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")], and the Massachusetts Clean Waters Act, as amended, (M.G.L. Chap. 21, §§26-53),

Town of Warren
Board of Sewer Commissioners
2527 Main Street, P.O. Box 104
Warren, MA 01092

is authorized to discharge from a facility located at:

Warren Wastewater Treatment Plant
2527 Main Street
West Warren, MA 01092

to receiving water named: **Quaboag River (Chicopee River Basin – USGS Code # 01080204)**

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

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

This permit and the authorization to discharge will expire at midnight, five (5) years from the last day of the month preceding the effective date.

This permit supersedes the permit signed on September 29, 2000, and became effective on November 29, 2000.

This permit consists of 19 pages in Part I including effluent limitations and monitoring requirements, **Attachment A (Discharge Outfall), Attachment B (Freshwater Acute Toxicity Test Procedure and Protocol, February 2011)**, **Attachment C (Freshwater Chronic Toxicity Test Procedure and Protocol, March 2013)** and **Part II** (25 pages including NPDES Part II Standard Conditions).

Signed this 14th day of September, 2016

/S/SIGNATURE ON FILE
Ken Moraff, Director
Office of Ecosystem Protection
Environmental Protection Agency
Boston, MA

/S/SIGNATURE ON FILE
David R. Ferris, Director
Massachusetts Wastewater Management Program
Department of Environmental Protection
Commonwealth of Massachusetts
Boston, MA

* Pursuant to 40 CFR 124.15(b)(3), if no comments requesting a change to the draft permit are received, the permit will become effective upon the date of signature.

PART I

A.1. During the period beginning the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number **001** to the Quaboag River. Such discharge shall be limited and monitored by the permittee as specified below.

Effluent Characteristic		**Discharge Limitation**			**Monitoring Requirement** [*3]	
Parameter	**Units**	**Average Monthly**	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type** [*3]
Flow [*2]	MGD	1.5 [*2]	—	Report	Continuous	Recorder
Flow [*2]	MGD	Report	—	—	Continuous	Recorder
BOD_5 [*4]	mg/l lbs/day	30 375	45 563	Report Report	1/Week 1/Week	24-Hour Composite [*5] 24-Hour Composite [*5]
TSS [*4]	mg/l lbs/day	30 375	45 563	Report Report	1/Week 1/Week	24-Hour Composite [*5] 24-Hour Composite [*5]
Escherichia Coliform Bacteria [*1, *6] (May 1 - Sept. 30)	cfu/100 ml	126	—	409	1/Week	Grab
Total Residual Chlorine [*1, *7] (May 1 – September 30)	ug/l	77	—	133	1/Day	Grab
pH [*1]	Standard Units	6.5 – 8.3 (See Permit Part I.A.1.b.)			1/Day	Grab
Total Ammonia Nitrogen [*9] (Apr 1-Oct 31) Total Ammonia Nitrogen [*9] (Nov 1-Mar 31)	mg/l mg/l	Report Report	— —	Report Report	1/Week 1/Month	24-Hour Composite [*5] 24-Hour Composite [*5]
Total Kjeldahl Nitrogen [*9] (April 1-Oct 31) Total Kjeldahl Nitrogen [*9] (Nov 1-Mar 31)	mg/l, lbs/day mg/l, lbs/day	Report Report	— —	Report Report	1/Week 1/Month	24-Hour Composite [*5] 24-Hour Composite [*5]
Total Nitrate Nitrogen [*9] (Apr 1-Oct 31) Total Nitrate Nitrogen [*9] (Nov 1-Mar 31)	mg/l, lbs/day mg/l, lbs/day	Report Report	— —	Report Report	1/Week 1/Month	24-Hour Composite [*5] 24-Hour Composite [*5]

Effluent Characteristic	Units	Discharge Limitation			Monitoring Requirement	
Parameter		**Average Monthly**	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type[*3]**
Total Nitrite Nitrogen[*9](Apr 1-Oct 31) Total Nitrite Nitrogen[*](Nov 1-Mar 31)	mg/l, lbs/day mg/l, lbs/day	Report Report	— —	Report Report	1/Week 1/Month	24-Hour Composite[*5] 24-Hour Composite[*5]
Total Nitrogen[*8, *9, *10](Apr 1-Oct 31) Total Nitrogen[*8, *9, *10](Nov 1-Mar 31)	mg/l, lbs/day mg/l, lbs/day	Report Report	— —	Report Report	1/Week 1/Month	24-Hour Composite[*5] 24-Hour Composite[*5]
Copper, Total Recoverable[*11]	ug/l	10.2	—	17.8	1/Month	24-Hour Composite[*5]
Total Phosphorus (April 1 - October 31) [*12]	lbs/day (mg/l)	4.9 (Report)	—	Report (Report)	1/Week	24-Hour Composite[*5]
Total Phosphorus (Nov 1 – March 31) [*12]	lbs/day (mg/l)	4.9 (Report)	—	Report (Report)	1/Month	24-Hour Composite[*5]
Whole Effluent Toxicity [*13, *14, *15, *16]	% %	Acute LC_{50} $\geq$ 100% Chronic NOEC $\geq$ 14.3%			4/Year 4/Year	24-Hour Composite[*5] 24-Hour Composite[*5]
Hardness[*17]	mg/l	Report			4/Year	24-Hour Composite[*5]
Ammonia Nitrogen as N[*17]	mg/l	Report			4/Year	24-Hour Composite[*5]
Total Recoverable Aluminum[*17]	mg/l	Report			4/Year	24-Hour Composite[*5]
Total Recoverable Cadmium[*17]	mg/l	Report			4/Year	24-Hour Composite[*5]
Total Recoverable Copper[*17]	mg/l	Report			4/Year	24-Hour Composite[*5]
Total Recoverable Nickel[*17]	mg/l	Report			4/Year	24-Hour Composite[*5]
Total Recoverable Lead[*17]	mg/l	Report			4/Year	24-Hour Composite[*5]
Total Recoverable Zinc[*18]	mg/l	Report			4/Year	24-Hour Composite[*5]

Footnotes:

*1. Required for State Certification.

*2. Report annual average, monthly average, and the maximum daily flow. The limit is an annual average, which shall be reported as a rolling average. The value will be calculated as the arithmetic mean of the monthly average flow for the reporting month and the monthly average flows of the eleven previous months.

*3. Effluent sampling shall be representative of the discharge.

A routine sampling program shall be developed in which samples are taken at the same location, same time, and same days of every month. Occasional deviations from the routine sampling program described above are allowed, but the reason for the deviation shall be documented in correspondence appended to the applicable discharge monitoring report.

All samples shall be tested using the analytical methods found in 40 CFR §136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR §136.

All required effluent samples shall be collected at the point specified herein. Any change in sampling location must be reviewed and approved in writing by EPA and MassDEP.

PARAMETER:	SAMPLE LOCATION:
FLOW	Influent Parshall Flume
E-COLI	After discharge from the disinfection chamber, prior to discharge into the Quaboag River
BOD_5, TSS, pH RANGE, TOTAL AMMONIA AS N, TOTAL KJELDAHL NITROGEN, TOTAL NITRITE, TOTAL NITRATE, and WHOLE EFFLUENT TOXICITY	Special Manhole #1
WHOLE EFFLUENT TOXICITY DILUTION WATER	Quaboag River upstream of treated wastewater discharge outfall
BOD_5 and TSS (Influent)	Influent Line prior to primary tanks

*4. Sampling is required for influent and effluent.

*5. A 24-hour composite sample will consist of at least twenty-four (24) grab samples taken during one consecutive 24-hour period, either collected at equal intervals and combined proportional to flow or continuously collected proportionally to flow.

*6. The monthly average limit for *Escherichia coli (E. coli)* is expressed as a geometric mean. E. coli monitoring shall be conducted concurrently with a total residual chlorine sample.

*7. Total residual chlorine monitoring is required whenever chlorine is added to the treatment process (i.e. TRC sampling is not required if chlorine is not added for disinfection or other purpose). The limitations are in effect year-round.

The minimum level (ML) for total residual chlorine is defined as 20 ug/l. This value is the minimum level for chlorine using EPA approved methods found in the most currently approved version of Standard Methods for the Examination of Water and Wastewater, Method 4500 CL-E and G. One of these methods must be used to determine total residual chlorine. For effluent limitations less than 20 ug/l, compliance/non-compliance will be determined based on the ML. Sample results less than the detection limit shall be reported as "[< detection limit]" on the discharge monitoring report.

Chlorination and dechlorination systems shall include an alarm system for indicating system interruptions or malfunctions. Any interruption or malfunction of the chlorine dosing system that may have resulted in levels of chlorine that were inadequate for achieving effective disinfection, or interruptions or malfunctions of the dechlorination system that may have resulted in excessive levels of chlorine in the final effluent shall be reported with the monthly DMRs. The report shall include the date and time of the interruption or malfunction, the nature of the problem, and the estimated amount of time that the reduced levels of chlorine or dechlorination chemicals occurred.

*8. See Part I.B.1, Special Conditions, for requirements to evaluate and implement optimization of nitrogen removal.

*9. Total ammonia nitrogen, total Kjeldahl nitrogen, nitrite nitrogen, and nitrate nitrogen samples shall be collected concurrently. The results of these analyses shall be used to calculate both the concentration and mass loadings of total nitrogen (total nitrogen = total kjeldahl nitrogen + total nitrate nitrogen + total nitrite nitrogen).

The total nitrogen loading values reported each month shall be calculated as follows:

Total Nitrogen (lbs/day) = [(average monthly total nitrogen concentration (mg/l) * total monthly flow (Millions of Gallons (MG)) / # of days in the month] * 8.34

If the wastewater treatment system is optimized to remove total nitrogen to the greatest extent practicable, and if the effluent nitrogen monitoring results demonstrate a long-term decreasing trend in total nitrogen loading to the receiving water, the permittee may submit a written request to EPA for a reduction in the total nitrogen monitoring requirements. The permittee is required to continue testing as specified in the permit until notice is received by certified mail from the EPA that the nitrogen monitoring frequency requirements have been changed.

*10. See Part I.B.2., Special Condition 1 for a schedule of compliance.

*11. The minimum level (ML) for copper is defined as 3 ug/l. This value is the minimum level for copper using the Furnace Atomic Absorption analytical method 220.2. This method or another EPA-approved method with an equivalent or lower ML shall be used for effluent limitations less than 3 ug/l. Compliance/non-compliance will be determined based on the ML. Sampling results less than the detection limit shall be reported as "[≤ detection limit]" on the discharge monitoring report.

*12. The sampling frequency identified is the minimum sampling frequency. If any additional phosphorus sampling is conducted, including process control samples, the individual phosphorus results, including the day each sample was taken, the type of sample (i.e., 24-hour composite or grab), and the analytical method, must be reported on an attachment to the discharge monitoring report. Additionally, the chemical dosing rate for all chemicals added for the purpose of phosphorus removal shall be reported for each day of the month. Only 24-hour composite samples analyzed with an EPA-approved method shall be used in determining compliance with the permit limit.

See Part I.B., Special Condition 2 for a schedule of compliance.

*13. The permittee shall conduct acute and chronic toxicity tests four times per year. The permittee shall test the daphnid, Ceriodaphnia dubia, only. Toxicity test samples shall be collected during the same week each time and during the months of February, May, August, and November. The test results shall be submitted by the last day of the month following the completion of the test. The results are due March 31st, June 30th, October 31st, and December 31st, respectively. The tests must be performed in accordance with test procedures and protocols specified in **Attachments B and C** of this permit.

Test Dates during the month:	**Submit Results By:**	**Test Species**	**Acute Limit,** LC_{50}	**Chronic Limit,** NOEC
February May August November	March 31st June 30th October 31st December 31st	Ceriodaphnia dubia (Daphnid) See **Attachments B and C**	≥ 100%	≥ 14.3%

*14. The LC_{50} is the concentration of effluent which causes mortality to 50% of the test organisms. Therefore, a 100% limit means that a sample of 100% effluent (no dilution) shall cause no more than a 50% mortality rate.

*15. The chronic-no observed effect concentration (C-NOEC) is defined as the highest tested concentration of toxicant in effluent to which organisms are exposed in a life cycle or partial life cycle test which causes no adverse effect on growth, survival, or reproduction, based on a statistically significant difference from dilution control, at a specific time of observation as determined from hypothesis testing. As described in the EPA WET Method Manual EPA 821-R-02-013, section 10.2.6.2, all test results are to be reviewed and reported in accordance with EPA guidance on the evaluation of the concentration-response relationship. The "14.3% or greater" is defined as a sample which is composed of 14.3% (or greater) effluent, the remainder being dilution water.

*16. If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall follow procedures outlined in **Attachments B and C, Section IV., DILUTION WATER** in order to obtain permission to use an alternate dilution water. In lieu of individual approvals for alternate dilution water required in **Attachments B and C**, EPA-New England has developed a Self-Implementing Alternative Dilution Water Guidance document (called "Guidance Document") which may be used to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. This guidance is found in Attachment G of the NPDES Program Instructions for the Discharge Monitoring Report Forms (DMRs) which is sent to all permittees with their annual set of DMRs and may also be found on the EPA, Region I web site at http://www.epa.gov/region01/enforcementandassistance/dmr.html. If this guidance is revoked, the permittee shall revert to obtaining individual approval as outlined in **Attachments B and C**. Any modification or revocation to this guidance shall be transmitted to the permittees as part of the annual DMR instruction package. However, at any time, the permittee may choose to contact EPA-New England directly using the approach outlined in **Attachments B and C**. If the permittee has already received permission to use an alternative dilution water under the previous permit, the permittee does not need to repeat this approval process. If the permittee uses an alternative dilution water, the ambient water will still need to be tested.

*17. 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 **Attachments B and C**. Also the permittee should note that all chemical parameter results must still be reported in the appropriate toxicity report.

Part I.A.1. (Continued)

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

b. The pH of the effluent shall not be less than 6.5 nor greater than 8.3 Standard Units (S.U.) at any time.

c. The discharge shall not cause objectionable discoloration of the receiving waters.

d. The effluent shall not contain a visible oil sheen, foam, or floating solids at any time.

e. The permittee's treatment facility will maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand. The percent removal will be based on monthly average values.

f. The permittee shall minimize the use of chlorine while maintaining adequate bacterial control.

g. The results of sampling for any parameter analyzed in accordance with EPA approved methods above its required frequency must also be reported.

h. If the average annual flow in any calendar year exceeds 80 percent of the facility's design flow [1.2 MGD], the permittee will submit a report to MassDEP by **March 31st** of the following calendar year describing its plans for further flow increases and describing how it will maintain compliance with the flow limit and all other effluent limitations and conditions. The permittee is not required to submit this report to EPA.

2. All POTWs must provide adequate notice to the Director of the following:

a. Any new introduction of pollutants into that POTW from an indirect discharger which would be subject to section 301 or 306 of the Clean Water Act if it were directly discharging those pollutants; 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 will include information on:

(1) the quantity and quality of effluent introduced into the POTW; and
(2) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

3. Prohibitions Concerning Interference and Pass Through:

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

4. Toxics Control

    a. The permittee will not discharge any pollutant or combination of pollutants in toxic amounts.
    b. Any toxic components of the effluent will not result in any demonstrable harm to aquatic life or violate any state or federal water quality standard which has been or may be promulgated. Upon promulgation of any such standard, this permit may be revised or amended in accordance with such standards.

5. Numerical Effluent Limitations for Toxicants

    a. EPA or MassDEP may use the results of the toxicity tests and chemical analyses conducted pursuant to this permit, as well as national water quality criteria developed pursuant to Section 304(a)(1) of the Clean Water Act (CWA), state water quality criteria, and any other appropriate information or data, to develop numerical effluent limitations for any pollutants, including but not limited to those pollutants listed in Appendix D of 40 CFR Part 122.

B. SPECIAL CONDITIONS

1. Nitrogen

    a. Within **one year of the effective date of the permit**, the permittee shall complete an evaluation of alternative methods of operating the existing wastewater treatment facility to optimize the removal of nitrogen, and submit a report to EPA and MassDEP documenting this evaluation and presenting a description of recommended operational changes. The methods to be evaluated include, but are not limited to, operational changes designed to enhance nitrification (seasonal and year round), incorporation of anoxic zones, septage receiving policies and procedures, and side stream management. This report may be combined with the permittee's annual nitrogen report under Part I.B.1.b., if both reports are submitted to EPA and the MassDEP by February 1st.

    b. The permittee shall also submit an annual report to EPA and the MassDEP, by **February 1st** each year, that summarizes activities related to optimizing nitrogen removal efficiencies, documents the annual nitrogen discharge load from the facility, and tracks trends relative to the previous year.

2. Total Phosphorus

a. The permittee shall evaluate the ability of the existing treatment facilities, with small capital improvements, to achieve the year round monthly average total phosphorus limitation of 4.9 lbs per day and shall submit a report on or before **24 months from the effective date of the permit** that summarizes the evaluation and includes a determination whether the existing facility is capable of reliably achieving the effluent limitations. The evaluation shall include optimization of chemical dosing, including use of alternate chemicals if necessary. The evaluation shall include the following two milestones: (1) work with the Warren Water District to optimize corrosion control operations in the water supply system, and characterize the existing influent and effluent quality with respect to total phosphorus (accomplishing both tasks on or before **24 months from the effective date of the permit**), and (2) correlate the characterization of total phosphorus with any changes that might be occurring with the water supply system (accomplishing this task on or before **24 months from the effective date of the permit**).

b. If the permittee concludes that the existing facilities can achieve the 4.9 lbs per day monthly average limit, the limit will become effective **24 months from the effective date of the permit**.

c. If the permittee concludes that the existing facilities cannot achieve the monthly average limit (and EPA and MassDEP concur), the permittee shall complete necessary design and construction of any facilities necessary to achieve the limit within **60 months from the effective date of the permit**, at which time the effluent limit will become effective.

d. Until the limit is achieved, the Town shall submit a report to EPA and MassDEP at **12 months, 24 months, 36 months, 48 months, and 60 months from the effective date**, describing progress towards attaining the effluent limitation, including a description of planning, design, and construction of any necessary facilities.

C. UNAUTHORIZED DISCHARGES

This permit authorizes discharges only from the outfall(s) listed on **Attachment A** and in Part I.A.1. of this permit in accordance with the terms and conditions of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs) are not authorized by this permit and must be reported to EPA and MassDEP in accordance with Part II. Section D.1.e.(1) of the General Requirements of this permit (Twenty-four hour reporting).

Notification of SSOs to MassDEP will be made on its SSO reporting form (which includes MassDEP regional office telephone numbers). The reporting form and instructions for its completion can be found on-line at: http://www.mass.gov/eea/agencies/massdep/service/approvals/sanitary-sewer-overflow-bypass-backup-notification.html.

D. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

Operation and maintenance of the sewer system will be in compliance with the General Requirements of Part II and the following terms and conditions. The permittee is required to complete the following activities for the collection system which it owns:

1. Maintenance Staff

The permittee will 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. Provisions to meet this requirement will be described in the Collection System O & M Plan required pursuant to Section D.5. below.

2. Preventative Maintenance Program

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

3. Infiltration/Inflow:

The 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 D.5. below.

4. Collection System Mapping

Within 30 months of the effective date of this permit, the permittee shall prepare a map of each sewer collection system it owns (see page 1 of this permit for the effective date). The map shall be on a street map of the community, with sufficient detail and at a scale to allow easy interpretation. The collection system information shown on the map shall be based on current conditions and 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

The permittee shall develop and implement a Collection System Operation and Maintenance Plan.

a. **Within six (6) months of the effective date of the permit**, the permittee shall submit to EPA and MassDEP:

(1) A description of the collection system management goal, staffing, information management, and legal authorities;

(2) A description of the collection system and the overall condition of the collection system including a list of all pump stations and a description of all recent studies and construction activities; and

(3) A schedule for the development and implementation of the full Collection System O & M Plan including the elements in paragraphs b.1. through b.8. below.

b. The full Collection System O & M Plan shall be completed, implemented, and submitted to EPA and MassDEP **within twenty-four (24) months from the effective date of the permit**. The Plan shall include:

(1) The required submittal from paragraph 5.a. above, update to reflect current information;

(2) A preventative maintenance and monitoring program for the collection system;

(3) Description of sufficient staffing necessary to properly operate and maintain the sanitary sewer collection system and how the operation and maintenance program is staffed;

(4) Description of funding, the source(s) of funding and provisions for funding sufficient for implementing the plan;

(5) Identification of known and suspected overflows and back-ups, including manholes. A description of the cause of the identified overflows and back-ups, corrective actions taken, and a plan for addressing the overflows and back-ups consistent with the requirements of this permit;

(6) A description of the permittee's programs 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 and inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts; and

(7) An educational public outreach program for all aspects of I/I control, particularly private inflow.

(8) An Overflow Emergency Response Plan to protect public health from overflows and unanticipated bypasses or upsets that exceed any effluent limitation in the permit.

