor is the ratio of the increase in the ground level ambient air concentration for a pollutant at or beyond the property line of the site where the sewage sludge incinerator is located to the mass emission rate for the pollutant from the incinerator stack.

Displacement is the relative movement of any two sides of a fault measured in any direction.

Domestic septage is either liquid or solid material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device, or similar treatment works that receives only domestic sewage. Domestic septage does not include liquid or solid material removed from a septic tank, cesspool, or similar treatment works that receives either commercial wastewater or industrial wastewater and does not include grease removed from a grease trap at a restaurant.

Domestic sewage is waste and wastewater from humans or household operations that is discharged to or otherwise enters a treatment works.

Dry weight basis means calculated on the basis of having been dried at 105 degrees Celsius (°C) until reaching a constant mass (i.e. essentially 100 percent solids content).

Fault is a fracture or zone of fractures in any materials along which strata on one side are displaced with respect to the strata on the other side.

Feed crops are crops produced primarily for consumption by animals.

Fiber crops are crops such as flax and cotton.

Final cover is the last layer of soil or other material placed on a sewage sludge unit at closure.

Fluidized bed incinerator is an enclosed device in which organic matter and inorganic matter in sewage sludge are combusted in a bed of particles suspended in the combustion chamber gas.

Food crops are crops consumed by humans. These include, but are not limited to, fruits, vegetables, and tobacco.

Forest is a tract of land thick with trees and underbrush.

Ground water is water below the land surface in the saturated zone.

Holocene time is the most recent epoch of the Quaternary period, extending from the end of the Pleistocene epoch to the present.

Hourly average is the arithmetic mean of all the measurements taken during an hour. At least two measurements must be taken during the hour.

Incineration is the combustion of organic matter and inorganic matter in sewage sludge by high temperatures in an enclosed device.

Industrial wastewater is wastewater generated in a commercial or industrial process.

Land application is the spraying or spreading of sewage sludge onto the land surface; the injection of sewage sludge below the land surface; or the incorporation of sewage sludge into the soil so that the sewage sludge can either condition the soil or fertilize crops or vegetation grown in the soil.

Land with a high potential for public exposure is land that the public uses frequently. This includes, but is not limited to, a public contact site and reclamation site located in a populated area (e.g., a construction site located in a city).

Land with low potential for public exposure is land that the public uses infrequently. This includes, but is not limited to, agricultural land, forest and a reclamation site located in an unpopulated area (e.g., a strip mine located in a rural area).

Leachate collection system is a system or device installed immediately above a liner that is designed, constructed, maintained, and operated to collect and remove leachate from a sewage sludge unit.

Liner is soil or synthetic material that has a hydraulic conductivity of 1×10^{-7} centimeters per second or less.

Lower explosive limit for methane gas is the lowest percentage of methane gas in air, by volume, that propagates a flame at 25 degrees Celsius and atmospheric pressure.

Monthly average (Incineration) is the arithmetic mean of the hourly averages for the hours a sewage sludge incinerator operates during the month.

Monthly average (Land Application) is the arithmetic mean of all measurements taken during the month.

Municipality means a city, town, borough, county, parish, district, association, or other public body (including an intermunicipal agency of two or more of the foregoing entities) created by or under State law; an Indian tribe or an authorized Indian tribal organization having jurisdiction over sewage sludge management; or a designated and approved management agency under section 208 of the CWA, as amended. The definition includes a special district created under state law, such as a water district, sewer district, sanitary district, utility district, drainage district, or similar entity, or an integrated waste management facility as defined in section 201 (e) of the CWA, as amended, that has as one of its principal responsibilities the treatment, transport, use or disposal of sewage sludge.

Other container is either an open or closed receptacle. This includes, but is not limited to, a bucket, a box, a carton, and a vehicle or trailer with a load capacity of one metric ton or less.

Pasture is land on which animals feed directly on feed crops such as legumes, grasses, grain stubble, or stover.

Pathogenic organisms are disease-causing organisms. These include, but are not limited to, certain bacteria, protozoa, viruses, and viable helminth ova.

Permitting authority is either EPA or a State with an EPA-approved sludge management program.

Person is an individual, association, partnership, corporation, municipality, State or Federal Agency, or an agent or employee thereof.

Person who prepares sewage sludge is either the person who generates sewage sludge during the treatment of domestic sewage in a treatment works or the person who derives a material from sewage sludge.

pH means the logarithm of the reciprocal of the hydrogen ion concentration; a measure of the acidity or alkalinity of a liquid or solid material.

Place sewage sludge or sewage sludge placed means disposal of sewage sludge on a surface disposal site.

Pollutant (as defined in sludge disposal requirements) is an organic substance, an inorganic substance, a combination or organic and inorganic substances, or pathogenic organism that, after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food chain, could on the basis on information available to the Administrator of EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction) or physical deformations in either organisms or offspring of the organisms.

Pollutant limit (for sludge disposal requirements) is a numerical value that describes the amount of a pollutant allowed per unit amount of sewage sludge (e.g., milligrams per kilogram of total solids); the amount of pollutant that can be applied to a unit of land (e.g., kilograms per hectare); or the volume of the material that can be applied to the land (e.g., gallons per acre).

Public contact site is a land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.

Qualified ground water scientist is an individual with a baccalaureate or post-graduate degree in the natural sciences or engineering who has sufficient training and experience in ground water hydrology and related fields, as may be demonstrated by State registration, professional certification, or completion of accredited university programs, to make sound professional judgments regarding ground water monitoring, pollutant fate and transport, and corrective action.

Range land is open land with indigenous vegetation.

Reclamation site is drastically disturbed land that is reclaimed using sewage sludge. This includes, but is not limited to, strip mines and construction sites.

Risk specific concentration is the allowable increase in the average daily ground level ambient air concentration for a pollutant from the incineration of sewage sludge at or beyond the property line of a site where the sewage sludge incinerator is located.

Runoff is rainwater, leachate, or other liquid that drains overland on any part of a land surface and runs off the land surface.

Seismic impact zone is an area that has 10 percent or greater probability that the horizontal ground level acceleration to the rock in the area exceeds 0.10 gravity once in 250 years.

Sewage sludge is a solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to:, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in treatment works.

Sewage sludge feed rate is either the average daily amount of sewage sludge fired in all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located for the number of days in a 365 day period that each sewage sludge incinerator operates, or the average daily design capacity for all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located.

Sewage sludge incinerator is an enclosed device in which only sewage sludge and auxiliary fuel are fired.

Sewage sludge unit is land on which only sewage sludge is placed for final disposal. This does not include land on which sewage sludge is either stored or treated. Land does not include waters of the United States, as defined in 40 CFR §122.2.

Sewage sludge unit boundary is the outermost perimeter of an active sewage sludge unit.

Specific oxygen uptake rate (SOUR) is the mass of oxygen consumed per unit time per unit mass of total solids (dry weight basis) in sewage sludge.

Stack height is the difference between the elevation of the top of a sewage sludge incinerator stack and the elevation of the ground at the base of the stack when the difference is equal to or less than 65 meters. When the difference is greater than 65 meters, stack height is the creditable stack height determined in accordance with 40 CFR §51.100 (ii).

State is one of the United States of America, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Trust Territory of the Pacific Islands, the Commonwealth of the Northern Mariana Islands, and an Indian tribe eligible for treatment as a State pursuant to regulations promulgated under the authority of section 518(e) of the CWA.

Store or storage of sewage sludge is the placement of sewage sludge on land on which the sewage sludge remains for two years or less. This does not include the placement of sewage sludge on land for treatment.

Surface disposal site is an area of land that contains one or more active sewage sludge units.

Total hydrocarbons means the organic compounds in the exit gas from a sewage sludge incinerator stack measured using a flame ionization detection instrument referenced to propane.

Total solids are the materials in sewage sludge that remain as residue when the sewage sludge is dried at 103 to 105 degrees Celsius.

Treat or treatment of sewage sludge is the preparation of sewage sludge for final use or disposal. This includes, but is not limited to, thickening, stabilization, and dewatering of sewage sludge. This does not include storage of sewage sludge.

Treatment works is either a federally owned, publicly owned, or privately owned device or system used to treat (including recycle and reclaim) either domestic sewage or a combination of domestic sewage and industrial waste of a liquid nature.

Unstable area is land subject to natural or human-induced forces that may damage the structural components of an active sewage sludge unit. This includes, but is not limited to, land on which the soils are subject to mass movement.

Unstabilized solids are organic materials in sewage sludge that have not been treated in either an aerobic or anaerobic treatment process.

Vector attraction is the characteristic of sewage sludge that attracts rodents, flies, mosquitoes, or other organisms capable of transporting infectious agents.

Volatile solids is the amount of the total solids in sewage sludge lost when the sewage sludge is combusted at 550 degrees Celsius in the presence of excess air.

Wet electrostatic precipitator is an air pollution control device that uses both electrical forces and water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

Wet scrubber is an air pollution control device that uses water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

3. Commonly Used Abbreviations

BOD	Five-day biochemical oxygen demand unless otherwise specified
CBOD	Carbonaceous BOD
CFS	Cubic feet per second
COD	Chemical oxygen demand
Chlorine	
Cl_2	Total residual chlorine
TRC	Total residual chlorine which is a combination of free available chlorine (FAC, see below) and combined chlorine (chloramines, etc.)

TRO	Total residual chlorine in marine waters where halogen compounds are present
FAC	Free available chlorine (aqueous molecular chlorine, hypochlorous acid, and hypochlorite ion)
Coliform	
Coliform, Fecal	Total fecal coliform bacteria
Coliform, Total	Total coliform bacteria
Cont. (Continuous)	Continuous recording of the parameter being monitored, i.e. flow, temperature, pH, etc.
Cu. M/day or M^3/day	Cubic meters per day
DO	Dissolved oxygen
kg/day	Kilograms per day
lbs/day	Pounds per day
mg/l	Milligram(s) per liter
ml/l	Milliliters per liter
MGD	Million gallons per day
Nitrogen	
Total N	Total nitrogen
NH_3-N	Ammonia nitrogen as nitrogen
NO_3-N	Nitrate as nitrogen
NO_2-N	Nitrite as nitrogen
NO_3-NO_2	Combined nitrate and nitrite nitrogen as nitrogen
TKN	Total Kjeldahl nitrogen as nitrogen
Oil & Grease	Freon extractable material
PCB	Polychlorinated biphenyl
pH	A measure of the hydrogen ion concentration. A measure of the acidity or alkalinity of a liquid or material
Surfactant	Surface-active agent

Temp. °C	Temperature in degrees Centigrade
Temp. °F	Temperature in degrees Fahrenheit
TOC	Total organic carbon
Total P	Total phosphorus
TSS or NFR	Total suspended solids or total nonfilterable residue
Turb. or Turbidity	Turbidity measured by the Nephelometric Method (NTU)
ug/l	Microgram(s) per liter
WET	"Whole effluent toxicity" is the total effect of an effluent measured directly with a toxicity test.
C-NOEC	"Chronic (Long-term Exposure Test) – No Observed Effect Concentration". The highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specified time of observation.
A-NOEC	"Acute (Short-term Exposure Test) – No Observed Effect Concentration" (see C-NOEC definition).
LC_{50}	LC_{50} is the concentration of a sample that causes mortality of 50% of the test population at a specific time of observation. The LC_{50} = 100% is defined as a sample of undiluted effluent.
ZID	Zone of Initial Dilution means the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND - REGION I
FIVE POST OFFICE SQUARE, SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

FACT SHEET

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

NPDES PERMIT NO.: NH0100161

PUBLIC NOTICE START/FINISH DATE:

NAME AND MAILING ADDRESS OF APPLICANT:

Town of Merrimack
c/o Town Manager
6 Baboosic Lake Road
Merrimack, New Hampshire 03054

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Town of Merrimack
Merrimack Wastewater Treatment Facility
36 Mast Road
Merrimack, New Hampshire 03454

The Town of Bedford is a co-permittee for specific activities required by the permit, as set forth in Section IV.H. of this fact sheet and Section I.B., I.C., and I.D. of the draft permit. The responsible municipal department is:

Town of Bedford
Department of Public Works
24 North Amherst Road
Bedford, New Hampshire 03110

RECEIVING WATER: Merrimack (Hydrologic Unit Code: 01070002)

CLASSIFICATION: B

TABLE OF CONTENTS

I. Proposed Action, Type of Facility, and Discharge Location.

The above named applicant has applied to the U.S. Environmental Protection Agency (EPA) for reissuance of its NPDES permit to discharge treated effluent into the designated receiving water. The facility is involved in the collection and treatment of domestic, commercial, and industrial wastewaters. Secondary treatment is provided using an activated sludge process, and disinfection is provided by chlorination (followed by dechlorination). The facility has a design flow of 5.0 mgd and discharges treated wastewater from Outfall 001 to the Merrimack River. The facility serves a population of 27,000 people in the Town of Merrimack and 430 people in the Town of Bedford. In addition, approximately 35% of the influent is effluent from the Anheuser-Busch brewery.

Since the Town of Bedford owns and operates a portion of the collection system, it has been included as a co-permittee for portions of the permit relating to unauthorized discharges, operation and maintenance of the sewer system, and alternate power sources.

The previous permit was issued on September 25, 2007, became effective on December 1, 2007 and expired on November 30, 2012. The existing permit ("2007 permit") will be administratively extended if necessary because the applicant filed a complete application for permit reissuance pursuant to 40 Code of Federal Regulations (C.F.R.) Section 122.6.

Impaired water quality conditions persist in the Merrimack River and have resulted in its listing in the State of New Hampshire's 2010 *Final List of Threatened or Impaired Waters That Require a TMDL*, also referred to as the 303(d) list. According to the 303(d) list, primary contact recreational uses are impaired by *Escherichia coli* bacteria and aquatic life uses are impaired by dissolved oxygen, pH and aluminum in the proximity of the Merrimack Wastewater Treatment Facility discharge.

The location of the facility, Outfall 001, and receiving water are shown in Attachment A.

II. Description of Discharge.

A quantitative description of significant effluent parameters based on Discharge Monitoring Reports (DMRs) is shown in Attachment B. The data are from January 2008 through April 2012.

III. Limitations and Conditions.

Effluent limitations and monitoring requirements are found in PART I of the draft NPDES permit.

IV. Permit Basis and Explanation of Effluent Limitation Derivation.

A. General Regulatory Background

Congress enacted the Clean Water Act (CWA) "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." CWA § 101(a). To achieve this objective, the CWA makes it unlawful for any person to discharge any pollutant into waters of the United

States from any point source, except as authorized by specified permitting sections of the CWA, one of which is Section 402. See CWA §§ 301(a) and 402(a). Section 402 establishes one of the CWA's principal permitting programs, the National Pollutant Discharge Elimination System (NPDES). Under this section of the CWA, EPA may "issue a permit for the discharge of any pollutant or combination of pollutants" in accordance with certain conditions. See CWA § 402(a). NPDES permits generally contain discharge limitations and establish related monitoring and reporting requirements. See CWA § 402(a)(1)-(2).

Section 301 of the CWA provides for two types of effluent limitations to be included in NPDES permits: "technology-based" limitations and "water quality-based" limitations. See CWA §§ 301, 303, 304(b); 40 C.F.R. Parts 122, 125, 131. Technology-based limitations, generally developed on an industry-by-industry basis, reflect a specified level of pollutant reducing technology available and economically achievable for the type of facility being permitted. See CWA § 301(b). As a class, POTWs must meet performance based requirements dependent on available wastewater treatment technology. CWA § 301(b)(1)(B). The performance level for POTWs is referred to as "secondary treatment". Secondary treatment is comprised of technology-based requirements expressed in terms of BOD_5, TSS, and pH. 40 C.F.R. Part 133.

Water quality-based effluent limits are designed to ensure that state water quality standards are met regardless of the decision made with respect to technology and economics in establishing technology-based limitations. In particular, Section 301(b)(1)(C) requires achievement of, "any more stringent limitation, including those necessary to meet water quality standards…established pursuant to any State law or regulation…" See 40 C.F.R. §§ 122.4(d), 122.44(d)(1) (providing that a permit must contain effluent limits as necessary to protect State water quality standards, "including State narrative criteria for water quality")(emphasis added) and 122.45(d)(5) (providing in part that a permit incorporate any more stringent limits required by Section 301(b)(1)(C) of the CWA).

The CWA requires that States develop water quality standards for all water bodies within the State. CWA § 303. These standards have three parts: (1) one or more "designated uses" for each water body or water body segment in the state; (2) water quality "criteria" consisting of numerical concentration levels and/or narrative statements specifying the amounts of various pollutants that may be present in each water body without impairing the designated uses of that water body; and (3) an antidegradation provision, focused on protecting high quality waters and protecting and maintaining water quality necessary to protect existing uses. CWA § 303(c)(2)(a); 40 C.F.R. § 131.12. The limits and conditions of the permit reflect the goal of the CWA and EPA to achieve and then to maintain water quality standards.

The applicable New Hampshire water quality standards can be found in Surface Water Quality Regulations, Chapter Env-Ws 1700 et seq. See generally, Title 50, Water Management and Protection, Chapter 485A, Water Pollution and Waste Disposal Section 485-A. Hereinafter, New Hampshire's Surface Water Quality Regulations are referred to as the NH standards.

Receiving stream requirements are established according to numerical and narrative standards adopted under state law for each stream classification. When using chemical-specific numeric criteria from a State's water quality standards to develop permit limits, both the acute and chronic aquatic life criteria are used and expressed in terms of maximum allowable in-stream pollutant concentrations. Acute aquatic life criteria are generally implemented through

maximum daily limits and chronic aquatic life criteria are generally implemented through average monthly limits. When a State has not established a numeric water quality criterion for a specific pollutant that is present in the effluent in a concentration that causes or has a reasonable potential to cause a violation of narrative water quality standards, the permitting authority must establish effluent limits in one of three ways: based on a "calculated numeric criterion for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and fully protect the designated use"; on a "case-by-case basis" using CWA § 304(a) recommended water quality criteria, supplemented as necessary by other relevant information; or in certain circumstances, based on an "indicator parameter". 40 C.F.R. § 122.44(d)(1)(vi)(A-C).

All statutory deadlines for meeting various treatment technology-based effluent limitations established pursuant to the CWA have expired. When technology-based effluent limits are included in a permit, compliance with those limitations is from the date the issued permit becomes effective. See 40 C.F.R. § 125.3(a)(1). Compliance schedules and deadlines not in accordance with the statutory provisions of the CWA cannot be authorized by an NPDES permit. The regulations governing EPA's NPDES permit program are generally found in 40 C.F.R. Parts 122, 124, and 136.

B. Introduction

The permit must limit any pollutant or pollutant parameter (conventional, non-conventional, toxic, and whole effluent toxicity) that is or may be discharged at a level that causes or has "reasonable potential" to cause or contribute to an excursion above any water quality standard, including narrative water quality criteria. See 40 C.F.R. 122.44(d)(1). An excursion occurs if the projected or actual in-stream concentration exceeds the applicable criterion.

1. Reasonable Potential

In determining reasonable potential, EPA considers: (1) existing controls on point and non-point sources of pollution; (2) pollutant concentration and variability in the effluent and receiving water as determined from permit applications, monthly discharge monitoring reports, and State and Federal water quality reports; (3) sensitivity of the species to toxicity testing; (4) statistical approach outlined in *Technical Support Document for Water Quality-based Toxics Controls*, March 1991, EPA/505/2-90-001 in Section 3; and where appropriate, (5) dilution of the effluent in the receiving water. In accordance with New Hampshire Standards (RSA 485-A:8VI, Env-Ws 1705.02), available dilution for rivers and streams is based on a known or estimated value of the lowest average flow which occurs for seven (7) consecutive days with a recurrence interval of once in ten (10) years (7Q10) for aquatic life and human health criteria for non-carcinogens, or the long-term harmonic mean flow for human health (carcinogens only) in the receiving water at the point just upstream of the outfall. Furthermore, 10 percent of the receiving water's assimilative capacity is held in reserve for future needs in accordance with New Hampshire's Surface Water Quality Regulations Env-Ws 1705.01.

2. Anti-backsliding

Section 402(o) of the CWA generally provides that the effluent limitations of a renewed, reissued, or modified permit must be at least as stringent as the comparable effluent limitations in

the previous permit. Unless certain limited exceptions are met, "backsliding" from effluent limitations contained in previously issued permits is prohibited. EPA has also promulgated anti-backsliding regulations which are found at 40 C.F.R. § 122.44(l). Unless applicable anti-backsliding requirements are met, the limits and conditions in the reissued permit must be at least as stringent as those in the previous permit.

3. State Certification

Section 401(a)(1) of the CWA requires all NPDES permit applicants to obtain a certification from the appropriate state agency stating that the permit will comply with all applicable federal effluent limitation and state water quality standards. See CWA § 401(a)(1). The regulatory provisions pertaining to state certification provide that EPA may not issue a permit until a certification is granted or waived by the state in which the discharge originates. 40 C.F.R. § 124.53(a). The regulations further provide that, "when certification is required…no final permit shall be issued…unless the final permit incorporated the requirements specified in the certification under § 124.53(e)." 40 C.F.R. § 124.55(a)(2). Section 124.53(e) in turn provides that the State certification shall include "any conditions more stringent than those in the draft permit which the State finds necessary" to assure compliance with, among other things, State water quality standards, see 40 C.F.R. 124.53(e)(2), and shall also include "[a] statement of the extent to which each condition of the draft permit can be made less stringent without violating the requirements of State law, including water quality standards," see 40 C.F.R. 124.53(e)(3).

However, when EPA reasonably believes that a State water quality standard requires a more stringent permit limitation than that reflected in a state certification, it has an independent duty under CWA §301(b)(1)(C) to include more stringent permit limitations. See 40 C.F.R. §§ 122.44(d)(1) and (5). It should be noted that under CWA § 401, EPA's duty to defer to considerations of State law is intended to prevent EPA from relaxing any requirements, limitations, or conditions imposed by State law. Therefore, "[a] State may not condition or deny a certification on the grounds that State law allows a less stringent permit condition." 40 C.F.R. § 124.55(c). In such an instance, the regulations provide that, "The Regional Administrator shall disregard any such certification conditions or denials as waivers of certification." Id. EPA regulations pertaining to permit limits based upon water quality standards and state requirements are contained in 40 C.F.R. § 122.4(d) and 40 C.F.R. § 122.44(d).

C. Flow

The Merrimack WWTF has a design flow of 5.0 mgd. This flow rate is used to calculate available dilution as discussed below. If the effluent flow rate exceeds 80 percent of the 5.0 mgd design flow (4.0 mgd) for a period of three (3) consecutive months then the permittee must notify EPA and the NHDES-WD and implement a program to maintain satisfactory treatment levels.

At present the average monthly discharge from the treatment facility is approximately 2.2 mgd (see Attachment B). A flow limit has been carried forward from the 2007 permit. Additionally, the monitoring requirement for the amount of brewery waste received has been carried forward to keep track of how much the brewery is contributing to the Merrimack Wastewater Treatment Facility.

D. Conventional Pollutants

1. BOD_5 and TSS

An analysis of the monitoring data from January 2008 through April 2012 shows that the average monthly effluent flow from the Merrimack Wastewater Treatment Facility is 2.17 mgd. During this same time period, the average monthly influent flow from the brewery was 0.77 mgd. Hence, the brewery accounts for 35% of the flow to the treatment facility and the towns of Merrimack and Bedford account for 65% of the flow. In the 2007 permit, the brewery contributed approximately 60% of the flow and the towns contributed 40%. The change in percentage is mainly due to a decrease in flow from the brewery (see Attachment B). When more than 10% of the loading to a facility comes from an industrial category, pursuant to 40 C.F.R. §133.103(b) the BOD_5 and TSS limits can be adjusted upward proportionately.

The effluent limits for BOD_5 and TSS were developed using draft effluent limitation guidelines for breweries (Food and Beverage category) in conjunction with the secondary treatment standards found in 40 C.F.R. §133.102. The Jan 2010 through May 2012 peak monthly average brewery production value of 9,559 barrels/day was used in the development of these limits. This was a slight decrease from the 9,672 barrels/day used in the 2007 permit. Since the domestic flow accounts for approximately 65% of the total flow, the design flow of 5.0 mgd for the treatment plant was multiplied by this percentage. Hence, the domestic portion of the effluent limits in the draft permit is based on a flow of 3.25 mgd.

Based upon a domestic flow of 3.25 mgd and a production value at the brewery of 9,559 barrels/day the following effluent limitations were calculated:

Parameter	Average Monthly (lb/day)	Maximum Daily (lb/day)
BOD_5	1,504	3,081
TSS	1,775	3,747

The detailed calculations for the BOD_5 and TSS limits can be found in Attachment C.

As indicated above, the segment of the Merrimack River receiving this discharge is impaired for dissolved oxygen. Hence, water quality considerations preclude EPA from relaxing the BOD_5 effluent limit. Specifically, 40 C.F.R. § 122.44(l)(2)(ii) does not allow the relaxation of limits if the "implementation of such limitation would result in a violation of a water quality standard under Section 303 applicable to such waters." Therefore, the more stringent BOD_5 limits in the 2007 permit will be carried forward. These limits are **1,199 lb/day** and **2,581 lb/day** for monthly average and maximum daily, respectively. Should any new information show that these limits must be made more stringent to ensure compliance with water quality standards, the permit may be re-opened and modified to include such limits.

The TSS limits calculated above are also less stringent than the limits in the 2007 permit. The calculated monthly average limits are 300 lb/day higher than the corresponding limits in the 2007 permit, a twenty percent increase. In accordance with antibacksliding regulations found at CWA 402(o), the 2007 TSS limits will be carried forward. These limits are **1,473 lb/day** and **3,255 lb/day** for monthly average and maximum daily, respectively. EPA notes that the facility has been able to demonstrate consistent compliance with the more stringent limits.

Consistent with the 2007 permit, the draft permit limitations for both BOD_5 and TSS are only expressed in terms of mass. Given that the current average flow to the facility is only about 2.2 mgd, the municipal contribution to the facility is currently 1.4 mgd, approximately 65% of the total flow. Inclusion of concentration limits based on the full design flow of the facility (assuming a total municipal contribution of 3.75 mgd) would require attainment of significantly lower mass limitations at less than design flow, effectively removing the benefit of adjusting the limits pursuant to 40 CFR 133.102(b). As the facility flow increases, the mass limit will require that progressively lower concentrations are achieved.