6. Annual Reporting Requirement

The 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 MassDEP **annually by March 31st**. 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 its design flow [1.2 mgd] based on the annual average flow during the reporting year, 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.

7. Alternate Power Source

In order to maintain compliance with the terms and conditions of this permit, the permittee shall provide an alternative power source(s) sufficient to operate its portion of the publicly owned treatment works1 it owns and operates.

E. SLUDGE CONDITIONS

1. The permittee shall comply with all existing federal and state laws and regulations that apply to sewage sludge use and disposal practices, including EPA regulations promulgated at 40 CFR §503, which prescribe "Standards for the Use or Disposal of Sewage Sludge" pursuant to Section 405(d) of the CWA, 33 U.S.C. §1345(d).

2. If both state and federal requirements apply to the permittee's sludge use and/or disposal practices, the permittee shall comply with the more stringent of the applicable requirements.

3. The requirements and technical standards of 40 CFR §503 apply to the following sludge 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 - the placement of sewage sludge in a sludge only incinerator.

4. The requirements of 40 CFR §503 do not apply to facilities which dispose of sludge in a municipal solid waste landfill. 40 CFR §503.4. These requirements also do not apply to facilities which do not use or dispose of sewage sludge during the life of the permit but rather treat the sludge (e.g. lagoons, reed beds), or are otherwise excluded under 40 CFR §503.6.

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1 As defined at 40 CFR §122.2, which references the definition at 40 CFR §403.3

5. The 40 CFR. Part 503 requirements including the following elements:

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

   Which of the 40 CFR §503 requirements apply to the permittee will depend upon the use or disposal practice followed and upon the quality of material produced by a facility. The EPA Region 1 Guidance document, "EPA Region 1 - NPDES Permit Sludge Compliance Guidance" (November 4, 1999), may be used by the permittee to assist it in determining the applicable requirements.[2]

6. The sludge shall be monitored for pollutant concentrations (all Part 503 methods), pathogen reduction (land application and surface disposal) 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 than1500	1 /quarter
1500 to less than 15000	6 /year
15000 +	1 /month

   Sampling of the sewage sludge shall use the procedures detailed in 40 CFR §503.8.

7. Under 40 CFR §503.9(r), the permittee is a "person who prepares sewage sludge" because it "is … the person who generates sewage sludge during the treatment of domestic sewage in a treatment works …." If the permittee contracts with *another* "person who prepares sewage sludge" under 40 CFR §503.9(r) – i.e., with "a person who derives a material from sewage sludge" – for use or disposal of the sludge, then compliance with Part 503 requirements is the responsibility of the contractor engaged for that purpose. If the permittee does not engage a "person who prepares sewage sludge," as defined in 40 CFR §503.9(r), for use or disposal, then the permittee remains responsible to ensure that the applicable requirements in Part 503 are met. 40 CFR §503.7. If the ultimate use or disposal method is land application, the permittee is responsible for providing the person receiving the sludge with notice and necessary information to comply with the requirements of 40 CFR Part 503 Subpart B.

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2 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

8. The permittee shall submit an annual report containing the information specified in the 40 CFR Part 503 requirements (§503.18 (land application), §503.28 (surface disposal), or §503.48 (incineration)) by **February 19th** (*see also* "EPA Region 1 - NPDES Permit Sludge Compliance Guidance"). Reports shall be submitted to the address contained in the reporting section of the permit. If the permittee engages a contractor or contractors for sludge preparation and ultimate use or disposal, the annual report need contain only the following information:

   a. Name and address of contractor(s) responsible for sludge preparation, use or disposal

   b. Quantity of sludge (in dry metric tons) from the POTW that is transferred to the sludge contractor(s), and the method(s) by which the contractor will prepare and use or dispose of the sewage sludge.

F. MONITORING AND REPORTING

The monitoring program in the permit specifies sampling and analysis, which will provide continuous information on compliance and the reliability and effectiveness of the installed pollution abatement equipment. The approved analytical procedures found in 40 CFR Part 136 are required unless other procedures are explicitly required in the permit. The Permittee is obligated to monitor and report sampling results to EPA and the MassDEP within the time specified within the permit.

Unless otherwise specified in this permit, the permittee shall submit reports, requests, and information and provide notices in the manner described in this section.

1. Submittal of DMRs Using NetDMR

The permittee shall continue to submit its monthly monitoring data in discharge monitoring reports (DMRs) to EPA and MassDEP no later than the 15th day of the month electronically using NetDMR. When the permittee submits DMRs using NetDMR, it is not required to submit hard copies of DMRs to EPA or MassDEP.

2. Submittal of Reports as NetDMR Attachments

Unless otherwise specified in this permit, the permittee shall electronically submit all reports to EPA as NetDMR attachments rather than as hard copies. Permittees shall continue to send hard copies of reports other than DMRs to MassDEP until further notice from MassDEP. (See Part I.F.5. for more information on state reporting.) Because the due dates for reports described in this permit may not coincide with the due date for submitting DMRs (which is no later than the 15th day of the month), a report submitted electronically as a NetDMR attachment shall be considered timely if it is electronically submitted to EPA using NetDMR with the next DMR due following the particular report due date specified in this permit.

3. Submittal of Requests and Reports to EPA/OEP

The following requests, reports, and information described in this permit shall be submitted to the EPA/OEP NPDES Applications Coordinator in the EPA Office Ecosystem Protection (OEP).

A. Transfer of permit notice
B. Request for changes in sampling location
C. Request for reduction in testing frequency
D. Request for reduction in WET testing requirement
E. Report on unacceptable dilution water / request for alternative dilution water for WET testing
F. Notification of proposal to add or replace chemicals and bio-remedial agents including microbes

These reports, information, and requests shall be submitted to EPA/OEP electronically at R1NPDES.Notices.OEP@epa.gov or by hard copy mail to the following address:

U.S. Environmental Protection Agency
Office of Ecosystem Protection
EPA/OEP NPDES Applications Coordinator
5 Post Office Square - Suite 100 (OEP06-03)
Boston, MA 02109-3912

4. Submittal of Reports in Hard Copy Form

The following notifications and reports shall be submitted as hard copy with a cover letter describing the submission. These reports shall be signed and dated originals submitted to EPA.

A. Written notifications required under Part II
B. Notice of unauthorized discharges, including Sanitary Sewer Overflow (SSO) reporting
C. Sludge monitoring reports

This information shall be submitted to EPA/OES at the following address:

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

All sludge monitoring reports required herein shall be submitted only to:

U.S. Environmental Protection Agency, Region 7
Biosolids Center
Water Enforcement Branch
11201 Renner Boulevard
Lenexa, Kansas 66219

5. State Reporting

Unless otherwise specified in this permit, duplicate signed copies of all reports, information, requests or notifications described in this permit, including the reports, information, requests or notifications described in Parts I.F.3 and I.F.4 also shall be submitted to the State at the following addresses:

MassDEP – Western Region
Bureau of Water Resources
436 Dwight Street, Suite 402
Springfield, MA 01103

Copies of toxicity tests, nitrogen and phosphorus optimization reports only shall be submitted to:

Massachusetts Department of Environmental Protection
Watershed Planning Program
8 New Bond Street
Worcester, Massachusetts 01606

6. Verbal Reports and Verbal Notifications

Any verbal reports or verbal notifications, if required in Parts I and/or II of this permit, shall be made to both EPA and to MassDEP. This includes verbal reports and notifications which require reporting within 24 hours. (As examples, see Part II.B.4.c. (2), Part II.B.5.c. (3), and Part II.D.1.e.) Verbal reports and verbal notifications shall be made to EPA's Office of Environmental Stewardship at:

617-918-1510

G. STATE PERMIT CONDITIONS

1. This authorization to discharge includes two separate and independent permit authorizations. The two permit authorizations are: (i) a federal National Pollutant Discharge Elimination System permit issued by the U.S. Environmental Protection Agency (EPA) pursuant to the Federal Clean Water Act, 33 U.S.C. §§1251 et seq.; and (ii) an identical state surface water discharge permit issued by the Commissioner of the Massachusetts Department of Environmental Protection (MassDEP) pursuant to the Massachusetts Clean Waters Act, M.G.L. c. 21, §§26-53, and 314 C.M.R. 3.00. All of the requirements contained in this authorization, as well as the standard conditions contained in 314 CMR 3.19, are hereby incorporated by reference into this state surface water discharge permit.

2. This authorization also incorporates the state water quality certification issued by MassDEP under §401(a) of the Federal Clean Water Act, 40 C.F.R. 124.53, M.G.L.c.21, §27 and 314 CMR 3.07. All of the requirements (if any) contained in MassDEP's water quality certification for the permit are hereby incorporated by reference into this state surface water discharge permit as special conditions pursuant to 314 CMR 3.11.

3. Each Agency will have the independent right to enforce the terms and conditions of this permit. Any modification, suspension or revocation of this permit will be effective only with respect to the Agency taking such action, and will not affect the validity or status of this permit as issued by the other Agency, unless and until each Agency has concurred in writing with such modification, suspension or revocation. In the event any portion of this permit is declared, invalid, illegal or otherwise issued in violation of State law such permit will remain in full force and effect under Federal law as an NPDES permit issued by the U.S. Environmental Protection Agency. In the event this permit is declared invalid, illegal or otherwise issued in violation of Federal law, this permit will remain in full force and effect under State law as a permit issued by the Commonwealth of Massachusetts.

Attachment A
Secondary Wastewater Treatment Plant Discharge Outfall
NPDES Permit No. MA0101567
Warren, MA

Outfall:	Description of Discharge:	Outfall Location/Receiving Water:
001	Secondary Wastewater Treatment Plant Effluent	Quaboag River

ATTACHMENT B

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/methods/cwa/wet/disk2_index.cfm

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°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/enforcement/water/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 (°C)	20 ± 1°C or 25 ± 1°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	≥ 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 (°C)	20 ± 1 ° C or 25 ± 1°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	≥ 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 C

FRESHWATER CHRONIC TOXICITY TEST PROCEDURE AND PROTOCOL

USEPA Region 1

I. GENERAL REQUIREMENTS

The permittee shall be responsible for the conduct of acceptable chronic toxicity tests using three fresh samples collected during each test period. The following tests shall be performed as prescribed in Part 1 of the NPDES discharge permit in accordance with the appropriate test protocols described below. (Note: the permittee and testing laboratory should review the applicable permit to determine whether testing of one or both species is required).

- **Daphnid (Ceriodaphnia dubia) Survival and Reproduction Test.**
- **Fathead Minnow (Pimephales promelas) Larval Growth and Survival Test.**

Chronic toxicity data shall be reported as outlined in Section VIII.

II. METHODS

Methods to follow are those recommended by EPA in: Short Term Methods For Estimating The Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, Fourth Edition. October 2002. United States Environmental Protection Agency. Office of Water, Washington, D.C., EPA 821-R-02-013. The methods are available on-line at http://www.epa.gov/waterscience/WET/ . Exceptions and clarification are stated herein.

III. SAMPLE COLLECTION AND USE

A total of three fresh samples of effluent and receiving water are required for initiation and subsequent renewals of a freshwater, chronic, toxicity test. The receiving water control sample must be collected immediately upstream of the permitted discharge's zone of influence. Fresh samples are recommended for use on test days 1, 3, and 5. However, provided a total of three samples are used for testing over the test period, an alternate sampling schedule is acceptable. The acceptable holding times until initial use of a sample are 24 and 36 hours for on-site and off-site testing, respectively. A written waiver is required from the regulating authority for any hold time extension. All test samples collected may be used for 24, 48 and 72 hour renewals after initial use. All samples held for use beyond the day of sampling shall be refrigerated and maintained at a temperature range of 0-6° C.

All samples submitted for chemical and physical analyses will be analyzed according to Section VI of this protocol.

Sampling guidance dictates that, where appropriate, aliquots for the analysis required in this protocol shall be split from the samples, containerized and immediately preserved, or analyzed as per 40 CFR Part 136. EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection. Testing for the presence of total residual chlorine (TRC) must be analyzed immediately or as soon as possible, for all effluent samples, prior to WET testing. TRC analysis may be performed on-site or by the toxicity testing laboratory and the samples must be dechlorinated, as necessary, using sodium thiosulfate prior to sample use for toxicity testing.

If any of the renewal samples are of sufficient potency to cause lethality to 50 percent or more of the test organisms in any of the test treatments for either species or, if the test fails to meet its permit limits, then chemical analysis for total metals (originally required for the initial sample only in Section VI) will be required on the renewal sample(s) as well.

IV. DILUTION WATER

Samples of receiving water must be collected from a location in the receiving water body 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. EPA strongly urges that screening for toxicity be performed prior to the set up of a full, definitive toxicity test any time there is a question about the test dilution water's ability to achieve test acceptability criteria (TAC) as indicated in Section V of this protocol. The test dilution water control response will be used in the statistical analysis of the toxicity test data. All other control(s) required to be run in the test will be reported as specified in the Discharge Monitoring Report (DMR) Instructions, Attachment F, page 2,Test Results & Permit Limits.

The test dilution water must be used to determine whether the test met the applicable TAC. When receiving water is used for test dilution, an additional control made up of standard laboratory water (0% effluent) is required. This control will be used to verify the health of the test organisms and evaluate to what extent, if any, the receiving water itself is responsible for any toxic response observed.

If dechlorination of a sample by the toxicity testing laboratory is necessary a "sodium thiosulfate" control, representing the concentration of sodium thiosulfate used to adequately dechlorinate the sample prior to toxicity testing, must be included in the test.

If the use of an alternate dilution water (ADW) is authorized, in addition to the ADW test control, the testing laboratory must, for the purpose of monitoring the receiving water, also run a receiving water control.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable an ADW of known quality with hardness similar to that of the receiving water may be substituted. Substitution is species specific meaning that the decision to use ADW is made for each species and is based on the toxic response of that particular species. Substitution to an ADW is authorized in two cases. The first is the case where repeating a test due to toxicity in the site dilution water requires an **immediate decision** for ADW use be made by the permittee and toxicity testing laboratory. The second is in the case where two of the most recent documented incidents of unacceptable site dilution water toxicity requires ADW use in future WET testing.

For the second case, written notification from the permittee requesting ADW use **and** written authorization from the permit issuing agency(s) is required **prior to** switching to a long-term use of ADW for the duration of the permit.

Written requests for use of ADW must be mailed with supporting documentation to the following addresses:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency, Region 1
Five Post Office Square, Suite 100
Mail Code OEP06-5
Boston, MA 02109-3912

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
Five Post Office Square, Suite 100
Mail Code 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.

V. TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

Method specific test conditions and TAC are to be followed and adhered to as specified in the method guidance document, EPA 821-R-02-013. If a test does not meet TAC the test must be repeated with fresh samples within 30 days of the initial test completion date.

V.1. Use of Reference Toxicity Testing

Reference toxicity test results and applicable control charts must be included in the toxicity testing report.

If reference toxicity test results fall outside the control limits established by the laboratory for a specific test endpoint, a reason or reasons for this excursion must be evaluated, correction made and reference toxicity tests rerun as necessary.

If a test endpoint value exceeds the control limits at a frequency of more than one out of twenty then causes for the reference toxicity test failure must be examined and if problems are identified corrective action taken. The reference toxicity test must be repeated during the same month in which the exceedance occurred.

If two consecutive reference toxicity tests fall outside control limits, the possible cause(s) for the exceedance must be examined, corrective actions taken and a repeat of the reference toxicity test must take place immediately. Actions taken to resolve the problem must be reported.

V.1.a. Use of Concurrent Reference Toxicity Testing

In the case where concurrent reference toxicity testing is required due to a low frequency of testing with a particular method, if the reference toxicity test results fall slightly outside of laboratory established control limits, but the primary test met the TAC, the results of the primary test will be considered acceptable. However, if the results of the concurrent test fall well outside the established **upper** control limits i.e. ≥3 standard deviations for IC25 values and ≥ two concentration intervals for NOECs, and even though the primary test meets TAC, the primary test will be considered unacceptable and must be repeated.

V.2. For the *C. dubia* test, the determination of TAC and formal statistical analyses must be performed using only the first three broods produced.

V.3. Test treatments must include 5 effluent concentrations and a dilution water control. An additional test treatment, at the permitted effluent concentration (% effluent), is required if it is not included in the dilution series.

VI. CHEMICAL ANALYSIS

As part of each toxicity test's daily renewal procedure, pH, specific conductance, dissolved oxygen (DO) and temperature must be measured at the beginning and end of each 24-hour period in each test treatment and the control(s).

The additional analysis that must be performed under this protocol is as specified and noted in the table below.

Parameter	Effluent	Receiving Water	ML (mg/l)
Hardness[1, 4]	x	x	0.5
Total Residual Chlorine (TRC)[2, 3, 4]	x		0.02
Alkalinity[4]	x	x	2.0
pH[4]	x	x	--
Specific Conductance[4]	x	x	--
Total Solids[6]	x		--
Total Dissolved Solids[6]	x		--
Ammonia[4]	x	x	0.1
Total Organic Carbon[6]	x	x	0.5
Total Metals[5]			
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
- USEPA 1983. Manual of Methods Analysis of Water and Wastes
  -Method 330.5

3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing
4. Analysis is to be performed on samples and/or receiving water, as designated in the table above, from all three sampling events.
5. Analysis is to be performed on the initial sample(s) only unless the situation arises as stated in Section III, paragraph 4
6. Analysis to be performed on initial samples only

VII. TOXICITY TEST DATA ANALYSIS AND REVIEW

A. Test Review

1. Concentration / Response Relationship

A concentration/response relationship evaluation is required for test endpoint determinations from both Hypothesis Testing and Point Estimate techniques. The test report is to include documentation of this evaluation in support of the endpoint values reported. The dose-response review must be performed as required in Section 10.2.6 of EPA-821-R-02-013. Guidance for this review can be found at http://water.epa.gov/scitech/methods/cwa/ . In most cases, the review will result in one of the following three conclusions: (1) Results are reliable and reportable; (2) Results are anomalous and require explanation; or (3) Results are inconclusive and a retest with fresh samples is required.

2. Test Variability (Test Sensitivity)

This review step is separate from the determination of whether a test meets or does not meet TAC. Within test variability is to be examined for the purpose of evaluating test sensitivity. This evaluation is to be performed for the sub-lethal hypothesis testing endpoints reproduction and growth as required by the permit. The test report is to include documentation of this evaluation to support that the endpoint values reported resulted from a toxicity test of adequate sensitivity. This evaluation must be performed as required in Section 10.2.8 of EPA-821-R-02-013.

To determine the adequacy of test sensitivity, USEPA requires the calculation of test percent minimum significant difference (PMSD) values. In cases where NOEC determinations are made based on a non-parametric technique, calculation of a test PMSD value, for the sole purpose of assessing test sensitivity, shall be calculated using a comparable parametric statistical analysis technique. The calculated test PMSD is then compared to the upper and lower PMSD bounds shown for freshwater tests in Section 10.2.8.3, p. 52, Table 6 of EPA-821-R-02-013. The comparison will yield one of the following determinations.

- The test PMSD exceeds the PMSD upper bound test variability criterion in Table 6, the test results are considered highly variable and the test may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC). If the test results indicate that the discharge is not toxic at the PLC, then the test is considered insufficiently sensitive and must be repeated within 30 days of the initial test completion using fresh samples. If the test results indicate that the discharge is toxic at the PLC, the test is considered acceptable and does not have to be repeated.

- The test PMSD falls below the PMSD lower bound test variability criterion in Table 6, the test is determined to be very sensitive. In order to determine which treatment(s) are statistically significant and which are not, for the purpose of reporting a NOEC, the relative percent difference (RPD) between the control and each treatment must be calculated and compared to the lower PMSD boundary. See *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program*, EPA 833-R-00-003, June 2002, Section 6.4.2. The following link: Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program can be used to locate the USEPA website containing this document. If the RPD for a treatment falls below the PMSD lower bound, the difference is considered statistically insignificant. If the RPD for a treatment is greater that the PMSD lower bound, then the treatment is considered statistically significant.

- The test PMSD falls within the PMSD upper and lower bounds in Table 6, the sub-lethal test endpoint values shall be reported as is.

B. Statistical Analysis

1. General - Recommended Statistical Analysis Method

Refer to general data analysis flowchart, EPA 821-R-02-013, page 43

For discussion on Hypothesis Testing, refer to EPA 821-R-02-013, Section 9.6

For discussion on Point Estimation Techniques, refer to EPA 821-R-02-013, Section 9.7

2. *Pimephales promelas*

Refer to survival hypothesis testing analysis flowchart, EPA 821-R-02-013, page 79

Refer to survival point estimate techniques flowchart, EPA 821-R-02-013, page 80

Refer to growth data statistical analysis flowchart, EPA 821-R-02-013, page 92

3. *Ceriodaphnia dubia*

Refer to survival data testing flowchart, EPA 821-R-02-013, page 168

Refer to reproduction data testing flowchart, EPA 821-R-02-013, page 173

VIII. TOXICITY TEST REPORTING

A report of results must include the following:

- Test summary sheets (2007 DMR Attachment F) which includes:
  - Facility name
  - NPDES permit number
  - Outfall number
  - Sample type
  - Sampling method
  - Effluent TRC concentration
  - Dilution water used
  - Receiving water name and sampling location
  - Test type and species
  - Test start date
  - Effluent concentrations tested (%) and permit limit concentration
  - Applicable reference toxicity test date and whether acceptable or not
  - Age, age range and source of test organisms used for testing
  - Results of TAC review for all applicable controls
  - Test sensitivity evaluation results (test PMSD for growth and reproduction)
  - Permit limit and toxicity test results
  - Summary of test sensitivity and concentration response evaluation

In addition to the summary sheets the report must include:

- A brief description of sample collection procedures
- Chain of custody documentation including names of individuals collecting samples, times and dates of sample collection, sample locations, requested analysis and lab receipt with time and date received, lab receipt personnel and condition of samples upon receipt at the lab(s)
- Reference toxicity test control charts
- All sample chemical/physical data generated, including minimum limits (MLs) and analytical methods used
- All toxicity test raw data including daily ambient test conditions, toxicity test chemistry, sample dechlorination details as necessary, bench sheets and statistical analysis
- A discussion of any deviations from test conditions
- Any further discussion of reported test results, statistical analysis and concentration-response relationship and test sensitivity review per species per endpoint

NPDES PART II STANDARD CONDITIONS
(January, 2007)

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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
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FACT SHEET

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

NPDES PERMIT NO.: **MA0101567**

PUBLIC NOTICE START AND END DATES: March 13, 2015 – April 11, 2015

NAME AND ADDRESS OF APPLICANT:

Town of Warren
Board of Sewer Commissioners
2527 Main Street
P.O. Box 104
West Warren, MA 01092

NAME AND ADDRESS OF FACILITY WHERE THE DISCHARGE OCCURS:

Warren Wastewater Treatment Plant (WWTP)
2527 Main Street
Warren, MA 01092

TO RECEIVING WATER: **Quaboag River (MA36-16)**
(Chicopee River Basin – USGS Code # 01080204)

in accordance with effluent limitations, monitoring requirements and other conditions set forth in the permit.

CLASSIFICATION: **B (Warm Water Fishery)**

Table of Contents

I. PROPOSED ACTION

The above named applicant has applied to the U.S. Environmental Protection Agency (EPA) for reissuance of its National Pollutant Discharge Elimination System (NPDES) permit to discharge into the designated receiving waters. The existing permit expired on September 30, 2005 and is still in effect. The draft permit proposes an expiration date five (5) years from the effective date of the final permit.

II. TYPE OF FACILITY AND DISCHARGE LOCATION

The facility is a secondary wastewater treatment plant and is engaged in the collection and treatment of municipal wastewater. Currently, the facility serves approximately 2,000 people in the Town of Warren and 1,750 people in the village of West Warren. The facility does not serve any significant industrial users (SIUs). The treatment plant discharges into the Quaboag River. The facility's location is shown in **Figure 1**.

Information regarding the facility's treated discharge outfall is listed below:

Outfall:	Description of Discharge:	Outfall Location:
001	Secondary Wastewater Treatment Plant Effluent	N 42^{O} 12' 45" / W 71^{O} 14' 7"

III. DESCRIPTION OF THE DISCHARGE

A quantitative description of the wastewater treatment plant discharge in terms of significant effluent parameters based on recent monitoring data is shown on **Attachment A** of this fact sheet. This facility's flow schematic is shown in **Figure 2**.

IV. LIMITATIONS AND CONDITIONS

The effluent limitations of the draft permit and monitoring requirements may be found in the draft NPDES permit.

V. PERMIT BASIS AND EXPLANATION OF EFFLUENT LIMITATION DERIVATION

A. BACKGROUND

a. Treatment Process Description

The Warren WWTP treatment processes include: automatic bar racks, grit removal, primary clarification, rotating biological contactors, secondary clarification with flocculation, and disinfection with chlorine gas followed by dechlorination. Waste sludge is trucked off-site and transported to the Upper Blackstone Water Pollution Abatement District in Millbury, MA for incineration. The Warren WWTP generates approximately 105 dry metric tons of sludge each year.

b. Collection System Description

The Warren WWTP is served by a separate sewer system. A separate sanitary sewer conveys domestic, industrial and commercial sewage, but not storm water. It is part of a "two pipe system" consisting of separate sanitary sewers and storm sewers. The two systems have no interconnections; the sanitary sewer leads to a wastewater treatment plant and the storm sewers discharge to a local water body.

c. Overview of Federal and State Regulations

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 the waters of the United States from any point source, except as authorized by specific permitting sections of the CWA, one of which is Section 402. See CWA §§ 303(a), 402(a). Section 402(a) establishes one of the CWA's principal permitting programs, the National Pollutant Discharge Elimination System (NPDES). Under this section, 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, 304(b); 40 C.F.R. 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, publicly owed treatment works (POTWs) must meet performance-based requirements based on available wastewater treatment technology. See 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. See 40 C.F.R. §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)(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 122.44(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. See 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 numeric 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 anti-degradation provision, focused on protecting existing uses. See CWA § 303(c)(2)(A) and 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.

Receiving stream requirements are established according to numeric and narrative standards adopted under State law for each stream classification. When using chemical-specific numeric criteria from the 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 average monthly limits.

Where a State has not established a numeric water quality criterion for a specific chemical 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 Section 304(a) recommended water quality criteria, supplemented as necessary by other relevant information; or, in certain circumstances, based on an indicator parameter. See 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. §122, §124, §125, and §136.

The permit must limit any 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 criterion. See 40 C.F.R. §122.44(d)(1)(i). An excursion occurs if the projected or actual in-stream concentration exceeds the applicable criterion.

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 the permit's reissuance application, DMRs, and State and Federal Water Quality Reports; 3) sensitivity of the species to toxicity testing; 4) the statistical approach outlined in *Technical Support Document for Water Quality-Based Toxics Control* (TSD), March 1991, EPA/505/2-90-001 in Section 3; and, where appropriate, 5) dilution of the effluent in the receiving water.

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. 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.

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 limitations 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. See 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 incorporates the requirements specified in the certification under §124.53(e)." See 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 conditions 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 consideration 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." See 40 C.F.R. §12455(c). In such an instance, the regulation provides that, "The Regional Administrator shall disregard any such certification conditions or denials as waivers of certification." 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).

In accordance with the regulations found at 40 C.F.R. Section 131.12, the Massachusetts Department of Environmental Protection (MassDEP) has developed and adopted a statewide anti-degradation policy to maintain and protect existing in-stream water quality. The Massachusetts Anti-Degradation Provisions are found at 314 CWR 4.04 and in an associated document entitled "Implementation Procedure for the Antidegradation Provisions of the State Water Quality Standards", October 21, 2009. No lowering of water quality is allowed, except in accordance with the anti-degradation policy. All existing uses of the Quaboag River must be protected. This draft permit is being reissued with allowable discharge limits as, or more, stringent than those in the current permit and with the same parameter coverage. There is no change in outfall location. The public is invited to participate in the anti-degradation finding through the permit public notice process.

d. Water Quality Standards; Designated Use; Outfall 001

The Warren WWTP discharges into the Quaboag River within Segment MA36-16. This river segment is 8.7 miles in length, and travels from the Warren WWTP discharge to the Route 32 Bridge in Palmer / Monson, MA. The Quaboag River flows in a southwesterly direction through the Town of Warren to the confluence with the Ware and Chicopee Rivers in Palmer. The Quaboag River is a part of the Chicopee River Basin, which flows to the Connecticut River and discharges into Long Island Sound.

The Quaboag River has been designated as a Class B warm water fishery by the Massachusetts Surface Water Quality Standards(MA SWQS), 314 Code of Massachusetts Regulations ("CMR") 4.05(4)(a). The MA SWQS (314 CMR 4.02) defines warm water fisheries as waters in which the maximum mean monthly temperature generally exceeds 68^{o} Fahrenheit (20^{o} Celsius) during the summer months and are not capable of supporting a year-round population of cold water stenothermal aquatic life. The MA SWQS at 314 CMR 4.05(3)(b) state that Class B waters are designated as habitat for fish, other aquatic life, and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. They shall be a source of public water supply (i.e., where designated and with appropriate treatment). They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. They shall also have consistently good aesthetic value.

The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. To meet this goal, the CWA requires states to develop information on the quality of their water resources and report this information to EPA, the U.S. Congress, and the public. To this end, the EPA released guidance on November 19, 2001, for the preparation of an integrated "List of Waters" that could combine reporting elements of both §305(b) and 303(d) of the CWA. The integrated list format allows the states to provide the status of all their assessed waters in one list. States choosing this option must list each water body or segment in one of the following five categories:

1) Unimpaired and not threatened for all designated uses; 2) Unimpaired waters for some uses and not assessed for others; 3) Insufficient information to make assessments for any uses; 4) Impaired or threatened for one or more uses but not requiring the calculation of a Total Maximum Daily Load (TMDL); and 5) Impaired or threatened for one or more uses and requiring a TMDL.

The MassDEP's Massachusetts Year 2012 Integrated List of Waters (2012 Integrated List), the 303(d) list, includes the Quaboag River, within the river segment downstream of the Warren WWTP, as Massachusetts Category 5 Waters and in need of a total maximum daily load (TMDL) assessment due to bacteria. This assessment is based on the sampling results of the 2008 Quaboag River Survey conducted by the MassDEP.

e**. Available Dilution**

7 Day, 10 Year Low Flow

Water quality-based effluent limitations are established with the use of a calculated dilution factor, based on the available dilution of the effluent. Massachusetts water quality regulations require that the available effluent dilution be based upon the 7 day, 10 year low flow (7Q10 flow) of the receiving water (314 CMR 4.03(3)(a)). The 7Q10 low flow is the mean low flow over seven consecutive days, recurring every ten years.

The facility design flow is 1.5 million gallons per day (mgd) or 2.3205 cubic feet per second (cfs). The dilution factor used to calculate the water quality-based limits in the current permit was 7.7, based on a calculated 7Q10 receiving water flow of 15.8 cfs. This value was calculated using the 7Q10 flow at United States Geological Survey gage number 01176000, located on the Quaboag River in West Brimfield, downstream of the treatment plant, adjusted for runoff area. The watershed area at the treatment plant discharge is about 146 square miles,

and the watershed area at the gage is 150 square miles. Using this information, with current 7Q10 data from the USGS gage encompassing the whole gage record including the period since the previous permit was issued, a 7Q10 at the Warren outfall can be calculated as follows using the same methodology used in the current permit:

$$Q_s = Q_{001} = \frac{(A_{001})}{(A_{gage})} * (Q_{gage}) = \frac{(146 \text{ miles}^2)}{(150 \text{ miles}^2)} * (15.8 \text{ cfs}) = 15.38 \text{ cfs}$$

The dilution factor can then be calculated as follows:

$$\text{Dilution Factor (DF)} = \frac{(Q_s) + (Q_d)}{(Q_d)} = \frac{(15.4 \text{ cfs}) + (2.3 \text{ cfs})}{(2.3 \text{ cfs})} = 7.69 = 7.7$$

Where:

Q_{gage} = Estimated 7Q10 flow for the Quaboag River at the West Brimfield, MA gage station (gage station # 01176000, downstream from the WWTP discharge) = 14.7 cfs

A_{gage} = Drainage area at the gage station = 150 miles^2

A_{001} = Quaboag River drainage area at Outfall 001 = 146 miles^2

Q_d = Treatment plant design flow = (1.5 mgd x 1.547) = 2.3 cfs

1.547 = converts million gallons per day (mgd) to cubic feet per second (cfs) units

However, in reviewing this methodology, EPA realized that the 7Q10 flow at the treatment plant outfall, assumed to be the flow upstream of the treatment plant was too high, given that the measured 7Q10 flow at the downstream gage included the discharge flow. A more appropriate calculation of the 7Q10 would include subtracting the treatment plant flow from the downstream 7Q10 flow, and then apportioning that flow according to the watershed area. A long term period of record (August 19, 1912 to the current year) was used to calculate the 7Q10 for the draft permit, since the Quaboag River is not within a highly developed watershed and we are not aware of any significant alterations to the hydrology that would warrant using the current period of record. Recalculating the 7Q10 just upstream of the treatment plant and using a treatment plant flow of 0.3852 cfs (the lowest monthly average flow over the past five years) and the current 7Q10 of 14.7 cfs at the West Brimfield gage result in a 7Q10 of 13.9 cfs and a dilution factor of 7.0.

The calculations are as follows:

$$Q_s = Q_{001} = \frac{(A_{001})}{(A_{gage})} * (Q_{gage} - Q_d)$$

$$= \frac{(146 \text{ miles}^2)}{(150 \text{ miles}^2)} * (14.7 \text{ cfs} - 0.3852 \text{ cfs}) = 13.933 \text{ cfs} = 13.9 \text{ cfs}$$

Where:

Q_{gage} = Estimated 7Q10 flow for the Quaboag River at the West Brimfield, MA gage station (gage station # 01176000, downstream from the WWTP discharge) = 14.7 cfs

A_{gage} = Drainage area at the gage station = 150 miles^2

A_{001} = Quaboag River drainage area at Outfall 001 = 146 miles^2

Q_d = Treatment plant dry weather flow = (0.249 mgd x 1.547) = 0.3852 cfs

1.547 = converts million gallons per day (mgd) to cubic feet per second (cfs) units

Based on the most recent instream low flow data available, the resulting dilution factor at the Warren WWTP Outfall 001 is re-calculated to be 7.0 using the following equation and data:

$$\text{Dilution Factor (DF)} = \frac{(Q_s) + (Q_d)}{(Q_d)} = \frac{(13.9 \text{ cfs}) + (2.3205 \text{ cfs})}{(2.3205 \text{ cfs})} = 6.99 = 7.0$$

Where:

Q_s = 7Q10 flow at the treatment plant outfall = 13.9 cfs

Q_d = Treatment plant design flow = (1.5 mgd * 1.547) = 2.3205 cfs

This dilution factor is slightly less than the value used to calculate water quality-based limits for the current permit.

B. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (Outfall 001)

In addition to the State and Federal regulations described above, data submitted by the permittee in its permit application as well as in monthly discharge monitoring reports (DMRs) and in whole effluent toxicity (WET) test reports from 2005 to 2011 was used to evaluate the discharge during the effluent limitations development process (see **Attachments A and B**).

a. Flow

The 12 month rolling average flow limitation of 1.5 million gallons per day in the current permit has been maintained in the draft permit. This is the design flow of the facility found in Form 2A, Part A, Section a.6. of the permit application. The draft permit requires continuous flow measurement, and also requires reporting of the average monthly and maximum daily flows.

b. Conventional Pollutants

1. Biochemical Oxygen Demand (BOD_5)

The draft permit includes average monthly and average weekly BOD_5 concentration limits and average monthly percent removal limits based on the requirements of 40 CFR § 133.102(a)(1),(2),(3), and average monthly and average weekly mass limitations based on the concentration limits and the treatment plant flow, pursuant to 40 CFR § 122.45(f) and 40 CFR 122.45(b)(1). The permit also requires that the maximum daily concentration and mass be reported. These limits are the same limits in the current permit, consistent with anti-backsliding regulations.

Calculations are presented following the Total Suspended Solids (TSS) Section.

2. Total Suspended Solids (TSS)

The draft permit includes average monthly and average weekly TSS concentration limits and average monthly percent removal limits based on the requirements of 40 CFR § 133.102(a)(1),(2),(3), and average monthly and average weekly mass limitations based on the concentration limits and the treatment plant flow, pursuant to 40 CFR § 122.45(f) and 40 CFR 122.45(b)(1). The permit also requires that the maximum daily concentration and mass be reported. These limits are the same limits in the current permit, consistent with anti-backsliding regulations.

Calculations for BOD_5 and TSS Limitations

The average monthly and average weekly mass limitations for BOD and TSS were calculated as follows:

Mass Limitation (lbs/day) = C * DF * 8.34

Where:

C = Concentration limit
DF = Design flow of the facility, in million gallons per day (MGD)
8.34 = Factor to convert effluent concentration in mg/l and design flow in MGD to lbs/day. The units of this 8.34 conversion factor are (lbs)(l)/(mg)(gal).

BOD Limitations

Average Monthly Mass Limit =
30 mg/l * 1.5 MGD * 8.34 = 375.3 lbs/day = 375 lbs/day

Average Weekly Mass Limit =
45 mg/l * 1.5 MGD * 8.34 = 562.9 lbs/day = 563 lbs/day

The mass BOD limitations in the draft permit are the same as those in the current permit and are consistent with anti-backsliding requirements.

TSS Limitations

Average Monthly Mass Limit =
30 mg/l * 1.5 MGD * 8.34 = 375.3 lbs/day = 375 lbs/day

Average Weekly Mass Limit =
45 mg/l * 1.5 MGD * 8.34 = 562.9 lbs/day = 563 lbs/day

The mass TSS limitations in the draft permit are the same as those in the current permit and are consistent with anti-backsliding requirements.

3. pH

The draft permit includes pH limitations equal to the state water quality criteria for Class B waters. See 314 CMR 4.05(b)(3). The pH limits are more stringent than those required under 40 CFR § 133.102(c). The pH limits are carried forward from the current permit, and so are consistent with antibacksliding requirements of 40 CFR § 122.44(1). The monitoring frequency for pH is set at once per day in the draft permit.

4. *Escherichia Coli Bacteria (E. coli)*

The *Escherichia Coli (E. coli)* limits for outfall 001 are based on state water quality standards for Class B waters (314 CMR 4.05(b)(4)). The State of Massachusetts promulgated new bacteria criteria in the MA SWQS (314 CMR 4.00) on December 29, 2006, which were approved by EPA on September 19, 2007. The *E. coli* bacteria limits proposed in the draft permit for Outfall 001 are 126 cfu per 100 ml geometric mean and 409 cfu per 100 ml maximum daily value (this is the 90% distribution of the geometric mean of 126 cfu per 100 ml). The current permit requires bacteria limitations and monitoring year-round. Since seasonal limits will provide adequate water quality protection, the draft permit proposes seasonal bacteria limits and monitoring, from April 1st – October 31st, to ensure the protection of the receiving water during the recreational period. The proposed bacteria monitoring frequency in the draft permit has been set at once per week, consistent with the current permit.

c. Non-Conventional Pollutants

Nutrients: Ammonia-Nitrogen, Nitrogen, and Phosphorus

Nutrients are compounds containing nitrogen and phosphorus. Although nitrogen and phosphorus are essential for plant growth, high concentrations of these nutrients can cause eutrophication, a condition in which aquatic plant and algal growth is excessive. Plant and algae respiration and decomposition reduces dissolved oxygen concentrations in the water, creating poor habitat for fish and other aquatic animals. In addition, nitrogen in the form of ammonia can reduce the receiving stream's dissolved oxygen concentration through nitrification and can also be toxic to aquatic life at elevated temperatures. The toxicity level of ammonia depends on the temperature and pH of the receiving water (USEPA 1999).

1. Ammonia-Nitrogen (NH_3-N)

The current permit does not include ammonia limitations or monitoring. Ammonia limits were considered for the draft permit to ensure that ammonia toxicity does not cause or contribute to violations of water quality standards for a Class B water. Available effluent data were reviewed to determine if reasonable potential exists for the discharge to exceed the water quality criteria for ammonia. See 40 CFR 122.45(d).

The following calculations were made using EPA-recommended ammonia criteria from the document: *Update of Ambient Water Quality Criteria for Ammonia*, 1999 (EPA822-R-99-014). These are the freshwater ammonia criteria recommended in EPA's *National Recommended Water Quality Criteria*, 2002 (EPA822-R-02-047) document. The 2002 criteria were adopted by MassDEP as numeric criteria for toxics in its surface water quality standards (see: 314 CMR 4.05(5)(e)).