In addition to the effluent limitations for BOD_5 and TSS, the draft permit requires monitoring and reporting of the average weekly mass loading and the monthly average, weekly average, and maximum daily concentrations for BOD_5 and TSS. These requirements are the same as in the 2007 permit.

Percent removal limits for BOD_5 and of TSS, required under 40 CFR Section 133.102 (a) (3) and (b)(3), respectively, are the same as the limits in the 2007 permit and in accordance with the antibacksliding requirements found in 40 CFR Section 122.44.

2. pH

The limit for pH is based upon State Certification Requirements and RSA 485-A:8, which states that "The pH range for said (Class B) waters shall be 6.5 to 8.0 except when due to natural causes."

The draft permit includes a provision allowing a relaxation of the pH limits if the permittee performs an in-stream dilution study that demonstrates that the in-stream standards for pH would be protected. If the State approves results from a pH demonstration study, this permit's pH limit range may be relaxed. The notification of the relaxation must be made by certified letter to the permittee from EPA-New England. The pH limit range cannot be less restrictive than 6.0 - 9.0 S.U., the limitations included in the applicable National Effluent Limitation Guideline (Secondary Treatment Regulations in 40 CFR Part 133) for the facility.

3. Escherichia coli

The average monthly and maximum daily limitations for *Escherichia coli* bacteria are in accordance with Class B water quality standards established by the State of New Hampshire in RSA 485-A:8.II and the anti-backsliding requirements mentioned above.

The average monthly and maximum daily limitations for *Escherichia coli* bacteria (*E. coli*) is based on requirements in the State's Statutes (N.H. RSA 485-A:8) for non-designated beach area, and Env-Wq 1703.06 (b), which requires that bacteria criteria shall be applied at the end of a wastewater treatment facility's discharge pipe. The average monthly discharge of *E. coli* is determined by calculating the geometric mean. Effluent limitations for *E. coli* in the draft permit are the same as the limits in the 2007 permit and, therefore, are in accordance with antibacksliding requirements found in 40 CFR §122.44(1).

During the review period (see Attachment B) the facility had 15 daily maximum violations and 3 monthly average violations of its *E. coli* permit limits. As stated previously, the segments of the Merrimack River both upstream and downstream of the WWTF's discharge is impaired for E. Coli.

The compliance monitoring frequencies for *E. coli* in the draft permit is 3/week. Samples for *E. coli* compliance monitoring must be taken concurrently with samples for total residual chlorine.

E. Non-Conventional and Toxic Pollutants

Water quality based limits for specific toxic pollutants were determined from numeric chemical specific criteria derived from extensive scientific studies. The EPA has summarized and published specific toxic pollutants and their associated toxicity criteria in *Quality Criteria for Water*, 1986, EPA440/5-86-001 as amended, commonly known as the federal "Gold Book". Each pollutant generally includes an acute aquatic life criterion to protect against short term effects, such as death, and a chronic aquatic life criteria to protect against long term effects, such as poor reproduction or impaired growth. New Hampshire adopted these "Gold Book" criteria, with certain exceptions, and included them as part of the State's Surface Water Quality Regulations adopted on December 10, 1999. EPA uses these pollutant specific criteria along with available dilution in the receiving water to determine a pollutant specific draft permit limit.

1. 7Q10 Flow and Available Dilution

The available dilution of the receiving water is determined by using the facility's design flow of 5.0 mgd and the annual 7-day mean low flow at the 10 year recurrence interval (7Q10) in the receiving water just above the treatment plant's outfall. The available dilution is reduced by 10 percent to account for the State's assimilative capacity reserve rule.

The dilution factor is 77 based upon the treatment plant design flow of 5.0 mgd and a 7Q10 of 659.17 cfs (426.1 mgd). The calculations for the 7Q10 and the dilution factor can be found in Attachment D.

2. Total Chlorine Residual

The New Hampshire water quality standards specify the chronic and acute aquatic-life criterion for chlorine as 0.011 mg/l and 0.019 mg/l, respectively, for freshwater; and 0.0075 mg/l and 0.013 mg/l, respectively, for marine water. Based upon available dilution, applicable total residual chlorine limits would be a monthly average limit of 0.85 mg/l (0.011 mg/l * 77) and a daily maximum limit of 1.46 mg/l (0.019 mg/l * 77).

Chlorine and chlorine compounds, such as "organo-chlorines", produced by the chlorination of wastewater can be extremely toxic to aquatic life. Section 101(a)(3) of the Act, and New Hampshire standards at Env-Ws 1703.21(a) prohibit the discharge of toxic pollutants in toxic amounts. Therefore, to reduce the potential for the formation of chlorinated compounds during the wastewater disinfection process and to be protective of the States' narrative standards, EPA-New England has, historically, established a maximum total residual chlorine limitation of 1.0 mg/l for both the average monthly and the maximum daily limitations. These limitations may be more stringent, after considering the available dilution, than the limits determined using the

States' numeric water quality criteria. In this case, the monthly average limit is **0.85 mg/l** and the daily maximum limit is set at **1.0 mg/l**.

3. Phosphorus

Phosphorus and other nutrients (i.e. nitrogen) can promote the growth of nuisance algae and rooted aquatic plants. Typically, elevated levels of nutrients will cause excessive algal and/or plant growth resulting in reduced water clarity, poor aesthetic quality, and impaired aquatic habitat. Through respiration, and the decomposition of dead plant matter, excessive algae and plant growth can reduce in-stream dissolved oxygen concentrations to levels that could negatively impact aquatic life and/or produce strong unpleasant odors.

EPA had produced several guidance documents which contain recommended total phosphorus criteria for receiving waters. The 1986 Quality Criteria of Water (Gold Book) recommends instream phosphorus concentrations of 0.050 mg/l in any stream entering a lake or reservoir, 0.100 mg/l for any stream not discharged directly to lakes or impoundments, and 0.025 mg/l within a lake or reservoir.

In December 2000, EPA released "Ecoregional Nutrient Criteria" (USEPA 2000), which was established as part of an effort to reduce problems associated with excess nutrients in water bodies located within specific areas of the country. The published criteria represent conditions in waters within each specific ecoregion which are minimally impacted by human activities, and thus are representative of waters without cultural eutrophication. Merrimack is within Ecoregion VIII, *Nutrient Poor Largely Glaciated Upper Midwest and Northeast*. Recommended criteria for this ecoregion is a total phosphorus criterion of 10 ug/l (0.010 mg/l) and chlorophyll *a* criterion of 0.63 ug/l (0.00063 mg/l). These recommended criteria are found in the *Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion VIII* (USEPA 2001).

More recently, Mitchell, Liebman, Ramseyer, and Card (in draft 2004), in conjunction with the New England states, developed potential nutrient criteria for rivers and streams in New England. Using several river examples representative of typical conditions for New England streams and rivers, they investigated several approaches for the development of river and stream nutrient criteria that would be dually protective of designated uses in both upstream reaches and downstream impoundments. Based on this investigation an instream total phosphorus concentration of 0.020 – 0.022 mg/l was identified as protective of designated uses for New England rivers and streams. The development of the New England-wide total phosphorus concentration was based on more recent data than the National Ecoregional nutrient criteria, and has been subject to quality assurance measures. Additionally, the development of the New England-wide concentration included reference conditions for waters presumed to be protective of designated uses.

The New Hampshire Surface Water Quality Regulations contain a narrative criterion which states that phosphorus contained in effluent shall not impair a water body's designated use. Specifically, Env-Ws 1703.14(b) states that, "Class B waters shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring." Env-WS 1703.14 further states that, "Existing discharges containing either phosphorus or nitrogen which encourage cultural eutrophication shall be treated to remove

phosphorus or nitrogen to ensure attainment and maintenance of water quality standards." Cultural eutrophication is defined in Env-Ws 1702.15 as, "…the human-induced addition of wastes containing nutrients which results in excessive plant growth and/or decrease in dissolved oxygen." Although numeric nutrient criteria have not yet been developed in New Hampshire, a total phosphorus concentration of 0.050 mg/l is considered by the NHDES as a level of potential concern (NHVRAP & NHDES 2002, 2003, and 2005).

EPA has decided to use the Gold Book criterion (0.100 mg/l) rather than the more stringent ecoregional criteria, given that it was developed from an effects-based approach versus the ecoregional criteria that were developed on the basis of reference conditions. The effects-based approach is taken because it is more directly associated with an impairment to a designated use (i.e. fishing, swimming). The effects-based approach provides a threshold value above which adverse effects (i.e. water quality impairments) are likely to occur. It applies empirical observations of a causal variable (i.e. phosphorus) and a response variable (i.e. chlorophyll *a*) associated with designated use impairments. Reference-based values are statistically derived from a comparison within a population of rivers in the same ecoregional class. They are a quantitative set of river characteristics (physical, chemical, and biological) that represent minimally impacted conditions.

EPA's regulation at 40 CFR 122.44(d)(1) establishes the basis for determining if there is an excursion of numeric or narrative water quality criteria. Section (ii) of that regulation states: *"When determining whether a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard, the permitting authority shall use procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity), and where appropriate, the dilution of the effluent in the receiving water.*"

The Merrimack WWTF reported in its 2012 permit application an effluent phosphorus concentration of 13 mg/l (maximum daily) based on 24 samples. Dividing this effluent value by the dilution factor of 77, results in an in-stream concentration of 0.168 mg/l. Since this in-stream concentration is above the recommended Gold Book concentration of 0.1 mg/l, the facility has reasonable potential to cause or contribute to an in-stream water quality violation under critical conditions.

In addition, the NHDES "One Stop" database provided in-stream sampling results from July 27, 2010 just upstream of the Merrimack WWTF outfall. The median phosphorus concentration of 3 samples taken upstream of this outfall and downstream of the nearest major confluence was 0.044 mg/l. By adding the effluent concentration (after dilution) to the background concentration, there is potential to be at 0.212 mg/l, more than twice the recommended Gold Book concentration (2 times 0.100 mg/l or 0.200 mg/l).

To address this potential, an effluent limit for phosphorus will be imposed. Based upon the request of the permittee, this limit will be applied as a mass-based limit. To ensure a mass-based limit is protective under worst-case conditions, the limit is calculated using the lowest expected receiving water flow and effluent flow. Hence, the upstream 7Q10 receiving water flow (426.1 mgd) and the lowest monthly average effluent flow during the review period (1.73 mgd, see Attachment B) are used. The numeric mass-based limit is determined based upon the following

mass balance equation:

$$Q_d C_d + Q_S C_S = Q_r C_r (0.90)$$

rewritten as:

$$M_d = Q_d C_d * 8.345 = (Q_r C_r (0.90) - Q_S C_S) * 8.345$$

where:

M_d = mass-based phosphorus limit
Q_d = effluent flow in mgd (lowest effluent monthly average flow = 1.73 mgd)
C_d = effluent phosphorus concentration in mg/L
Q_S = receiving water flow upstream (7Q10 upstream = 659.17 cfs = 426.1 mgd)
C_S = background in-stream phosphorus concentration in mg/l (0.044 mg/l)
Q_r = resultant in-stream flow, after discharge in mgd ($Q_S + Q_d$ = 427.83 mgd)
C_r = resultant in-stream pollutant concentration in mg/L (Gold Book target: 0.100 mg/l)
0.90 = Factor to reserve 10 % assimilative capacity
8.345 = Factor to convert from *mgd * mg/l* to *lb/d*

Solving for M_d gives the maximum allowable mass the facility may discharge without violating water quality standards. This allowable discharge is **164.8 lb/d**. This mass-based limit is applied seasonally, from April 1st through October 31st, as a monthly average limit to be monitored once per week, as indicated in the draft permit.

The analysis above was done using data from a study currently being conducted by the Army Corps of Engineers. This study is not yet completed and may result in recommended phosphorus allocations for point sources along the Merrimack River. Upon completion of the study, this permit may be reopened to allow for the phosphorus limit to be adjusted accordingly.

4. Metals

Certain metals in water can be toxic to aquatic life. There is a need to limit toxic metal concentrations in the effluent where aquatic life may be impacted. An evaluation of the concentration of metals in the facility's effluent (from Whole Effluent Toxicity reports submitted between January 2008 and April 2012) was used to determine reasonable potential for toxicity caused by aluminum, cadmium, chromium, copper, lead, nickel and zinc.

Metals may be present in both dissolved and particulate forms in the water column. However, extensive studies suggest that it is the dissolved fraction that is biologically available, and therefore, presents the greatest risk of toxicity to aquatic life inhabiting the water column. This conclusion is widely accepted by the scientific community both within and outside of EPA (Water Quality Standards Handbook: Second Edition, Chapter 3.6 and Appendix J, EPA 1994 [EPA 823-B-94-005a]. Also see http://www.epa.gov/waterscience/standards/handbook/chapter03.html#section6). As a result, water quality criteria are established in terms of dissolved metals.

However, many inorganic components of domestic wastewater, including metals, are in the particulate form, and differences in the chemical composition between the effluent and the

receiving water affects the partitioning of metals between the particulate and dissolved fractions as the effluent mixes with the receiving water, often resulting in a transition from the particulate to dissolved form (*The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007]). Consequently, quantifying only the dissolved fraction of metals in the effluent prior to discharge may not accurately reflect the biologically-available portion of metals in the receiving water. Regulations at 40 CFR 122.45(c) require, with limited exceptions, that metals limits in NPDES permits be expressed as total recoverable metals.

The facility's effluent concentrations (from Attachment B) were characterized assuming a lognormal distribution in order to determine the estimated 95th percentile of the daily maximum. For metals with hardness-based water quality criteria, the criteria were determined using the equations in NH standards Env-Wq 1703.24, using the appropriate factors for the individual metals found in the NH Standards (see table below). The downstream hardness was calculated to be 22.3 mg/l as $CaCO_3$, using a mass balance equation with the design flow, receiving water 7Q10, an upstream median hardness of 19 mg/l as $CaCO_3$ and an effluent median hardness of 300 mg/l as $CaCO_3$. Since this downstream hardness is below 25 mg/l, the default value of 25 mg/l specified in the NH standards Env-Wq 1703.22(f) was used to determine the total recoverable metals criteria. The following table presents the factors used to determine the acute and chronic total recoverable criteria for each metal:

Metal	Parameters				Total Recoverable Criteria	
	ma	ba	mc	bc	Acute Criteria (CMC)* (ug/L)	Chronic Criteria (CCC)** (ug/L)
Aluminum	—	—	—	—	750	87
Cadmium	1.1280	-3.6867	0.7852	-2.7150	0.95	0.83
Chromium III	0.819	3.7256	0.819	0.6848	579.32	27.69
Copper	0.9422	-1.7000	0.8545	-1.702	3.79	2.85
Lead	1.273	-1.46	1.273	-4.705	13.98	0.54
Nickel	0.846	2.255	0.846	0.0584	145.21	16.14
Zinc	0.8473	0.884	0.8473	0.884	37.02	37.02

*Acute Criteria (CMC) = exp{ma*ln(hardness)+ba}
**Chronic Criteria (CCC) = exp{mc*ln(hardness)+bc}

In order to determine whether the effluent has the reasonable potential to cause or contribute to an exceedence above the in-stream water quality criteria for each metal, the following mass balance is used to project in-stream metal concentrations downstream from the discharge.

$$Q_d C_d + Q_S C_S = Q_r C_r$$

rewritten as:

$$C_r = \frac{Q_d C_d + Q_S C_S}{Q_r}$$

where:

Q_d = effluent flow (design flow = 5.0 mgd = 7.74 cfs)
C_d = effluent metals concentration in ug/L (95th percentile)
Q_S = stream flow upstream (7Q10 upstream = 659.17 cfs)
C_S = background in-stream metals concentration in ug/L (median)
Q_r = resultant in-stream flow, after discharge ($Q_S + Q_d$ = 666.91 cfs)
C_r = resultant in-stream concentration in ug/L

Reasonable potential is then determined by comparing this resultant in-stream concentration (for both acute and chronic conditions) with the criteria for each metal multiplied by the factor 0.9 to reserve 10% assimilative capacity. In EPA's Technical Support Document for Water Quality

Based Toxics Control, EPA/505/2-90-001, March 1991, commonly known as the "TSD", box 3-2 describes the statistical approach in determining if there is reasonable potential for an excursion above the maximum allowable concentration (criteria * 0.9). If there is reasonable potential (for either acute or chronic conditions), the appropriate limit is then calculated by rearranging the above mass balance to solve for the effluent concentration (C_d) using the criterion times 0.9 as the resultant in-stream concentration (C_r). See the table below for the results of this analysis with respect to aluminum, cadmium, chromium, copper, lead, nickel and zinc. Also, see Attachment E for a sample calculation of reasonable potential determination.

Metal	**Q_d**	**C_d[1] (95th Percentile)**	**Q_s**	**C_s[2] (Median)**	**$Q_r = Q_s + Q_d$**	**$C_r = (Q_dC_d+Q_sC_s)/Q_r$**	**Criterion * 0.9**		**Reasonable Potential?**
	cfs	**ug/l**	**cfs**	**ug/l**	**cfs**	**ug/l**	**Acute (ug/l)**	**Chronic (ug/l)**	**C_r > Criteria*0.9**
Aluminum		117		72.5		73.0	675	78.3	N
Cadmium		0		0		0	0.851	0.746	N
Chromium		0		0		0	521.39	24.92	N
Copper	7.73	54.1	659.17	0.9[3]	666.9	1.52	3.41	2.57	N
Lead		0		0		0	12.58	0.49	N
Nickel		52		0		0.60	130.69	14.53	N
Zinc		367.9		8.4		12.6	33.31	33.31	N

[1] Values calculated using 4 annual toxicity measurements from the 2008-2011 WET testing noted above (see Attachment E).
[2] Median upstream data taken from Whole Effluent Toxicity (WET) testing on the Merrimack River just upstream of the Merrimack WWTF (see Attachment B).
[3] Copper data from the WET tests were determined to be flawed due to low level copper (<1 ppm) in the sample preservative. Subsequently, the facility sampled for instream copper on 9/4/2012 and 9/25/2012 just upstream of the outfall. The median of these samples is used in this analysis. The permittee is required to use an appropriate preservative for metals analyses that will not interfere with required detection levels in future WET tests.

As indicated in the table above, there is no reasonable potential (for either acute or chronic conditions) that the discharge of aluminum, cadmium, chromium, copper, lead, nickel or zinc will cause or contribute to an exceedance of applicable water quality criteria. Hence, no metals limits are included in the draft permit. Monitoring will continue to be required as part of the annual WET tests.

F. Whole Effluent Toxicity

EPA's *Technical Support Document for Water Quality Based Toxics Control*, EPA/505/2-90-001, March 1991, recommends using an "integrated strategy" containing both pollutant (chemical) specific approaches and whole effluent (biological) toxicity approaches to control toxic pollutants in effluent discharges from entering waters of the U.S.. EPA-New England adopted this "integrated strategy" on July 1, 1991, for use in permit development and issuance. These approaches are designed to protect aquatic life and human health. Pollutant specific approaches such as those in the Gold Book and State Regulations address individual chemicals, whereas whole effluent toxicity (WET) approaches evaluate interactions between pollutants thus rendering an "overall" or "aggregate" toxicity assessment of the effluent. Furthermore, WET measures the "additive" and/or "antagonistic" effects of individual chemical pollutants which pollutant specific approaches do not, thus the need for both approaches. In addition, the presence of an unknown toxic pollutant can be discovered and addressed through this process.

Section 101(a)(3) of the CWA specifically prohibits the discharge of toxic pollutants in toxic amounts and New Hampshire law states that, "all waters shall be free from toxic substances or chemical constituents in concentrations or combinations that injure or are inimical to plants, animals, humans, or aquatic life; ...." (NH RSA 485-A:8, VI and the NH Code of Administrative Rules, PART Env-Ws 1703.21). The federal NPDES regulations at 40 CFR §122.44(d)(1)(v) require whole effluent toxicity limits in a permit when a discharge has a "reasonable potential" to cause or contribute to an excursion above the State's narrative criteria for toxicity. Inclusion of the whole effluent toxicity limit in the draft permit will demonstrate the compliance with narrative water quality criteria of "no toxics in toxics amounts" found in both the CWA and State of New Hampshire regulations.

The 2007 permit contains an LC50 limit of 100 percent using both *Ceriodaphnia dubia* and *Pimephales promelas*. During the review period, the facility had only one violation of the LC50 limit for the *Ceriodaphnia dubia*, in 2009 (see Attachment B). This permit limit has been carried forward in the draft permit. WET testing shall be performed once per year during the third quarter (July 1 – September 30) using *Ceriodaphnia dubia* and *Pimephales promelas*.

G. Pretreatment

The permittee is required to administer a pretreatment program based on the requirements of 40 C.F.R. Part 403 and Section 307 of the CWA. The permittee's pretreatment program received EPA approval on February 27, 1985 and, as a result, appropriate pretreatment program requirements were incorporated into the existing permit, making it consistent with the approval and federal pretreatment regulations in effect when the permit was issued.

Periodically, the Federal Pretreatment Regulations in 40 C.F.R. Part 403 are amended. Those amendments establish new requirements for implementation of the pretreatment program. Upon reissuance of this NPDES permit, the permittee is obligated to modify its pretreatment program to be consistent with the current Federal regulations. Those activities that the permittee must address include, but are not limited to, the following: (1) develop and enforce EPA approved specific effluent limits (technically-based local limits); (2) revise the local sewer use ordinance

or regulation, as appropriate, to be consistent with Federal regulations; (3) develop an enforcement response plan; (4) implement a slug control evaluation program; (5) track significant noncompliance for industrial users; and (6) establish a definition of and track significant industrial users. These requirements are necessary to ensure continued compliance with the NPDES permit.

In addition to the requirements described above, the draft permit requires the permittee to submit to EPA in writing, within 180 days of the effective date of the permit, a description of proposed changes to the permittee's pretreatment program deemed necessary to assure conformity with current federal pretreatment regulations. These requirements are included in the draft permit to ensure that the pretreatment program is consistent and up to date with all pretreatment requirements in effect. Lastly, the permittee must continue to submit, annually on August 1st, a pretreatment report detailing the activities of the program for the twelve month period ending 60 days prior to the due date.

H. Operation and Maintenance

Regulations regarding proper operation and maintenance are found at 40 C.F.R. § 122.41(e). These regulations require, "that the permittee shall at all times operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit." The treatment plant and the collection system are included in the definition "facilities and systems of treatment and control" and are therefore subject to proper operation and maintenance requirements.

Similarly, a permittee has a "duty to mitigate" pursuant to 40 C.F.R. § 122.41(d), which requires the permittee to "take all reasonable steps to minimize or prevent any discharge in violation of the permit which has a reasonable likelihood of adversely affecting human health or the environment."

General requirements for proper operation and maintenance and mitigation have been included in Part II of the permit. Specific permit conditions have also been included in Part I.B., I.C., and I.D. of the draft permit. These requirements include mapping of the wastewater collection system, reporting of unauthorized discharges including SSOs, maintaining an adequate maintenance staff, performing preventative maintenance, controlling inflow and infiltration to the extent necessary to prevent SSOs and I/I related effluent violations at the wastewater treatment plant, and maintaining alternate power where necessary.

I. Sludge

Section 405(d) of the CWA requires that EPA develop technical standards regulating the use and disposal of sewage sludge. These regulations were signed on November 25, 1992, published in the Federal Register on February 19, 1993, and became effective on March 22, 1993. Domestic sludge, which is land applied, disposed of in a surface disposal unit or fired in a sewage sludge incinerator, is subject to Part 503 technical standards. Part 503 regulations have a self implementing provision, however, in that the CWA requires implementation through permits. Domestic sludge, which is disposed of in a municipal solid waste landfill, is in compliance with

Part 503 regulations, provided that the sludge meets the quality criteria of the landfill and the landfill meets the requirements of 40 C.F.R. Part 258.

The draft permit requires that sewage sludge use and disposal practices meet Section 405(d) Technical Standards of the CWA. In addition, the EPA Region I – NPDES Permit Sludge Compliance Guidance document dated November 4, 1999 is included with the draft permit for use by the permittee in determining their appropriate sludge conditions for their chosen method of sludge disposal. The permittee is required to submit to EPA and to NHDES-WD annually, by February 19th, the various sludge reporting requirements as specified in the guidance document for the chosen method of sludge disposal.

The Town of Merrimack receives dewatered sludge from the towns of Hooksett (44 dry metric tons), Bristol (20 dry metric tons), Jaffrey (35 dry metric tons), and Henniker, NH (23 dry metric tons) and Amesbury, MA (97 dry metric tons) as well as dewatered sludge from their own wastewater treatment facility (1,451 dry metric tons). The sludge is treated in an on-site composting facility and a total of 2,385 dry metric tons of Class A biosolids is produced for land application each year.

J. Essential Fish Habitat and Endangered Species

1. Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104267), established a new requirement to describe and identify (designate) "essential fish habitat" (EFH) in each federal fishery management plan. Only species managed under a federal fishery management plan are covered. Fishery Management Councils determine which area will be designated as EFH. The Councils have prepared written descriptions and maps of EFH, and include them in fishery management plans or their amendments. EFH designations for New England were approved by the Secretary of Commerce on March 3, 1999.

The 1996 Sustainable Fisheries Act broadly defined EFH as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Waters include aquatic areas and their associated physical, chemical, and biological properties. Substrate includes sediment, hard bottom, and structures underlying the waters. Necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem. Spawning, breeding, feeding, or growth to maturity covers all habitat types utilized by a species throughout its life cycle. Adversely affect means any impact which reduces the quality and/or quantity of EFH. Adverse impacts may include direct (i.e. contamination, physical disruption), indirect (i.e. loss of prey), site specific or habitat wide impacts including individual, cumulative, or synergistic consequences of actions.

According to the National Marine Fisheries Service (NMFS), the Merrimack River is EFH for Atlantic salmon (*Salmo salar*). According to the New Hampshire Fish and Game Department, Atlantic salmon are stocked further upstream in the Merrimack River watershed but not in this area. This stretch of the river is used by salmon smolts in spring months for downstream passage

to the sea. Adult Atlantic salmon returning to the river from the ocean do not make it up this far because they are collected at a dam in Lawrence, Massachusetts primarily for use as broodstock.

EPA has concluded that the limits and conditions contained in the draft permit minimize adverse effects to EFH for the following reasons:

- The WWTF has a dilution factor of 77.
- The permit prohibits the discharge to cause a violation of State water quality standards.
- The permit prohibits the discharge of pollutants or combinations of pollutants in toxic amounts.
- The permit requires toxicity testing once each year to ensure that the discharge does not present toxicity problems.
- The permit contains water quality based limits for total residual chlorine.

EPA believes the draft permit adequately protects EFH and therefore additional mitigation is not warranted. NMFS will be notified and EFH consultation will be reinitiated if adverse impacts to EFH are detected as a result of this permit action or if new information becomes available that changes the basis for these conclusions.

2. Endangered Species

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) administers Section 7 consultations for freshwater species. The National Marine Fisheries Service (NOAA Fisheries) administers Section 7 consultations for marine species and anadromous fish.

EPA has reviewed the federal endangered or threatened species of fish and wildlife to see if any such listed species might potentially be impacted by the re-issuance of this NPDES permit. Based on the normal distribution of these species, it is highly unlikely that they would be present in the vicinity of this discharge. Furthermore, effluent limitations and other permit conditions which are in place in this draft permit should preclude any adverse effects should there be any incidental contact with listed species in the Merrimack River.

EPA believes the proposed limits are sufficiently stringent to assure that water quality standards will be met and to ensure protection of aquatic life and maintenance of the receiving water as an aquatic habitat. The Region finds that adoption of the proposed permit is unlikely to adversely affect any threatened or endangered species or its critical habitat. If adverse effects do occur as a result of this permit action, or if new information becomes available that changes the basis for this conclusion, then EPA will notify and initiate consultation with both the USFWS and the

NOAA Fisheries. A copy of the draft permit has been provided to both USFWS and NOAA Fisheries for review and comment.

V. Antidegradation

This draft permit is being reissued with limitations that are at least as stringent as those in the 2007 permit and there is no change in the outfall location. Since the State of New Hampshire has indicated that there will be no lowering of water quality and no loss of existing uses, no additional antidegradation review is needed.

VI. Monitoring and Reporting

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 CFR §§122.41 (j), 122.44 (l), and 122.48.

The draft permit includes new provisions related to Discharge Monitoring Report (DMR) submittals to EPA and the State. The draft permit requires that, no later than one year after the effective date of the permit, the permittee submit all monitoring data and other reports required by the permit to EPA using NetDMR, unless the permittee is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for submitting DMRs and reports ("opt-out request").

In the interim (until one year from the effective date of the permit), the permittee may either submit monitoring data and other reports to EPA in hard copy form, or report electronically using NetDMR.

NetDMR is a national web-based tool for regulated Clean Water Act permittees to submit discharge monitoring reports (DMRs) electronically via a secure Internet application to U.S. EPA through the Environmental Information Exchange Network. NetDMR allows participants to discontinue mailing in hard copy forms under 40 CFR § 122.41 and § 403.12. NetDMR is accessed from the following url: http://www.epa.gov/netdmr. Further information about NetDMR, including contacts for EPA Region 1, is provided on this website.

EPA currently conducts free training on the use of NetDMR, and anticipates that the availability of this training will continue to assist permittees with the transition to use of NetDMR. To participate in upcoming trainings, visit http://www.epa.gov/netdmr for contact information for New Hampshire.

The draft permit requires the permittee to report monitoring results obtained during each calendar month using NetDMR, no later than the 15th day of the month following the completed reporting period. All reports required under the permit shall be submitted to EPA as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of DMRs or other reports to EPA or to NHDES.

The draft permit also includes an "opt-out" request process. Permittees who believe they cannot use NetDMR due to technical or administrative infeasibilities, or other logical reasons, must demonstrate the reasonable basis that precludes the use of NetDMR. These permittees must submit the justification, in writing, to EPA at least sixty (60) days prior to the date the facility would otherwise be required to begin using NetDMR. Opt-outs become effective upon the date of written approval by EPA and are valid for twelve (12) months from the date of EPA approval. The opt-outs expire at the end of this twelve (12) month period. Upon expiration, the permittee must submit DMRs and reports to EPA using NetDMR, unless the permittee submits a renewed opt-out request sixty (60) days prior to expiration of its opt-out, and such a request is approved by EPA.

Until electronic reporting using NetDMR begins, or for those permittees that receive written approval from EPA to continue to submit hard copies of DMRs, the Draft Permit requires that submittal of DMRs and other reports required by the permit continue in hard copy format. Hard copies of DMRs must be postmarked no later than the 15th day of the month following the completed reporting period.

VII. 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 and, among other things, that the discharge will not cause the receiving water to violation NH standards or waives its right to certify as set forth in 40 C.F.R. §124.53.

Upon public noticing of the draft permit, EPA is formally requesting that the State's certifying authority 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.

The NHDES-WD, Wastewater Engineering Bureau is the certifying authority. EPA has discussed this draft permit with the staff of the Wastewater Engineering Bureau and expects that the draft permit will be certified. Regulations governing state certification are set forth in 40 C.F.R. §§ 124.53 and 124.55.

The State's certification should include the specific conditions necessary to assure compliance with applicable provisions of the CWA, Sections 208(e), 301, 302, 303, 306, and 307 and with the appropriate requirements of State law. In addition, the State should provide a statement of the extent to which each condition of the draft permit can be made less stringent without violating the requirements of State law. Since the State's certification is provided prior to permit issuance, any failure by the State to provide this statement waives the State's right to certify or object to any less stringent condition. These less stringent conditions may be established by EPA during the permit issuance process based on information received following the public notice of the draft permit. If the State believes that any conditions more stringent than those contained in the draft permit are necessary to meet the requirements of either the CWA or State law, the State should include such conditions and, in each case, cite the CWA or State law reference upon

which that condition is based. Failure to provide such a citation waives the right to certify as to that condition.

Reviews and appeals of limitations and conditions attributable to State Certification shall be made through the applicable procedures of the State and may not be made through the applicable procedures set forth in 40 C.F.R. Part 124.

VIII. Comment Period, Hearing Requests, and Procedures for Final Decisions

All persons, including applicants, who believe any condition of the 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: **Mr. Michael Cobb, U.S. Environmental Protection Agency, Region 1 (New England), 5 Post Office Square - Suite 100, Mail Code OEP06-1, Boston, MA 02109-3912**. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA-New England 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 after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit, the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA-New England's Boston office.

Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Administrator 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.

IX. EPA-New England Contact

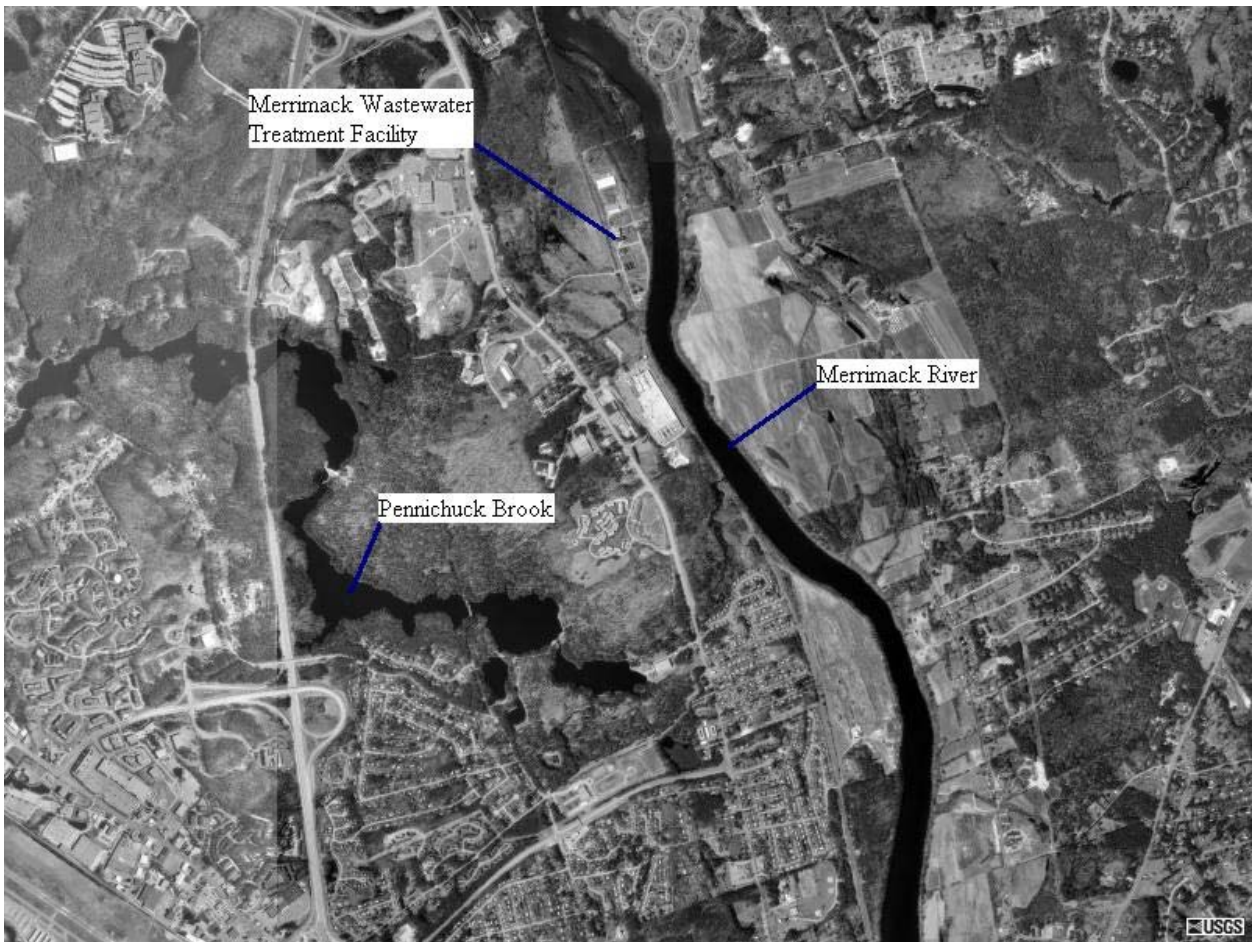
Additional information concerning the draft permit may be obtained between the hours of 9:00 A.M. and 5:00 P.M. (8:00 A.M. and 4:00 P.M. for the state), Monday through Friday, excluding holidays from:

Mr. Michael Cobb, Environmental Engineer
U.S. Environmental Protection Agency
Office of Ecosystem Protection
5 Post Office Square
Suite 100, Mail Code: OEP06-1
Boston, Massachusetts 02109-3912
Telephone No.: (617) 918-1369
FAX No.: (617) 918-0369

December 11, 2012
Date:

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

ATTACHMENT A – MERRIMACK WWTF LOCATION



* Aerial photo taken April 11, 1998. Photo obtained through http://www.terraserver.microsoft.com.

ATTACHMENT B – DMR SUMMARY OUTFALL 001

Monitoring Period End Date	BOD5							TSS						
	MO AVG		WKLY AVG		DAILY MX		MO AV MN	MO AVG		WKLY AVG		DAILY MX		MO AV MN
	1199 lb/d	mg/L	lb/d	mg/L	2581 lb/d	mg/L	85 %	1473 lb/d	mg/L	lb/d	mg/L	3255 lb/d	mg/L	85 %
01/31/2008	292.	12.3	331.	14.4	386.	16.8	96.5	203.	8.5	324.	13.8	395.	17.	98.2
02/29/2008	744.	29.3	1125.	43.8	1459.	65.2	90.6	681.	26.1	974.	36.5	1545.	69.	93.7
03/31/2008	814.	27.6	987.	32.4	1250.	39.7	90.	523.	17.6	633.	20.2	795.	25.	95.7
04/30/2008	611.	21.3	765.	25.4	866.	30.4	92.7	352.	12.1	442.	14.6	470.	15.	97.2
05/31/2008	562.	21.6	797.	29.8	992.	36.1	94.	306.	11.8	394.	14.8	552.	20.1	98.
06/30/2008	444.	18.4	529.	21.8	950.	37.9	95.	290.	11.9	368.	14.6	564.	22.5	98.
07/31/2008	157.	7.4	247.	10.4	247.	10.4	98.	77.	3.6	104.	4.4	157.	6.9	99.
08/31/2008	241.	11.6	373.	18.1	514.	26.4	97.	117.	5.5	178.	8.9	337.	17.3	98.
09/30/2008	330.	16.	342.	17.7	518.	24.5	95.	160.	8.	153.	8.3	344.	16.3	98.
10/31/2008	387.	21.	426.	23.8	845.	42.7	94.	237.	12.9	317.	16.6	465.	23.5	97.
11/30/2008	655.	34.9	765.	41.1	1011.	52.6	91.	274.	14.5	388.	20.8	565.	29.4	98.
12/31/2008	827.	39.5	1312.	58.5	1410.	63.2	87.	399.	19.5	631.	28.1	685.	29.7	95.
01/31/2009	875.	46.1	1046.	53.8	1129.	59.1	87.3	619.	32.6	907.	46.3	1072.	56.8	93.4
02/28/2009	831.	46.1	1101.	59.9	1220.	67.3	86.7	618.	34.1	907.	50.6	1031.	56.6	93.6
03/31/2009	874.	44.7	1074.	51.5	1231.	58.3	87.5	475.	24.2	523.	28.5	661.	33.9	94.9
04/30/2009	679.	34.4	825.	41.9	892.	43.4	90.	539.	26.4	551.	24.8	1082.	55.6	94.5
05/31/2009	401.	21.1	746.	40.8	637.	34.1	94.2	291.	15.3	795.	41.5	523.	29.8	97.4
06/30/2009	545.	29.5	561.	29.2	1083.	57.6	91.	458.	24.4	529.	29.5	801.	42.4	95.9
07/31/2009	504.	26.4	780.	42.	1003.	46.7	91.	470.	25.	689.	39.	989.	53.8	95.
08/31/2009	282.	16.2	348.	20.8	487.	26.	95.	214.	12.3	313.	18.6	434.	23.9	98.
09/30/2009	396.	23.	560.	32.5	670.	36.7	93.7	290.	16.9	427.	24.6	584.	31.9	97.2
10/31/2009	242.	15.3	338.	20.6	494.	29.1	95.7	198.	12.5	336.	20.4	467.	28.5	98.2
11/30/2009	516.	30.8	1231.	72.1	1738.	100.5	93.	368.	22.3	817.	49.2	1530.	92.	96.1
12/31/2009	476.	28.4	474.	28.8	870.	50.8	91.7	337.	20.2	323.	19.4	743.	43.4	96.4
01/31/2010	476.	27.4	897.	47.7	1055.	58.6	92.3	281.	16.5	524.	31.5	595.	32.2	97.
02/28/2010	582.	32.9	698.	37.1	1055.	50.1	90.7	425.	24.	530.	28.3	796.	37.8	95.4
03/31/2010	949.	40.4	3537.	141.	**5322.**	206.9	85.6	841.	35.	2444.	98.3	**3841.**	145.6	92.1
04/30/2010	356.	17.5	371.	18.	564.	33.1	93.9	283.	14.1	294.	15.1	527.	30.9	97.3
05/31/2010	554.	31.3	882.	47.9	1343.	75.1	91.2	519.	29.3	648.	36.3	754.	42.6	95.9

06/30/2010	412.	25.2	511.	31.4	592.	38.1	93.2	402.	24.6	542.	33.3	640.	41.2	96.6
07/31/2010	187.	12.	355.	22.	291.	19.	96.9	151.	9.7	268.	16.7	229.	14.1	98.5
08/31/2010	156.	9.9	179.	11.2	345.	21.6	97.6	158.	10.1	199.	13.8	318.	22.8	98.6
09/30/2010	136.	8.8	170.	11.6	208.	14.4	97.9	133.	8.5	161.	10.3	203.	13.6	98.8
10/31/2010	133.	8.6	196.	11.9	287.	20.9	97.7	100.	6.5	133.	8.	199.	12.9	99.
11/30/2010	199.	13.1	299.	18.7	374.	22.4	96.8	153.	10.	211.	14.3	254.	15.9	98.2
12/31/2010	179.	12.1	193.	13.3	290.	19.2	96.9	174.	11.7	170.	11.7	302.	20.4	98.
01/31/2011	294.	19.5	354.	23.1	423.	27.5	95.4	248.	16.4	270.	17.6	433.	30.8	97.
02/28/2011	239.	16.4	280.	18.6	372.	24.6	95.8	227.	15.6	253.	17.1	356.	21.7	97.8
03/31/2011	488.	23.4	1110.	46.8	2271.	88.6	93.	475.	22.5	1235.	52.2	2610.	101.8	96.2
04/30/2011	311.	18.2	429.	23.5	543.	29.8	95.	298.	17.4	429.	23.7	554.	30.4	97.2
05/31/2011	254.	14.6	344.	19.1	492.	25.3	96.2	208.	11.9	316.	17.6	407.	23.4	98.1
06/30/2011	145.	8.8	236.	13.8	334.	18.7	97.7	176.	10.6	250.	14.8	266.	16.1	98.5
07/31/2011	96.	6.3	136.	8.3	183.	11.2	98.7	52.	4.	115.	13.9	379.	22.1	99.
08/31/2011	133.	8.3	192.	11.7	313.	16.9	98.3	166.	10.4	271.	16.6	454.	24.8	98.4
09/30/2011	96.	6.1	158.	10.	118.	7.3	98.6	80.	4.2	200.	12.6	92.	5.7	99.2
10/31/2011	96.	5.4	151.	7.7	223.	10.6	98.3	100.	5.4	122.	5.8	149.	7.1	99.
11/30/2011	102.	5.8	113.	6.7	166.	9.	98.3	88.	4.8	97.	5.4	116.	6.8	99.1
12/31/2011	141.	8.	171.	10.3	220.	13.4	97.6	131.	7.4	180.	10.4	220.	11.7	98.6
01/31/2012	173.	10.7	265.	17.4	265.	17.4	97.3	156.	9.6	224.	13.9	336.	19.5	98.3
02/29/2012	136.	8.9	176.	10.8	223.	13.2	97.7	126.	8.2	161.	10.	206.	12.	98.6
03/31/2012	142.	9.3	155.	11.7	254.	20.4	97.2	126.	8.1	143.	8.7	202.	15.1	98.4
04/30/2012	224.	14.5	255.	16.8	466.	27.6	95.8	221.	14.2	270.	17.5	433.	30.3	97.4
Maximum	949.	46.1	3537.	141.	5322.	206.9	98.7	841.	35.	2444.	98.3	3841.	145.6	99.2
Minimum	96.	5.4	113.	6.7	118.	7.3	85.6	52.	3.6	97.	4.4	92.	5.7	92.1
Average	386.	20.1	574.9	28.8	778.7	38.4	94.2	288.3	15.2	436.2	22.5	628.1	31.7	97.2

Monitoring Period End Date	TRC		E. Coli		Total Flow			Brewery Flow			pH	
	MO AVG	DAILY MX	MO GEO	DAILY MX	MO AVG	WKLY AVG	DAILY MX	MO AVG	WKLY AVG	DAILY MX	MIN	MAX
	0.85 mg/L	1 mg/L	126 #/100mL	406 #/100mL	5 MGD	MGD	MGD	MGD	MGD	MGD	6.5 SU	9 SU
01/31/2008	0.76	0.96	5.	27.	2.86	2.93	3.11	1.36	1.38	1.56	7.5	7.8
02/29/2008	0.78	1.	64.	**2040.**	3.15	3.39	4.05	1.36	1.42	1.66	7.42	7.78
03/31/2008	0.82	1.	31.	**727.**	3.45	3.67	4.22	1.29	1.36	1.59	7.35	7.69
04/30/2008	0.8	0.94	--	--	3.41	3.64	3.86	1.3	1356.	1.54	7.33	7.68
05/31/2008	0.82	1.	--	--	3.06	3.3	3.5	1.33	1.36	1.56	7.45	7.69
06/30/2008	0.79	1.	7.	112.	2.86	2.95	3.31	1.23	1.3	1.43	7.57	7.76
07/31/2008	0.7	0.97	4.5	27.5	2.51	2.74	3.21	1.1	1.18	1.31	7.1	7.8
08/31/2008	0.64	0.8	21.3	261.	2.42	2.61	2.9	0.98	1.02	1.1	7.29	7.65
09/30/2008	0.76	1.	26.5	**1413.6**	2.41	2.6	3.23	0.94	0.98	1.09	7.21	7.69
10/31/2008	0.77	1.	23.2	**920.8**	2.16	2.36	2.45	0.83	0.86	1.1	7.36	7.74
11/30/2008	0.84	1.	32.4	**980.4**	2.15	2.22	2.42	0.83	0.88	1.04	7.5	7.8
12/31/2008	0.78	1.	**126.**	**2419.6**	2.41	2.62	2.91	0.85	0.91	1.09	7.28	7.62
01/31/2009	0.77	1.	57.6	**816.**	2.23	2.33	2.44	0.85	0.89	0.99	7.4	7.66
02/28/2009	0.71	0.99	13.5	118.7	2.13	2.15	2.29	0.85	0.88	1.01	7.49	7.78
03/31/2009	0.61	1.	24.6	344.8	2.3	2.44	2.59	0.85	0.92	1.09	7.28	7.73
04/30/2009	0.62	1.	6.8	387.3	2.41	2.51	2.98	0.85	0.86	1.09	7.09	7.54
05/31/2009	0.59	1.	5.7	275.5	2.2	2.38	2.57	0.76	0.82	0.95	7.03	7.57
06/30/2009	0.64	1.	38.4	**648.8**	2.19	2.24	2.45	0.79	0.82	0.97	7.13	7.54
07/31/2009	0.69	0.99	24.5	**1299.7**	2.22	2.27	2.57	0.78	0.82	0.97	7.2	7.5
08/31/2009	0.74	1.	28.6	365.4	2.05	2.21	2.3	0.75	0.77	0.96	7.22	7.55
09/30/2009	0.6	1.	17.5	**517.2**	1.98	1.99	2.22	0.77	0.78	0.96	7.39	7.57
10/31/2009	0.63	0.99	19.5	**1553.1**	1.81	2.	2.29	0.68	0.8	0.86	7.16	7.65
11/30/2009	0.54	1.	5.	31.8	1.91	1.99	2.41	0.7	0.76	0.87	7.25	7.58
12/31/2009	0.52	1.	5.	325.5	1.92	2.	2.22	0.66	0.75	0.9	6.92	7.58
01/31/2010	0.69	1.	36.2	357.8	1.95	2.1	2.49	0.69	0.73	0.88	7.14	7.57
02/28/2010	0.54	1.	12.7	71.2	2.09	2.31	3.07	0.71	0.75	0.86	6.98	7.5
03/31/2010	0.66	1.	11.4	**1413.6**	2.56	2.71	3.96	0.79	0.82	1.	6.78	7.51
04/30/2010	0.64	1.	10.8	122.	2.48	3.18	3.53	0.63	0.72	0.78	6.77	7.54
05/31/2010	0.53	1.	**275.9**	**727.**	2.06	2.14	2.35	0.69	0.73	0.81	7.21	7.7
06/30/2010	0.61	1.	15.9	**547.5**	1.91	1.96	2.31	0.68	0.69	0.89	7.31	7.65
07/31/2010	0.7	1.	4.7	18.5	1.8	1.85	2.18	0.67	0.72	0.82	7.37	7.57

08/31/2010	0.71	1.	23.	195.6	1.85	1.96	2.48	0.71	0.75	0.91	7.34	7.62
09/30/2010	0.66	0.9	9.9	40.4	1.8	1.89	2.09	0.67	0.75	0.85	7.35	7.73
10/31/2010	0.65	0.81	11.4	62.4	1.84	1.92	2.24	0.68	0.79	1.05	7.37	7.73
11/30/2010	0.74	1.	8.4	26.2	1.79	1.86	2.03	0.63	0.66	0.76	7.4	7.71
12/31/2010	0.76	1.	22.6	344.8	1.75	1.88	2.13	0.56	0.65	0.75	7.34	7.67
01/31/2011	0.74	0.99	9.	39.9	1.8	1.83	2.16	0.58	0.61	0.89	7.41	7.64
02/28/2011	0.78	1.	9.4	31.1	1.73	1.8	2.08	0.61	0.66	0.98	7.35	7.69
03/31/2011	0.73	1.	31.	199.7	2.31	2.76	3.08	0.6	0.64	0.84	7.08	7.5
04/30/2011	0.79	1.	**19.**	**2419.6**	2.03	2.13	2.26	0.55	0.62	0.73	7.17	7.46
05/31/2011	0.67	1.	13.	98.7	2.02	2.17	2.33	0.6	0.65	0.81	7.27	7.57
06/30/2011	0.59	0.88	8.38	30.5	1.95	1.97	2.47	0.61	0.64	0.72	6.98	7.68
07/31/2011	0.48	0.87	21.9	62.4	1.83	1.94	2.15	0.68	0.8	0.83	7.5	7.84
08/31/2011	0.57	0.8	49.	260.3	1.88	1.95	2.24	0.69	0.81	1.02	7.14	7.86
09/30/2011	0.55	0.78	14.6	52.	1.86	1.93	2.2	0.61	0.65	0.78	7.25	7.69
10/31/2011	0.56	0.8	9.6	61.3	2.05	2.29	2.56	0.6	0.69	0.79	7.13	7.64
11/30/2011	0.63	1.	7.7	52.1	2.1	2.12	2.59	0.6	0.65	0.74	7.23	7.61
12/31/2011	0.57	0.71	10.6	29.5	2.07	2.18	2.56	0.53	0.62	0.7	6.83	7.51
01/31/2012	0.7	1.	15.4	209.8	1.92	2.	2.33	0.54	0.61	0.7	7.24	7.58
02/29/2012	0.62	0.77	10.7	34.5	1.82	1.94	2.05	0.53	0.56	0.66	7.32	7.57
03/31/2012	0.77	0.96	4.6	51.2	1.85	1.99	2.21	0.53	0.54	0.66	7.22	7.49
04/30/2012	0.78	1.	19.	145.	1.82	1.97	2.15	0.6	0.64	0.7	7.33	7.63
Maximum	0.84	1.	275.9	2419.6	3.45	3.67	4.22	1.36	1356.	1.66	7.57	7.86
Minimum	0.48	0.71	4.5	18.5	1.73	1.8	2.03	0.53	0.54	0.66	6.77	7.46
Average	0.68	0.96	25.67	466.35	2.17	2.31	2.63	0.77	26.88	0.97	7.24	7.64

Monitoring Period End Date	Al	Cd	Cr	Cu	Pb	Ni	Zn	Hardness	Ammonia-N	LC50 - 48 Hr Acute Ceriodaphnia	LC50 - 48Hr Acute Pimephales
	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MN	DAILY MN
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100 %	100 %
09/30/2008	0.03	0.	0.	0.007	0.	0.02	0.076	373.4	0.1	100.	100.
09/30/2009	0.045	0.	0.	0.018	0.	0.019	0.089	130.7	0.26	**63.7**	100.
09/30/2010	0.	0.	0.	0.0185	0.	0.	0.0948	235.	0.24	100.	100.
09/30/2011	0.	0.	0.	0.0208	0.	0.004	0.1415	370.	0.46	100.	100.
Maximum	0.045	0.	0.	0.0208	0.	0.02	0.1415	373.4	0.46	100.	100.
Minimum	0.	0.	0.	0.007	0.	0.	0.076	130.7	0.1	63.7	100.
Average	0.019	0.	0.	0.016	0.	0.011	0.1	277.3	0.27	90.93	100.