Ammonia-Nitrogen Warm Weather Limit Calculation:

Critical instream temperature = 24° C (75° F) (summer instream temperature)
Critical instream pH = 7.0 (summer instream pH)
Chronic ammonia criteria (chronic criterion for Early Life Stages Present) = 3.21 mg/l

Therefore, the ammonia-nitrogen monthly average summer limit:

(7Q10 dilution factor x summer instream ammonia criterion)
(7.0 * 3.21 mg/l) = 22.5 mg/l

Ammonia-Nitrogen Cold Weather Limit:

Critical instream temperature = 10° C (winter instream temperature)
Critical instream pH = 7.0 (winter instream pH)
Chronic ammonia criteria (chronic criterion for Early Life Stages Present) = 5.91 mg/l

Therefore, the ammonia-nitrogen monthly average winter limit:
(30Q10 winter dilution factor x winter instream ammonia criterion)
(23.8 * 5.91 mg/l) = 140.7 mg/l

Quaboag River estimate of 30Q10 for the period of November 1 to April 30:

A 30Q10 flow at the point of discharge was used to determine the need for winter ammonia limits. The 30Q10 is defined as the mean stream flow for thirty consecutive days with a ten-year recurrence interval and was calculated to be 53.0 cfs for the period of November 1 to April 30. The 30Q10 calculations are as follows:

Quaboag River at West Brimfield gage 30Q10 = 54.8 cfs at the gaging station

The contributing flow upstream used for the estimated 30Q10 is based on a treatment plant flow of 0.3852 cfs (the lowest monthly average flow over the past five years).

$$Q_s = Q_{001} = \frac{(A_{001})}{(A_{gage})} * (Q_{gage} - Q_d)$$

$$= \frac{(146 \text{ miles}^2)}{(150 \text{ miles}^2)} * (54.8 \text{ cfs} - 0.3852 \text{ cfs}) = 52.96 \text{ cfs} = \underline{53.0 \text{ cfs}}$$

Where:

Q_{gage} = Estimated winter 30Q10 flow for the Quaboag River at the West Brimfield, MA gage station (gage station # 01176000, downstream from the WWTP discharge)

= 54.8 cfs

A_{gage} = Drainage area at the gage station = 150 miles^2

A_{001} = Quaboag River drainage area at Outfall 001 = 146 miles^2

Q_d = Treatment plant dry weather flow = (0.249 mgd x 1.547) = 0.3852 cfs

1.547 = converts million gallons per day (mgd) to cubic feet per second (cfs) units

Based on the most recent instream low flow data available, the resulting 30Q10 winter dilution factor at the Warren WWP Outfall 001 is recalculated to be 23.8 using the following equation and data:

$$\text{Dilution Factor (DF)} = \frac{(Q_s) + (Q_d)}{(Q_d)} = \frac{(53.0 \text{ cfs}) + (2.3205 \text{ cfs})}{(2.3205 \text{ cfs})} = 23.84 = \mathbf{23.8}$$

Where:

Q_s = Winter 30Q10 flow at the treatment plant outfall = 53.0 cfs

Q_d = Treatment plant design flow = (1.5 mgd * 1.547) = 2.3205 cfs

This 30Q10 winter dilution factor is slightly less than the value used to calculate water quality based limits for the current permit. EPA acknowledges that the 30Q10 winter dilution in Attachment C of the current permit's Fact Sheet was incorrectly calculated.

The calculated total ammonia-nitrogen limits for the draft permit would be 22.5 mg/l in the summer and 140.7 mg/l in the winter. Since the calculated summer and winter limits are well above the levels of the estimated total ammonia-nitrogen concentration levels (based on the available total Kjeldahl nitrogen concentration levels reported in the permittee's dmr reports from January 2009 through January 2014), the calculations above shows there is not a reasonable potential for the ammonia concentration in the effluent to exceed the instream criteria and this is consistent with the current permit. Therefore, a limit has not been proposed for the draft permit.

The following statistical tools and stream flow gage data was used to prepare the preceding calculations.

USGS – *StreamStats is a web-based tool that allows users to obtain stream flow statistics, drainage-basin characteristics, and other information for user-selected sites on streams (i.e.,* http://water.usgs.gov/osw/streamstats/massachusetts.html). Streamstats was used to calculate the drainage area at the POTW.

USGS – gage flow data derived from the National Water Information System, Web Interface, http://ma.water.usgs.gov/water/default.htm.

USEPA – *DFLOW 3.1 is a Windows-based tool that allows users to estimate design stream flows for low flow analysis using instream flow gage records (i.e., http://water.epa.gov/ scitech/datait/models/dflow/index.cfm).* DFLOW was used to estimate the 30Q10 stream flow.

2. Total Nitrogen

It has been determined that excessive nitrogen loadings are causing significant water quality problems in Long Island Sound, including low dissolved oxygen. In December 2000, the Connecticut Department of Environmental Protection (CT DEP) completed a Total Maximum

Daily Load (TMDL) for addressing nitrogen-driven eutrophication impacts in Long Island Sound. The TMDL included a Waste Load Allocation (WLA) for point sources and a Load Allocation (LA) for non-point sources.

The point source WLA for out-of-basin sources (Massachusetts, New Hampshire and Vermont wastewater facilities discharging to the Connecticut, Housatonic and Thames River watersheds) requires an aggregate 25 percent reduction from the baseline total nitrogen loading estimated in the TMDL.

The baseline total nitrogen point source loadings estimated for the Connecticut, Housatonic, and Thames River watersheds were 21,672 lbs/day, 3,286 lbs/day, and 1,253 lbs/day respectively (see Table 1 below). The estimated current point source total nitrogen loadings for the Connecticut, Housatonic, and Thames Rivers respectively are 13,836 lbs/day, 2,151 lbs/day, and 1,015 lbs/day, based on recent information and including all POTWs in the watershed. The following table summarizes the estimated baseline loadings, TMDL target loadings, and estimated current loadings:

Table 1. Nitrogen Loadings to Long Island Sound

Basin	Baseline Loading[1] (lbs/day)	TMDL Target[2] (lbs/day)	Current Loading[3] (lbs/day)
Connecticut River	21,672	16,254	13,836
Housatonic River	3,286	2,464	2,151
Thames River	1,253	939	1,015
Totals	26,211	19,657	17,002

1. Estimated loading from TMDL, (see Appendix 3 to CT DEP "Report on Nitrogen Loads to Long Island Sound," April 1998).
2. Reduction of 25% from baseline loading.
3. Estimated current loading from 2004 – 2005 DMR data – detailed summary attached as **Exhibit A**.

The TMDL target of a 25 percent aggregate reduction from baseline loadings is currently being met, and the overall loading from MA, NH and VT wastewater treatment plants discharging to the Connecticut River watershed has been reduced by about 36 percent.

In order to ensure that the aggregate nitrogen loading from out-of-basin point sources does not exceed the TMDL target of a 25 percent reduction over baseline loadings, EPA intends to include a permit condition for all existing treatment facilities in Massachusetts and New Hampshire that discharge to the Connecticut, Housatonic and Thames River watersheds, requiring the permittees to evaluate alternative methods of operating their treatment plants to optimize the removal of nitrogen, and to describe previous and ongoing optimization efforts. Facilities not currently engaged in optimization efforts will also be required to implement optimization measures sufficient to ensure that their nitrogen loads do not increase, and that the aggregate 25 percent reduction is maintained. The State of Vermont is currently including similar requirements in its discharge permits.

The draft permit requires an evaluation of alternative methods of operating the existing wastewater treatment facility in order to control total nitrogen levels, including, but not limited to, operational changes designed to enhance nitrification (seasonal and year round),

incorporation of anoxic zones, septage receiving policies and procedures, and side stream management. This evaluation is required to be completed and submitted to EPA and MassDEP within one year of the effective date of the permit, along with a description of past and ongoing optimization efforts. The annual average total nitrogen load from this facility (2004 – 2005) is estimated to be 62 lbs/day. The draft permit requires annual reports to be submitted that summarize progress and activities related to optimizing nitrogen removal efficiencies, document the annual nitrogen discharge load from the facility, and track trends relative to previous years. The current permit requires average monthly reporting for total Kjeldahl nitrogen (TKN), total nitrite nitrogen (NO_2), and total nitrate nitrogen (NO_3) at a monitoring frequency of once per month. Since the effluent data generally indicates a higher loading of total nitrogen when the effluent flow increases, the draft permit proposes average monthly and maximum daily reporting requirements for total nitrogen (TN), ammonia nitrogen, TKN, NO_2, and NO_3, at an increased sampling frequency of once per week in the effluent in order to more accurately assess the total nitrogen loading and the removal efficiency for this facility. If the wastewater treatment system is optimized to remove total nitrogen to the greatest extent practicable, and if the effluent nitrogen monitoring results demonstrate a long-term decreasing trend in total nitrogen loading to the receiving water, the permittee may submit a written request to EPA for a reduction of the total nitrogen monitoring requirements.

The agencies will annually update the estimate of all out-of-basin total nitrogen loads and may incorporate total nitrogen limits in future permit modifications or reissuances as may be necessary to address increases in discharge loads, a revised TMDL, or other new information that may warrant the incorporation of numeric permit limits. There have been significant efforts by the New England Interstate Water Pollution Control Commission (NEIWPCC) work group and others since completion of the 2000 TMDL, which are anticipated to result in revised wasteload allocations for in-basin and out-of-basin facilities. Although not a permit requirement, it is strongly recommended that any facilities planning that might be conducted for this facility should consider alternatives for further enhancing nitrogen reduction.

3. Phosphorus

While phosphorus is an essential nutrient for the growth of aquatic plants, it can stimulate rapid plant growth in freshwater ecosystems when it is present in high quantities. The excessive growth of aquatic plants and algae within freshwater systems negatively impacts water quality and can interfere with the attainment of designated uses by: (1) increasing the oxygen demand within the water body (to support an increase in both plant respiration and the biological breakdown of dead organic (plant) matter); (2) causing an unpleasant appearance and odor; (3) interfering with navigation and recreation; (4) reducing water clarity; and (5) reducing the quality and availability of suitable habitat for aquatic life. Cultural (or accelerated) eutrophication is the term used to describe dense and excessive plant growth in a water body that results from nutrients entering the system as a result of human activities.

Discharges from municipal and industrial wastewater treatment plants, agriculture runoff, and stormwater are examples of human-derived (i.e., anthropogenic) sources of nutrients in surface waters.

The MA SWQS under 314 CMR 4.05(5)(c) require that, unless naturally occurring, surface waters must be free from nutrients that cause or contribute to impairment of the existing or designated uses, and the concentration of phosphorus may not exceed site specific criteria developed in a TMDL. Nutrients are also prohibited in concentrations that would cause or contribute to cultural eutrophication.

In the absence of numeric criteria for phosphorus, EPA uses nationally recommended criteria and other technical guidance to develop effluent limitations for the discharge of phosphorus. EPA has published national guidance documents which contain recommended total phosphorus criteria and other indicators of eutrophication. EPA's 1986 *Quality Criteria for Water* (the "Gold Book") recommends that in-stream phosphorus concentrations not exceed 0.05 mg/l in any stream entering a lake or reservoir, 0.1 mg/l for any stream not discharging directly into lakes or impoundments, and 0.025 mg/l within a lake or reservoir. For this segment of the Quaboag River, the 0.1 mg/l standard would apply for the downstream of the discharge.

More recently, EPA has released recommended Ecoregional Nutrient Criteria, established as part of an effort to reduce problems associated with excess nutrients in water bodies in specific areas of the country. The published criteria represent conditions in waters within ecoregions that are minimally impacted by human activities, and thus free from the effects of cultural eutrophication. Palmer is located within Ecoregion XIV, Eastern Coastal Plains. The recommended total phosphorus criterion for this ecoregion, found in Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion XIV (EPA December 2000) is 24 ug/l (0.024 mg/l).

The effects-based Gold Book threshold is a general target applicable in free-flowing streams. As the Gold Book notes, there are natural conditions of a water body that can result in either increased or reduced eutrophication response to phosphorus inputs; in some waters more stringent phosphorus reductions may be needed, while in some others a higher total phosphorus threshold could be assimilated without inducing a eutrophic response. In this case, EPA is not aware of any evidence that the Quaboag River is unusually susceptible to eutrophication impacts, so that the 100 ug/l threshold appears sufficient in this receiving water. With respect to factors that can reduce susceptibility, the Gold Book identifies morphometric features (steep banks, great depths and substantial flows), limitation by nutrients other than phosphorus, reduced light penetration where waters are highly laden with natural silts or color, or other naturally occurring phenomena that limit plant growth.[1] EPA is not aware of evidence that any of these factors are reducing eutrophic response in the Quaboag River downstream of the discharge.

[1] The Gold Book also includes waters where "technological or cost-effective limitations may help control induced pollutants"; "waters managed primarily for waterfowl or other wildlife" and waters where "phosphorus control cannot be sufficiently effective under present technology to make phosphorus the limiting nutrient". As these factors do not address water body response but instead alternative technological solutions or changes in management goals, EPA does not consider them as altering the threshold necessary to meet the narrative water quality standard.

Elevated concentrations of chlorophyll a, excessive algal and macrophyte growth, and low levels of dissolved oxygen are all effects of nutrient enrichment. The relationship between these factors and high in-stream total phosphorus concentrations is well documented in scientific literature, including guidance developed by EPA to address nutrient over-enrichment (Nutrient Criteria Technical Guidance Manual – Rivers and Streams. (EPA July 2000 [EPA-822-B-00-002]).

Sampling data from the 2008 Water Quality Assessment Report reported five summer in-stream phosphorus concentrations collected at Station W1-868, located about one half mile downstream of the wastewater treatment facility discharge, in an easterly direction off Route 67 near the Palmer/Warren, MA border. The results were as follows: 38 ug/l, 47 ug/l, 49 ug/l, 53 ug/l, and 38 ug/l. This data was collected on: 5/20/08, 6/17/08, 7/22/08, 8/19/08, and 9/23/08, respectively. These results are all less than the Gold Book criteria of 100 ug/l for free flowing segments.

Although the data indicates that this segment met the 100 ug/l Gold Book criterion on the sampling dates, inspection of the flow data from the Brimfield gage shows that the river flow was never less than 5 times the 7Q10 on any of the sampling dates (the gaged flows ranged 5 to 20 times the 7Q10) and the treatment plant flow during the summer of 2008 averaged about 0.3 MGD, about 20 percent of design flow. Both of these factors (high receiving water flow and low treatment plant flow) would tend to reduce the downstream concentration relative to the concentration that would be expected under 7Q10 streamflow conditions and full treatment plant design flow.

EPA calculated a required effluent limit that would ensure attainment of an instream concentration of 100 ug/l under 7Q10 low flow conditions with the treatment plant discharging at design flow.

This 2008-era data corresponds to the following instream flow values collected at the USGS gage #01176000: 242 cfs, 117 cfs, 70 cfs, 293 cfs, and 292 cfs. Since a correlation cannot be shown between the instream phosphorus concentrations and the instream flow values, an overall average phosphorus concentration of 37 ug/l was used to calculate a discharge limit. This value is based on the following 2008-era data collected approximately one quarter river mile upstream of the Warren WWTP's discharge at the Gilbert Road, Warren, MA sampling location: 31 ug/l, 37 ug/l, 34 ug/l, 49 ug/l, and 34 ug/l. (See: Attachment B of this Fact Sheet). In order to determine whether there is a reasonable potential to cause or contribute to an instream water quality criterion exceedance, the discharge limit necessary to achieve an instream phosphorus concentration of 100 ug/l can be calculated as follows:

$\{(Q_R + Q_W) * C_{WQ} – (Q_R * C_R)\} / Q_W = C_W$

Where:

Q_R = 7Q10 flow of the Quaboag River = 13.9 cfs
Q_W = Design flow of the Warren WWTP = 2.3205 cfs
C_{WQ} = In-stream water quality criteria = 100 ug/l
C_R = In-stream phosphorus concentration located upstream of the discharge = 37 ug/l
C_W = Calculated phosphorus concentration limit for the Warren WWTP
$\{(13.9+ 2.3205) * 100 – (13.9 * 37)\} / 2.3205 = 477.4$ ug/l = 0.48 mg/l

The calculation above indicates that a limitation is necessary to ensure protection of water quality standards during low flow conditions, since the effluent concentration range was 1.6 to 5.9 mg/l during the growing season months of April through October during the period from April 2008 through October 2011, which exceeded the calculated limit.

April 1 – October 31 Limitation

EPA is proposing a total phosphorus limit in terms of mass, rather than concentration. The mass limitation provides an incentive to control flows coming into the facility and encourages water conservation efforts, while still protecting water quality. The treatment plant currently operates at about 20 percent of its design flow during the April to October period. EPA believes that a mass discharge limit is protective provided that the mass limit would result in a downstream concentration equal to, or less than, 100 ug/l under all discharge flow conditions.

Under design flow conditions of 1.5 MGD (2.3205 cfs) a mass limit of 6.13 lbs per day would be protective, based on a discharge concentration of 0.49 mg/l:

Mass limitation (lbs/day) = discharge concentration (mg/L) * flow (MGD) * 8.34
= 0.49 * 1.5 * 8.34
= 6.13 lbs/d

However, this mass limit would not be protective at lower discharge flows because of the effect of the lower discharge flow on the available dilution (i.e., as the discharge flow is decreased, there becomes less total flow in the river). Therefore, EPA selected the minimum monthly average discharge flow recorded over the previous five years (0.249 MGD, or 0.3852 cfs) to calculate an effluent concentration limit, which was then converted to a mass limit. The calculations are as follows:

$$Cd = \frac{QrCr - QsCs}{Qd}$$

Where:

Qr = The Quaboag River's flow downstream of the discharge
= Qd + Qs = 0.3852 + 13.9 = 14.3 cfs
Qd = Summer low flow of the Warren WWTP = 0.3852 cfs
Qs = 7Q10 flow upstream of the discharge = 13.9 cfs
Cs = In-stream water quality concentration upstream of the discharge = 37 ug/l
Cr = Resulting in-stream phosphorus concentration downstream of the discharge = 100 ug/l
Cd = Phosphorus concentration in the Warren discharge = discharge limit

$$Cd = \frac{(14.3 * 100) – (13.9 * 37)}{0.3852}$$

Cd = 2377.2 ug/l = 2.38 mg/l

Mass limitation (lbs/day) = discharge concentration (mg/L) * flow (MGD) * 8.34
= 2.38 * 0.249 * 8.34
= 4.9 lbs per day

Therefore, a monthly average limit of 4.9 pounds per day is proposed in the draft permit for the period of April through October, the algal growing season. A maximum daily reporting requirement has been added, and the current monthly average monitoring frequency of once per month has been increased to once per week.

Effluent data submitted by the permitittee shows that its monthly average mass discharge load during the months of April through October range from 1.5 to 14.6 pounds per day, with an average of about 8.6 lbs per day (see Table 2 below). This indicates that the facility is not currently able to attain the proposed limit. A compliance schedule has therefore been included in the draft permit. The proposed compliance schedule in the draft permit allows time to perform: (1) a one year pilot study while optimizing the current treatment facility and reducing total phosphous in the influent, and (2) an additional two years for the removal and construction of new operational equipment, if the 4.9 lbs/day permit limit cannot be met after treatment optimization.

Table 2. Total Phosphorus Effluent Data

Sampling Date	Effluent, Total Phosphorus, mg/l	Effluent Flow (monthly ave), MGD	Effluent Total Phosphorus, (estimated loading), lbs/d
April, 2011	0.64	0.288	1.5
May	1.9	0.298	4.7
June	1.9	0.316	5.0
July	1.9	0.316	5.0
August	2.6	0.329	7.13
September	2.1	0.349	6.11
October	1.6	0.365	4.87
April, 2012	2.0	0.397	6.62
May	2.3	0.375	7.19
June	1.6	0.397	5.29
July	2.0	0.358	5.97
August	2.4	0.347	6.95
September	4.8	0.327	13.1
October	1.8	0.312	4.68
April, 2013	5.4	0.291	13.12
May	5.2	0.293	12.71
June	3.8	0.306	9.69
July	3.7	0.311	9.59
August	4.8	0.312	12.48
September	5.3	0.287	12.68
October	5.6	0.314	14.66

November 1 – March 31 Limitation

Typically, draft permits also include a monthly average phosphorus limit of 1.0 mg/l for the period from November through March. However, since a monthly average phosphorus limit of 4.9 lbs per day would be protective and prevent water quality exceedances, a monthly average phosphorus limit of 4.9 lbs per day is proposed for the draft permit during the winter period. This limit on total phosphorus is necessary to ensure that phosphorus discharged during the winter period does not accumulate in the sediments downstream of the discharge. The Red Bridge Impoundment, located downstream of the Warren WWTP, is a concern relative to eutrophication and accumulation of phosphorus in the sediments. The once per month monitoring frequency for orthophosphorus during the winter period is consistent with other NPDES permits in the region.

d. Toxics Control

1. Total Residual Chlorine (TRC)

Chlorine compounds produced by the chlorination of wastewater can be extremely toxic to aquatic life. In its water quality standards, the MassDEP has adopted the numeric criteria for chlorine that are recommended by EPA in *National Recommended Water Quality Criteria: 2002* published by EPA pursuant to Section 304(a) of the Clean Water Act (See: 314 CMR 4.05(5)(e)). The numeric aquatic life criteria for total residual chlorine are 11 ug/l (chronic) and 19 ug/l (acute). The draft permit includes revised total residual chlorine limitations based on the following calculations:

Total Residual Chlorine Limitations:

Maximum Daily TRC Limit = (acute criteria x dilution factor)
= (19 ug/l x 7.0)
= 133 ug/l

Monthly Average TRC Limit = (chronic criteria x dilution factor)
= (11 ug/l x 7.0)
= 77 ug/l

The maximum daily and monthly average TRC limits have been revised based on the updated dilution factor. The maximum daily limit decreased from 146 ug/l to 133 ug/l and the average monthly limit decreased from 85 ug/l to 77 ug/l. The season that the TRC limitations and monitoring requirements are in effect from May 1st – September 30th are based on state certification requirements, and in order to be consistent with other NPDES permits within the Chicopee River Basin. Also, the once-per-day monitoring frequency for TRC in the current permit has been proposed for the draft permit. The draft permit requires that once per week bacterial samples be collected concurrently with a TRC sample.

e. 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 to the permitting agencies from February 2009 through February 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 A**) 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 EPA's National Recommended Water Quality Criteria: 2002, using the appropriate factors for the individual metals found in the MA Standards (see table below).