Receiving Water Upstream of Outfall 001

Date	Al	Cd	Cr	Cu	Pb	Ni	Zn	Hardness
	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
09/30/2008	0.18	---	---	---	0.	0.	0.006	22.44
09/30/2009	0.095	---	---	---	0.	0.	0.0038	11.95
09/30/2010	0.05	0.	0.	---	0.	0.	0.0153	17.17
09/30/2011	0.05	0.	0.	---	0.	0.	0.0107	20.13
09/04/2012	---	---	---	0.	---	---	---	---
09/25/2012	---	---	---	0.0018	---	---	---	---
Median	**0.0725**	**0.**	**0.**	**0.0026**	**0.**	**0.**	**0.00835**	**18.65**

ATTACHMENT C – BOD_5 AND TSS EFFLUENT LIMIT CALCULATIONS

Limits for the Brewery Portion of the Effluent:

Draft Effluent Guidelines for Breweries (Food and Beverage Category)		
Parameter	Monthly Ave. (lb/1000 barrels)	Daily Max. (lb/1000 barrels)
BOD_5	72.24	180.60
TSS	100.63	250.26

Production = 9,559 barrels/day

BOD_5 – Monthly Ave. = 9,559 * (72.24 lb/1000 barrels) = 691 lb/day

BOD_5 – Daily Max. = 9,559 * (180.60 lb/1000 barrels) = 1,726 lb/day

TSS – Monthly Ave. = 9,559 * (100.63 lb/1000 barrels) = 962 lb/day

TSS – Daily Max. = 9,559 * (250.26 lb/1000 barrels) = 2,392 lb/day

Limits for Domestic Portion of the Effluent:

To calculate effluent limits for the domestic portion of the effluent limits, 3.25 mgd is used since 65% of the 5.0 mgd design flow comes from the municipality.

BOD_5 and TSS Monthly Average Concentration limit is 30 mg/l.

(30 mg/l)(1 gr/ 1000 mg)(1 lb/454 gr)(3.785 l/gal)(3,250,000 gal/day) = 813 lb/day

BOD_5 and TSS Daily Maximum Concentration limit is 50 mg/l.

(50 mg/l)(1 gr/ 1000 mg)(1 lb/454 gr)(3.785 l/gal)(3,250,000 gal/day) = 1,355 lb/day

Total Effluent Limitations:

Parameter	**Monthly Ave. (lb/day)**	**Daily Max. (lb/day)**
BOD_5	1,504 (691 + 813)	3,081 (1,726 + 1,355)
TSS	1,775 (962 + 813)	3,747 (2,392 + 1,355)

ATTACHMENT D – 7Q10 AND DILUTION FACTOR CALCULATIONS

7Q10 Calculation:

$Q_{001} = Q_{Mer} + Q_{Sou} + Q_{UA} - Q_{consumptive\ uses}$

where:

Q_{001} = 7Q10 flow of the Merrimack River upstream of Outfall 001.
Q_{Mer} = 7Q10 flow of the Merrimack River near Goffs Falls, below Manchester, NH (USGS Gage No. 01092000) = 638.65 cfs
Q_{Sou} = 7Q10 flow of the Souhegan River at Merrimack, NH (USGS Gage No. 01094000) = 13.01 cfs
Q_{UA} = 7Q10 flow of the ungaged area between stream flow stations and the Merrimack WWTF = 8.3 cfs
$Q_{consumptive\ uses}$ = Estimated quantity of consumptive water uses in the watershed = 0.79 cfs

Q_{001} = 638.65 + 13.01 + 8.3 – 0.79 = **659.17 cfs**

Dilution Calculation

Dilution Factor = $(Q_{001} \times 0.9) / (Q_{PDF} \times 1.547)$

where:

Q_{001} = 7Q10 flow of the Merrimack River upstream of Outfall 001 = 659.17 cfs
Q_{PDF} = Treatment plant design flow = 5.0 mgd = 7.73 cfs
1.547 = Factor to convert mgd to cfs.
0.9 = Factor to reserve 10% of assimilative capacity.

Dilution Factor = (659.17 x 0.9) / (1.547 x 5.0) = 76.7 = **77**

ATTACHMENT E – EXAMPLE CALCULATION OF REASONABLE POTENTIAL DETERMINATION

The following is an example for determining reasonable potential, using aluminum (Al) and the relevant acute water quality criterion.

For aluminum (Al), the resultant in-stream concentration (C_r) is calculated as follows:

$$C_r = \frac{Q_d C_d + Q_S C_S}{Q_r}$$

where:

Q_d = effluent flow (design flow = 5.0 mgd = 7.74 cfs)
C_d = effluent metals concentration in ug/L (95th percentile, see calculation below)
Q_S = stream flow upstream (7Q10 upstream = 659.17 cfs)
C_S = background in-stream metals concentration in ug/L (median = 72.5, see Att. B)
Q_r = resultant in-stream flow, after discharge ($Q_S + Q_d$ = 666.91 cfs)
C_r = resultant in-stream concentration in ug/L

The 95th percentile estimated effluent daily maximum concentration (C_d) is calculated as follows:

The results of the toxicity measurements of Al are: 7/16/2008, 30 ug/l; 7/15/2009, 40 ug/l and 8/12/2009, 50 ug/l (2009 samples were averaged to make one sample of 45 ug/l); 7/27/2010 Not Detected (ND); and 7/26/2011, ND. See TSD chapter 3 and box 3-2 for a more detailed description of the steps below:

Step 1) The maximum value of these four samples is 50 ug/l.
Step 2) CV = 0.6, when there are less than 10 measurements.
Step 3) Using table 3-2 in the TSD, the reasonable potential multiplication factor (RPMF) for the 95% percentile is 2.6. (4 samples with CV=0.6)
Step 4) The 95th percentile of the distribution is the maximum effluent value multiplied by the RPMF: 45 ug/l * 2.6 = 117 ug/l.

In this permit all the metal sample sizes are less than 10. However, if the number of samples were greater than 10, then EPA uses box 3-2 , as well as Appendix E "Lognormal Distribution and Permit Limit Derivations" of the TSD. Also, note that non-detects are considered to be equal to 0.

Hence, for aluminum the resultant in-stream concentration is:

C_r = [(7.73 cfs)(117 ug/l) + (659.17 cfs)(72.5 ug/l)] / 660.9 cfs = **74 ug/l**

Reasonable potential is then determined by comparing this resultant downstream concentration with the relevant criterion * 0.9. In this case, the acute criterion, 750 ug/l, times 0.9 results in 675 ug/l, and the chronic criterion, 87 ug/l, times 0.9 results in 78.3 ug/l. Since the resultant in-

stream concentration (74 ug/l) is not greater than the acute criterion times 0.9 (675 ug/l) or the chronic criterion times 0.9 (78.3 ug/l), there is no reasonable potential and an aluminum limit is not warranted.

If there was reasonable potential for either acute or chronic conditions, a limit would then be determined by rearranging the above mass balance to solve for the effluent concentration (C_d), as follows:

$$C_d = \frac{Q_r C_r - Q_S C_S}{Q_d}$$

The terms would be the same as above with the exception of the resultant in-stream concentration (C_r) being replaced with the relevant criterion times 0.9, to reserve 10% assimilative capacity. The calculated effluent concentration (C_d) would be included in the permit as a total recoverable limit.

RESPONSE TO COMMENTS
REISSUANCE OF NPDES PERMIT NO. NH0100161
TOWN OF MERRIMACK
MERRIMACK WASTEWATER TREATMENT FACILITY
MERRIMACK, NEW HAMPSHIRE

From January 31, 2013 through March 1, 2013, Region 1 of the U.S. Environmental Protection Agency (EPA or Region 1) and the New Hampshire Department of Environmental Services, Water Division (NHDES) solicited public comments on the draft National Pollutant Discharge Elimination System (NPDES) permit to be reissued to the Town of Merrimack, New Hampshire (Permittee).

Region 1 and NHDES received comments from the permittee, Town of Merrimack, dated February 7, 2013 and from the City of Manchester, dated February 27, 2013. Below are the comments received and EPA's responses to those comments, including a description of any changes made to the permit as a result of those comments.

A copy of the final permit may be obtained by writing or calling Michael Cobb, United States Environmental Protection Agency, 5 Post Office Square, Suite 100 (Mail Code: OEP06-1), Boston, Massachusetts 02109-3912; Telephone (617) 918-1369. Copies may also be obtained from the EPA Region 1 web site at http://www.epa.gov/region1/npdes/index.html.

I. COMMENTS FROM THE TOWN OF MERRIMACK

Comment I.A.

"We appreciate the time that EPA and NHDES took to meet with the Town prior to issuance of the draft permit to discuss potential changes."

Response I.A.

EPA also appreciates the opportunity to work with the Town in the process of developing this permit reissuance.

Comment I.B.

"The Town agrees with EPA that a monthly seasonal permit limit for Total Phosphorous of 164.8 lbs/day monthly average will be protective of the Merrimack River. The permit limit is based on a conservative assumption of 7Q10 flow and a dilution factor of 77 to 1 at our design flow of 5.0 mgd. The current Town flows have been decreasing over the last several years to the point where our average daily flow is 1.8 mgd yielding an actual dilution factor of 237 to 1 based on 7Q10 flow. In addition, our maximum day Total Phosphorus value for 2012 was 10.8 mg/l and our average annual Total Phosphorous discharge for April through October 2012 was 8.0 mg/l. Using a dilution factor of 237 to l yields an in stream concentration of .046 mg/l using the maximum value and .034 mg/l using the average value for 2012, well below the Gold Book standard of .1 mg/l. Since we do not anticipate an increase in flow for this permit cycle, and the fact that Anheuser-Busch is the largest contributor of flow and load and has reduced flows significantly, we believe the mass based limit will be protective of the Merrimack River now and into the foreseeable future."

Response I.B.

EPA agrees that the seasonal monthly average permit limit of 164.8 lb/day for total phosphorus (TP) will be protective of the Merrimack River. In the fact sheet, the dilution factor of 77 was calculated using the upstream 7Q10 river flow and the facility's design flow. However, it should be noted that the TP limit calculations in the fact sheet (pgs. 11-12) were performed using a mass-balance instead of the dilution factor. The mass-balance was used to calculate the maximum allowable load of TP that would not cause an exceedance of the 0.1 mg/l target downstream of the discharge. In this mass balance, the upstream 7Q10 river flow and the lowest monthly average effluent flow (not the design flow) were used. These flows were chosen to ensure the mass-based limit would be protective under worst-case conditions (*i.e.*, lowest total downstream flow). EPA recognizes that effluent flows have decreased in recent years to levels well below the design flow and are not expected to rise within this permit cycle. Based upon this, EPA agrees with the Town that the mass-based limit will be protective of the Merrimack River under all potential effluent flows both now and into the foreseeable future.

Comment I.C.

"The Town approved a $4.2 MM wastewater treatment plant upgrade at Town meeting in April 2012 and we are currently completing a preliminary design with our consultants. A key component of the upgrade will be designing the facility to further enhance Total Phosphorous removal that will allow us to further reduce the levels that are discharged into the Merrimack River. We expect to be able to complete this major upgrade within three years and fully expect to see a further decrease in the concentration of Phosphorus discharged to the Merrimack River."

Response I.C.

EPA notes the comment for the record. It may be prudent to select a design that would be compatible with achieving lower phosphorus limits, should they be required in the future.

Comment I.D.

"The Town will request a change in our permitted pH range from 6.5 to 8.0 to 6.5 to 9.0 standard units by submitting a pH demonstration project during the 2013 calendar year similar to the submittal and test procedures that were used for the 2007 permit."

Response I.D.

EPA has received notification from NHDES (dated September 16, 2013) and from the Town of Merrimack (dated September 17, 2013) indicating that the pH demonstration study was conducted properly and NHDES *supports* reissuing the Merrimack WWTF's NPDES permit with a pH limit within 6.5-9.0 S.U., as requested by the Town. This pH range is included in the final permit and is the same as that in the 2007 permit.

II. COMMENTS FROM THE CITY OF MANCHESTER

Comment II.A.

SECTION 1

The Merrimack Draft Permit indicates that according to pg. 3 of 34 of the Fact sheet, the 303(d) list, primary contact recreational uses are impaired by E-coli bacteria and aquatic life uses are impaired by dissolved oxygen, pH and aluminum in the proximity of the WWTP discharge. The Fact Sheet states, *"When a State has not established a numeric water quality criterion for a specific pollutant that is present in the effluent in a concentration that causes or has a reasonable potential to cause a violation of the narrative water quality standards, the permitting authority must establish effluent limits in one of three ways."* One is by calculated numeric criterion for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and fully protect the designated use. The second determined on a case-by-case basis using CWA §304(a) recommended water quality criteria, supplemented as necessary by other relevant information. Third, is based on an indicator parameter.

Manchester's comments will demonstrate that;

1. There is no dissolved oxygen impairment in the Merrimack River;
2. The NHDES had an extensive "sound-science" document at their disposal, yet deferred to "reasonable potential" in setting a phosphorus limit;
3. The NHDES calculated a "reasonable potential" loading that is greatly exceeded in field findings with no observed effects to the receiving body;
4. The NHDES did not follow their "2012 Section 305(b) and 303(d) Consolidated Assessment and Listing Methodology (CALM) as developed in April 2012;
5. The most recent extensive Merrimack and Pemigewasset River Study demonstrate that there is no oxygen impairment, hence no phosphorus concentration loading issue within the Merrimack River.
6. Existing Pretreatment requirements within the draft and previous permits assures that phosphorus loading can never exceed river water quality criteria;
7. The NHDES is pushing an unfunded mandate to achieve their environmental agenda goal of nutrient treatment on the Merrimack River;
8. The aluminum assumptions contained within the permit do not consider "naturally occurring" events within the Merrimack River.

In April 2012 the NHDES released a document titled "2012 Section 305(b) and 303(d) Consolidated Assessment and Listing Methodology (CALM)" as prepared by Ken Edwardson. This is an important document that will be referenced during these comments and should be used as the basis for the scientific foundation of setting permit limits.

Response II.A.

As a threshold matter, the commenter should note that the permit is a federal permit that may be adopted by the state of New Hampshire, meaning that most, if not all, of the actions attributed above to NHDES should actually be attributed to EPA.

Additionally, the commenter should be aware that EPA has not yet made any determinations regarding potential limits in the City of Manchester's NPDES permit, which is still in the very

preliminary stages of the reissuance process. EPA imposes limits on a case-by-case basis, determined in large part by the size and location of the facility, as well as other site-specific factors. The Region's determination of the effluent limit for the Merrimack WWTP is specific to the plant and the particular impacts on its receiving water, and does not translate into a decision to impose the same or similar limit on Manchester. Any such decision will be made only after a site-specific analysis. The statute and regulations require EPA to set permit effluent limits for each point source at the level that is necessary to ensure compliance with state water quality standards.

Comment II.B.

DISSOLVED OXYGEN

The most recent 'Upper Merrimack and Pemigewasset River Study Field Program' (MRP-Study) that was conducted between 2009 and 2012, as funded by the USACOE, contains numerous data. For brevity sake this document will be referred to as MPR-Study. The CALM states, "*Surface water quality assessments are intended to determine the current designated use support. Use of out-dated information can result in assessments that are not representative of actual conditions in the water body… Obviously the more current the data the more accurate the assessment…. The maximum data age requirement for lakes and ponds is 10 years versus five years for other water body types.*" (CALM – Section 3.1.11 Data Age).

"One of the goals of the Section 305(b) of the CWA is to assess all surface waters. To assess a large population such as surface waters, there are two generally accepted data collection schemes. The first is a consensus which requires examination of every unit in the population. A more practical and economic approach is to conduct a sample survey which involves sampling a portion of the population through probability (or random) sampling…. Probabilistic assessments are most useful for 305(b) reporting purposes… which might otherwise be impossible to do using the census approach" (CALM – Section 3.1.27 Probabilistic Assessments).

The extensive MPR-Study is not only the most current data available, but in this rare instance includes an entire population of data for the largest river in the state, rare by any scientific standard as pointed out by both the EPA and NHDES. The CALM states, "*The number of samples needed to make a use support decision plays a large role in an assessments defensibility and believability…. The more data there is the more confident one can be that the data represents actual conditions. In statistical terms the entire collection of all measurements is called the population. Since it is impossible to sample the entire population, it is necessary to try to describe the population based on a subset of the measurement. By doing so, some error is always introduced*" (CALM Section 3.1.17). In this instance the entire population was not only sampled once, but twice during lower flow critical conditions. One sampling event happened on July 27, 2010 when the flow was at 2.5 times the 7Q10 and the other was on September 21, 2010 when the flow was at 1.5 times the 7Q10. This far exceeds the expectations of Section 305(b) of the CWA and the CALM as it attained both the consensus and population approach as outlined in those documents.

Appendix C of the MPR-Study has 140 pages of data tables. Within these data tables is the most extensive sampling that has ever occurred on the entire Merrimack River within the boundaries of New Hampshire. Contained within these pages are 945 actual field sample events for dissolved oxygen (DO). In review of all the 945 DO data sets the lowest observed DO reading during the two critical events occurred at station M042 on July 27th. The DO was 5.5 mg/l with a saturation

of 69%. A follow up DO was taken with a subsequent DO reading of 6.4 mg/l and a saturation of 77.8% (Attachment 1). It appears for whatever reason, the initial reading was compromised and should not be considered as the DO increased by 0.9 mg/l and the saturation by 8.8%.

Two other DO samples within the myriad of the critical low flow sampling period should be considered suspect. One of the DO samples was taken at station M049 during the September 21st critical low flow event at 3:30 PM (DO 5.7 mg/l with a saturation of 65.5%) with a follow up sample at 3:45 PM (DO 5.7 with a saturation of 65.3%). On first look these two samples are almost identical and one would think the samples are statistically correct. However, the Winkler DO test for 3:30 PM reads 8.0 mg/l which is 2.3 mg/l higher than the meter reading [Attachment 2 and 2(b)]. This adds doubt to the DO readings.

The other DO sample was done on September 21st. M047 had a DO of 6.1 mg/l and 72.4% saturation at 2:35 PM and retest DO of 6.8 mg/l with a saturation of 71.5% at 2:50 PM. The M047 test is questionable due to the fact the Winkler DO test for 2:35 PM had a reading of 7.9 mg/l for DO (Attachment 3).

There were no field samples of the 945 below the 5.0 mg/l limit for Class B waters. Two sampling stations on the Merrimack River had saturation limits below the 75% designation. These were Station M006 with a DO of 6.1 mg/l and a saturation of 71.6% on July 27th. Station M025 had a DO of 5.9 and saturation of 72.2% on July 27th.

Should oxygen saturation be assessed separately from the DO mg/l levels only two samples fall within the criteria as cited, The CALM has a 10% rule for impairment. "*For water quality assessments, there are basically two types of error Type I, the water body is assessed as impaired when it is really fully supporting and Type II, the water body is assessed as fully supporting when it is really impaired…. DES employed the 'binomial approach; in previous reporting cycles. The binomial approach, however, was criticized by some as being too lenient because the number of exceedances needed for a water body to be considered impaired increased with the total sample size, and at least 3 exceedances were needed for total sample sizes of 10 or less. The concern was that some water bodies were not being listed which were actually impaired. In response to these concerns DES decided to abandon the binomial approach starting with the 2006 cycle and adopt the slightly more stringent ten percent rule (i.e. 10% rule) for determining use support*" (CALM – Section 3.1.17 Minimum Number of Samples -10 Percent Rule). No field samples demonstrated a DO of less than 5 mg/l and only a couple of saturation levels fell below the 75%. Note: In 2006 NHDES dropped the assessment methodology from the binominal approach 30% to determine impairment to the 10% rule. This is a 200% reduction[1] that is significantly more restrictive than the binominal approach.

The CALM states, "Any data submitted to the NHDES is first reviewed against the existing protocols in the CALM document. In the event the CALM does not include protocols to adequately assess a particular data set, DES staff review the data in the context of the NH water quality standards and prepare a written summary that includes a review of data, the applicable water quality standards, and a recommendation of attainment status. Nothing in the CALM shall be construed as a basis for not evaluating a submitted dataset" (CALM – Section 1.2.1 Assessment and Listing Methodology).

[1] EPA notes that a reduction from 30 percent to 10 percent is a 67 percent reduction, not a 200 percent reduction.

As referenced within the CALM and verified via sound-science through the MRP-Study, there is no criteria to base DO impairment on in the Merrimack River. The NHDES is taking the unscientific approach by making the statement that "reasonable potential" in the Merrimack Draft Permit will cause future violations of the dissolved oxygen standard. Based on the two critical low-flow period sampling events, that comprise the most current data, it was demonstrated that there is no dissolved oxygen impairment within the Merrimack River. This reasoning assures a Type I error for dissolved oxygen and phosphorus as outlined in the CALM.

Response II.B.

EPA has addressed the specific comments in detail below, but as a preliminary matter, the Region observes that most if not all of the legal/regulatory objections to the permit underlying the City's comments on DO and other issues have been squarely addressed in past decisions by the United States Environmental Appeals Board and by the United States Court of Appeals for the First Circuit. *See Upper Blackstone Water Pollution Abatement Dist. v. U.S. EPA*, 690 F.3d 9, 33 (1st Cir. 2012), *cert. denied*, 133 S. Ct. 2282 (2013) (upholding the Region's overall methodology for the imposing a phosphorus limit, including use of the Gold Book, among other information, to establish a site-specific TP limit applicable to that particular discharge); *In re Upper Blackstone Water Pollution Abatement Dist.*, NPDES Appeal Nos. 08-11 to 08-18 & 09-06 (EAB May 28, 2010) (same); *see also, In re City of Attleboro*, NPDES Appeal No. 8-08 (EAB Sept. 15, 2009) (same). Most recently, the EAB comprehensively addressed the Region's approach to interpreting the State's narrative nutrient criterion to derive an effluent limitation in *In re Town of Newmarket Treatment Plant*, NPDES Appeal No. 12-05, 16 E.A.D. __ (EAB December 2, 2013). EPA encourages the Town to consult the specific portions of these decisions noted below in conjunction with reviewing the Region's responses below. They are available at:

Upper Blackstone First Circuit Decision Affirming Imposition of Phosphorus and Nitrogen Limits

http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/2D0D249E441A18F185257B6600725F04/$File/1st%20cir..pdf

Page	Issue
30, 33-34	Finding that the CWA and EPA regulations allow EPA to proceed with permit reissuance even where there is uncertainty in the existing data without waiting until better science can be developed or more data gathered
31	Discussing risk associated with waiting to address to nutrient-based cultural eutrophication
32	Addressing claim that EPA should have "relied on more recent data" where EPA has no reason to question the continuing validity of data on which it relied
36	Discussing MERL model's use of correlations between data sets, rather than cause-and-effect models, in development of nutrient permit limit
50-53	Upholding EPA's use of national and regional guidance criteria, including the Gold Book value of 0.1 mg/l, in conjunction with site-specific data in determining phosphorus limit

Upper Blackstone EAB Decision Affirming Imposition of Phosphorus and Nitrogen Limits

http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/NPDES%20Permit%20Appeals%20(CWA)/34E841C87F346D94852577360068976F/$File/Denying%20Review....pdf

Page	Issue
31-32	Finding that affirmative reasonable potential determination requires neither demonstration of causation nor certainty ("greater than a mere possibility)
80-83	Finding EPA's approach of establishing a range of target ambient values for phosphorus from EPA nationally recommended criteria guidance to be a regulatorily-authorized method for determining a phosphorus limit
83	Rejecting request for delay in imposition of phosphorus limit pending additional data or causal demonstrations in light of, *inter alia*, Region's conservative approach to nutrient permitting and overall objectives of the CWA

Attleboro EAB Decision Affirming Imposition of Phosphorus and Nitrogen Limits

http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/NPDES%20Permit%20Appeals%20(CWA)/D506EBEE22A1035E8525763300499A78/$File/Denying%20NPDES%2008...84.pdf

Page	Issue
63	Upholding EPA's use of recommended Gold Book values and low flow conditions in determining phosphorus limit
65	Finding that EPA need not demonstrate actual impacts to the receiving water prior to imposing a permit effluent limit
72-73	Finding that EPA may reasonably consider current background conditions despite any expected future reductions

Newmarket EAB Decision Affirming Implementation of the Narrative Nutrient Criterion

http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/Recent~Additions/97CCD304C9B7E58585257C3500799108/$File/Order%20Denying%20Review.pdf

Page	Issue
49-51	Rejecting request for delay in imposition of nutrient limit pending additional data or causal demonstrations in light of, *inter alia*, Region's conservative approach to nutrient permitting and overall objectives of the CWA
54 n 23	Finding that "reasonable potential" determination does not require a conclusive demonstration of cause and effect

Overall, the City's comments reflect a flawed understanding of the legal framework for NPDES permitting, including the regulatory standard for imposing necessary effluent limitations in a permit. As established by the decisions cited above, and as evidenced by the plain language of the statute and regulations, a waterbody need not be listed as impaired for a pollutant in order for the Region to impose an effluent limitation for that pollutant in an NPDES permit. Sections 301 and 402 of the Act, and implementing regulations at 40 C.F.R. § 122.44(d), are the

provisions that govern this permitting action, not Section 303(d) and associated non-binding listing guidance such as CALM.

Under CWA section 402, 33 U.S.C. § 1342, EPA may issue NPDES permits "for the discharge of any pollutant, or combination of pollutants" if the permit conditions assure that the discharge complies with certain requirements, including those of section 301 of the CWA, 33 U.S.C. § 1311. Section 301(b)(1)(C), 33 U.S.C. § 1311(b)(1)(C), of the Act requires that NPDES permits include effluent limits more stringent than technology-based limits whenever:

> necessary to meet water quality standards, treatment standards, or schedules of compliance, established pursuant to any State law or regulations…or any other Federal law or regulation, or required to implement any applicable water quality standard established pursuant to [the CWA].

NPDES permits must contain effluent limitations necessary to attain and maintain WQS, without consideration of the cost, availability or effectiveness of treatment technologies. *See Upper Blackstone Water Pollution Abatement Dist. v. U.S. EPA*, 690 F.3d 9, 33 (1st Cir. 2012), *cert. denied*, 133 S. Ct. 2282 (2013).

EPA has implemented its Sections 301(b)(1)(C) and 402 of the Act through numerous regulations, which specify when the Region must include permit conditions, water quality-based effluent limitations or other requirements in NPDES permits. Most trenchantly, 40 C.F.R. § 122.4(d) *prohibits* issuance of an NPDES permit "[w]hen the imposition of conditions cannot *ensure* [emphasis added] compliance with the applicable water quality requirements of all affected States." Section 122.44(d)(1) is similarly broad in scope and obligates the Region to include in NPDES permits "any requirements…necessary to: (1) Achieve water quality standards established under section 303 of the CWA, including State narrative criteria for water quality."

EPA's regulations set out the process for the Region to determine whether permit limits are "necessary" to achieve WQS and for the formulation of these requirements. *See* 40 C.F.R. § 122.44(d). Permit writers are first required to determine whether pollutants "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion" of the narrative or numeric criteria set forth in the WQS. *Id.* § 122.44(d)(1)(i). EPA guidance directs that this "reasonable potential" analysis be based on "worst-case" conditions. *In re Washington Aqueduct Water Supply Sys.*, 11 E.A.D. 565, 584 (EAB 2004). If a discharge is found to cause, have the reasonable potential to cause, or contribute to an excursion of a state water quality criterion, then a permit *must* contain effluent limits as stringent as necessary to achieve the WQS. 40 C.F.R. § 122.44(d)(1), (5).

Even assuming that there is no evidence of exceedances of water quality standards for DO —a conclusion with which the Region disagrees, as described below—it is well established under Board precedent and guidance that EPA does *not* need to wait for the water quality violations to occur prior to imposing a protective effluent limitation in an NPDES permit. The requirement to impose a permit limit is not only premised on a finding that the pollutant discharges "are" at a level that "causes" violation of the applicable water quality standards, but the requirement is also triggered by a finding that the facility's pollutant discharges "may" be at a level that "contributes" to or has the "reasonable potential" to cause a violation. 40 C.F.R. § 122.44(d)(1)(i). The regulation requires water quality-based effluent limits even when there is some degree of

uncertainty regarding both the precise pollutant discharge levels and the potential causal effects of those discharges, so long as the record is sufficient to establish that there is a "reasonable potential" for that discharge to cause or contribute to a violation of water quality standards. EPA in the Final Rule Preamble for 40 C.F.R. § 122.44(d)(1) dispels any doubt over the necessity of proving an impairment and causation of that impairment prior to either deriving a numeric in-stream target to implement a narrative water quality criterion, or imposing a water quality-based effluent limitation to implement that criterion:

> "Several commenters asked if it was necessary to show in-stream impact, or to show adverse effects on human health before invoking [§ 122.44(d)(1)(vi)] as a basis for establishing water quality-based limits on a pollutant of concern. It is not necessary to show adverse effects on aquatic life or human health to invoke this paragraph []. The CWA does not require such a demonstration and it is EPA's position that it is not necessary to demonstrate such effects before establishing limits on a pollutant of concern." 54 Fed. Reg. 23,868, 23,878 (June 2, 1989).

"Reasonable potential" requires some degree of certainty greater than a mere possibility, but it leaves to the permit writer's scientific and technical judgment how much certainty is necessary. The regulations, thus, require a precautionary approach when determining whether the permit must contain a water quality-based effluent limit for a particular pollutant.

The contention that the Region should be limited to the CALM and the MRP-Study in making its reasonable potential determinations is unfounded, as is the vague allegation that the data and approaches the Region did consider are somehow scientifically or technical unsound. In determining whether a discharge has the reasonable potential to cause or contribute to a WQS violation, "the permitting authority shall use procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant or pollutant parameter in the effluent . . . and where appropriate, the dilution of the effluent in the receiving water." 40 C.F.R. § 122.44; *see also* 54 Fed. Reg. 23,868, 23,873 (June 2, 1989) ("[A] permitting authority has a significant amount of flexibility in determining whether a particular discharge has a reasonable potential to cause an excursion above a water quality criterion, taking the factors in subparagraph (ii) into account"). It is the Region's position that, in making reasonable potential determinations, no one source of information should necessarily be given definitive weight, nor should the absence of any particular information source necessarily preclude EPA from establishing an effluent limit. The approach of utilizing available technical materials generated by EPA and States, as supplemented by other information reasonably available at the time of permit reissuance, is also reasonable in light of federal regulations requiring EPA to include requirements that will achieve state water quality standards when reissuing a permit and prohibiting issuance of a permit when the imposition of conditions cannot ensure compliance with the applicable state water quality requirements of all affected States. *See* 40 C.F.R. §§ 122.4(d), 122.44(d)(1); *see also* CWA §§ 301(b)(1)(C) and 401(a)(2).

Responses to Specific Comments

As discussed above, whether or not a receiving water segment is listed on the State's 305(b) and 303(d) lists does not determine whether a limit should be included in an NPDES permit. The absence of such a listing is irrelevant from a regulatory standpoint in instances where the Region otherwise concludes that the discharge has the reasonable potential to cause or contribute to a water quality standards violation. While NPDES determinations may be informed by State water quality assessments and listings, such listings are not prerequisites for determining that NPDES

permit limits are necessary. EPA's regulations do not require that determinations on water quality-based effluent limits necessarily be consistent with existing state 303(d) listing designations. Impairment designations are not made according to the same standard that governs NPDES permitting decisions; permitting regulations require the imposition of effluent limits whenever a pollutant discharge "causes, has the reasonable potential to cause, or contributes to" a water quality violation. In determining the existence of reasonable potential, the Region considered the Section 303(d) listing to be one relevant factor pointing toward imposition of a limit but conducted additional analysis before concluding that a limit was necessary. EPA has used the available data and in the fact sheet articulated a rational approach allowable under regulations to determine that the facility has the reasonable potential to cause or contribute to a water quality violation. This approach is not the same as that used in 303(d) listing procedures, nor is required to be.[2] EPA's reasonable potential determination for phosphorus is provided on pages 10 – 12 of the Fact Sheet, with further analysis provided below.

The Region has reviewed the MPR-Study cited by the City. Contrary to the commenter's view, the Region concludes that the MPR-Study does not undermine the Region's permitting decision in this case.

The State of New Hampshire's 2010 *Final List of Threatened or Impaired Waters That Require a TMDL* designates the Merrimack River segment, located 4 miles upstream of the discharge (NHRIV700060804-11) in the Town of Merrimack, as impaired for DO. The segment immediately upstream of the discharge (NHRIV700061002-13) and the segment receiving the Merrimack WWTF discharge (NHRIV700061002-14) were not designated as impaired for DO. Note that page 3 of the Fact Sheet is referring to the segment which ends 9 miles upstream of the discharge (NHRIV700060803-14-02) in describing an impairment designation for DO "in the proximity of the Merrimack Wastewater Treatment Facility discharge."

The MPR-Study referenced in this comment includes two types of DO tests: field tests and Winkler tests. Put simply, field tests are instantaneous DO measurements taken in the field using portable DO meters, and Winkler tests are samples that were preserved and later analyzed in the lab. These samples were collected as single grab samples at each sampling location. This is not the preferred data/condition for assessing DO conditions described in the CALM. The CALM's preferred method is that such determinations be based on a series of measurements taken at the same location one hour apart over a 24 hour period. When preferred data is not available, assessments may be done for individual grab samples according to criteria found in Part 3.2.4, Indicator 1, Notes 5.c.2.a and 5.c.2.b. For DO concentration in a Class B water, any sample collected between 05:00 and 08:00 with less than 4.5 mg/l DO is an exceedance. For percent saturation, any sample collected between 05:00 and 10:00 with DO saturation less than 45 percent or any sample collected between 14:00 and 19:00 with DO saturation less than 70 percent is an exceedance.

EPA acknowledges that the DO field tests on July 27 and September 21, 2010, the two sampling days with receiving water flow closest to 7Q10 flow, did not show any violations of the 5.0 mg/l

[2] While 40 CFR § 122.44 does require consistency with some state determinations, for example requiring that effluent limit be "consistent with the requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA," §122.44(d)(vii)(B), there is no such mention of State listing decisions pursuant to CWA sections 305 and 303(d). Indeed, the State listing materials are not even mentioned in the list of "relevant information" set forth in 122.44(d)(vi)(A), nor in the reasonable potential provision of the regulation.

criterion. However, almost all of the Winkler tests taken on September 21, 2010 both upstream and downstream of the Merrimack discharge were significantly below this criterion (approximately 32 out of 33 Winkler tests that day were under 5 mg/l along the Merrimack River). Of the 33 Winkler tests that day, seven were taken between 05:00 and 08:00. Six out of those seven tests were below 4.5 mg/l, violating the CALM's criterion. Significantly, the only one of those seven samples taken downstream of the Merrimack discharge was a violation (3.86 mg/l DO, taken at 8:00 AM at station M071). The State's minimum DO criterion is applicable under all receiving water flow conditions.

In addition, the commenter referenced five field tests on these two days (July 27 and September 21, 2010) that were less than 75% DO saturation (one at M042, two at M049 and two at M047), but considers them questionable due to a higher DO value in either a retest or a corresponding Winkler test. In the first example, a DO saturation of 69.0% was measured at station M042 on July 27, 2010, but a second measurement (77.8%) at the same location and time was above the criterion. These samples were taken at 6:25 PM indicating that the 69% measurement is a violation per the CALM (i.e., less than 70% between 14:00 and 19:00) while the 77.8% measurement was not.

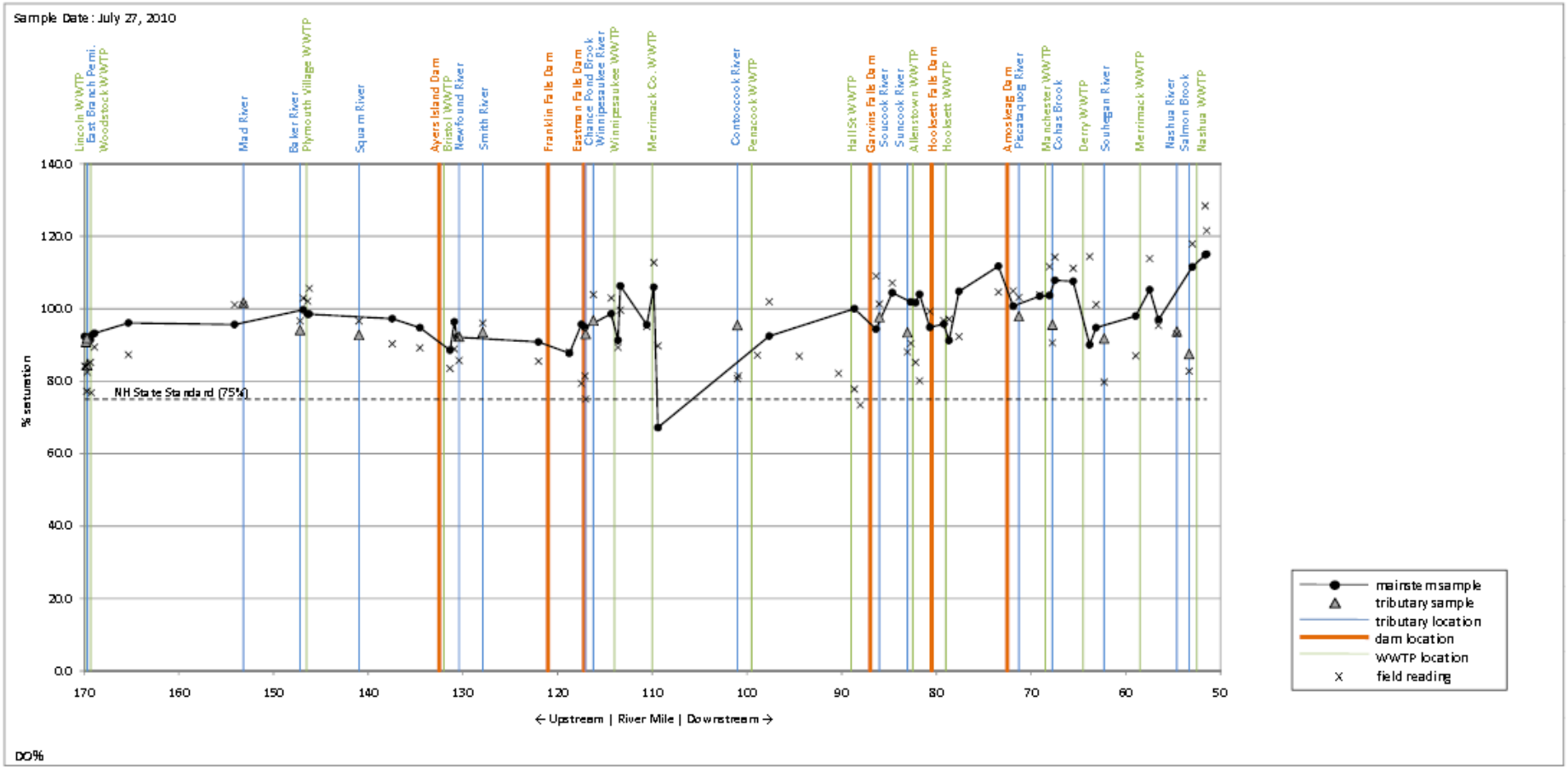
In the second example, at station M049 on September 21, 2010, two DO % saturation measurements (65.5% and 65.3%) were taken. These samples were taken at 3:30 AM and 3:45 AM, respectively, so would not be exceedances per the CALM. The commenter suggests that these are questionable because both of these were at 5.7 mg/l DO and a corresponding Winkler test was 8.0 mg/l. In the final example, at station M047 on September 21, 2010 two DO % saturation measurements (72.4% and 71.5%) were taken. These samples were taken at 2:35 AM and 2:50 AM, respectively, so would not be exceedances per the CALM. The commenter suggests that these are questionable because these measurements were at DO concentrations of 6.1 and 6.8 mg/l respectively and a corresponding Winkler test was 7.9 mg/l. Although EPA does acknowledge some discrepancies seem to exist between corresponding percent saturation and concentration measurements in the data, one (69% at station M042) of the five field tests referenced by the commenter is determined to be a violation per the CALM.

In summary, a review of all the relevant data shows that there are some discrepancies between the field tests and the Winkler tests. In some cases, the Winkler tests resulted in violations of the DO concentration criterion (5 mg/l) while corresponding field tests did not. In other cases, the field tests showed DO percent saturation violations, while corresponding Winkler tests do not indicate a violation. As mentioned, EPA agrees that there is some discrepancy between the field tests and Winkler tests at various sampling locations, but does not have sufficient QA/QC information to determine which data points most closely characterize the actual DO concentrations. EPA believes that the data does raise a significant level of concern regarding instream DO in the Merrimack River. As noted previously, these data were not determinative in EPA's reasonable potential calculations or in the decision to include a limit on total phosphorus in the permit.

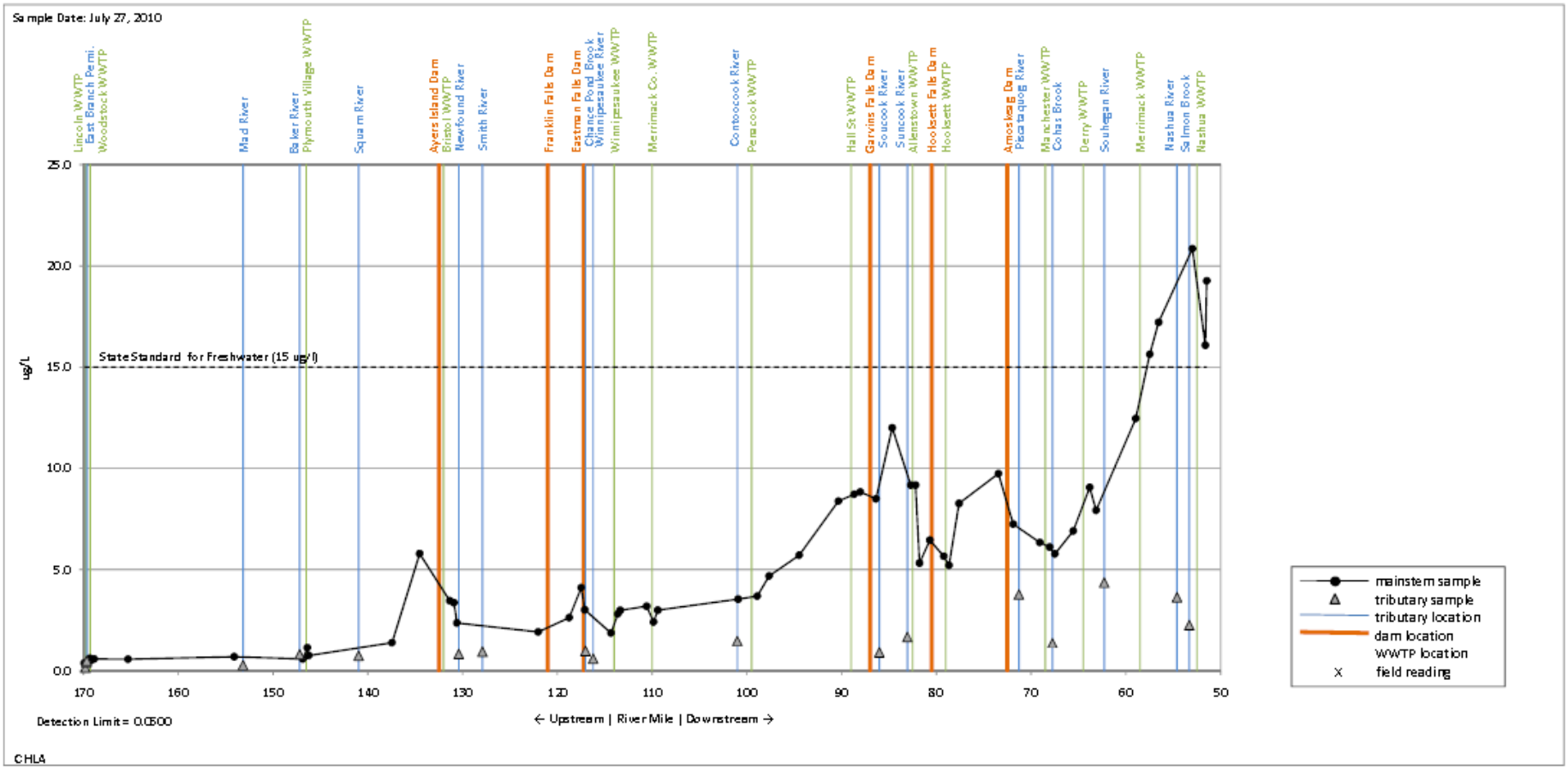
EPA also notes that in many cases low DO may not be the best indicator of eutrophication. Depending on the time of day and water depth during sampling, a better indicator may be DO supersaturation and increased levels of chlorophyll-a. Based upon the diurnal cycle of algae these indicators represent evidence of algal growth (typically occurring during the day near the water surface), whereas low DO saturation represents evidence of algal die-off (typically occurring during the night near the river bottom). In this case, although there were only a few measurements below the 75% DO saturation criterion, a review of the data report from the July

2010 sampling event does indicate significant DO supersaturation (>100%) as well as increased levels of chlorophyll-a (>15 ug/l) just downstream of the Merrimack discharge. The figures below from the *Upper Merrimack and Pemigewasset River Study Monitoring Data Report* (December 2012) illustrate the levels of DO saturation and chlorophyll-a along the Merrimack River on July 27. 2010. Both DO saturation and chlorophyll-a levels increase appreciably downstream of the Merrimack WWTF discharge (located at about river mile 58), which suggests eutrophic effects are present and the current discharge of phosphorus from the Merrimack WWTF has the reasonable potential to cause or contribute to these effects. Hence, the permit contains a total phosphorus limit.

Mainstem, Tributary, and WWTP Effluent Samples
Dissolved Oxygen Percent Saturation



Mainstem, Tributary, and WWTP Effluent Samples
Chlorophyll-a



*Note that a chlorophyll-a concentration of 15 ug/l is not the state standard but rather a listing criterion in the CALM.

Comment II.C.

PHOSPHORUS

The Phosphorus section in the Fact Sheet says, "nutrients can promote growth of nuisance algae and rooted aquatic plants and that elevated levels of nutrients will cause excessive algal and/or plant growth resulting in reduced water clarity, poor aesthetic quality and impaired aquatic habitat which in turn reduces in-stream dissolved oxygen concentrations."

The NHDES requires an average monthly total phosphorus limit of 164.8 pounds in the draft Merrimack permit based on the following: "*The Merrimack WWTF reported in its 2012 permit application a maximum effluent phosphorus concentration of 13 mg/l (maximum daily) based on 24 samples. Dividing that effluent by the dilution factor of 77, results in an in-stream concentration of 168 ug/l. Since the in-stream concentration is above the recommended Gold Book concentration of 100 ug/l, the facility has reasonable potential to cause or contribute to an in-stream water quality violation under critical conditions. NHDES "One-Stop" database provided in-stream sampling results from July 27, 2010 just upstream of the Merrimack WWTF outfall. The median phosphorus concentration of 3 samples taken was 44 ug/l. By adding the effluent concentration (after dilution) to the background concentration, there is potential to be at 212 ug/l, more than twice the recommended Gold Book concentration*" (Pg 11 of 34 of the Fact Sheet).

The Gold Book section on phosphorus (Attachment 4) states that phosphorus control is for the purpose of controlling nuisance aquatic growths. Mackenthun's 1973 recommendation is for a T. phosphorus not to exceed 100 ug/l for flowing waters. The document elaborates on natural conditions that dictate the consideration of either a more or less stringent phosphorus level. The guidance states, "The word **"criterion"** should not be used interchangeably with or as a synonym for the word '*standard.*' The word "criterion" represents a constituent concentration or level associated with a degree of environmental effect upon which scientific judgment may be based."

The NHDES indeed uses the word criteria and standard interchangeably in conflict with the Gold Book guidance. The NHDES states in two sections of page 11 of 34 of the permit the following, "*Since this in-stream concentration is above the recommended Gold Book concentration of 0.1 mg/l."* This happens again when the NHDES states, "*By adding the effluent concentration (after dilution) to the background concentration, there is a potential to be at 0.212 mg/l, more than twice the recommended Gold Book concentration (2 times 0.100 mg/l or 0.200 mg/l).*" This leads the reader to believe that 100 ug/l is the State's established concentration for phosphorus in the Merrimack River.

The 0.1 mg/l criterion is just that a recommended criterion not a recommended concentration. The NHDES is interchanging the word criterion for concentration and setting a definite 100 ug/l standard when the guidance specifically warns against this. The NHDES is assuming there is a straight line correlation in their "reasonable potential" argument and that 100 ug/l concentration within the water body will cause impairment to the Merrimack River.

Response II.C.

The commenter quarrels with EPA's use of certain terminology, and that the use of certain words over others "leads the reader to believe that 100 ug/l is the State's established concentration for phosphorus in the Merrimack River." To be clear, EPA fully concurs that there is no applicable

numeric NH water quality criterion (or concentration or standard, as the commenter prefers) for phosphorus in the Merrimack River, and that the Gold Book recommended value has not been used as an applicable standard in itself. The fact that New Hampshire does not have a numeric nutrient criterion does not relieve EPA of its duty to translate the applicable narrative criterion into a numeric limit, as explained below. ("EPA's legal obligation to ensure that NPDES permits meet all applicable water quality standards, including narrative criteria, cannot be set aside while a state develops [numeric] water quality standards." National Pollutant Discharge Elimination System; Surface Water Toxics Control Program; Final Rule, 54 Fed. Reg. 23,868, 23,877 (June 2, 1989).) The imposition of 0.1 mg/l, which utilized the *Gold Book* value as relevant information consistent with EPA regulations, reflects this process of translation.

Contrary to the commenter's assertion, EPA did not mechanically apply the Gold Book recommended value of 100 ug/l for either reasonable potential purposes or in the course of determining a water quality-based effluent limitation on the discharge, but determined that such a target concentration would protect designated uses in light of all the information in the record and upon a consideration of site-specific factors. EPA does not believe that any of the factors cited in the Gold Book would lead to a less restrictive target in this receiving water. In preparing the permit limit, the Region expressed a step-by-step methodology to guide it toward reasonable and sufficiently protective permit limits to interpret the State's narrative water quality for nutrients, as well as other applicable water quality criteria, through the imposition of a numeric phosphorus limitation. The Region had substantial information at its disposal in setting the permit's discharge limitations, including national EPA guidance, State water quality reports and assessments, and years of on-the-ground measurements and observations of conditions in the Merrimack.