Certain metals, including cadmium, lead, nickel, and zinc, are more toxic at lower hardness, and this is factored into calculations of the water quality criteria. EPA's Office of Water – Office of Science and Technology stated in a letter dated July 7, 2000 that: *The hardness of the water containing the discharged toxic metals should be used for determining the applicable criterion. Thus, the downstream hardness should be used.*

The theoretical hardness of Quaboag River downstream of the treatment plant during critical low flow periods and design discharge flow was calculated based on average ambient and effluent hardness data as reported in the facility's whole effluent toxicity tests conducted in the summer months of August 2008 – 2010 (i.e., see Table 3, below).

Table 3. Quaboag River and Warren WWTP Hardness

WET Test Date	Effluent Hardness, mg/l (as $CaCO_3$)	Ambient Hardness, mg/l (data collected upstream)
8/11/08	53	25
8/13/08	54	20
8/15/08	56	26
8/10/09	60	22
8/12/09	60	22
8/14/09	58	20
8/9/09	58	26
8/11/09	58	24
8/13/09	58	28
8/8/10	60	22
8/10/10	56	24
8/12/10	54	22
Average	**57.1**	**23.4**

Calculation of hardness in the receiving water:

$$Cr = \frac{QdCd + QsCs}{Qr} = \frac{(2.3205 \text{ cfs})(57.1 \text{ mg/l}) + (13.9 \text{ cfs})(23.4 \text{ mg/l})}{(13.9 \text{ cfs} + 2.3205 \text{ cfs})} = \mathbf{28.22} \text{ mg/l}$$

Where:

Qs = 7Q10 river stream flow upstream of plant = 13.9 cfs
Qd = Design discharge flow from plant = 1.5 MGD = 2.3205 cfs
Qr = Combined stream flow (7Q10 + plant flow) = (13.9 + 2.3205) = 16.2205 cfs
Cs = Upstream hardness concentration = 23.4 mg/l as $CaCo_3$
Cd = Plant discharge hardness concentration = 57.1 mg/l as $CaCo_3$
Cr = Receiving water hardness concentration

Therefore, a hardness of 28.2 mg/l as $CaCo_3$ was used to calculate the water quality criteria for certain metals.

Table 4. Summary of Quaboag River Metals Concentrations Upstream of the Warren WWTP

Date	Upstream Copper, mg/l	Upstream Lead, mg/l	Upstream Nickel, mg/l	Upstream Cadmium, mg/l	Upstream Zinc, mg/l	Upstream Aluminum, mg/l
2/9/09	bdl	bdl	bdl	bdl	0.018	0.061
5/11/09	0.002	bdl	bdl	bdl	0.003	0.098
8/10/09	0.003	bdl	bdl	bdl	0.003	0.033
11/9/09	0.001	bdl	bdl	bdl	0.002	0.044
2/8/10	0.002	bdl	bdl	bdl	0.005	0.081
5/10/10	bdl	bdl	bdl	bdl	0.003	0.059
11/8/10	0.039	bdl	bdl	bdl	0.076	0.055
Average	0.006	bdl	bdl	bdl	0.015	0.055
Median	0.002	bdl	bdl	bdl	0.003	0.059

Note: "bdl" means below detection level.

The following table presents the factors used to determine the acute and chronic total recoverable criteria for each metal:

Table 5. 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	1.0166	-3.9240	0.7409	-4.7190	0.59	0.11
Copper	0.9422	-1.7000	0.8545	-1.702	4.25	3.16
Lead	1.273	-1.46	1.273	-4.705	16.30	0.63
Nickel	0.846	2.255	0.846	0.0584	160.78	17.88
Zinc	0.8473	0.884	0.8473	0.884	40.99	40.99

*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 = design discharge flow from plant = = (1.5 mgd x 1.547) = 2.305 cfs
C_d = effluent metals concentration, in ug/l (95th percentile)
Q_S = stream flow upstream of plant (7Q10 upstream) = 14.3 cfs
C_S = upstream metals concentration, in ug/l (median)
Q_r = combined stream flow (7Q10 + plant flow) = (14.3 + 0.3852) = 14.7 cfs
C_r = resultant in-stream metals 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. 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. 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 as the resultant in-stream concentration (C_r). See Table 6 below for the results of this analysis with respect to aluminum, cadmium, copper, lead, nickel and zinc.

As indicated in Table 6, there is reasonable potential that the discharge of copper will cause or contribute to an exceedance of applicable acute and chronic water quality criterion. Therefore, maximum daily and monthly average copper limits are included in the Draft Permit. Monitoring and reporting of all metals listed in Table 6 will continue to be required as part of the annual WET tests.

Aluminum

The acute and chronic water quality criteria for aluminum are 750 ug/l and 87 ug/l and are expressed in terms of total recoverable metal in the water column. Aluminum criteria are not dependent on the hardness of the receiving water. The reasonable analysis calculations for aluminum indicate there is not a reasonable potential to exceed the water quality criteria, and therefore limits for aluminum are not proposed for the draft permit.

Cadmium

A review of the cadmium data from the facility's WET tests were all reported as non-detect (at or less than 0.5 ug/l, the minimum level) as shown in Attachment C of the fact sheet. Since all of the available data is below the minimum level, and since data reported below the minimum level is unreliable, EPA determined there is no reasonable potential to exceed the cadmium water quality criterion.

Lead

Available lead data from the facility's WET tests are shown in Attachment C of the fact sheet. Since the reasonable potential analysis calculations indicate there is no reasonable potential to exceed the lead water quality criteria, permit limits are not included in the draft permit.

Nickel

Available nickel data from the facility's WET tests are shown in Attachment C of the fact sheet. Since the reasonable potential analysis calculations indicate there is no reasonable potential to exceed the nickel water quality criteria, permit limits are not included in the draft permit.

Zinc

Available zinc data from the facility's WET tests are shown in Attachment C of the fact sheet. Since the reasonable potential analysis calculations indicate there is no reasonable potential to exceed the zinc water quality criteria, permit limits are not included in the draft permit.

Sample Calculations for Copper:

The available instream data was evaluated to determine the background concentration of copper in the Quaboag River upstream of the treatment plant discharge. This data, from the WET test dilution water samples, is shown in Table 4 of this fact sheet.

Acute and Chronic Dissolved Criteria Calculations:

CMC = Acute copper criteria (total recoverable)
= exp{0.9422 [ln 28.1)] - 1.7} = 4.28 ug/l

CCC = Chronic copper criteria (total recoverable)
= exp{0.85452 [ln 28.1)]-1.702} = 3.16 ug/l

Calculation With Background Copper:

$\{(Q_s + Qd) * C_{WQ} - (Qs * Cs)\} / Qd = Cd$

Where:
Q_s = 7Q10 flow of Quaboag River at the point of discharge = 13.9 cfs
Qd = Design flow of the Warren WWTP = (1.5 mgd x 1.547) = 2.305 cfs
C_{WQ} = In-stream water quality criteria = 4.23 ug/l (acute total recoverable criteria)
C_{WQ} = In-stream water quality criteria = 3.15 ug/l (chronic total recoverable criteria)
C_S = In-stream copper concentration located upstream of the discharge = 2 ug/l
Cd = Copper concentration limit for the Warren WWTP

Acute:
{(13.9 + 2.305) * 4.23 – (13.9 * 2)} / 2.305 = 17.8 ug/l total recoverable limit

Chronic:
{(13.9 + 2.305) * 3.15 – (13.9 * 2)} / 2.305 = 10.2 ug/l total recoverable limit

Table 6. Reasonable Potential Table

Metal	Qd	Cd [1] (95th Percentile)	Qs	Cs [2] (Median)	Qr = Qs + Qd	Cr = (QdCd+QsCs) /Qr	Criteria		Reasonable Potential	Limit = (Qr*Criteria-Qs*Cs)/Qd	
	cfs	ug/l	cfs	ug/l	cfs	ug/l	Acute (ug/l)	Chronic (ug/l)	Cr > Criteria	Acute (ug/l)	Chronic (ug/l)
Aluminum	2.3205	135.1	13.9	59	16.2205	69.9	750	87	N	N/A	
Copper		86.827		2.0		14.1	4.23	3.16	Acute and Chronic	17.8	N/A10.2
Lead		0		0		0	16.30	0.63	N	N/A	N/A
Nickel		2.58		0		0.4	160.78	17.88	N	N/A	N/A
Zinc		119.83		3.0		19.7	40.99	40.99	N	N/A	N/A

[1] Data from the 2009-2012 Whole Effluent Toxicity (WET) testing were used to calculate values for aluminum, cadmium, copper, lead, nickel and zinc. Data from 2008-2014 discharge monitoring reports (DMRs) were also used to calculate values for copper (see Attachments A and C).

Median upstream data taken from WET testing on Quaboag River just upstream of the Warren WWTP (see Attachment C).

2

As indicated in the copper calculations above, and in Table 6, the concentrations of copper in the discharge have a reasonable potential to cause or contribute to an exceedance of the applicable water quality criteria. Therefore, copper limits are included in the draft permit. Since the concentration of aluminum, lead, nickel and zinc do not indicate a reasonable potential to cause or contribute to an exceedance of the applicable water quality criteria, limits for these metals are not proposed for the draft permit. Monitoring for metals will continue to be required as part of the annual WET tests.

f. Whole Effluent Toxicity

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The MA SWQS, found at 314 CMR 4.05(5)(e), include the following narrative statements and require that EPA criteria established pursuant to Section 304(a)(1) of the CWA be used as guidance for interpretation of the following narrative criteria:

> *All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife. For pollutants not otherwise listed in 314 CMR 4.00,the National recommended water quality criteria: 2002, EPA 822-r-02-047, November 2002 published by EPA pursuant to Section 304(a) of the Federal Water Pollution Control Act, are the allowable receiving water concentrations for the affected waters, unless the State either establishes a site specific criterion or determines that naturally occurring background concentrations are higher. Where the State determines that naturally occurring background concentrations are higher, those concentrations shall be the allowable receiving water concentrations. The State may establish site specific criteria for toxic pollutants based on site specific considerations. Site-specific limits, human health risk levels and permit limits will be established in accordance with 314 CMR 4.05(5)(e)(1)(2)(3)(4).*

National studies conducted by the EPA have demonstrated that domestic sources, as well as industrial sources, contribute toxic constituents to POTWs. These constituents include metals, chlorinated solvents, aromatic hydrocarbons and others. Based on the potential for toxicity from domestic and industrial contributions, the state narrative water quality criterion, the level of dilution at the discharge location, and in accordance with EPA national and regional policy and 40 CFR § 122.44(d), the draft permit includes a whole effluent acute toxicity (lethal concentration to 50% of the test organisms, or LC_{50}) limitation and a chronic toxicity (no observed effluent concentration, or C-NOEC) limitation. (See also: *Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants*, 49 Fed. Reg. 9016, March 9, 1984, and EPA's TSD.)

The MassDEP's Division of Watershed Management has a current toxics policy which requires toxicity testing for all major dischargers such as the Warren WWTP (*Implementation Policy for the Control of Toxic Pollutants in Surface Waters*, MassDEP 1990). In addition, EPA feels that toxicity testing is required to assure that the synergistic effect of the pollutants in the discharge does not cause toxicity, even though the pollutants may be at low concentrations in the effluent. The inclusion of whole effluent toxicity limitations in the draft permit will assure that the Warren WWTP does not discharge combinations of toxic compounds into the Quaboag River in amounts which would affect aquatic or human life.

Pursuant to EPA Region I Policy, and MassDEP's *Implementation Policy for the Control of Toxic Pollutants in Surface Waters* (February 1990), dischargers having a dilution factor less than 10 are required to conduct acute and chronic toxicity testing four times per year unless there are passing results over an extended period of time. In accordance with the above guidance, the draft permit includes an acute toxicity limit (LC_{50} of $\geq$ 100%) and a chronic toxicity limit (C-NOEC of $\geq$ 14.3 %). The permittee shall conduct the acute and chronic toxicity tests using the daphnid, *Ceriodaphnia dubia* (*C. dubia*), as the test species. Toxicity testing must be performed in accordance with the EPA Region I test procedures and protocols specified in **Attachment B and C** of the draft permit (Freshwater Acute Toxicity Procedure and Protocol and Freshwater Chronic Toxicity Procedure and Protocol), and the tests will be conducted four times a year. The requirements for WET testing recently changed. It has come to EPA Region I's attention that the modified acute toxicity test in the current permit, which is conducted as part of the chronic toxicity test, is not an approved method under 40 CFR Part 136. As of March 2013, the modified acute testing requirement is being replaced by a standalone acute toxicity test. The acute toxicity testing protocol is Attachment B of the draft permit. EPA and the MassDEP may use the results of the toxicity tests and chemical analyses conducted by the permittee, required by the permit, as well as national water quality criteria, state water quality criteria, and any other appropriate information or data, to develop numerical effluent limitations for any pollutants.

The C-NOEC calculations are as follows:

(1/dilution factor * 100) = (1/7.0 * 100) = 14.3 percent

VI. SLUDGE CONDITIONS

Section 405(d) of the Clean Water Act requires that EPA develop technical standards regarding the use and disposal of sewage sludge. On February 19, 1993, EPA promulgated technical standards. These standards are required to be implemented through permits. The conditions in the permit satisfy this requirement.

VII. INFILTRATION/INFLOW (I/I)

Infiltration is groundwater that enters the collection system through physical defects such as cracked pipes or deteriorated joints. Inflow is extraneous flow that enters the collection system through point sources such as roof leaders, yard and area drains, sump pumps, manhole covers, tide gates, and cross connections from storm water systems. Significant I/I in a collection system may displace sanitary flow, reducing the capacity and the efficiency of the treatment works and may cause bypasses of secondary treatment. It greatly increases the potential for sanitary sewer overflows (SSO) in separate systems, and combined sewer overflows (CSO) in combined systems.

The draft permit includes a requirement for the permittee to control infiltration and inflow (I/I) within the sewer collection system it owns and operates. The permittee shall develop an I/I removal program commensurate with the severity of I/I in the collection system. This program may be scaled down in sections of the collection system that have minimal I/I.

VIII. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

The standard permit conditions for "Proper Operation and Maintenance", set forth at 40 CFR §122.41(e), require the proper operation and maintenance of permitted wastewater systems and associated facilities to achieve permit conditions. The requirements at 40 CFR §122.41(d) impose a "duty to mitigate" upon the permittee, which requires that "all reasonable steps be taken to minimize or prevent any discharge violation of the permit which has a reasonable likelihood of adversely affecting human health or the environment". EPA and the MassDEP maintain that an I/I removal program is an integral component to ensuring compliance with the requirements of the permit under the provisions at 40 CFR §122.41(d) and (e).

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.D. and I.E. of the draft permit. These requirements include mapping of the wastewater collection system, preparing and implementing a collection system operation and maintenance plan, reporting of unauthorized discharges including SSOs, maintaining an adequate maintenance staff, performing preventative maintenance, controlling inflow and infiltration to separate sewer collection systems (combined sewers are not subject to I/I requirements) to the extent necessary to prevent SSOs and I/I related effluent violations at the wastewater treatment plant, and maintaining alternate power where necessary. These requirements are included to minimize the occurrence of permit violations that have a reasonable likelihood of adversely affecting human health or the environment.

Several of the requirements in the draft permit are not included in the current permit, including collection system mapping, and preparation of a collection system operation and maintenance plan. EPA has determined that these additional requirements are necessary to ensure the proper operation and maintenance of the collection system and has included schedules for completing these requirements in the draft permit.

IX. ANTIDEGRADATION

No lowering of water quality is allowed, except in accordance with the state's antidegradation policy. All existing uses of the Quaboag River must be protected. This draft permit is being reissued with allowable discharge limits as, or more, stringent than those in the current permit and with the same parameter coverage. There is no change in outfall location. The public is invited to participate in the antidegradation finding through the permit public notice process.

X. ESSENTIAL FISH HABITAT DETERMINATION (EFH)

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et.seq. (1998)), EPA is required to consult with the National Marine Fisheries Services (NMFS) if EPA's action or proposed actions that it funds, permits, or undertakes, "may adversely impact any essential fish habitat," (16 U.S.C. § 1855(b)).

The Amendments broadly define "essential fish habitat" (EFH) as: "waters and substrate necessary to fish for spawning, breeding, or growth to maturity," (16 U.S.C. § 1802(10)). "Adverse impact" means any impact which reduces the quality and/or quantity of EFH (50 CFR § 600.910(a)). Adverse effects may include direct (e.g., contamination or physical

disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific of habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

EFH is only designated for species for which federal fisheries management plans exist (16 U.S.C. § 1855(b)(1)(A)). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999. The Quaboag River has not been designated as an EFH riverine system, and thus EPA and the MassDEP have determined that a formal consultation with NMFS is not required.

XI. ENDANGERED SPECIES ACT (ESA)

Section 7(a) of the Endangered Species Act (ESA) of 1973, as amended (the "Act"), grants authority to and imposes requirements upon Federal agencies regarding threatened or endangered species of fish, wildlife, or plants ("listed species") and habitat of such species that have been designated as critical ("critical habitat").

Section 7(a)(2) of the CWA requires every Federal agency in consultation with and with the assistance of the Secretary of the 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 NMFS administers Section 7 consultations for freshwater species. EPA has reviewed the federal endangered or threatened species of fish and wildlife to determine if any listed species might potentially be impacted by the re-issuance of this NPDES permit. The review revealed that there are no known federally listed threatened or endangered species or their critical habitat within the vicinity of the Warren discharge and, therefore, a formal ESA consultation will not be required for this discharge.

XII. 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 requires the permittee to report monitoring results obtained during each calendar month in the Discharge Monitoring Reports (DMRs) no later than the 15th day of the month following the completed reporting period.

The Draft Permit includes new provisions related to electronic DMR submittals to EPA and the State. The Draft Permit requires that, no later than six months after the effective date of the permit, the permittee submit all DMRs 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 six months from the effective date of the permit), the permittee may either submit monitoring data 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 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 can be found on the EPA Region 1 NetDMR website located at http://www.epa.gov/region1/npdes/netdmr/index.html.

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 learn more about upcoming trainings, please visit the EPA Region 1 NetDMR website http://www.epa.gov/region1/npdes/netdmr/index.html.

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 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.

In most cases, reports required under the permit shall be submitted to EPA as an electronic attachment through NetDMR, subject to the same six month time frame and opt-out provisions as identified for NetDMR. Certain exceptions are provided in the permit such as for providing written notifications required under the Part II Standard Permit Conditions. Once a permittee begins submitting reports to EPA using NetDMR, it will no longer be required to submit hard copies of DMRs or other reports to EPA and will no longer be required to submit hard copies of DMRs to MassDEP. However, permittees must continue to send hard copies of reports other than DMRs to MassDEP until further notice from MassDEP.

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.

XIII. STATE PERMIT CONDITIONS

The NPDES Permit is issued jointly by the U. S. Environmental Protection Agency and the Massachusetts Department of Environmental Protection under federal and state law, respectively. As such, all the terms and conditions of the permit are, therefore, incorporated into and constitute a discharge permit issued by the Director of the Division of Watershed Management pursuant to M.G.L. Chap. 21, §43.

XIV. GENERAL CONDITIONS

The general conditions of the permit are based on 40 CFR §122, Subparts A and D and 40 CFR §124, Subparts A, D, E, and F and are consistent with management requirements common to other permits.

XV. STATE CERTIFICATION REQUIREMENTS

EPA may not issue a permit unless the MassDEP either certifies that the effluent limitations contained in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State Water Quality Standards or waives its right to certify. Regulations governing state certification are set forth in 40 CFR §§124.53 and §124.55. The staff of the MassDEP has reviewed the draft permit and indicated to EPA that the limitations are adequate to protect water quality. EPA-New England has requested permit certification by the State and expects that the draft permit will be certified.

XVI. PUBLIC COMMENT PERMIT, PUBLIC HEARING, AND PROCEDURES FOR FINAL DECISION

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 before the close of the public comment period, to the U.S.EPA, Office of Ecosystem Protection, Att: Janet Deshais, Municipal Permits Unit (OEP06-1), 5 Post Office Square, Suite 100, Boston, MA 02109-3912 or to deshais.janet@epa.gov. Any person, prior to such date, may submit a request in writing to EPA and the state agency for a public hearing to consider the draft permit. Such requests shall state the nature of the issues proposed to be raised in the hearing. 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's Boston office.