EPA in issuing an NPDES permit must, by necessity, translate existing narrative criteria into in-stream numeric concentrations when developing water quality-based effluent limitations. As explained by the District of Columbia Circuit:

> As long as narrative criteria are permissible…and must be enforced through limitations in particular permits, a permit writer will inevitably have some discretion in applying the criteria to a particular case. The general language of narrative criteria can only take the permit writer so far in her task. Of course, that does not mean that the language of a narrative criterion does not cabin the permit writer's authority at all; rather, it is an acknowledgement that the writer will have to engage in some kind of interpretation to determine what chemical-specific numeric criteria—and thus what effluent limitations—are most consistent with the state's intent as evinced in its generic standard.

Am. Paper Inst., Inc. v. EPA, 996 F.2d 346, 351 (D.C. Cir. 1993) (citations omitted). The process of translating a narrative criterion is specifically governed by 40 C.F.R. § 122.44(d)(1)(vi), which implements Sections 301 and 402 of the Act. Subsection (A) of that provision mandates at the outset that in translating a state narrative criterion, EPA is to calculate a protective *numeric* concentration for the pollutant:

> Where a State has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an

applicable State water quality standard, the permitting authority must establish effluent limits using one or more of the following options:

> (A) Establish effluent limits *using a calculated numeric water quality criterion* [emphasis added] for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and will fully protect the designated use. Such a criterion may be derived using a proposed State criterion, or an explicit State policy or regulation interpreting its narrative water quality criterion, supplemented with other relevant information which may include: EPA's Water Quality Standards Handbook, October 1983, risk assessment data, exposure data, information about the pollutant from the Food and Drug Administration, and current EPA criteria documents[.]

See also Upper Blackstone, 690 F.3d at 23. Another approach sanctioned by that regulation, and also utilized by Region 1 in setting the phosphorus limit, is for EPA to "[e]stablish effluent limits on a case-by-case basis, using EPA's water quality criteria, published under section 304(a) of the CWA, supplemented where necessary by other relevant information . . . ." 40 C.F.R. § 122.44(d)(1)(vi)(B).

In determining the need for a permit limit, EPA accounts for the concentration of a given pollutant in the effluent (discharge concentration); the percentage of effluent in the receiving water immediately downstream of the discharge under the critical low flow conditions identified in the state water quality standards (available dilution); and the concentration of pollutants upstream of the discharge (background) to determine how much the discharge can contribute such that the resulting mix downstream does not exceed the criterion. NPDES Permit Writers Manual at 6-20, 33. In the absence of numeric criteria for phosphorus, the Region looks to a wide range of materials, including nationally recommended criteria, supplemented by other relevant materials, such as EPA technical guidance and information published under Section 304(a) of the CWA, peer-reviewed scientific literature and site-specific surveys and data to establish a protective in-stream target. *See* 40 C.F.R. § 122.44(d)(1)(ii) and (vi)(A), (B).

When permitting nutrient discharges, the Region analyzes available record materials from a reasonably conservative standpoint. This protective approach is appropriate because, once begun, the cycle of eutrophication can be difficult to reverse due to the tendency of nutrients to be retained in sediment and from there reintroduced into the water body. In addition, "[i]n flowing systems, nutrients may be rapidly transported downstream and the effects of nutrient inputs may be uncoupled from the nutrient source, [which] complicat[es] source control." *See Nutrient Criteria Technical Guidance Manual, Rivers and Streams* (July 2000) at 3. Thus, a key function of a nutrient limit is to protect downstream receiving waters "regardless of [their proximity] in linear distance."

EPA has produced several guidance documents which set forth total ambient phosphorus concentrations that are sufficiently stringent to control cultural eutrophication and other adverse nutrient-related impacts. These guidance documents present protective in-stream phosphorus concentrations based on two different analytical approaches. An effects-based approach provides a threshold value above which adverse effects (*i.e.*, water quality impairments) are likely to occur. It applies empirical observations of a causal variable (*i.e.*, phosphorus) and a response variable (*i.e.*, chlorophyll *a*) associated with designated use impairments.

Alternatively, reference-based values are statistically derived from a comparison within a population of rivers in the same eco-region class. They are a quantitative set of river characteristics (physical, chemical and biological) that represent conditions in waters in that ecoregion that are minimally impacted by human activities (*i.e.*, reference conditions), and thus by definition representative of water without cultural eutrophication. While reference conditions, which reflect minimally disturbed conditions, will meet the requirements necessary to support designated uses, they may also exceed the water quality necessary to support such requirements.

The 1986 Quality Criteria of Water ("Gold Book") follows an effects-based approach. It sets forth maximum threshold concentrations that are designed to prevent or control adverse nutrient-related impacts from occurring. Specifically, the Gold Book recommends in-stream phosphorus concentrations of no greater than 0.05 mg/l in any stream entering a lake or reservoir, 0.1 mg/l for any stream not discharging directly to lakes or impoundments, and 0.025 mg/l within the lake or reservoir. A more recent technical guidance manual, the Nutrient Criteria Technical Guidance Manual: Rivers and Streams (EPA 2000) ("Nutrient Criteria Technical Guidance Manual"), cites to a range of ambient concentrations drawn from the peer-reviewed scientific literature that are sufficiently stringent to control periphyton and plankton (two types of aquatic plant growth commonly associated with eutrophication). This guidance indicates in-stream phosphorus concentrations between 0.01 mg/l and 0.09 mg/l will be sufficient to control periphyton growth and concentrations between 0.035 mg/l and 0.070 mg/l will be sufficient to control plankton (Table 1 shows the range of literature values cited in the Nutrient Criteria Technical Manual, and Table 2 shows a range of phosphorus criteria established by various states)

Table 1

Nutrient (ug/l) and algal biomass criteria limits recommended to prevent nuisance conditions and water quality degradation in streams based either on nutrient-chlorophyll *a* relationships or preventing risks to stream impairment as indicated.

PERIPHYTON Maximum in mg/m^3

TN	TP	DIN	SRP	Chlorophyll *a*	Impairment Risk	Source
				100 – 200	nuisance growth	Welch et al. 1988, 1989
275 – 650	38 – 90			100 – 200	nuisance growth	Dodds et al. 1997
1500	75			200	Eutrophy	Dodds et al. 1998
300	20			150	nuisance growth	Clark Fork River Tri-State Council, MT
	20				*Cladophora* nuisance growth	Chetelat et al. 1999
	10 – 20				*Cladophora* nuisance growth	Stevenson unpubl. Data
		430	60		Eutrophy	UK Environ. Agency 1988
		100[1]	10[1]	200	nuisance growth	Biggs 2000
		25	3	100	reduced invertebrate diversity	Nordin 1985
			15	100	nuisance growth	Quinn 1991
		1000	10[2]	~ 100	Eutrophy	Sosiak pers. comm.

PLANKTON Mean in ug/l

TN	TP	DIN	SRP	Chlorophyll *a*	Impairment Risk	Source
300[3]	42			8	Eutrophy	Van Nieuwenhuyse and Jones 1996
	70			15	chlorophyll action level	OAR 2000
250[3]	35			8	Eutrophy	OECD 1992 (for lakes)

1 30-day biomass accrual time
2 Total Dissolved P
3 Based on Redfield ratio of 7.2N:1P (Smith et al. 1997)

Source: *Nutrient Criteria Technical Guidance Manual – Rivers and Streams*. EPA-822-B-00-002. U.S.EPA. July, 2000.

Table 2		
Examples of Numeric Criteria and Guidelines for Total Phosphorus in the U.S.		
State and Waters	**Phosphorus Criteria Values**	**Reference**
Arizona River Specific	Annual Mean 0.05 – 0.20 mg/l 90 Percentile: 0.10 – 0.33 mg/l Single Sample Maximum: 0.20 - 1.0 mg/l	AAC R18-11-109
Arkansas All Waters	Maximum limit: 0.100 mg/l (guideline)	2 AAC 2.509
Hawaii Inland Streams	Geometric Mean, not to exceed 0.05 mg/l – Wet Season (Nov.1 – Apr.30) 0.030 mg/l – Dry Season (May 1 – Oct. 31)	HAR 11-54-5.2
Illinois Streams at entrance to reservoir or lake with surface area of 8.1 hectares or more	Maximum limit: 0.05 mg/l	35 IAC 302.205
Nevada[*] River Specific	Monthly, average: 0.1 mg/l	NAC 445A
New Jersey Streams	Maximum limit: 0.1 mg/l, unless demonstrate TP is not a limiting nutrient and will not render the waters unsuitable for designated uses.	NJAC 7:9B-1.14(c)
New Mexico Perennial reaches of specific waters in Rio Grande, Pecos River, and San Juan River basins	Maximum limit (single sample): 0.1 mg/l	20 NMAC 6.4.109 20 NMAC 6.4.208 20 NMAC 6.4.404 20 NMAC 6.4.407
North Dakota Class I, IA, II and III streams	Maximum limit: 0.1 mg/l (interim guideline limit)	NDAC 33-16-02-09
Oregon Yamhill River and its tributaries	Monthly median: 0.070 mg/l as measured during summer low flow	OAR 340-041-0350
Utah Streams and rivers to protect aquatic life; 3B, 3C waters	Maximum limit: 0.05 mg/l (used as pollution indicator; when exceeded, further investigations are conducted)	UAC R317-2 (Table 2.14.2)
Vermont Upland streams (> 2,500 ft.)	Maximum limit: 0.010 mg/l at low median monthly flow	VWQS 3-01-B2
Washington Spokane River (river mile 34 – 58)	Average euphotic zone: 0.025 mg/l (during June 1 to October 1)	WAC 173-201A-130
[*] Different requirements may exist to maintain existing higher quality streams.		

Source: *A Literature Review for use in Nutrient Criteria Development for Freshwater Streams and Rivers in Virginia*. Virginia Polytechnic Institute and State University – Virginia Water Resources Research Center. 2006.

EPA's *Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Nutrient Ecoregion XIV* ("*Ecoregional Nutrient Criteria*"), meanwhile recommends criteria under a reference-based approach. The Fact Sheet describes the facility as being in Ecoregion VIII, but in the process of responding to comments it was determined that the facility is actually in Ecoregion XIV. The total phosphorus criterion for Ecoregion XIV, Subregion 59, which includes the Merrimack River at the Merrimack POTW discharge, is 23.75 ug/l. The different ecoregion does not affect the results of the analysis herein.

Based on these materials, EPA determined that an in-stream numeric phosphorus target of 0.1 mg/l would fully protect uses designated by the State for the Merrimack River and implement the State's narrative nutrient criteria.[3] *See* 40 C.F.R. § 122.44(d)(1). EPA determined that an ambient phosphorus concentration of 0.1 mg/l would be necessary to control the effects of cultural eutrophication and to ensure compliance with applicable narrative and numeric nutrient criteria in New Hampshire. The Region opted for an in-stream phosphorus target reflecting an effects-based approach because it is more often directly associated with an actual impairment to a designated use (such as healthy aquatic life or swimming). Reference-based values, by contrast, may reflect water quality that is better than necessary to support designated uses, and thus may result in unnecessarily stringent permit limitations. The Region concluded that ambient phosphorus concentrations must be brought within a protective range bounded by the values discussed above (*i.e.*, 0.01 mg/l to 0.1 mg/1). In selecting an instream phosphorus target of 0.1 mg/l, at the high end of the effects-based protective range that it deemed most appropriate, the Region recognized that the lower values recommended by the *Nutrient Criteria Guidance* and the *Ecoregional Nutrient Criteria* represent targets based on seasonal averages and corresponding seasonal flows (as opposed to worst-case, low-flow conditions). Thus, by establishing the 0.1 mg/l limit at low-flow conditions, instream phosphorus concentrations would be lower than 0.1 mg/l when calculated over the seasonal average period, which includes higher flow conditions that provide more dilution. This is reasonable given EPA's conservative approach to nutrient permitting, which is particularly apt under these circumstances in light of evidence of nutrient impairment and troubling indications that the eutrophic cycle has commenced. The Region also notes that available target values from the guidance and literature all fall within a relatively narrow zone.

EPA has concluded that the available data clearly shows that the discharge of total phosphorus from the Merrimack treatment plant has the reasonable potential to cause or contribute to exceedances of New Hampshire's water quality standards. Based upon this numeric target, the facility's effluent data, the projected receiving water concentrations, and evidence of algal growth in the receiving water (including downstream chlorophyll-a impairments), the Merrimack WWTF discharge was determined to have reasonable potential to cause, or contribute to an excursion above water quality standards.[4] Hence, a total phosphorus limit was required to be included in the permit.[5]

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[3] There are numerous criteria designed to protect uses that could be affected by excessive phosphorus. By focusing on the narrative nutrient criterion, EPA was also ensuring that these other criteria, such as DO, would be maintained, since the narrative nutrient criterion prohibits phosphorus in waters at levels that would impair any existing or designated uses.

[4] EPA consulted 40 C.F.R. § 122.44(d)(1)(vi)(A) for guidance on how to interpret the narrative criterion. As discussed above, EPA in issuing an NPDES permit must, by necessity, translate existing narrative criteria into in-stream numeric concentrations when developing water quality-based effluent limitations. *Am. Paper Inst., Inc. v. EPA*, 996 F.2d 346, 351 (D.C. Cir. 1993). The process of translating or interpreting a narrative criterion is governed

For a detailed response to the commenter's reference to natural conditions, refer to Response II.M below.

Comment II.D.

Looking at the actual data for that day we have a background average concentration of 44 ug/l and the Merrimack WWTP discharge of 1.804 mgd with a phosphorus concentration of 10,909 ug/l (10.9 mg/l). The Merrimack discharge would be 1.804 X 10.91 X 8.34 which is 164 pounds of phosphorus loading from the Merrimack WWTP. (This is the same monthly average daily discharge loading limit cited in the draft permit.) The projected "reasonable potential" loading from the NHDES narrative statement stated the Merrimack River had a background of 44 ug/l. This equates to 0.044 X 426 (critical condition low flows) X 8.34 or 156 pounds of background load. The 426 mgd is the 7Q10 for that portion of the Merrimack at 659 cfs. The reasonable potential loading set by the NHDES is 100 ug/l. (0.1 mg/l X 426 mgd (7Q10) X 8.34 = 355 lbs). Ten percent (10%) of this is held in reserve (35 lbs) leaving a TMDL of 320 lbs. With 156 lbs of background concentration on that day and the 164 lbs discharged from the Merrimack WWTP, the phosphorus loading to the Merrimack was 320 lbs (156 + 164). In view of the NHDES narrative and with the statistical loading of that day, the Merrimack River had reached its "reasonable potential" where the only load availability left was the 35 lbs held in reserve.

Attachment 5 is a spreadsheet outlining the actual data in the sampling stations before the Merrimack outfall to the last sampling location in the Merrimack. Attachment 6 is maps showing the locations of the sampling points. The spreadsheet takes the data from the last upstream location before the Merrimack Plant outfall to the last sampling station on the Merrimack during the MPR-Study (Station M072).

The M066 Station load was 534 pounds during the 7/27/2010 low flow sampling event. The 9/21/2010 station M072 sample had phosphorus of 102.18 ug/l. The total flow at that location would have been around 650 mgd for that day (1.5 X the 7Q10). This produced a load in the Merrimack River of 554 pounds (similar to the 7/27/2010 loading). This is almost twice the "reasonable potential" load basis as outlined in the draft permit, and when you look at the Attachment 5 data sets, and the field sheets included in Attachment 7, one finds the Merrimack River is not impaired at these much higher loading rates.

The Merrimack River during the two low flow loading events actually has high clarity, DO and percent oxygen saturation that are above the minimum criteria and no algae coverage. This

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by 40 C.F.R. § 122.44(d)(1)(vi), subsection (A) of which describes a process for calculating a protective in-stream numeric concentration for the pollutant of concern. This calculated numeric in-stream target, along with other information relied on by EPA such as evidence of low dissolved oxygen and excessive plant growth in the receiving waters, is facially relevant and material to EPA's determination of whether the receiving water's assimilative capacity for phosphorus had been reached, and whether a reasonable potential for the discharge to cause, or to contribute to, a water quality criterion exceedance exists.

[5] The Region takes into account site-specific circumstances particular to each discharge before imposing an effluent limitation. The commenter should note, however, that the Region's overall approach to calculating numeric phosphorus limits to implement narrative water quality criteria has been upheld by the U.S. Environmental Appeals Board and the First Circuit Court of Appeals.

"sound-science" data strongly indicates no impairments whatsoever under these loading conditions. The station M072 phosphorus loading (102.19 ug/l), with a flow of 659 mgd, and the field sheets demonstrating good DO and no algae it demonstrates that the Merrimack is capable of handling higher phosphorus loading than what was measured during the two low flow sampling events in the area of the Merrimack WWTP outfall. Looking at the sheets in attachment 5 and 7 it is clear that there were no impairments downstream of the Merrimack WWTP at a 40% higher loading than the assumption made by the NHDES under their "reasonable potential" standard as laid out in the Merrimack Draft Permit.

Table 3-14 Factors Considered in the Weight of Evidence Approach within the CALM states, "Usually more weight is give to data which is the most recent, but one must also consider if samples were taken at times when exceedances are most likely to occur (i.e. the critical period)…. In general more weight is given to data collected the furthest downstream in an assessment unit (AU)…. In general, more weight is given to the indicator which has the most data as it is more likely to be representative of the population being sampled, provided that a sufficient number of samples were collected during the critical period when violations are most apt to occur." The Attachment 7 field sheets and Attachment 5 spreadsheet demonstrate that the furthest down AU should be given the most weight of evidence, and that again, the data events of Attachment 5 and field observations in Attachment 7 indicate no impairment at 40% higher loading than the loadings outlined in the NHDES' "reasonable potential" argument.

Response II.D.

The commenter does not specifically identify the day he is referencing in his statement ("Looking at the data on that day...."), but the sampling data used in his calculations matches data collected on July 27, 2010. The commenter's calculations of the treatment plant phosphorus load on that day are correct, as is the calculation of the total phosphorus background load that would occur under the assumptions used in the Fact Sheet (i.e., a concentration of 44 ug/l and a flow of 426 MGD). The calculation of the downstream load that would result with the river flow at 7Q10 and the treatment plant discharging phosphorus at its permitted limit and at design flow is also essentially correct (only failing to include the treatment plant flow in the downstream flow estimate).

However, in drawing his conclusions regarding these calculations, the commenter has made several errors. First, the limits in the permit were established to ensure that the receiving water downstream of the discharge attain a concentration of 100 ug/l under 7Q10 conditions. On the day that the sampling was done, the river was well above 7Q10, which would allow loads greater than those in the Fact Sheet while still achieving a downstream concentration of 100 ug/l. In fact, on the day in question, the measured downstream concentration was less than 100 ug/l (60.17 ug/l), meeting the target concentration of 100 ug/l, and on the other sampling day (September 21, 2010) the concentration was 102.19 ug/l, only marginally greater than the target concentration.

Second, an exceedance of the 100 ug/l instream target for a single day would not necessarily lead to noticeable eutrophic effects at the point of discharge. Other variable factors such as temperature, turbidity and available light influence the growth of aquatic plants. Also, in complex river systems such as this, significant lag time might occur between loading of phosphorus and visible effects of that loading. Geological, physical and biological habitat factors that affect the extent and timing of algal response given adequate to high nutrient supply and non-toxic conditions include: current velocity, turbidity/color, open/closed canopy, stream depth,

degree of scouring, degree of macroinvertebrate grazing, and depth to width ratio. *See Nutrient Criteria Technical Guidance Manual, Rivers and Streams* (July 2000) at 21.

As noted previously, whether or not the receiving water is listed by the State as an impaired water is not determinative regarding the need for NPDES permit limits. Therefore, the CALM methodology (the methodology by which the state determines whether to list a receiving water as impaired) is not determinative. NPDES permit limits are required whenever there is, among other things, the reasonable potential for the discharge to cause a water quality exceedance. It should, however, be noted that even in the context of section 303(d) listing decisions, EPA's 2001 Nutrient Criteria Development Memorandum, recommends (at p. 19) that listing should "ideally occur prior to highly visible responses such as algal blooms to facilitate a more proactive approach to management[,]" and states should "consider excessive levels of nitrogen and phosphorus as a basis for listing regardless of the status of early response variables such as chlorophyll *a* or turbidity."

Comment II.E.

INDUSTRIAL PRETREATMENT

Merrimack has a large influent phosphorus contribution due to the industrial discharge from Anheuser Busch (AB). Merrimack's discharge on 7/27/2010 was the highest of any WWTP at 10.909 mg/l. The discharge from all the other plants on the Merrimack River during that day's sampling event was 4.617 mg/l. It is evident that Merrimack's discharge is heavily influenced by the AB discharge. The previous permits, and current draft permit, have extensive requirements under the industrial pretreatment program. This is outlined in Section G. Pretreatment, page 16 of the draft permit. It requires the permittee to administer the program according to 40 CFR part 403 and Section 307 of the CWA. These requirements include (1) enforcement of technically-based local limits, (2) revision to sewer use ordinance, (3) development of an enforcement response plan, (4) implementation of a slug control plan, (5) tracking of significant non-compliance of industrial users and (6) establish a definition of and track significant industrial users.

AB has been a discharger to the Merrimack WWTP for many years and over many permit cycles. In 2001 the Merrimack WWTP had a daily average discharge of 3.696 mgd of which AB contributed an average of 1.940 mgd (current average annual flow is 2.2 mgd). A sample of the AB discharge in 2001 indicated a T. phosphorus discharge of 12.1 mg/l. There were mass limits set for BOD/TSS (as with the current permit), but no limits required for nutrients as the Merrimack had not evidence any impairment from increased nutrient discharge.

The current annual average discharge for AB is 0.566 mgd (71 % reduction in discharge contribution). If there were no problems in the Merrimack with larger plant and industrial discharges in the Merrimack during the 2000s, what premise does the NHDES assume there is a "reasonable potential" now as it never manifested when the discharge was 40% greater than it is now. Also as pointed out earlier, there were two massive sampling events carried out in 2010 and none of the data indicated impairments to the Merrimack River.

The industrial pretreatment program is the vehicle to control excess T. phosphorus discharge from the industrial user. The Town and AB are in full compliance with both permits. As with any pollutant, Merrimack is required to review their local limits to determine what course of action to take and in light of a new permit limit to determine if one needs to be developed. The

NHDES reasoning for "reasonable potential" does not take into account the viability of this permit aspect and assumes this will not be effective in the future control of phosphorus (if indeed one is needed). The Merrimack WWTP and AB are in compliance with their existing permits.

Manchester was able to reduce 10,000 lbs of BOD daily loads from Coca Cola in Londonderry to less than 2,000 lbs of BOD daily through the pretreatment program. Similar BOD reductions were achieved with two other industries (Stonyfield and NYCOA) vial the same permit vehicle.

The pretreatment program allows the Town of Merrimack to work with AB to reduce the influent loads. The "reasonable potential" argument requires Merrimack to reduce the discharge at the end of the plant, placing the burden on the Town for design, construction and equipment costs which are not needed now, or anytime in the foreseeable future.

Response II.E.

EPA agrees that the Anheuser Busch (AB) brewery discharges a significant amount of TP to the Merrimack WWTF and is subject to a pretreatment program. While it is true that the contribution from the brewery has decreased in recent years, EPA does not have any measurements of TP in the AB discharge to determine its current contribution to the Merrimack WWTF discharge or the trend over time. EPA's calculations show that the WWTF discharge of TP currently has the reasonable potential to cause or contribute to an exceedance of water quality standards. Reasonable potential is shown in the fact sheet calculations and further discussed in the Response to Comment II.B. The reasonable potential determination was made based on currently available information and is not dependent on the conclusion of previous analyses or previous permitting decisions. As the WWTF works to ensure compliance with the TP limit included in the permit, it may consider whether reducing TP from the brewery is a viable option.

Comment II.F.

UNFUNDED MANDATE

Article 28-a of the State's Constitution, Bill of Rights, adopted on November 28, 1984 states, "The state shall not mandate or assign any new expanded or modified programs or responsibilities to any political subdivision in such a way as to necessitate additional local expenditures by the political subdivision unless such programs or responsibilities are fully funded by the state or unless such programs or responsibilities are approved for funding by a vote of the local legislative body of the political subdivision."

Section 541-A:25 Unfunded State Mandates II of the Administrative Procedures Act State, "Such programs also include, but are not limited to, functions such as police, fire and rescue, roads and bridges, solid waste, sewer and water, and construction and maintenance of buildings and other municipal facilities or other facilities or functions undertaken by a political subdivision."

The NHDES is establishing new limits for phosphorus at the Merrimack WWTP and within the Merrimack River where clearly, the "sound-science" data of the MPR-Study indicates there is no impairment in the Merrimack River. The "reasonable potential" loadings as expressed in the permit narrative were exceeded by 40% during the extensive consensus/population MPR-Study with no impairment results. This contradicts the NHDES' "reasonable potential" argument as evident through the massive amount of data gathered in the MPR-Study. The MPR-Study

demonstrates that a phosphorus limit is not needed for the Merrimack WWTP and that the Merrimack River is in compliance with WQ standards.

The NHDES "reasonable potential" argument is mandating Merrimack to upgrade their facility to meet phosphorus removal capabilities that will cost the town millions of dollars for design, construction, equipment and ongoing operations and maintenance costs. It is clear that the pounds loading limit included in the draft permit based on 'reasonable potential', but clearly contradicted by the scientific findings of the MPR-Study, is an unfunded mandate that will cost the rate payers of Merrimack unneeded expenses to achieve a reduction of a pollutant that does not currently, nor will it during the next permit cycle, cause a water quality violation.

Response II.F.

By its terms, Section 541-A:25 Unfunded State Mandates II applies to the state, not EPA in issuing a federal NPDES permit. To the extent that the reference to "unfunded mandates" also refers to the requirements of the Unfunded Mandate Reform Act of 1995 (UMRA), the UMRA is inapplicable to this permitting action. The UMRA applies to rulemaking, and not individual NPDES permit decisions. For example, in *In re City of Blackfoot Wastewater Treatment Facility*, NPDES Appeal No. 00-32 (EAB September 17, 2001) the Environmental Appeals Board denied a petition for review of compliance with UMRA on grounds that UMRA applies only to regulations, not to individual NPDES permits, which are more akin to licenses than a regulation.

The State generally adopts federal NPDES permits as State permits so that facilities can lawfully discharge wastewater under State law, specifically RSA 485-A:13, I(a). However, no issue under Part I, Article 28-a of the N.H. Constitution arises when that happens. Any costs incurred to comply with the federal NPDES permit are attributable to the federal action in issuing the permit. The costs to Merrimack to comply with the permit will not increase as a result of the State's adoption of the federal NPDES permit as a state permit. There thus are no "additional local expenditures" that can be attributed to the State's actions. RSA 541-A:25, which is the General Court's interpretation of Part I, Article 28-a, likewise does not apply to this case. RSA 541-A:25, I, to which the language quoted by Merrimack refers, establishes that the section applies to a "state agency to which rulemaking authority has been granted". The Department is not aware of any case in which RSA 541-A:25 has been applied outside of a rulemaking proceeding.

EPA assistists in financing the cost of treatment needed to achieve compliance with the Clean Water Act through the Clean Water Act State Revolving Fund (SRF). Through the SRF program, New Hampshire maintains revolving loan funds to provide low cost financing for a wide range of water quality infrastructure projects. Funds to establish or capitalize the SRF program are provided through federal government grants and state matching funds (equal to 20% of federal government grants). EPA has provided New Hampshire with a total of $358,419,565 in Clean Water Act SRF grant funds for the period from 1989 through 2012.

Regarding the "sound-science" data of the MPR-Study, the commenter does not accurately characterize the data. The loadings on the sampling dates were not proportionally higher when compared to the river flow on those dates relative to 7Q10. Refer to Response II.E. above for a more through explanation. EPA believes that the data do not contradict the reasonable potential determination presented in the Fact Sheet.

Comment II.G.

ALUMINUM

Attachment E of the draft permit has a determination for reasonable potential for Aluminum. Attachment 8 is the page from the permit. The four data points indicate aluminum loading from the detection limit of 50 ug/l to 180 ug/l. The permit provides a mean of 72.5 ug/l. Note no river flows are given for any of the sample dates. Also note that 50 ug/l is the minimum detection limit for aluminum, unless a lower test limit is requested. Were the two 50 ug/l measurements actually 50 ug/l or < 50 ug/l and 50 was used as the default?

The four river samples were all taken at times when the river flow was well over the 3X 7Q10 criteria the NHDES uses for low flow sampling event criteria. Included in Attachment 9 is the Manchester MORs that correspond to the dates of Merrimack's upstream aluminum samples. There was 0.53 inches of rain along with numerous antecedent rainfall for the September 2008 sample of 180 ug/l. The 2009 sample had antecedent rainfall days that accounted for 0.62 inches of rain. The same conditions existed for the 2010 and 2011 sample events indicating that the river flows were potentially in the 7X to >10X the critical 7Q10 flow conditions. At the very least, the aluminum mean of the four samples should not have been measured against the acute criterion, but only the chronic due to the rainfall events on the day of or antecedent rainfall events.

The City of Manchester, working with the NHDES, did an extensive evaluation of the section of the Merrimack River for aluminum above and below its outfall. This extensive study for aluminum was submitted to the EPA March 2011. In this study it was proven that during rain events, the feeder ponds in the White Mountains and headwaters of the Merrimack discharge highly laden naturally occurring aluminum waters (>100 ug/l). In review of the "One-Stop" aluminum data on the NHDES website, it confirms that the concentration of this naturally occurring aluminum actually dilutes out over the course of the descent through the lower reaches of the Merrimack River. Within Manchester's Aluminum Study, the findings were that when the Merrimack River was at 3X the 7Q10 limit or less (2,000 cfs), the background river concentration for aluminum never exceeded 32.6 ug/l for total recoverable aluminum (Attachment 10). As the river cfs increased, the corresponding aluminum increased.

The concern is that the Merrimack draft permit is using chronic river values for aluminum and comparing them to the 90% of the acute standard. The permit Attachment B should have included the river 7Q10 flows at the time the four upstream samples were taken to demonstrate the actual cfs of the Merrimack river. The premise that 72.5 ug/l is the correct analytical result to measure against the acute standard is of concern. It is correct to measure against the chronic standard as the samples were all taken when the Merrimack River was well over 3X the 7Q10 standard for low flow conditions. It is questionable if these high flow sample data sets should be measured against an acute (3X the 7Q10 or less) gold book standard.

Based on the above narrative and the Manchester 2011 Aluminum Study an aluminum potential should not have been raised due to naturally occurring aluminum within the Merrimack River.

Response II.G.

EPA notes that the aluminum analysis in the Fact Sheet did not indicate reasonable potential for aluminum to cause or contribute to an exceedance of the applicable water quality criteria and a

permit limit was not included in the Draft Permit. The commenter may have misunderstood the section of the Fact Sheet describing the process of determining whether there was reasonable potential to be an actual confirmation of reasonable potential. An aluminum limit is not included in the draft permit or final permit.

In response to the commenter's question regarding the data used in the reasonable potential analysis, the two background Al samples reported as 50 ug/l were not reported as default values nor were they at the detection limit. According to both submitted reports, the reported values were 50 ug/l with reported detection limits of 20 ug/l (using Method 3120B).

Comment II.H.

SECTION II

Phosphorus

The proposed permit includes a water quality-based effluent limitation for phosphorus even though New Hampshire does not have numeric nutrient criteria. EPA included this limitation in an attempt to interpret and implement the state's narrative criteria with respect to phosphorus. (Fact Sheet at 10) The pertinent part of this standard reads as follows:

> Class B waters shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring… Existing discharges containing either phosphorus or nitrogen which encourage cultural eutrophication shall be treated to remove phosphorus or nitrogen to ensure attainment and maintenance of water quality standards.

Env-WS 1703.14.

The Fact Sheet (at 11) further notes that cultural eutrophication is defined in Env-Ws 1702.15 as, "… the human-induced addition of wastes containing nutrients which results in excessive plant growth and/or decrease in dissolved oxygen."

This limitation was based upon application of EPA's 1986 Gold Book value for flowing waters. The Fact Sheet with the draft permit states that the Gold Book criterion was used because it was developed from an effects-based approach versus eco-regional criteria which are based on reference conditions. (Fact Sheet at 11)

> "The effects-based approach provides a threshold value above which adverse effects (i.e., water quality impairments) are likely to occur. It applies empirical observations of a causal variable (i.e., phosphorus) and a response variable (i.e., chlorophyll *a*) associated with designated use impairments."

At a minimum, this narrative standard requires that there be a demonstration that the discharge is causing impairment, either excessive plant growth that impairs uses or plant growth that causes a dissolved oxygen criteria violation. Moreover, in applying the Gold Book criterion, there needs to be some showing that use impairment is occurring due to plant growth caused by the discharge of phosphorus from anthropogenic sources.

However, the only demonstration provided in the Fact Sheet is that the discharge from the Town of Merrimack POTW may cause an exceedance of the Gold Book value based on mixing under design flow conditions. EPA attempts to justify this approach citing 40 CFR § 122.44(d)(1). As discussed below, application of the Gold Book criterion as presented in the Fact Sheet is not supported by any Clean Water Act (CWA) requirements.

In issuing the draft permit, the Region has made three very important unsubstantiated assumptions: first, the Merrimack River is impaired by nutrients; second, the applicable numeric criteria should be the 0.1 mg/L suggested as a possible objective in the 1986 Quality Criteria of Water ("Gold Book"), and; three, the Town of Merrimack WWTF is causing or contributing to an excursion above the assigned instream phosphorus criteria. As explained below, we have several significant objections with the assumptions and determinations made by the Region in developing this limit.

Response II.H.

Please see Response II.B and C. EPA will address these comments in detail as they are raised specifically below.

Comment II.I.

1. Misapplication of 40 CFR § 122.44(d)

The CWA is a "science-based" statute that requires the establishment of criteria "accurately reflecting the latest scientific information" regarding "…the effects of pollutants on biological community diversity, productivity and stability…" Section 304(a)(1); *accord*, 40 CFR 131.3(c) (criteria developed by EPA are based on "the effect of a constituent on a particular aquatic species"). No criteria (including a narrative criteria interpretation) can be approved unless it is "based on a sound scientific rationale". 40 CFR 131.11(a). Likewise, the effluent limit generated to meet the "applicable standard" must be demonstrated to be "necessary" and "which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria". 40 CFR 122.44(d)(1)(vi). Obviously compliance with the statute and applicable regulations requires an objective scientific assessment to show that the selected approach is both necessary and sufficient to achieve criteria compliance.[6]

Given the language of the Act and the implementing regulations, it is not surprising that Courts have determined "that neither the language of the Act nor the intent of Congress appears to contemplate liability without causation" NAMF v. EPA, 719 F. 2d 624, 640 (3rd. Cir. 1983); Ark. Poul. Fed. V. EPA, 852 F. 2d 324, 328 (8th Cir. 1988) (the discharge must at least be "a cause" of the violation.) In the TMDL context, such nutrient wasteload allocations must be based on a documented "cause and effect" relationship using appropriate water quality models:

> An integral part of the TMDL process is the analysis of cause-effect relationships via a mathematical model of loading input and resulting water quality response.[7]

[6] Sufficient does not mean that the individual facility must ensure WQS are attained, but that the selected criteria, when achieved will produce this result.

[7] Technical Guidance Manual for Developing Total Maximum Daily Loads Book 2: Rivers and Streams; Part 1: Biochemical Oxygen Demand/ Dissolved Oxygen and Nutrients/ Eutrophication. USEPA March 1997 at 4-27.

On its face, 122.44(d) itself indicates that more restrictive limits only apply if the discharge "causes" a water quality criteria excursion[8] as discussed in the *Upper Blackstone* decision. The *Upper Blackstone* decisions repeatedly refer to the fact that nutrients were demonstrated to be "causing" extensive "cultural eutrophication" as the basis for imposing more restrictive limitations.[9]

Because there are no such analyses for Merrimack River, EPA asserts that it may use the procedures identified in Section (d)(1)(vi) to not only develop an effluent limitation but to also use that endpoint to declare that the waters do not attain the state's narrative standard in the first instance. EPA is interpreting 122.44(d) in a manner inconsistent with the rule language, as well as the structure of the Act. Had EPA not done this, these stringent permit limits would never have been imposed.

A created numeric value is cannot be used to determine that narrative criteria (which describes a desired physical or biological condition in the water body) are being violated. As with the New Hampshire narrative criteria, the Rhode Island narrative in the *Upper Blackstone* case also was based on preventing "cultural eutrophication" as evidenced by nutrients causing excessive algal growth, low DO and other deleterious effects. In that case, the court first looked to see if the effects of "cultural eutrophication" existed and were documented to be caused by nutrients:

> An influx of nitrogen and phosphorus from sewage treatment plants is causing serious problems for the River's waters and those downstream. The Blackstone, Seekonk, and Providence Rivers, and Narragansett Bay, all suffer from severe cultural eutrophication.(at 11)…. Here, the EPA states, and the record reflects, that the MERL model demonstrated the relationship between nitrogen loading, dissolved oxygen, and chlorophyll *a* production for a range of loading scenarios in a water environment similar to the Bay's. (at 27). *Subsequently*, in order to address the severe and ongoing phosphorus-driven cultural eutrophication in the Blackstone River, the EPA incorporated a more stringent phosphorus limit into the 2008 permit. In formulating this limit, the EPA considered the national and regional guidance criteria and recommended values it had recently published. (at 31) (Emphasis supplied)

After this fact was confirmed the court determined that EPA's derivation of permit limits using the methods described in Section (vi) was acceptable, not that EPA could claim impairments based on those values absent documenting cultural eutrophication caused by excessive nutrient loads.

Under EPA's approach used in the Town of Merrimack NPDES permit, "cultural eutrophication" (the condition intended to be regulated under the adopted narrative criteria) is equated with a

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[8] The "or contributes" language means it is contributing to the "cause" of the violation.

[9] ***Upper Blackstone Water Pollution Abatement Dist. v. EPA*, 690 F.3d 9 (1st Cir. 2012)**
"An influx of nitrogen and phosphorus from sewage treatment plants ***is causing serious problems*** for the River's waters and those downstream. The Blackstone, Seekonk, and Providence Rivers, and Narragansett Bay, all suffer from severe cultural eutrophication." (at 11). "State water quality standards generally supplement these effluent limitations, so that where one or more point source dischargers, otherwise compliant with federal conditions, are nonetheless ***causing a violation of state water quality standards***, they may be further regulated to alleviate the water quality violation. Id. *§ 1311(b)(1)(C)* (at 14);

numeric value to conclude more restrictive limits are "necessary" *even if the water body is not exhibiting signs of cultural eutrophication.* However, the NPDES regulation was intended to implement the adopted standard as closely as possible with the state's intent – not to substitute a new numeric value in place of it. See, *Am Iron and Steele v. EPA.*

The structure of the rule and "relevant" preamble discussion[10] confirms this is how the rule is to apply. Under Section 122.44(d)(1)(ii) the permit writer first determines if "a discharge… causes or contributes to an instream excursion". In the case of a narrative standard one looks to see if the characteristics that are intended to be prevented are evidenced in the waters (i.e., cultural eutrophication causing some type of system imbalance). If it is determined that an excursion is occurring (or likely to occur) then and only then "the permitting authority must establish effluent limits using one or more of the following methods…" The structure of the rule is clear; the methods for picking a protective instream level are only used to set the effluent limits, not to decide that the waters are in violation of the narrative standard. The 1989 preamble discussion further supported that the methods used to derive the effluent limit was not the same method used to determine if an excursion existed:

> Subparagraph (i) should assist the permitting authority in determining whether it is necessary, under Federal regulations, to establish limits for a pollutant. Note, however, this is different from calculating water quality-based effluent limits. …Proposed subparagraph (iv) addresses the situation in which…the permitting authority does not have a numeric criteria to use *in deriving a water quality-based limit.*" 54 Fed. Reg. 1303,104 January 12, 1989 (emphasis supplied)

As is clear from these quotes, Section (vi) is used to set the permit limits *after the excursion (violation) is identified*, not to declare the waters in exceedance (violation) of a state's narrative standard. Any other approach would turn the structure of the Act on its head.[11] EPA is not implementing the adopted narrative standard; EPA is replacing it with a new numeric standard as if it was the adopted narrative standard. That plainly violates the Alaska Rule and 40 CFR 131.21.

EPA is simply jumping over that process by claiming that exceeding a non-specific nutrient concentration constitutes a narrative criteria violation, regardless of whether or not nutrients are actually causing excessive plant growth or DO violations. Thus, it is apparent, that EPA's latest

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[10] The preamble indicates that one does not need to wait for impairment to trigger the application of a more restrictive limit under 122.44(d). That is true, but irrelevant. One may project a violation of a narrative standard (i.e., that "cultural eutrophication" is predicted to occur in the future) if adequate modeling or other reliable predictive capabilities are available, considering the physical parameters of the system. This would restrict future load INCREASES. However, in this instance, EPA is dramatically lowering the existing load to the system, claiming that it is currently far too high. In this case, EPA should be able to readily identify the existing cultural eutrophication and identify, with a reasonable scientific certainty, how phosphorus caused the excessive plant growth to occur. However, there is no such demonstration.

[11] Under EPA's approach, under Section 303(d) a state could determine that an area is not exhibiting "cultural eutrophication" and therefore not place the water on the Section 303(d) impaired waters list, regardless of the nutrient concentration present. However, when it comes time for permitting, EPA substitutes its chosen numeric criteria for the narrative standard and determines that a more restrictive limit is needed to meet the narrative criteria, contrary to Section 301(b)(1)(C) and the Section 303(d) determination which only allows the imposition of more restrictive water quality based limits where "necessary to meet the applicable water quality standards." The applicable standard is the narrative definition of the intended biological condition (e.g., no excessive plant growth).

position is a major reinterpretation of 40 CFR 122.44(d), without rulemaking and contrary to the structure of the Act. It is thus, therefore, patently illegal and may not be applied in this instance. *U.S. Telecom. Ass'n v. FCC*, 400 F.3d 29 at 35 ('a substantive change in the regulation,' requires notice and comment) (quoting *Shalala v. Guernsey Mem'l Hosp.*, 514 U.S. 87, 100 (1995).

Response II.I.

The criteria approval and TMDL process, and regulations and guidance pertaining thereto, are not directly applicable to this permit proceeding. There is no approved phosphorus TMDL for the segment into which the Merrimack WWTP discharges. Moreover, EPA is implementing an existing narrative water quality standard for nutrients under section 402 and 40 C.F.R. Part 122, so the criteria approval process is not relevant to its determinations. The City's legal objections have been resolved by the EAB's recent decision in *In re Town of Newmarket Treatment Plant*, NPDES Appeal No. 12-05, 16 E.A.D. __ (EAB December 2, 2013), *slip op.* at 62-64, including the applicability of the Alaska Rule and whether the Region's derivation of an in-stream target for a pollutant under 122.44(d)(1) amounted to an illegal rulemaking.[12]

The commenter misquotes 40 CFR §122.44(d)(1)(ii) above as stating that a permit writer first determines if "*a discharge… causes or contributes to an instream excursion*." The regulation actually states that the permitting authority must determine whether "*a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion.*" As stated in Response II.B and C above and restated here, EPA is not required to demonstrate that nutrients are "causing" extensive "cultural eutrophication" but simply that there is the "reasonable potential to cause" such water quality excursions.

The City's interpretation of the First Circuit's decision in Upper Blackstone is entirely without merit. The City contends that the *Upper Blackstone* decision actually stands for the proposition that "causation" must be proven prior to imposition of a water quality-based effluent limitation under 40 C.F.R. § 122.44(d), pointing facilely to the Court's use of the word "causing" and its reference to EPA's conclusion, based on a laboratory experiment, "that the basic causal relationship demonstrated in the MERL experiments 'corresponds to what is actually occurring in the Providence /Seekonk River system.'" Although the Court in *Upper Blackstone* may indeed have been convinced that EPA's record demonstrated that the District's treatment plant was "causing" a water quality standards excursion, it nowhere suggested that such a finding was necessary prior to imposing a water quality-based effluent limitation. On the contrary, the court specifically acknowledges the full breadth of the regulations:

> EPA regulations require permitting authorities to include in NPDES permits conditions which control all pollutants or pollutant parameters . . . [that] are or may be discharged at a level which will cause, *have the reasonable potential to cause*, [emphasis supplied] or contribute to an excursion above any State water

[12] This is unsurprising, as the Region notes that the City has merely copied and pasted portions of petitioner's submissions in the Newmarket permit appeal. *See* http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/Filings%20By%20Appeal%20Number/E3E03BFDEDDDF6D485257B21006F63D0/$File/Reply%20to%20EPA's%20Memo%20in%20Opposition%20...40.pdf. EPA rebutted that filing at http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/Filings%20By%20Appeal%20Number/B85DF6EB6B3EC40B85257B320044E0D9/$File/Respondent%20EPA's%20Sur-Reply...46.pdf and, in the interest of efficiency, incorporates those responses here.

> quality standard, including State narrative criteria for water quality. We thus reject the notion that in order to strengthen the District's discharge limits, the EPA must show that the new limits, in and of themselves, will cure any water quality problems [internal quotation marks and citations omitted]. *Upper Blackstone Water Pollution Abatement Dist. v. U. S. EPA*, 690 F.3d 9, 33 (1st Cir. 2012).

The City's reading of the case is impossible to reconcile with the Court's view that, "[R]ecognizing…the developing nature of [the field]…[t]he [EPA] Administrator may apply his expertise to draw conclusions from suspected, but not completely substantiated, relationships between facts, from trends among facts, from theoretical projections from imperfect data, from probative preliminary data not yet certifiable as 'fact,' and the like." *Id.* at 24 (quoting *Ethyl Corp. v.EPA*, 541 F.2d 1, 27-28 (D.C. Cir. 1976). The City should be aware that the reasonable potential determinations in the Blackstone permit were *not* based on a causal model, but correlations among data sets, as here.

Similarly, the City badly misreads the Board's decision in the Blackstone case, where it held, the "[Agency] does not need to justify the decision to impose a permit limit based on a site-specific demonstration that nutrients are causing the claimed impairments in the water body of concern, but need only demonstrate that the discharge causes, *has the reasonable potential to cause, or contributes* to an in-stream excursion above a numeric or narrative criteria within a state water quality standard." *In re Upper Blackstone Water Pollution Abatement Dist*., NPDES Appeal Nos. 08-11 to 08-18 & 09-06, slip op. at 32 (May 28, 2010).

EPA rejects the commenter's premise that the receiving waters are not evidencing signs of cultural eutrophication. As described in Response II.B above, EPA believes there is sufficient evidence of algal growth and DO violations in the Merrimack River downstream of the discharge to conclude that New Hampshire's narrative criteria regarding cultural eutrophication have been violated. In fact, the segment of the Merrimack River in the Town of Nashua (NHRIV700061206-24), approximately 5 miles downstream of the Merrimack discharge, is impaired for chlorophyll-a. This is contrary to the commenter's assertion that EPA is equating cultural eutrophication with a numeric value "*even if the water body is not exhibiting signs of cultural eutrophication.*" In fact, the data illustrates DO supersaturation (>100%) and an increase in chlorophyll-a (>15 ug/l), both of which are indications that cultural eutrophication is occurring downstream of the discharge. Also contrary to the comment above, EPA is not required to demonstrate that the receiving water does not attain water quality standards before applying a permit limit. Nor is EPA required to demonstrate that an excursion is "likely to occur." Rather, EPA is required to demonstrate that there is *reasonable potential* for the discharge to cause or contribute to a water quality violation. In this case, reasonable potential was determined based upon the documented excursions above the EPA interpreted numeric criterion (0.1 mg/l) combined with in-stream evidence of excessive downstream algal growth.

The commenter's claim that EPA erred by consulting 40 C.F.R. § 122.44(d)(1)(vi)(A) for guidance on how to interpret the narrative criterion is unfounded. EPA in issuing an NPDES permit must, by necessity, translate existing narrative criteria into in-stream numeric concentrations when developing water quality-based effluent limitations. *Am. Paper Inst., Inc. v. EPA*, 996 F.2d 346, 351 (D.C. Cir. 1993). The process of translating or interpreting a narrative criterion is governed by 40 C.F.R. § 122.44(d)(1)(vi), subsection (A) of which describes a process for calculating a protective in-stream numeric concentration for the pollutant of concern. This calculated numeric in-stream target, along with other information relied on by EPA such as

evidence of low dissolved oxygen and excessive plant growth in the receiving waters, is facially relevant and material to EPA's determination of whether the receiving water's assimilative capacity for phosphorus had been reached, and whether a reasonable potential for the discharge to cause, or to contribute, to a water quality criterion exceedance exists. The commenter fails to identify any reason why EPA should be precluded from utilizing an in-stream numeric target as a part of its reasonable potential analysis, which as described above was intended to be a flexible process to allow the permit writer to carry out the objectives of the Act, including ensuring compliance with state water quality standards. The commenter, moreover, neglects to describe what alternative technical methodology, other than a conclusive cause-and-effect demonstration it would employ in order to make such a reasonable potential determination.

The proposed numeric thresholds are neither new nor revised water quality standards, so the alleged significance of the "Alaska Rule" is misplaced. In this instance, the only applicable standard in the state water quality standards are *existing* approved narrative criteria for nutrients, which as explained above require translation or interpretation in order to yield a numeric effluent limitation. The legal/regulatory requirements associated with criteria adoption are not applicable to permitting decisions based on existing criteria, such as the New Hampshire narrative nutrient criterion applicable in this proceeding.

Similarly, issues associated with impaired waters designation are more appropriately addressed through the 303(d) listing process. Independent of any State decisions associated with 303(d) lists, EPA clearly documented a reasonable potential to exceed the narrative nutrient criteria in the Fact Sheet and has affirmed that conclusion through this response to comments.

As stated in footnote (8) above, "the preamble indicates that one does not need to wait for impairment to trigger the application of a more restrictive limit under 122.44(d)." The commenter claims that this is irrelevant because it should be interpreted to apply to future increased loads. However, the preamble specifically states that "more restrictive limits" may be applied, indicating a reduction from current levels, and furthermore says nothing about any reasonable potential findings having to be based on cause-and-effect models or demonstrations. It should be noted that in the case of Merrimack's discharge, the limit being applied is not significantly less than its typical discharge. In fact, Merrimack WWTF's average reported TP discharge (6.5 mg/l, reported in the 2012 permit application based on 24 samples) and their average flow from 2008 to 2012 (2.2 mgd, shown in Fact Sheet) results in a loading of 119 lb/d (6.5 mg/l x 2.2 mgd x 8.345), well under the TP limit of 164.8 lb/d included in the Draft Permit as a monthly average limit (April 1st through October 31st). Hence, the limit does effectually prevent future increases in TP while limiting the upper extreme of current loadings as well.

Comment II.J.

2. Waters Not Listed as Nutrient Impaired

Under section 303(d) of the Clean Water Act, New Hampshire is given primary authority for identifying which of its waterbodies are not meeting the governing water quality standards and for what reasons. EPA has limited authority (inapplicable in this instance) to intrude into this State responsibility. With regard to Merrimack River, New Hampshire has never identified the

waterbody as nutrient impaired on the State's 303(d) list.[13] Moreover, Region 1 specifically approved New Hampshire's decision not list the waterbody as nutrient impaired, indicating that the current instream conditions and loadings are acceptable. If EPA wishes to amend a State's 303(d) listing decision, there is a specific process for doing so. Until such steps are taken, however, EPA has no authority to presume nutrients are impairing Merrimack River or assert that a narrative criteria violation related to nutrients exists in this waterbody.

Response II.J.

See response above for a more detailed discussion. Including a limit in the permit for a particular pollutant is not dependent on the receiving water being listed as impaired for that pollutant. Regardless of whether waters are listed as impaired under Section 303(d), EPA has an independent duty under Section 301(b)(1)(C) of the Act to impose limits as stringent as necessary to meet applicable water quality standards. As stated in Response II.I., "The preamble indicates that one does not need to wait for impairment to trigger the application of a more restrictive limit under 122.44(d)."

Comment II.K.