Following the close of the comment period, and after a public hearing, if such a 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. Permits may be appealed to the Environmental Appeals Board in the manner described at 40 CFR § 124.19.

XVII. EPA AND MassDEP CONTACTS

Additional information concerning the draft permit may be obtained between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays from:

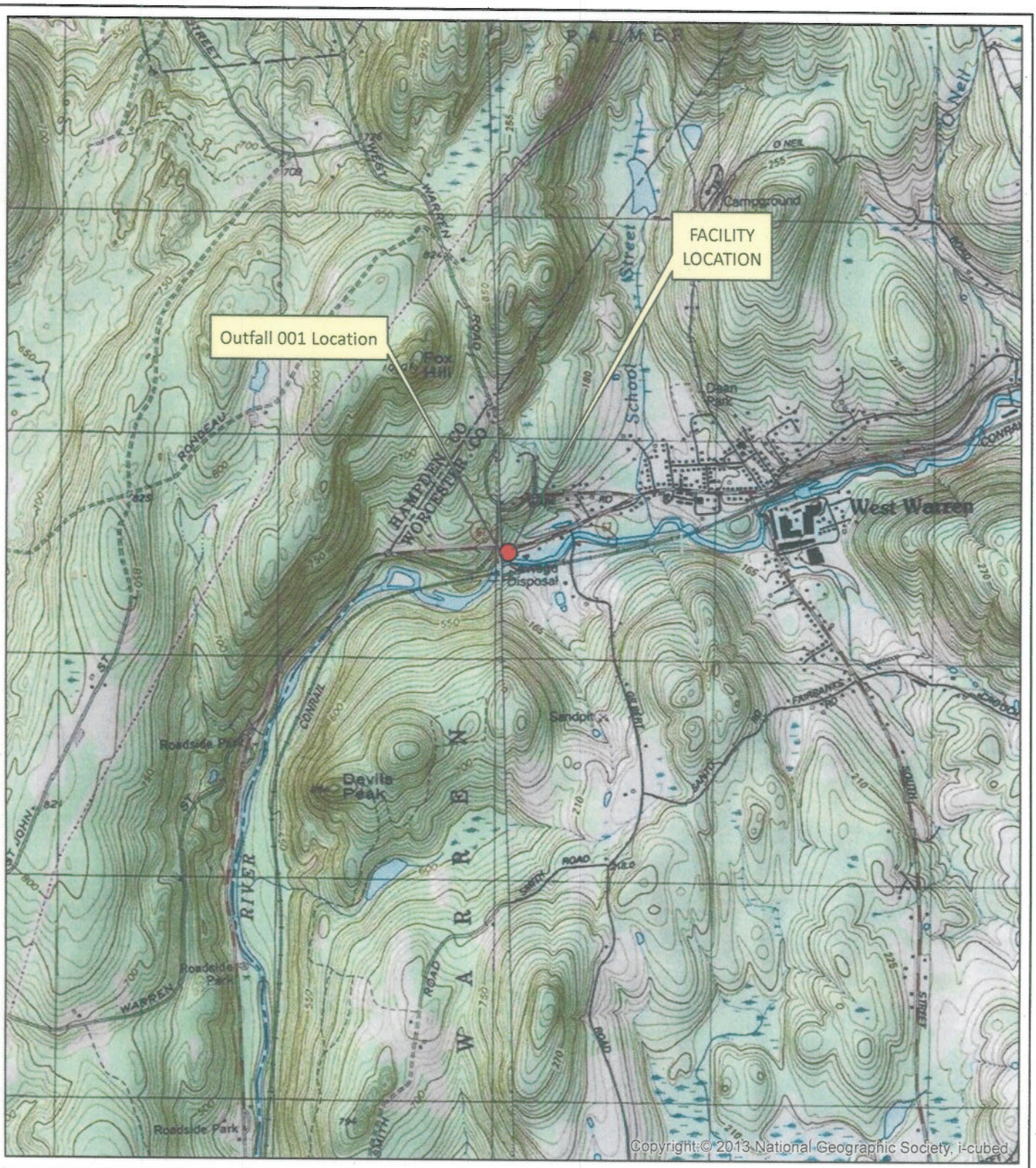
Janet Deshais
Chemical/Environmental Engineer
U.S. Environmental Protection Agency
Office of Ecosystem Protection (OEP06-1)
5 Post Office Square, Suite 100
Boston, MA 02109 – 3912
Telephone: (617) 918-1667
E-mail: deshais.janet@epa.gov

Claire Golden
Environmental Engineer
Bureau of Resource Protection
Department of Environmental Protection
205B Lowell Street
Wilmington, MA 01887
Telephone: (978) 694-3244
E-mail: claire.golden@state.ma.us

Date: _____

Ken Moraff, Director*
Office of Ecosystem Protection
U.S. Environmental Protection Agency

*Please address all comments to Janet Deshais and Claire Golden at the addresses above.



Scale 1 : 25,000

0 500 Meters

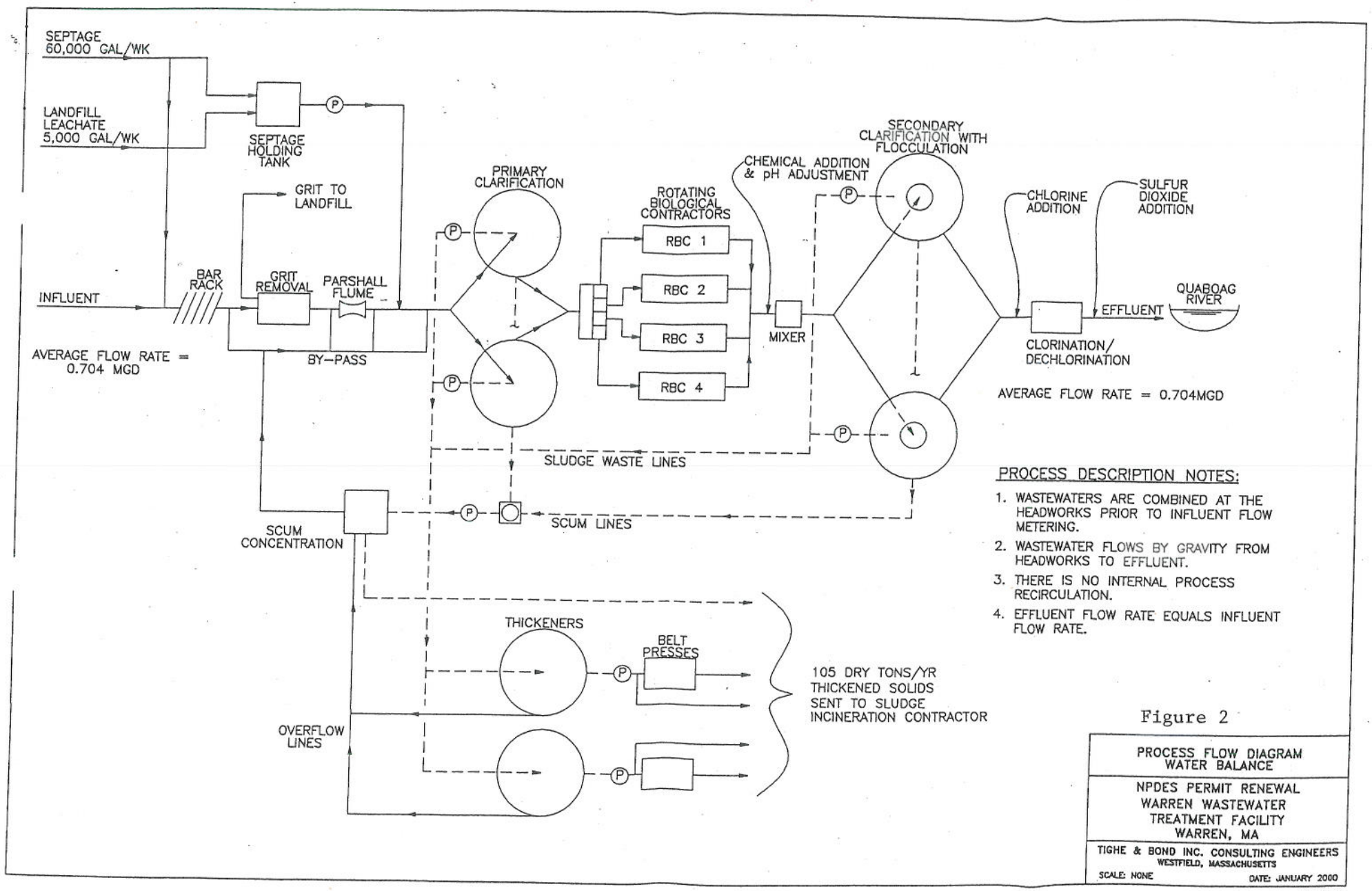
0 1,000 2,000 Feet

Regulated Facilities: EPA

FIGURE 1
Town of Warren
Wastewater Treatment Facility
NPDES Permit Renewal
Warren, MA

EPA

4/7/2014



PROCESS DESCRIPTION NOTES:

1. WASTEWATERS ARE COMBINED AT THE HEADWORKS PRIOR TO INFLUENT FLOW METERING.
2. WASTEWATER FLOWS BY GRAVITY FROM HEADWORKS TO EFFLUENT.
3. THERE IS NO INTERNAL PROCESS RECIRCULATION.
4. EFFLUENT FLOW RATE EQUALS INFLUENT FLOW RATE.

Figure 2

PROCESS FLOW DIAGRAM
WATER BALANCE

NPDES PERMIT RENEWAL
WARREN WASTEWATER
TREATMENT FACILITY
WARREN, MA

TIGHE & BOND INC. CONSULTING ENGINEERS
WESTFIELD, MASSACHUSETTS

SCALE: NONE DATE: JANUARY 2000

W0718\PFD

Attachment A: Warren Wastewater Treatment Plant - Discharge Monitoring Data:

MONITORING PERIOD	Flow (MGD)	Flow (MGD)	BOD, 05 day, 20 C (mg/l)	BOD, 05 day, 20 C (mg/l)	BOD, 05 day, 20 C (mg/l)	BOD, 05 day, 20 C (lbs/d)	Copper, Total (ug/l)
END DATE	Monthly Average	Daily Maximum	Daily Maximum	Weekly Average	Monthly Average	Monthly Average	Monthly Average
1/31/2009	0.348	0.498	12	12	10	26	29
2/28/2009	0.33	0.318	9	9	8	17	33
3/31/2009	0.318	0.395	8	8	8	20	36
4/30/2009	0.313	0.332	22	15	16	37	33
5/31/2009	0.313	0.288	22	22	21	48	34
6/30/2009	0.315	0.342	19	19	16	37	31
7/31/2009	0.32	0.584	17	17	15	44	45
8/31/2009	0.351	0.614	13	16	12	39	34
9/30/2010	0.321	0.408	13	13	11	28	46
10/31/2009	0.321	0.399	16	16	13	32	27
11/30/2009	0.363	0.419	18	18	16	46	36
12/31/2010	0.455	0.53	18	18	16	54	29
1/31/2009	0.327	0.478	19	19	15	42	29
2/28/2010	0.317	0.528	16	16	14	34	30
3/31/2010	0.322	0.692	22	22	15	52	20
4/30/2010	0.344	0.469	21	19	19	53	26
5/31/2010	0.249	0.312	19	21	15	33	25
6/30/2010	0.338	0.246	16	16	15	28	23
7/31/2010	0.324	0.288	18	18	17	27	29.6
8/31/2010	0.308	0.275	16	16	15	25	41
9/30/2010	0.3	0.231	18	14	14	24	37
10/31/2010	0.292	0.287	18	18	16	30	30
11/30/2010	0.284	0.299	18	18	16	35	31
12/31/2010	0.274	0.381	15	18	13	34	33
1/31/2011	0.274	0.357	14	15	13	35	42
2/28/2011	0.276	0.448	14	14	14	38	32
3/31/2011	0.286	0.866	15	15	13	52	26
4/30/2011	0.288	0.513	13	14	13	51	26
5/31/2011	0.298	0.418	13	13	9	29	40
6/30/2011	0.316	0.387	10	10	8	23	23
7/31/2011	0.316	0.331	13	13	11	28	24
8/31/2011	0.329	1.06	8	9	6	19	30
9/30/2011	0.349	1.026	11	11	9	31	34
10/31/2011	0.365	0.512	12	12	11	41	34

Attachment A, Continued;

MONITORING	Flow (MGD)	Flow (MGD)	BOD (mg/l)	BOD (mg/l)	BOD (mg/l)	BOD (lbs/day)	Copper, Total (ug/l)
END DATE	Monthly Average	Daily Maximum	Daily Maximum	Weekly Average	Monthly Average	Monthly Average	Monthly Average
11/30/2011	0.568	0.365	12	12	12	47	33
12/31/2011	0.397	0.705	15	15	15	61	39
1/31/2012	0.404	0.452	15	15	14	47	49
2/29/2012	0.408	0.414	15	15	14	46	38
3/31/2012	0.392	0.438	16	16	16	41	43
4/30/2012	0.397	0.339	17	17	15	36	50
5/31/2012	0.375	0.298	17	17	16	33	37
6/30/2012	0.397	0.3	12	12	11	21	32
7/31/2012	0.358	0.273	12	12	11	18	30
8/31/2012	0.347	0.327	14	14	12	22	36
9/30/2012	0.327	0.257	15	15	14	24	24
10/31/2012	0.312	0.359	16	16	14	29	40
11/30/2012	0.3	0.359	15	13	13	37	36
12/31/2012	0.287	0.414	14	15	12	35	49
1/31/2013	0.284	0.426	14	14	14	43	39
2/29/2013	0.283	0.558	15	15	14	48	52
3/31/2013	0.289	0.471	14	15	13	42	46
4/30/2013	0.291	0.36	15	15	14	36	42
5/31/2013	0.293	0.371	14	14	13	28	54
6/30/2013	0.306	0.576	11	11	10	29	37
7/31/2013	0.311	0.326	12	12	11	25	39
8/31/2013	0.312	0.287	11	11	11	20	42
9/30/2013	0.287	0.267	12	12	12	24	35
10/31/2013	0.314	0.265	15	14	13	26	56
11/30/2013	0.306	0.341	18	18	17	33	56
12/31/2013	0.295	0.374	21	21	17	40	51
1/31/2014	0.302	0.403	14	14	12	34	39
2000 Permit	1.5	Report Only	Report Only	45.00	30.00	375.00	22.00
Minimum	0.249	0.231	8.00	8.00	6.00	17.00	0.33
Maximum	0.57	1.06	22.00	45.00	30.00	375.00	56.00
Average	0.33	0.42	15.03	14.98	13.33	34.70	35.64
Standard Deviation	0.05	0.17	3.28	3.11	2.78	10.35	9.78
# Measurements	60.00	60.00	60.00	60.00	60.00	60.00	60.00
# Exceeds Limits	0	0.00	0.00	0	0	0	59

Attachment A, Continued;

MONITORING PERIOD	pH (s.u.)	pH (s.u.)	Fecal Coliform, 400/100mL	Fecal Coliform, 200/100mL	Total Residual Chlorine (ug/l)	Total Residual Chlorine (ug/l)	Total Phosphorus (mg/l)
END DATE	Minimum	Maximum	Daily Maximum	Monthly Average	Daily Maximm	Monthly Average	Monthly Average
1/31/2009	7.2	7.8					
2/28/2009	7.1	7.5					
3/31/2009	7	7.4					
4/30/2009	5.8	7.3					3.6
5/31/2009	5.6	7	148	14.3	0	0	4.6
6/30/2009	5.8	7	0	0	0	0	4.6
7/31/2009	6	6.4	4	2	0	0	2.9
8/31/2009	5.9	6.6	19	11	0	0	3.4
9/30/2010	5.9	6.7	17	2	0	0	5.1
10/31/2009	5.8	6.4					4.7
11/30/2009	5.8	6.3					
12/31/2010	5.9	7.2					
1/31/2009	6	6.4					
2/28/2010	6	6.3					
3/31/2010	5.9	6.9					
4/30/2010	6.3	7.2					2.5
5/31/2010	5.9	6.4	27	12	0	0	2.1
6/30/2010	5.9	6.2	141	7	0	0	4.3
7/31/2010	5.8	7	72	26	0	0	5.3
8/31/2010	6.3	6.7	4	2	0	0	5.7
9/30/2010	6	6.6	51	3.5	0	0	4.3
10/31/2010	6	6.6					2
11/30/2010	6.1	6.6					
12/31/2010	5.8	6.1					
1/31/2011	5.9	6.2					
2/28/2011	5.7	6.2					
3/31/2011	5.8	6.6					
4/30/2011	5.9	6.3					0.64
5/31/2011	6.1	6.4	3	1.3	0	0	1.9
6/30/2011	6.2	6.6	3	1.2	0	0	1.9
7/31/2011	6	6.5	11	3	0	0	1.9
8/31/2011	6	6.5	52	2.2	90	7.1	2.6
9/30/2011	5.7	6.6	5	1.5	0	0	2.1
10/31/2011	5.9	6.1					1.6

Attachment A, Continued;

MONITORING	pH (s.u.)	pH (s.u.)	Fecal Coliform	Fecal Coliform	Total Residual Chlorine	Total Residual Chlorine	Total Phosphorus (mg/l)
END DATE	Minimum	Maximum	Daily Maximum	Monthly Average	Daily Max (ug/l)	Monthly Ave (ug/l)	Monthly Ave
11/30/2011	5.5	6.2					
12/31/2011	5.7	6					
1/31/2012	5.6	5.7					
2/29/2012	5.4	5.8					
3/31/2012	5.5	5.8					
4/30/2012	5.5	5.9					2
5/31/2012	5.6	6.1	181	19	0	0	2.3
6/30/2012	5.8	6.3	20	5.98	0	0	1.6
7/31/2012	5.9	6.4	116	69.9	0	0	2
8/31/2012	5.8	6.2	81	6.5	0	0	2.4
9/30/2012	5.6	6.2	24	5.4	0	0	4.8
10/31/2012	5.8	6.2					1.8
11/30/2012	5.6	6.2					
12/31/2012	5.8	6.2					
1/31/2013	5.6	6.1					
2/29/2013	5.8	6.1					
3/31/2013	5.8	7					
4/30/2013	5.8	6.8					5.4
5/31/2013	5.7	6.4	15	3	0	0	5.2
6/30/2013	5.6	6.6	6	2	90	10	3.8
7/31/2013	5.4	6.1	109	9.6	0	0	3.7
8/31/2013	5.6	6.4	55	5.5	0	0	4.8
9/30/2013	5.6	6	64	5.4	0	0	5.3
10/31/2013	5.7	6.1					5.6
11/30/2013	5.6	6.3					
12/31/2013	5.8	6.4					
1/31/2014	5.6	6.4					
2000 Permit	>6.5	<8.3	Report Only	200.00	146.00	85.00	Report Only
Minimum	5.40	5.70	0.00	0.00	0.00	0.00	0.64
Maximum	7.20	7.80	181.00	69.90	90.00	10.00	5.70
Average	5.86	6.47	49.12	8.85	7.20	0.68	3.38
Standard Deviation	0.34	0.43	52.66	14.14	24.92	2.40	1.48
# Measurements	60.00	60.00	25.00	25.00	25.00	25.00	35.00
# Exceeds Limits	58	0	0.00	0	0	0	0.00

Attachment A, Continued;

MONITORING PERIOD	Total Suspended Solids (TSS)	Total Suspended Solids (TSS) (mg/l)	Total Suspended Solids (TSS)	LC50, Acute, Ceriodaphnia (%)	C-NOEC, Chronic, Ceriodaphnia (%)	Nitrite + Nitrate, Total, mg/l	Nitrite + Nitrate, Total, lbs/d
END DATE	Daily Max (mg/l)	Weekly Ave (mg/l)	Monthly Ave (mg/l)	Daily Minimum	Daily Minimum	Monthly Average	Monthly Average
1/31/2009	9	11	8			10	38.1
2/28/2009	7	7	7	100	100	9.9	19.7
3/31/2009	8	8	7			11	26.1
4/30/2009	16	12	11			10	25.6
5/31/2009	15	16	10	100	50	17	39.8
6/30/2009	9	9	7			13	20.2
7/31/2009	11	9	9			14	36.8
8/31/2009	11	11	10	100	100	14	49.2
9/30/2010	11	11	8			16	40
10/31/2009	8	8	7			24	62.4
11/30/2009	10	10	8	100	100	33	88.9
12/31/2010	9	9	6			28	96.9
1/31/2009	8	8	7			28	105.8
2/28/2010	10	10	7	100	100	22	53.6
3/31/2010	9	9	8			22	63.9
4/30/2010	9	9	9			5.6	18.3
5/31/2010	7	9	6	100	100	22	50.1
6/30/2010	8	8	6			24	45.4
7/31/2010	8	8	7			24	34.8
8/31/2010	11	11	10	100	100	19	27.9
9/30/2010	19	11	12			19	32.8
10/31/2010	14	19	12			15	28.6
11/30/2010	13	13	10	100	100	13	24.7
12/31/2010	10	13	10			18	42.6
1/31/2011	12	12	10			18	45.3
2/28/2011	12	12	11	100	100	21	60.2
3/31/2011	14	14	12			15	50.4
4/30/2011	16	16	12			16	50
5/31/2011	11	11	7	100	100	12	36.7
6/30/2011	7	7	5			17	44.8
7/31/2011	7	7	6			17	45.1
8/31/2011	6	5	4	100	100	12	36.1
9/30/2011	8	8	7			15	76.1
10/31/2011	7	7	6			21	65.85

Attachment A, Continued;

MONITORING	TSS, mg/l	TSS, mg/l	TSS, mg/l	LC50, Acute (%)	NOEC, Chronic (%)	Nitrite + Nitrate, Total, mg/l	Nitrite + Nitrate, Total, lbs/d
END DATE	Daily Maximum	Weekly Average	Monthly Average			Monthly Average	Monthly Average
11/30/2011	10	10	8	100	100	20	81.9
12/31/2011	13	13	12			18	96.2
1/31/2012	11	11	10			20	68.6
2/29/2012	11	10	10	100	100	22	74.9
3/31/2012	14	14	13			0.24	84.7
4/30/2012	11	11	9			26	61.8
5/31/2012	11	10	10	100	100	25	54.21
6/30/2012	9	15	7			17	37.86
7/31/2012	8	8	7			15	25.5
8/31/2012	10	10	8	100	100	20	30.9
9/30/2012	11	11	10			16	29.2
10/31/2012	16	16	9			27	44.81
11/30/2012	8	8	7	100	100	18	51.9
12/31/2012	10	10	9			20	47.2
1/31/2013	14	10	10			15	48.9
2/29/2013	13	14	12	100	50	18	53.4
3/31/2013	14	14	13			14	38.8
4/30/2013	15	15	13			18	53.3
5/31/2013	16	16	11	100	100	17	39.7
6/30/2013	9	9	8			15	38.3
7/31/2013	11	11	9			12	28.4
8/31/2013	7	8	7	100	100	9.5	18.8
9/30/2013	8	8	7			8.8	16.4
10/31/2013	9	9	8			17	34.9
11/30/2013	13	13	12	100	13	15	25.6
12/31/2013	10	10	10			15	34.2
1/31/2014	9	9	8			14	39.7
2000 Permit	Report Only	45.00	30.00	100.00	13.00	Report Only	Report Only
Minimum	6.00	5.00	4.00	4.00	13.00	0.24	16.40
Maximum	19.00	45.00	19.00	100.00	100.00	33.00	105.80
Average	10.67	10.67	9.75	31.35	90.65	17.18	46.60
Standard Deviation	2.88	2.83	2.18	0.00	23.86	5.73	20.76
# Measurements	60.00	60.00	60.00	20.00	20.00	60.00	60.00
# Exceeds Limits	0.00	0	0	0	0	0.00	0.00

Attachment A, Continued;

MONITORING PERIOD	Nitrogen, Kjeldahl, Total, mg/l	Nitrogen, Kjeldahl, Total, lbs/d	TKN + NO2 + NO3, Total, mg/l	TKN + NO2 + NO3, Total, lbs/d	Nitrogen, Kjeldahl, Total, mg/l	Nitrogen, Kjeldahl, Total, mg/l
END DATE	Monthly Average	Monthly Average	Monthly Average	Monthly Average	Mon Ave (summer)	Mon Ave (Winter)
1/31/2009	14	53.4	14	14		14
2/28/2009	21	41.9	21	21		21
3/31/2009	12	28.5	12	12		12
4/30/2009	12	30.7	12	12		12
5/31/2009	6	14.1	6	6	6	
6/30/2009	8.2	12.7	8.2	8.2	8.2	
7/31/2009	1.4	3.7	1.4	1.4	1.4	
8/31/2009	1.6	5.6	1.6	1.6	1.6	
9/30/2010	2.7	6.8	2.7	2.7	2.7	
10/31/2009	2.2	5.7	2.2	2.2	2.2	
11/30/2009	1.4	3.8	1.4	1.4		1.4
12/31/2010	2.8	9.7	2.8	2.8		2.8
1/31/2009	35	13.2	35	35		35
2/28/2010	3.8	9.3	3.8	3.8		3.8
3/31/2010	2.4	6.7	2.4	2.4		2.4
4/30/2010	15	49	15	15		15
5/31/2010	1.6	3.6	1.6	1.6	1.6	
6/30/2010	2.5	4.7	2.5	2.5	2.5	
7/31/2010	1.1	1.6	1.1	1.1	1.1	
8/31/2010	1.9	2.8	1.9	1.9	1.9	
9/30/2010	0	0	0	0	0	
10/31/2010	2.2	4.2	2.2	2.2	2.2	
11/30/2010	1.1	2.1	1.1	1.1		1.1
12/31/2010	0	0	0	0		0
1/31/2011	3.7	9.3	3.7	3.7		3.7
2/28/2011	4.3	12.3	4.3	4.3		4.3
3/31/2011	4	13.4	4	4		4
4/30/2011	2.4	7.5	2.4	2.4		2.4
5/31/2011	3.3	10.1	3.3	3.3	3.3	
6/30/2011	0	0	0	0	0	
7/31/2011	1.9	5	1.9	1.9	1.9	
8/31/2011	1.2	3.6	1.2	1.2	1.2	
9/30/2011	2.1	10.6	2.1	2.1	2.1	
10/31/2011	3.6	11.3	3.6	3.6	3.6	

Attachment A, Continued;

MONITORING	Nitrogen Kjeldahl, mg/l	Nitrogen Kjeldahl, lbs/d	TKN + NO2 + NO3, Total, mg/l	TKN + NO2 + NO3, Total, lbs/d	Nitrogen, Kjeldahl, Total, mg/l	Nitrogen, Kjeldahl, Total, mg/l
END DATE	Monthly Average	Monthly Average	Monthly Average	Monthly Average	Monthly Ave (Summer)	Monthly Ave (Winter)
11/30/2011	0	0	0	0		0
12/31/2011	1.7	9.1	1.7	1.7		1.7
1/31/2012	5.9	220.2	5.9	5.9		5.9
2/29/2012	4	13.6	4	4		4
3/31/2012	3.9	13.8	3.9	3.9		3.9
4/30/2012	4.6	10.9	4.6	4.6		4.6
5/31/2012	4.6	110	4.6	4.6	4.6	
6/30/2012	2	4.45	2	2	2	
7/31/2012	2.4	4.1	2.4	2.4	2.4	
8/31/2012	3.2	4.9	3.2	3.2	3.2	
9/30/2012	1.6	2.9	1.6	1.6	1.6	
10/31/2012	4.3	7.14	4.3	4.3	4.3	
11/30/2012	2.9	8.4	2.9	2.9		2.9
12/31/2012	4.9	11.6	4.9	4.9		4.9
1/31/2013	4	13	4	4		4
2/29/2013	5.4	16	5.4	5.4		5.4
3/31/2013	5.4	15	5.4	5.4		5.4
4/30/2013	3.7	11	3.7	3.7		3.7
5/31/2013	5	11.7	5	5	5	
6/30/2013	1.7	4.3	1.7	1.7	1.7	
7/31/2013	3.4	8.1	3.4	3.4	3.4	
8/31/2013	1.9	3.8	1.9	1.9	1.9	
9/30/2013	22	4.1	22	22	22	
10/31/2013	2.9	5.9	2.9	2.9	2.9	
11/30/2013	4	6.8	4	4		4
12/31/2013	5.5	12.5	5.5	5.5		5.5
1/31/2014	4.7	13.3	4.7	4.7		4.7
2000 Permit	Report Only	Report Only	Report Only	Report Only	Report Only	Report Only
Minimum	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	35.00	220.20	35.00	35.00	22.00	35.00
Average	4.82	15.47	4.82	4.82	3.28	6.31
Standard Deviation	5.90	31.34	5.90	5.90	3.92	7.09
# Measurements	60.00	60.00	60.00	60.00	30.00	31.00
# Exceeds Limits	0.00	0.00	0.00	0.00	0.00	0.00

ATTACHMENT B
QUABOAG RIVER SAMPLING
STATE MONITORING PROGRAM
PHOSPHORUS SAMPLING DATA
NPDES Permit No. MA0101567
WARREN, MA

The following sampling data was collected from the Quaboag River by the Massachusetts Department of Environmental Protection upstream and downstream from the Warren Wastewater Treatment Plant. Specifically, the "Gilbert Road" sampling location is approximately one quarter river mile upstream of the Warren WWTP's discharge, and the "East off Rt. 67 on Palmer/Warren border" sampling location is approximately one half river mile downstream from the Warren WWTP's discharge.

Quaboag River, Gilbert Road, Warren – W1011 – Total Phosphorus

DATE	SAMPLING LOCATION	TOTAL PHOSPHORUS (mg/l)
5/20/08	Gilbert Road	0.031
6/17/08	Gilbert Road	0.037
7/22/08	Gilbert Road	0.034
8/19/08	Gilbert Road	0.049
9/23/08	Gilbert Road	0.034

Quaboag River, East off Rt. 67 on Palmer/Warren border, W1868 – Total Phosphorus

DATE	SAMPLING LOCATION	TOTAL PHOSPHORUS (mg/l)
5/20/08	Rt. 87, Palmer/Warren border	0.038
6/17/08	Rt. 87, Palmer/Warren border	0.047
7/22/08	Rt. 87, Palmer/Warren border	0.049
8/19/08	Rt. 87, Palmer/Warren border	0.053
9/23/08	Rt. 87, Palmer/Warren border	0.038

ATTACHMENT C
WHOLE EFFLUENT TOXICITY (WET)
MONITORING DATA
NPDES Permit No. MA0101567
Warren, MA

Whole Effluent Toxicity (WET) – Effluent Chemistry Data, mg/l:

Parameter	2/11/08	5/11/08	8/11/08	11/10/08	2/09/09	5/11/09	8/10/09	11/09/09
Aluminum	0.056	0.185	0.063	0.06	0.025	0.053	0.053	0.079
Copper	0.041	0.053	0.038	0.045	0.075	0.043	0.036	0.039
Lead	0.0014	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Zinc	0.068	0.1	0.078	0.08	0.062	0.107	0.088	0.113
Nickel	0.0018	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Cadmium	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl

Parameter	2/08/10	5/10/10
Aluminum	0.04	0.033
Copper	0.029	0.028
Lead	bdl	bdl
Zinc	0.056	0.057
Nickel	0.002	0.003
Cadmium	bdl	bdl

Whole Effluent Toxicity (WET) – Instream Chemistry Data, mg/l: (upstream of the Warren WWTF):

Parameter	2/11/08	5/11/08	8/11/08	11/10/08	2/09/09	5/11/09	8/10/09	11/09/09
Aluminum	0.12	0.745	0.087	0.045	0.061	0.098	0.033	0.044
Copper	0.0018	0.007	0.006	0.001	bdl	0.002	0.003	0.001
Lead	0.0006	0.002	bdl	bdl	bdl	bdl	bdl	bdl
Zinc	0.007	0.261	0.003	0.004	0.018	0.003	0.003	0.002
Nickel	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
Cadmium	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl

Parameter	2/08/10	5/10/10
Aluminum	0.081	0.059
Copper	0.002	bdl
Lead	bdl	bdl
Zinc	0.005	0.003
Nickel	bdl	bdl
Cadmium	bdl	bdl

ATTACHMENT C, Continued;

Average and Median Instream Chemistry WET Data, mg/l (located upstream of the Warren WWTF):

Parameter	Average (2/09/09 – 11/08/10)	Median (2/09/09 – 11/08/10)
Aluminum	0.055	0.059
Copper	0.006	0.002
Lead	bdl	bdl
Zinc	0.015	0.003
Nickel	bdl	bdl
Cadmium	bdl	bdl

Note: "bdl" means below detection level. When calculating the average values above, half the quantifiable limit was used for "bdl" values.

Exhibit A
Nitrogen Loads

NH, VT, MA Discharges to Connecticut River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)[1]	AVERAGE FLOW (MGD)[2]	TOTAL NITROGEN (mg/l)[3]	TOTAL NITROGEN - Existing Flow(lbs/day)[4]
NEW HAMPSHIRE					
Bethlehem Village District	NH0100501	0.340	0.220	19.600	35.962
Charlestown WWTF	NH0100765	1.100	0.360	19.600	58.847
Claremont WWTF	NH0101257	3.890	1.610	14.060	188.789
Colebrook WWTF	NH0100315	0.450	0.230	19.600	37.597
Groveton WWTF	NH0100226	0.370	0.290	19.600	47.405
Hanover WWTF	NH0100099	2.300	1.440	30.000	360.288
Hinsdale WWTF	NH0100382	0.300	0.300	19.600	49.039
Keene WWTF	NH0100790	6.000	3.910	12.700	414.139
Lancaster POTW	NH0100145	1.200	1.080	8.860	79.804
Lebanon WWTF	NH0100366	3.180	1.980	19.060	314.742
Lisbon WWTF	NH0100421	0.320	0.146	19.600	23.866
Littleton WWTF	NH0100153	1.500	0.880	10.060	73.832
Newport WWTF	NH0100200	1.300	0.700	19.600	114.425
Northumberland Village WPCF	NH0101206	0.060	0.060	19.600	9.808
Sunapee WPCF	NH0100544	0.640	0.380	15.500	49.123
Swanzey WWTP	NH0101150	0.167	0.090	19.600	14.712
Troy WWTF	NH0101052	0.265	0.060	19.600	9.808
Wasau Paper (industrial facility)	NH0001562		5.300	4.400	194.489
Whitefield WWTF	NH0100510	0.185	0.140	19.600	22.885
Winchester WWTP	NH0100404	0.280	0.240	19.600	39.231
Woodsville Fire District	NH0100978	0.330	0.230	16.060	30.806
New Hampshire Total		**24.177**	**19.646**		**2169.596**
VERMONT					
Bellows Falls	VT0100013	1.405	0.610	21.060	107.141
Bethel	VT0100048	0.125	0.120	19.600	19.616
Bradford	VT0100803	0.145	0.140	19.600	22.885
Brattleboro	VT0100064	3.005	1.640	20.060	274.373
Bridgewater	VT0100846	0.045	0.040	19.600	6.539
Canaan	VT0100625	0.185	0.180	19.600	29.424
Cavendish	VT0100862	0.155	0.150	19.600	24.520
Chelsea	VT0100943	0.065	0.060	19.600	9.808
Chester	VT0100081	0.185	0.180	19.600	29.424
Danville	VT0100633	0.065	0.060	19.600	9.808
Lunenberg	VT0101061	0.085	0.080	19.600	13.077
Hartford	VT0100978	0.305	0.300	19.600	49.039
Ludlow	VT0100145	0.705	0.360	15.500	46.537
Lyndon	VT0100595	0.755	0.750	19.600	122.598
Putney	VT0100277	0.085	0.080	19.600	13.077
Randolph	VT0100285	0.405	0.400	19.600	65.386
Readsboro	VT0100731	0.755	0.750	19.600	122.598
Royalton	VT0100854	0.075	0.070	19.600	11.442

St. Johnsbury	VT0100579	1.600	1.140	12.060	114.662

NH, VT, MA Discharges to Connecticut River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)[1]	AVERAGE FLOW (MGD)[2]	TOTAL NITROGEN (mg/l)[3]	TOTAL NITROGEN - Existing Flow(lbs/day)[4]
Saxtons River	VT0100609	0.105	0.100	19.600	16.346
Sherburne Fire Dist.	VT0101141	0.305	0.300	19.600	49.039
Woodstock WWTP	VT0100749	0.055	0.050	19.600	8.173
Springfield	VT0100374	2.200	1.250	12.060	125.726
Hartford	VT0101010	1.225	0.970	30.060	243.179
Whitingham	VT0101109	0.015	0.010	19.600	1.635
Whitingham Jacksonville	VT0101044	0.055	0.050	19.600	8.173
Cold Brook Fire Dist.	VT0101214	0.055	0.050	19.600	8.173
Wilmington	VT0100706	0.145	0.140	19.600	22.885
Windsor	VT0100919	1.135	0.450	19.600	73.559
Windsor-Weston	VT0100447	0.025	0.020	19.600	3.269
Woodstock WTP	VT0100757	0.455	0.450	19.600	73.559
Woodstock-Taftsville	VT0100765	0.015	0.010	19.600	1.635
Vermont Totals		**15.940**	**10.960**		**1727.302**
MASSACHUSETTS					
Amherst	MA0100218	7.100	4.280	14.100	503.302
Athol	MA0100005	1.750	1.390	17.200	199.393
Barre	MA0103152	0.300	0.290	26.400	63.851
Belchertown	MA0102148	1.000	0.410	12.700	43.426
Charlemont	MA0103101	0.050	0.030	19.600	4.904
Chicopee	MA0101508	15.500	10.000	19.400	1617.960
Easthampton	MA0101478	3.800	3.020	19.600	493.661
Erving #1	MA0101516	1.020	0.320	29.300	78.196
Erving #2	MA0101052	2.700	1.800	3.200	48.038
Erving #3	MA0102776	0.010	0.010	19.600	1.635
Gardner	MA0100994	5.000	3.700	14.600	450.527
Greenfield	MA0101214	3.200	3.770	13.600	427.608
Hadley	MA0100099	0.540	0.320	25.900	69.122
Hardwick G	MA0100102	0.230	0.140	14.600	17.047
Hardwick W	MA0102431	0.040	0.010	12.300	1.026
Hatfield	MA0101290	0.500	0.220	15.600	28.623
Holyoke	MA0101630	17.500	9.700	8.600	695.723
Huntington	MA0101265	0.200	0.120	19.600	19.616
Monroe	MA0100188	0.020	0.010	19.600	1.635
Montague	MA0100137	1.830	1.600	12.900	172.138
N Brookfield	MA0101061	0.760	0.620	23.100	119.445
Northampton	MA0101818	8.600	4.400	22.100	810.982
Northfield	MA0100200	0.280	0.240	16.800	33.627
Northfield School	MA0032573	0.450	0.100	19.600	16.346
Old Deerfield	MA0101940	0.250	0.180	9.200	13.811
Orange	MA0101257	1.100	1.200	8.600	86.069
Palmer	MA0101168	5.600	2.400	18.800	376.301
Royalston	MA0100161	0.040	0.070	19.600	11.442
Russell	MA0100960	0.240	0.160	19.600	26.154
Shelburne Falls	MA0101044	0.250	0.220	16.900	31.008
South Deerfield	MA0101648	0.850	0.700	7.900	46.120
South Hadley	MA0100455	4.200	3.300	28.800	792.634
Spencer	MA0100919	1.080	0.560	13.600	63.517
Springfield	MA0103331	67.000	45.400	4.300	1628.135

Sunderland	MA0101079	0.500	0.190	8.700	13.786
Templeton	MA0100340	2.800	0.400	26.400	88.070

NH, VT, MA Discharges to Connecticut River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)[1]	AVERAGE FLOW (MGD)[2]	TOTAL NITROGEN (mg/l)[3]	TOTAL NITROGEN - Existing Flow(lbs/day)[4]
Ware	MA0100889	1.000	0.740	9.400	58.013
Warren	MA0101567	1.500	0.530	14.100	62.325
Westfield	MA0101800	6.100	3.780	20.400	643.114
Winchendon	MA0100862	1.100	0.610	15.500	78.855
Woronoco Village	MA0103233	0.020	0.010	19.600	1.635
Massachusetts Totals		**166.010**	**106.950**		**9938.820**

1. Design flow – typically included as a permit limit in MA and VT but not in NH.
2. Average discharge flow for 2004 – 2005. If no data in PCS, average flow was assumed to equal design flow.
3. Total nitrogen value based on effluent monitoring data. If no effluent monitoring data, total nitrogen value assumed to equal average of MA secondary treatment facilities (19.6 mg/l), average of MA seasonal nitrification facilities (15.5 mg/l), or average of MA year round nitrification facilities (12.7 mg/l). Average total nitrogen values based on a review of 27 MA facilities with effluent monitoring data. Facility is assumed to be a secondary treatment facility unless ammonia data is available and indicates some level of nitrification.
4. Current total nitrogen load.