3. State Narrative Criteria Misapplied

Currently, the only duly promulgated New Hampshire water quality criteria addressing nutrients in estuaries are found at Env-Wq 1703.14(b), which states:

> *Class B waters shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or designated uses*, *unless naturally occurring*. (emphasis supplied). The regulations continue:
>
> *Existing discharges containing either phosphorus or nitrogen which encourage cultural eutrophication shall be treated … to ensure attainment and maintenance of water quality standards.* Env-Wq 1703.14(c).
>
> *"Cultural eutrophication" is defined as "human-induced addition of wastes containing nutrients to surface waters which results in excessive plant growth and/or a decrease in dissolved oxygen."* Env-Wq 1702.15.

DES also has a narrative standard regarding "aquatic community integrity," which indicates, in relevant part, that "differences from naturally occurring conditions shall be limited to non-detrimental differences in community structure and function." Env-Wq 1703.19(b).

The key evidentiary component of the narrative nutrient criterion is that a violation is only found when it is demonstrated that phosphorus *is causing* an impairment (*e.g.*, "in such concentrations that would impair"; "human-induced addition of … nutrients … which results in"). This requires a "cause and effect" demonstration to find a violation of the narrative criteria. In issuing the draft permit, EPA relied on the Gold Book phosphorus criterion as an appropriate "narrative translator" and applied the Gold Book phosphorus criterion as though it represented a toxic

[13] As mentioned in the draft permit, stretches of the Merrimack River are identified as impaired by aluminum, dissolved oxygen, pH, and *Escherichia coli*. Unlike numerous other waterbodies in New Hampshire, chlorophyll-a (surrogate for plant growth) is not the basis of impairment.

substance by applying the criterion at the 7Q10 stream flow. However, the Gold Book notes that phosphorus concentrations critical to noxious plant growth vary and nuisance growth may result from a particular concentration of phosphate in one geographical area but not in another. Thus, even the Gold Book, upon which EPA relied upon to identify a potential criterion, cautioned that adverse effects cannot be assumed but must be confirmed.

To claim a nutrient limitation is necessary to eliminate use impairments and protect ecological resources under the state's narrative standard, EPA must first demonstrate that the nutrient at issue (phosphorus) caused the impairment, otherwise defined as "cultural eutrophication" (excessive algal growth causing impairment such as DO violations – Env-Wq 1702.15) under state law. Moreover, any "narrative translator" must be based on a system-specific defined "cause and effect" relationship showing the nutrients have caused such "cultural eutrophication."

The permit action is premised on the *assumption* that the waters are nutrient impaired, that the Gold Book phosphorus criterion is an appropriate numeric translator, and that a simple mass balance under design conditions is sufficient to demonstrate reasonable potential. However, there is no indication that "cultural eutrophication" has occurred as a result of the discharge, and the 303(d) list does not identify the waters as impaired by nutrients.

- **Deposition Testimony Confirmed Cause and Effect Demonstration Required for Narrative Criteria Violation**

The DES has identified the Great Bay Estuary as nutrient impaired based on a scientifically deficient draft criteria document specific to the estuary, and EPA has applied the draft criteria in setting NPDES limits for several municipal dischargers to the estuary. This action was challenged and several DES staff were deposed and gave testimony on application of the state's narrative nutrient criteria. Mr. Paul Currier of DES confirmed that any claim of narrative criteria violations requires a documented *causal relationship* between nutrients and excessive plant growth adversely impacting designated uses (*See* Currier Dep. at 18, 19, 134)[14].

The Gold Book phosphorus criterion cannot be a proper translator of the existing narrative criteria without a causal demonstration that phosphorus is causing cultural eutrophication. Moreover, both Mr. Currier and Mr. Trowbridge noted that merely exceeding values contained in the draft 2009 Criteria (and, in this case, the Gold Book criterion) does not provide a demonstration that a narrative violation exists. (Currier Dep. at 80; Trowbridge Dep. at 332-333)

Based on these sworn acknowledgements on how state law is intended to operate, it was improper for EPA to presume that the exceeding the Gold Book levels will or has caused impairment anywhere in the Merrimack River. It was equally improper for EPA to presume that attaining compliance with the numeric values contained in the Gold Book, was necessary to avoid violating the state's narrative criteria. Finally, it was also improper to presume that the Gold Book criterion accurately reflected the level of scientific demonstration required by the existing narrative standard to designate waters as nutrient impaired. Such speculation is not a basis for narrative criteria implementation and does not constitute "weight of evidence" that phosphorus has triggered narrative criteria violations as assumed in EPA's proposed permitting action. Consequently, the necessary evidence to support use of the Gold Book criterion as a

[14] Full copies of the Currier, Short and Trowbridge Depositions, plus exhibits have been provided to EPA by the Coalition's counsel. Due to the voluminous nature of those documents they are not being resubmitted with these comments.

"narrative translator" has not been provided and the use of the Gold Book criterion is this permit action is arbitrary and capricious.

Response II.K.

Deposition testimony of NHDES staff (or rather commenter's argumentative interpretation thereof) does not supplant EPA's obligations under section 301(b)(1)(C) of the Act to ensure compliance with state water quality standards or to implement its regulations, including those pertaining to reasonable potential. Again, the City's legal objections have been resolved by the EAB's recent decision *In re Town of Newmarket Treatment Plant*, NPDES Appeal No. 12-05, 16 E.A.D. __ (EAB December 2, 2013), including issues relating to cause-and-effect and relevance of the NHDES depositions, which the Region adopts here. EPA simply fails to see the relevance of deposition testimony in an unrelated state court proceeding to the federal permit proceeding here.

The commenter appears to believe that EPA's NPDES regulations require cause-and-effect proof between a pollutant discharge and a water quality impairment before the permit writer can derive a numeric in-stream target to interpret a narrative water quality criterion, or impose a water quality-based effluent limitation to implement that criterion. The commenter fundamentally misunderstands—or simply ignores—the legal threshold under 40 C.F.R. § 122.44(d)(1)(i) for determining the need for a water quality-based effluent limitation (*i.e.*, "reasonable potential"), and the types of information that may be used to establish that limit (*e.g.*, "relevant information"). *Id.* at § 122.44(d)(1)(vi). Under NPDES regulation, permit issuers are required to determine whether a given point source discharge "cause[s], ha[s] the reasonable potential to cause, or contribute[s] to an excursion above" the narrative or numeric criteria set forth in state water quality standards. 40 C.F.R. § 122.44(d)(1)(i). Thus, the regulations require nothing more than a *reasonable potential to cause, or contribute to* an excursion of a numeric or narrative state water quality criterion; whenever such a potential exists, a permit must contain effluent limits to meet state water quality standards. *See id.* § 122.44(d)(1), (5) (providing in part that a permit must incorporate any more stringent limits required by CWA § 301(b)(1)(C)). "'Reasonable potential' requires some degree of certainty greater than a mere possibility, but it leaves to the permit writer's scientific and technical judgment how much certainty is necessary." *See In re Upper Blackstone Water Pollution Abatement Dist.*, NPDES Appeal Nos. 08-11 to 08-18 & 09-06, slip op. at 32-33, n.29 (May 28, 2010). As EPA's preamble to its final rulemaking promulgating 40 C.F.R. § 122.44(d)(1)(vi) explained:

> Some commenters said that the phrase "reasonable potential to cause" was too vague and could apply to permittees that are not actually exceeding a water quality criterion. EPA does not believe that it is appropriate to be more specific because a permitting authority has a significant amount of flexibility in determining whether a particular discharge has a reasonable potential to cause an excursion above a water quality criterion, taking the factors in subparagraph (ii) into account.

54 Fed. Reg. 23,868, 23,873 (June 2, 1989). This regulatory provision has been upheld as a reasonable, authorized approach of necessary gap-filling in the CWA statutory scheme as it provides permit writers with guidance on how to interpret state narrative water quality standards in deriving effluent limitations. *See Am. Paper Inst. v. EPA*, 996 F.2d 346, 348, 351 (D.C. Cir. 1993); *see also Am. Iron & Steel Inst. v. EPA*, 115 F.3d 979, 990-991 (D.C. Cir. 1997). *Upper Blackstone*, slip op. at 31-32 (The "regulations . . . require a precautionary approach when

determining whether the permit must contain a[n] effluent limit for a particular pollutant."); *accord Upper Blackstone Water Pollution Abatement Dist. v. U. S. EPA*, 690 F.3d 9, 33 (1st Cir. 2012) ("EPA regulations require permitting authorities to include in NPDES permits conditions which control all pollutants or pollutant parameters . . . [that] are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality. We thus reject the notion that in order to strengthen the District's discharge limits, the EPA must show that the new limits, in and of themselves, will cure any water quality problems." (internal quotation marks and citations omitted)). EPA in the Final Rule Preamble for 40 C.F.R. § 122.44(d)(1) dispels any doubt over the necessity of proving an impairment and causation of that impairment prior to either deriving a numeric in-stream target to implement a narrative water quality criterion, or imposing a water quality-based effluent limitation to implement that criterion:

> Several commenters asked if it was necessary to show in-stream impact, or to show adverse effects on human health before invoking [§ 122.44(d)(1)(vi)] as a basis for establishing water quality-based limits on a pollutant of concern. It is not necessary to show adverse effects on aquatic life or human health to invoke this paragraph [iv]. The CWA does not require such a demonstration and it is EPA's position that it is not necessary to demonstrate such effects before establishing limits on a pollutant of concern.

54 Fed. Reg. at 23,878. EPA's preamble explanation of what is actually required is at odds with the City's view that a mathematical model, or controlled experiment, demonstrating direct cause and effect related to harm is the standard to which EPA should be held in the NPDES permitting process.

EPA agrees that merely exceeding the 0.1 mg/l in-stream value does not demonstrate that a narrative water quality violation is occurring. However, such a violation does not need to be demonstrated in order to determine that a discharge has the reasonable potential to cause or contribute to a future violation. In this case, however, EPA believes that evidence of a violation does exist (*see, e.g.*, Response II.B and C) which confirms the reasonable potential determination and supports the inclusion of a TP permit limit. EPA imposed the limit only after weighing all the evidence before it, including water quality data pertinent to cultural eutrophication, as well as different methodological approaches and values from the scientific literature.

Comment II.L.

4. No Evidence of Excessive Algal Growth

The conceptual model relating nutrients to aquatic life impairment requires that nutrient loads stimulate aquatic plant growth which, in turn, causes an adverse effect (e.g., dissolved oxygen criteria violations, impaired macroinvertebrate communities). That is, "cultural eutrophication" is a prerequisite to narrative criteria implementation. This model is well known and documented in EPA's Gold Book (1986), the Technical Guidance Manual for Developing Total Maximum Daily Loads (EPA, 1995)[15], the Protocol for Developing Nutrient TMDLs (EPA, 1999)[16], and

[15] USEPA. September 1995. Technical Guidance Manual for Developing Total Maximum Daily Loads. Book II: Streams and Rivers. Part 1: Biochemical Oxygen Demand/Dissolved Oxygen and Nutrients/Eutrophication. EPA 823-B-95-007.

[16] USEPA. November 1999. Protocol for Developing Nutrient TMDLs. First Edition. EPA 841-B-99-007

EPA's guidance on Using Stressor-response Relationships to Derive Numeric Nutrient Criteria (2010)[17].

> [I]f the maximum possible chlorophyll a level that could be achieved is extremely low, it will usually be safe to conclude that nutrients do not pose a problem in relation to water column algae.
>
> In most natural systems, especially flowing streams, the actual chlorophyll a levels that occur will be substantially less than the maximum potential under a combination of ideal conditions. Collection of chlorophyll a data could be used to verify the estimated chlorophyll a levels and to determine whether a problem exists.
>
> (Technical Guidance Manual at 4-8)

If the designated use impairment identified for the Merrimack River (dissolved oxygen) is due to phosphorus, there must be a showing that algal levels in the river are elevated and these elevated algal levels cause or contribute to the low dissolved oxygen reported for the river. However, there are no data reported in the Fact Sheet that address algal concentrations in the river. Without any data to support a key component of the conceptual model, EPA's presumption that phosphorus is causing a violation of the state's narrative criteria is arbitrary and capricious.

Response II.L.

As described in Response II.B above, EPA believes there is sufficient evidence of algal growth in the Merrimack River just downstream of the discharge to conclude that New Hampshire's narrative criteria have been violated. The data illustrates DO supersaturation (>100%) and a peak in chlorophyll-a (>15 ug/l), both of which are indications that "cultural eutrophication" is occurring downstream of the discharge. It should be noted that the 15 ug/l threshold used by the NHDES CALM for primary contact recreation is only a guideline used for recreational purposes, not for aquatic life. The segment of the Merrimack River receiving the Merrimack WWTF discharge is within Ecoregion XIV and the recommended chlorophyll *a* criterion for this ecoregion is 3.75 ug/l (0.00375 mg/l) found in the *Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Nutrient Ecoregion XIV* (USEPA 2000). Additionally, the following table provides a summary from the literature of the trophic status for fresh water systems as characterized by mean chlorophyll *a*[18].

[17] USEPA. November 2010. Using Stressor-response Relationships to Derive Numeric Nutrient Criteria. EPA-820-S-10-001.

[18] Algae are either the direct or indirect cause of most problems related to excessive nutrient enrichment; e.g., algae are directly responsible for excessive, unsightly periphyton mats or surface plankton scums, and may cause high turbidity, and algae are indirectly responsible for diurnal changes in DO and pH. Chl *a* is a photosynthetic pigment and sensitive indicator of algal biomass. It can be considered the most important biological response variable for nutrient-related problems.(*Nutrient Criteria Technical Guidance Manual Rivers and Streams* EPA-822-B-00-002 July 2000)

Freshwater System Trophic Status Based on Mean Chlorophyll *a**				
Trophic Status	Wetzel (2001)	Ryding and Rast (1989)	Smith (1998)	Novotny and Olem (1994)
Eutrophic	> 10 ug/l	6.7 – 31 ug/l	---	>10 ug/l
Mesotrophic	2 – 15 ug/l	3 – 7.4 ug/l	3.5 – 9 ug/l	4 – 10 ug/l
Oligotrophic	0.3 – 3 ug/l	0.8 – 3.4 ug/l	---	< 4 ug/l

* Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll *a* for the Chesapeake Bay and Its Tidal Tributaries. U.S. EPA Region III. April 2003.

Based upon this literature, freshwater systems may be characterized as eutrophic with chlorophyll-a concentrations as low as 6.7 ug/l. Compare this to the chlorophyll-a samples taken downstream of the Merrimack discharge on July 27,2010, which range from 15.63 ug/l to 20.85 ug/l (see Figure on Page 8.)

Applying the CALM state indicator threshold for primary contact recreation, the State of New Hampshire's 2010 *Final List of Threatened or Impaired Waters That Require a TMDL* designated a segment of the Merrimack River in the Town of Nashua (NHRIV700061206-24), approximately 5 miles downstream of the Merrimack discharge, as impaired for chlorophyll-a.

Based upon this analysis, EPA has determined that were the facility to discharge TP at the upper limit of its recently recorded levels (*i.e.*, maximum TP discharge of 13 mg/l at average flow rate of 2.17 mgd equals 235 lb/day) at a time when the river were at or near the 7Q10 flow, eutrophication would likely occur. Hence, the discharge has the reasonable potential to cause or contribute to a violation of water quality standards and a TP permit limit is necessary.

Comment II.M.

5. Gold Book Not Applicable as Criteria without Site-Specific Data Confirmation

As described above, EPA simply assumed that the Gold Book's 0.1 mg/L preliminary recommendation for phosphorus was the applicable instream target for the Merrimack River without using any site-specific data to confirm (1) the existence of a nutrient impairment or (2) whether such a criterion is necessary to protect the applicable uses. In so doing, EPA has effectively adopted a numeric criterion for all similar-situated waters in the state (i.e., free-flowing without a direct link to a lake or reservoir). Moreover, in this case, EPA has effectively concluded that 0.1 mg/l TP limit should be applied to all flowing waters without considering any of the relevant physical factors or whether the nutrient level is actually causing any use impairment. Such EPA action is both procedurally and substantively improper. First, States have primary authority to amend existing water quality standards and all amendments (state or federal) must be subjected to a public notice and comment process. For other states where EPA has determined that a numeric criterion was the applicable translator for a state's narrative standard, EPA has undergone notice and comment rulemaking. This is required by 40 C.F.R. §§ 131.21 and 22. EPA's recent nutrient criteria adoption action in Florida was an example of such agency decision-making. Second, the Gold Book does not recommend that a 0.1 mg/L TP nutrient level be established for streams. Rather, the Gold Book expressly qualifies its recommendation for nutrients because of the dynamic interplay nutrients have with individual ecosystems and the range of potentially appropriate nutrient levels given varied site-specific

conditions.[19] Thus, the Region has also failed to properly apply the recommended approach specified in the "Gold Book."

Response II.M.

As already explained, the Region imposed permit limits on a site-specific basis and has *not* "adopted a numeric criterion for all similar-situated waters in the state" in implementing the existing narrative criteria. Rather, the Region has translated the state's narrative criterion in accordance with 40 C.F.R. § 122.44(d)(1)(ii) and (vi), which allow consideration of EPA technical guidance and recommended criteria, including the Gold Book. The record clearly does not support the view that EPA determined a phosphorus limit was "necessary" within the meaning of regulations governing the NPDES permitting process without using any site-specific data to confirm the existence of a nutrient impairment.

Contrary to the comment, the Gold Book does cite the 0.1 mg/l as a recommended value for free-flowing streams. However, EPA agrees that the Gold Book elaborates on site-specific natural conditions that dictate the consideration of either a more or less stringent phosphorus level. Specifically, page 241 of the Gold Book states:

> "*There are natural conditions, also, that would dictate the consideration of either a more or less stringent phosphorus level. Eutrophication problems may occur in waters where the phosphorus concentration is less than that indicated above [100 ug/l] and, obviously, such waters would need more stringent nutrient limits. Likewise, there are those waters within the Nation where phosphorus is not now a limiting nutrient and where the need for phosphorus limits is substantially diminished. Such conditions are described in the last paragraph of this rationale.*"

This rationale seems to indicate that in any free-flowing stream where TP is a limiting nutrient (such as the portion of the Merrimack River in question), the recommended TP value would be either 100 ug/l or less, if eutrophication problems occur at a lower concentration. The paragraph referenced above is found on page 243 of the Gold Book as follows:

"*It should be recognized that a number of specific exceptions can occur to reduce the threat of phosphorus as a contributor to lake eutrophy:*

1. *Naturally occurring phenomena may limit the development of plant nuisances.*
2. *Technological or cost-effective limitations may help control introduced pollutants.*
3. *Waters may be highly laden with natural silts or colors which reduce the penetration of sunlight needed for plant photosynthesis.*
4. *Some waters morphometric features of steep banks, great depth, and substantial flows contribute to a history of no plant problems. Waters may be managed primarily for waterfowl or other wildlife.*

[19] Quality Criteria of Water (Gold Book) EPA 440/5-86-001 (May 1, 1986) (Recognizing that instream phosphorus levels "do not directly impact streams and rivers" and that "a number of specific exceptions can occur to reduce the threat of phosphorus"). Furthermore, EPA's document entitled "National Recommended Water Quality Criteria – Correction" (USEPA April 1999) specifies that no numeric recommendation has been proposed for phosphorus – only a "narrative statement" applies. This narrative statement requires consideration of site-specific information on whether or not the nutrient level is actually causing excessive plant growth and impairment of uses.

5. In some waters nutrient other than phosphorus is limiting to plant growth: the level and nature of such limiting nutrient would not be expected to increase to an extent that would influence eutrophication.
6. In some waters phosphorus control cannot be sufficiently effective under present technology to make phosphorus the limiting nutrient."

In this case, the Merrimack WWTF discharges into a free-flowing segment of the Merrimack River with evidence of eutrophication downstream (see Response II.B) and with no lakes or impoundments immediately downstream. Based on the DO and chlorophyll-a evidence that eutrophication is occurring downstream (see Response II.B), it is clear that items one through four are not characteristic of the receiving water to the extent that they preclude nutrient growth. Additionally, EPA believes that phosphorus is a limiting nutrient in the receiving water and that it can be sufficiently controlled to effectively limit nutrient-related impairment (addressing items five and six). Hence, EPA considers the Gold Book value (100 ug/l) to be appropriate and protective given the site-specific ecological setting and a TP limit is thus justified and necessary to meet this instream target. EPA made this determination only after considering a range of other potential in-stream values in addition to the Gold Book, and upon reviewing the available water quality data pertaining to eutrophic response variables in the receiving water.

Comment II.N.

6. Reference Waters

The Fact Sheet discusses several guidance documents which contain recommended total phosphorus criteria based on an evaluation of the concentration of phosphorus expected in reference waters. Although the Fact Sheet notes that EPA did not choose to apply a reference-based phosphorus criterion, we note that such application is inconsistent with New Hampshire's narrative criterion, which requires a demonstration that phosphorus is causing excessive plant growth and/or dissolved oxygen impairment. Moreover, the application of reference-based nutrient criteria to implement the state's narrative criterion was rejected by the court in the State of Florida (February 2012).

The circumstances in Florida are identical to the circumstances in New Hampshire. Both narrative criteria limit nutrient concentrations to prevent designated use impairments. The court found that reference-based criteria are premised on preventing any change in nutrient concentrations that increase above the "reference" concentration. However, the narrative criteria limit increases in nutrient concentrations above the concentration that causes harm. Consequently, before the reference-based criteria can be applied, EPA must first demonstrate that these criteria are set at a threshold above which use impairment is caused by phosphorus.

Response II.O.

For reasons discussed above, EPA disagrees with the claim that a cause-and-effect link must be established between phosphorus and cultural eutrophication in the receiving water prior to implementing the state's narrative nutrient water quality standard through an NPDES permit limit, regardless of the methodological approach (*i.e.*, effects-based or reference). The decision cited to by the commenter is inapposite, and did not involve the circumstances under which EPA could impose of effluent limitations under Section 402 and 301 of the Act to implement an existing narrative water quality standard. As described in the fact sheet and acknowledged by the commenter, EPA did not choose to apply the reference-based Ecoregion phosphorus criterion, but

rather the effects-based EPA Gold Book criterion as a numeric interpretation of New Hampshire's narrative water quality standards. This choice was based on a determination that the referenced-based criterion might be more stringent than necessary, based on the methodology used to generate the value, not on a reading of the NH WQS. Had it been determined that the reference-based criterion were more appropriate, EPA would simply need to demonstrate that this criterion is protective of water quality standards.

Comment II.P.

7. 7Q10 Flow Inappropriate for Nutrient Regulation

The phosphorus limit proposed in the Town of Merrimack permit was based and developed upon the calculated 7Q10 flow. However, nutrients are not toxics and their impacts are manifested over a growing season as discussed in EPA's Protocol for Developing Nutrient TMDLs (1999) (at 4-3).

> TMDL developers should be aware that nutrient problems tend to be seasonally expressed and in many cases might result from the accumulation of year-round loadings.

Criteria based on the prevention of toxic effects utilize low flow conditions in the development of water quality-based effluent limits to ensure that adverse effects, which are expressed over a short exposure period, do not occur. However, impairments associated with nutrients are not expressed in the same way. Rather, nutrient concentrations must stimulate plant growth which then causes use impairment. This conceptual model has a longer averaging period and does not require application under extreme low flow conditions as discussed in EPA's NPDES Permit Writers' Manual (September 2010).

> [T]he recommended nutrient criteria represent conditions of surface waters that have minimal impacts caused by human activities rather than values derived from laboratory toxicity testing.
>
> [S]tates may adopt seasonal or annual averaging periods for nutrient criteria instead of the 1-hour, 24-hour, or 4-day average durations typical of aquatic life criteria for toxic pollutants.
>
> (NPDES Permit Writers' Manual at 6-6)

Thus, it is well-settled that nutrient concerns for streams and rivers, to the extent they exist at all, are only a concern during the growing season (e.g. April – September). During this period, snow melt and wet weather result in stream flows typically far greater than 7Q10. As a result, the proposed limit was developed using a non-representative flow and is, consequently, unnecessarily stringent.

Response II.P.

The Clean Water Act requires that effluent limitations meet state water quality standards; therefore if a state's water quality standards require that water quality-based effluent limits be based upon a single, non-seasonal receiving water low flow to, for instance, introduce pollutant buffering capacity in the receiving water, the Clean Water Act would not allow these limits to be based on seasonal flows. Use of critical low flows to develop permit limits is consistent with

New Hampshire Standards, see Env-Wq 1705.02(d), and with the reasonably conservative approach the Region has adopted in nutrient permitting in general. The Region has determined it is necessary in this case in particular to address evidence of cultural eutrophication in the receiving waters. Additionally, EPA notes that 7Q10 critical low flow conditions would typically occur during portions of the growing season (July – August) and are, thus, appropriate for permit limit development. During the growing season, when light and temperature are optimal for plant growth and the receiving water is subject to elevated nutrients concentrations, aquatic plant biomass growth can proliferate in relatively short periods of time. A permit limit of 0.1 mg/l calculated using seasonal flows would have the potential to allow periods of excessive loading of nutrients during and around critical low flow conditions while still meeting the overall limit. The resulting biomass from any plant growth would violate water quality standards and have the potential to settle into the sediments and contribute to future water quality violations. It is imperative, therefore, to ensure that phosphorus effluent discharges from the WWTP and the resulting ambient phosphorus concentrations are maintained at consistently low levels. A phosphorus effluent limit that assumes worst case hydrological conditions will accomplish the objective of maintaining consistently low phosphorus in-stream concentrations.

Comment II.Q.

Based on these comments, it is respectfully requested that the Region withdraw the phosphorus limit from the draft permit. Under New Hampshire law, a narrative criteria violation requires some demonstration that a water body is being impaired by nutrients. The MPR-Study conducted on the Merrimack River by the USACOE demonstrated that this impairment does not exist. To impose a phosphorus limit, the Region must demonstrate that nutrients are, in fact, causing impairments in the Merrimack River and develop an instream phosphorus target based on the site-specific data used in that determination. Moreover, it is inappropriate to presume that a 0.1 mg/L TP level is required to protect all flowing waters from nutrient impacts. It is also scientifically inappropriate to base the proposed limit on the rarely occurring 7Q10 flow that does not control the degree of plant growth occurring in the river. Given the assumptions in the Region's approach to interpreting the state's narrative standard and setting phosphorus limits, the draft provision should be withdrawn.

Response II.Q.

Based on EPA's responses above to each of the issues raised herein, the TP limit will remain in the permit.