Total Nitrogen Load = 13,836 lbs/day
MA (41 facilities) = 9,939 lbs/day (72%)
VT (32 facilities) = 1,727 lbs/day (12%)
NH (21 facilities) = 2170 lbs/day (16%)
TMDL Baseline Load = 21,672 lbs/day

TMDL Allocation = 16,254 lbs/day (25% reduction)

MA Discharges to Housatonic River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)[1]	AVERAGE FLOW (MGD)[2]	TOTAL NITROGEN (mg/l)[3]	TOTAL NITROGEN - Existing Flow(lbs/day)[4]
MASSACHUSETTS					
Crane	MA0000671		3.100	8.200	212.003
Great Barrington	MA0101524	3.200	2.600	17.000	368.628
Lee	MA0100153	1.000	0.870	14.500	105.209
Lenox	MA0100935	1.190	0.790	11.800	77.745
Mead Laurel Mill	MA0001716		1.500	6.400	80.064
Mead Willow Mill	MA0001848		1.100	4.600	42.200
Pittsfield	MA0101681	17.000	12.000	12.400	1240.992
Stockbridge	MA0101087	0.300	0.240	11.100	22.218
West Stockbridge	MA0103110	0.076	0.018	15.500	2.327
Massachusetts Totals			**22.218**		**2151.386**

1. Design flow – typically included as a permit limit in MA and VT but not in NH.
2. Average discharge flow for 2004 – 2005. If no data in PCS, average flow was assumed to equal design flow.
3. Total nitrogen value based on effluent monitoring data. If no effluent monitoring data, total nitrogen value assumed to equal average of MA secondary treatment facilities (19.6 mg/l), average of MA seasonal nitrification facilities (15.5 mg/l), or average of MA year round nitrification facilities (12.7 mg/l). Average total nitrogen values based on a review of 27 MA facilities with effluent monitoring data. Facility is assumed to be a secondary treatment facility unless ammonia data is available and indicates some level of nitrification.
4. Current total nitrogen load.

Total Nitrogen Load = 2151.386 lbs/day

TMDL Baseline Load = 3,286 lbs/day
TMDL Allocation = 2,464 lbs/day (25% reduction)

MA Discharges to Thames River Watershed

FACILITY NAME	PERMIT NUMBER	DESIGN FLOW (MGD)[1]	AVERAGE FLOW (MGD)[2]	TOTAL NITROGEN (mg/l)[3]	TOTAL NITROGEN - Existing Flow(lbs/day)[4]
MASSACHUSETTS					
Charlton	MA0101141	0.450	0.200	12.700	21.184
Leicester	MA0101796	0.350	0.290	15.500	37.488
Oxford	MA0100170	0.500	0.230	15.500	29.732
Southbridge	MA0100901	3.770	2.900	15.500	374.883
Sturbridge	MA0100421	0.750	0.600	10.400	52.042
Webster	MA0100439	6.000	3.440	17.400	499.199
Massachusetts Totals		**11.820**	**7.660**		**1014.528**

1. Design flow – typically included as a permit limit in MA and VT but not in NH.
2. Average discharge flow for 2004 – 2005. If no data in PCS, average flow was assumed to equal design flow.
3. Total nitrogen value based on effluent monitoring data. If no effluent monitoring data, total nitrogen value assumed to equal average of MA secondary treatment facilities (19.6 mg/l), average of MA seasonal nitrification facilities (15.5 mg/l), or average of MA year round nitrification facilities (12.7 mg/l). Average total nitrogen values based on a review of 27 MA facilities with effluent monitoring data. Facility is assumed to be a secondary treatment facility unless ammonia data is available and indicates some level of nitrification.
4. Current total nitrogen load.

Total Nitrogen Load = 1014.528 lbs/day

TMDL Baseline Load = 1,253 lbs/day

TMDL Allocation = 939 lbs/day (25% reduction)

Response to Public Comments

In accordance with the provisions of 40 C.F.R. §124.17, this document presents EPA's responses to comments received on the draft NPDES Permit MA0101567. The response to comments explains and supports the EPA determinations that form the basis of the final permit. From March 13, 2015 to April 11, 2015, the United States Environmental Protection Agency ("EPA") and the Massachusetts Department of Environmental Protection ("MassDEP") (together, the "Agencies") solicited public comments on a draft NPDES permit, MA0101567, developed pursuant to a permit application from the Town of Warren, MA, for the reissuance of a National Pollutant Discharge Elimination System ("NPDES") permit to discharge secondary wastewater treatment plant effluent from outfall number 001 to the Quaboag River in Warren, Massachusetts.

EPA's decision-making process has benefitted from the public comments and additional information submitted. After a review of the comments received, EPA and MassDEP have made a final decision to issue this permit authorizing the discharge. The final permit is substantially identical to the draft permit that was available for public comment, with the exception of the following changes which are explained within this response to comments:

1. The nitrogen species monitoring frequency in the final permit has been changed from "1/week" to "1/month" during the winter season. See Response to Comment 2.
2. The compliance schedule proposed in the draft permit has been changed to include an additional two years in the final permit for the planning and construction of any facilities necessary to achieve the 4.9 lbs per day monthly average phosphorus limitation, if a major plant upgrade becomes necessary. See Response to Comment 13.
3. The final permit has been clarified under Part I.A.1.h. with regard to the Flow Planning Report. The following sentence has been added: "The permittee is not required to submit this report to EPA." See Response to Comment 11.
4. The requirements of Part I.B.1.a. were revised to clarify that the annual total nitrogen report may be combined with the permittee's initial nitrogen optimization report if they are both submitted by February 1st. See Response to Comment 12.
5. The ortho-phosphorus monitoring requirement proposed in the draft permit has been removed from the final permit. See Response to Comment 9.

In addition, the final permit has been changed under Part I.A.1., footnote 7. The draft permit proposed reporting total residual chlorine sample results less than the detection limit as "zero". The final permit will require the permittee to report the total residual chlorine sample results less than the detection limit as "[< detection limit]" on the DMR. This minor change will provide useful information on the DMR. Another minor change to the final permit has been made under Part I.F., Monitoring and Reporting to reflect the permittee's current method of reporting DMR information, using NetDMR. The draft permit proposed a six month period from the effective date of the permit to submit DMRs using NetDMR. Since the permittee is already submitting DMRs using NetDMR, the final permit simply requires the permittee to continue submitting DMRs using NetDMR.

A copy of the final permit and this response to comment document will be posted on the EPA Region 1 website: http://www.epa.gov/region1/npdes/permits_listing_ma.html.

A copy of the final permit may also be obtained by writing or calling Janet Deshais, United States Environmental Protection Agency, 5 Post Office Square, Suite 100 (Mail Code: OEP06-1), Boston, MA 02109-3912; Telephone: (617) 918-1667.

Comments submitted by the Town of Warren

Comment 1A:

Part I.A.1. and Part I.A.b. (page 2 of 19 and Page 7 of 19): *effluent limits for pH*
The draft permit includes an effluent limitation for pH that "must not be less than 6.5 nor greater than 8.3 standard units (s.u.) at any time." However, Part I.A.1.a of the current NPDES permit effective in 2000 allowed the pH of the effluent to exceed those values "due to natural causes or as a result of the approved treatment processes." Our current treatment processes do not include provisions for pH adjustment. We request this language be continued in the new final permit. Inclusion of this language would be consistent with the current permit and antibacksliding requirements of 40 CFR § 122.44(1).

Response to Comment 1A:

As stated in the Fact Sheet, the permit includes pH limits that are consistent with the state's water quality standards at 314 CMR 4.05(b)(3). The language in the previous permit, "…unless these values are exceeded due to natural causes or as a result of the approved treatment processes." was not included in the most recent MA SWQS. EPA has included the current language in order to assure compliance with the current MA SWQS.

EPA has an obligation under the Clean Water Act to establish permit limits that achieve instream state water quality standards. The pH standard is for the receiving water and not the effluent. EPAs standard practice for POTW permits has been to require the pH limit range to match the pH range of the criteria in the receiving water classification in order to ensure attainment of the receiving water criteria. In some instances, EPA has allowed a different pH range where there is sufficient dilution and buffering capacity. The allowable limit range is constrained by the EPA secondary treatment range for pH of 6.0 – 9.0 SU. See 40 C.F.R. §133.102.

EPA is unable to determine whether or not adjusting the minimum pH effluent limit to 6.0 standard units (S.U.) would cause an excursion of the minimum pH standard for a Class B water defined in 314 CMR 4.05 (3)(b). The Massachusetts State Water Quality Standards (MA SWQS) antidegradation provision at 314 CMR 4.04 (1) require, "in all cases existing uses and the level of water quality necessary to protect the existing uses shall be maintained and protected." The minimum pH to protect existing uses that include protection of habitat for fish, other aquatic life and wildlife that is necessary for their reproduction, migration, growth and other critical functions for a Class B water is 6.5 S.U. In considering the Town's request, EPA reviewed the upstream data collected during WET tests and it appears that the Quaboag River upstream of the Warren WWTP discharge does not always meet the 6.5 minimum pH specified in the Massachusetts Water Quality Standards (314 CMR 4.00). EPA also reviewed the level for alkalinity that is considered to provide sufficient buffering capacity (20 mg/l)[1] and the alkalinity of the receiving water. Alkalinity is important for fish and other aquatic life in freshwater systems, since it buffers pH that occurs naturally in a waterbody. See EPA's "Quality Criteria for Water"[2] for a summary on the Agency's recommendation of acceptable limits for aquatic life protection. Receiving water alkalinity data from the treatment plant's recent whole effluent toxicity tests shown in Table 1, are all less than 20 mg/l and would be unable to provide the capacity necessary to buffer a rapid change in pH in the receiving water.

Table 1: Alkalinity and pH Data for Town of Warren WWTP Discharge and Quaboag River

[1] http://www.water-research.net/Watershed/alkalinity.htm

[2] EPA, Quality Criteria for Water 1986, EPA 440/5.86-001, May 1, 1986.

Date:	Upstream pH:	Receiving Water Alkalinity:	Effluent pH:	Effluent Alkalinity:
November 8, 2013	6.9	15	6.8	15
November 6, 2013	7.1	15	6.7	10
November 4, 2013	6.3	10	6.0	20
August 9, 2013	6.7	15	6.5	15
August 7, 2013	7.4	15	6.6	15
August 5, 2013	7.4	15	7.3	15
May 10, 2013	6.4	15	6.2	15
May 8, 2013	7.2	15	6.8	10
May 6, 2013	6.8	10	6.6	10
February 15, 2013	6.3	10	6.3	10
February 13, 2013	6.6	10	6.8	10
February 11, 2013	6.1	10	6.4	10
November 16, 2012	6.2	10	6.0	5
November 14, 2012	5.7	15	5.7	5
November 12, 2012	5.8	10	5.6	5

Because it is not clear whether the Quaboag River has sufficient buffering capacity to assimilate low-pH discharges without a violation of water quality standards, EPA has decided to issue the Final Permit with pH limits based on state water quality standards for a Class B water.

The Town could complete a pH adjustment demonstration project during this permit cycle to provide data that could be used to determine if lowering the minimum pH to 6.0 S.U. will ensure the receiving water remains within the pH range of a Class B water, 6.5-8.3 S.U. The results of the project could be submitted with the Town's next NPDES Application. For fresh water receiving waters, a demonstration project must be conducted twice over the period of a year, once during the spring months (between March and April, when the receiving water flows are high) and once during the summer months (between July and August, when receiving water flows are low).

Detailed procedures for conducting a pH Adjustment Demonstration Project can be found in Attachment A of this Response to Public Comments document.

Comment 2A:

Part I.A.1 (page 2 of 19): *nitrogen species monitoring*
The draft permit includes new and more frequent monitoring requirements and with report only discharge limitations for five nitrogen species. We are substantially concerned by the proposed measurement frequency of 1/week. As you are aware, we currently collect samples for total nitrite, nitrate and TKN at a frequency of 1/month. Page 15 of the Fact Sheet states that the draft permit proposes an "increase sampling frequency of once per week in the effluent in order to more accurately assess the total nitrogen loading and the removal efficiency for the facility."

We are concerned about this increased frequency for a number of reasons:

- Based on discussions with certified Massachusetts laboratories, nitrate, nitrite, as well as total orthophosphorus samples cannot be preserved, and the samples collected must be delivered for testing within 48 hours. We do not have the capacity to complete analysis of these parameters in house, and samples must be delivered to our third party contract laboratory located in Buffalo, New York. Collection and delivery of the samples pulls our limited staff away from process

control and preventative maintenance activities. Even if we contracted a courier service to pick up the samples, the cost associated with this option will require us to shift our limited resources in our operating budget from other important preventative maintenance and operations activities to this additional sampling and analysis.

- Current average loads are less than the Long Island Sound (LIS) Nitrogen TMDL total nitrogen benchmark of 62.3 lbs per day for the Warren WWTP. Based on review of effluent data since January 2006, total nitrogen loads have averaged 54.4 lbs/day, with recent years (2013-present) being even lower, averaging 46.6 lbs/day.

Table 2: Sampling Frequency of Nitrogen Species for MA WWTPs in LIS Watershed

	Flow (mgd)	Frequency	Un
Chicopee	15.5	1/Week	Report
Northampton	8.6	1/Week	Report
Easthampton	3.8	1/Month	Report
Greenfield	3.4	1/Month	Report
Amherst	7.1	1/Week	Report
Athol	1.75	1/Month	Report
Belchertown	1.0	1/Month	report
Winchendon	1.1	2/Month	Ammonia limits, rest report
Westfield	6.1	1/Week	Ammonia limits, rest report
Ware	1.0	1/Month	Report
		1/Week	Ammonia limits
Pittsfield	17	1/Week	Report
		2/Week	Ammonia limits
Great Barrington	3.2	1/Month	Report
		1/Week	Ammonia only report

- This sampling requirement is inconsistent with other small facilities. Table 2 summarizes sampling frequencies for nitrogen species for other Massachusetts facilities in the Long Island Sound watershed. Note that the small facilities that are similar in flow to Warren have monthly or bimonthly frequencies (also with ammonia limits) and the larger facilities are required to sample weekly.

- Compared to many other wastewater treatment facilities in the Long Island Watershed, the Warren WWTF is a small facility. Because of the type of secondary treatment process (rotating biological contractors (RBCs)), we have a limited amount of process control for nitrogen removal and no opportunities to make operational or low-cost capital modifications to improve total nitrogen removal, which was also stated in the Final Report – Low Cost Retrofits for Nitrogen Removal at Wastewater Plants in the Upper Long Island Sound Watershed dated February 27, 2015 and prepared by JJ Environmental, LLC for NEIWPCC. As stated on page 15 of the Fact Sheet, total nitrogen loads tend to be higher when flows are higher. However, these flows typically occur during the cold weather months, which are also a challenge for nitrification, resulting in higher TKN loadings and less incidental denitrification. While our system was not designed for nitrification or denitrification, we do see seasonal changes in

nitrogen removal. The monthly sampling is sufficient to identify this seasonal variability in nitrogen loadings.

Given these comments, we respectfully request that EPA revise the measurement frequency to once per month for Total Ammonia-Nitrogen, Total Kjeldah Nitrogen, Total Nitrate-Nitrogen, Total Nitrite-Nitrogen, and Total Nitrogen for the new final permit.

Response to Comment 2A:

The permitting agencies understand the Town's logistical and financial concerns. While there have been past inconsistencies, the Region is in the process of applying a more consistent approach for managing the impacts and monitoring requirements associated with nitrogen loading. This approach is being applied to Region I NPDES permits in Massachusetts, New Hampshire, and for Vermont permits they issue. It is EPA's best professional judgement that wastewater treatment plants greater than 1.0 mgd design flow require more frequent monitoring of total nitrogen than our past requirements of "1/month sampling," and EPA is in the process of reviewing and adjusting each permit's monitoring requirements as each permit is reissued. The total nitrogen annual loading effluent data reported on the permittee's discharge monitoring reports from 2004 to 2015 are provided in Table 3, along with the corresponding annual average effluent flows (based on averaging the reported monthly average effluent flows).

Table 3: Total Nitrogen Annual Average Effluent Data

Year	Total Nitrogen Annual Loading	Effluent Flow, Annual Monthly Average
2004	78.29 lbs/day	0.56 mgd
2005	57.31 lbs/day	0.54 mgd
2006	64.72 lbs/day	0.47 mgd
2007	39.50 lbs/day	0.32 mgd
2008	54.34 lbs/day	0.31 mgd
2009	63.36 lbs/day	0.34 mgd
2010	52.14 lbs/day	0.31 mgd
2011	65.07 lbs/day	0.34 mgd
2012	85.30 lbs/day	0.36 mgd
2013	45.24 lbs/day	0.30 mgd
2014	45.35 lbs/day	0.29 mgd
2015	42.04 lbs/day	0.27 mgd

As pointed out in the comment and reflected in Table 3, the annual nitrogen loading data reported from 2004 to 2014 indicates a general lowering of total nitrogen loads in recent years. However, the recent low total nitrogen loads have been observed when the annual effluent flow also is low, such as during the years 2013-2015 (i.e., with the lowest corresponding annual monthly average flows of 0.30 mgd, 0.29 mgd, and 0.27 mgd) compared to the total nitrogen loads reported in 2004-2005 (i.e., with corresponding high annual monthly flows of 0.56 mgd and 0.54 mgd). The permit's more frequent monitoring requirements for five nitrogen species has been retained in the final permit to assess which factors, such as low effluent flow, are associated with lowering total nitrogen loads, and, in turn what changes can be made to optimize total nitrogen removal. As with the other POTWs with design flows greater that 1.0 mgd, EPA expects that the more frequent weekly monitoring will provide a more complete assessment of the facility-specific variations in nitrogen loading which will improve each facility's ability to optimize nitrogen removal. EPA has determined that this benefit outweighs the increase in operator time and costs

for the facility without creating an unnecessary burden. (See also: Response 9A, ortho-phosphorus monitoring was removed from the final permit.)

EPA understands that the type of wastewater treatment used at the Warren Wastewater Treatment Plant (rotating biological contractors (RBC)) may provide a limited amount of process control for nitrogen removal. Given this limitation, EPA did not include an annual total nitrogen loading cap limit in the draft and final permit. Instead, Part I.A.1., footnote 9 of the draft and final permit requires optimization in order to remove total nitrogen to the greatest extent practicable. The goal of optimizing nitrogen removal to the greatest extent practicable is not limited to alternative methods of operating the existing wastewater treatment, but also includes evaluating source controls, septic management, and side-stream management. Additionally, the permittee should maximize ammonia removal.

This optimization approach is also discussed within the Fact Sheet under Part V.B. c.2., paragraph 6. Generally, if the permittee is able to demonstrate that all practicable steps have been taken to optimize the removal of total nitrogen, then EPA will consider in a future permit action, the appropriateness of nitrogen reduction frequency during the summer, low flow season. As has been implemented in some other permits, the final permit has been changed from a "1/week" to "1/month" monitoring frequency during the winter season, which is a less critical period relative to nitrogen impacts.

Comment 3A:

Page 15 of the Fact Sheet states that "if the wastewater treatment system is optimized to remove total nitrogen to the greatest extent practicable, and if the effluent nitrogen monitoring results demonstrate a long-term decreasing trend in total nitrogen loading to the receiving water, the permittee may submit a written request to EPA for a reduction of the total monitoring requirements." This language should be added to the permit.

Response to Comment 3A:

Both the draft and final permits include this language under Part I.A.1., footnote 9.

Comment 4A:

Part I.A.1. (page 3 of 19): *effluent limits for copper*
The draft permit includes monitoring requirements and effluent limitations for total recoverable copper, and compliance with these limits will be achievable due to the type of treatment facility we operate and the amount of process control we have. As you are aware, our current limit is 22 ug/l average monthly and 29 ug/l maximum daily. The proposed new effluent limitations of 10.2 ug/l average monthly and 17.8 ug/l maximum daily are a significant change and substantially more stringent.

The Commonwealth of Massachusetts's Water Quality Standards require that effluent limitations for metals be based upon the criteria published in the National Recommended Water Quality Criteria, unless the Site-specific criteria are established or MassDEP determines that natural background concentrations are higher than the criteria (314 CMR § 4.05(5)(e)). Recognizing that EPA's Recommended Water Quality Criteria for copper may be inappropriate, MassDEP has developed site-specific copper water quality criteria for many receiving streams in Massachusetts. These site specific criteria have typically resulted in significantly higher copper concentration limits for discharges into these receiving streams. The town wishes to encourage Massachusetts to develop new site-specific copper criteria for our section of the Quaboag River that receives the WWTF discharge.

We request that a modification to the permit be completed by EPA, including the timeframe prior to the next permit cycle, if additional information is developed to support an increase in the copper limit, including but not limited to changes to the Massachusetts Surface Water Quality Standards for copper.

Response to Comment 4A:

If new information is developed to support an increase in the copper limit, including but not limited to changes to the Massachusetts Surface Water Quality Standards for copper, this would constitute new information that could be used as the basis for requesting a permit modification.

Comment 5A:

The permittee commented that Table 4 (Page 23) of the Fact Sheet presents a summary of metals concentrations in the Quaboag River upstream of the Warren WWTP outfall. Where were these samples collected and by who? What methods were used (e.g., "clean hands dirty hands")? Are there additional data on antecedent precipitation events available?

Response to Comment 5A:

The upstream data was submitted to EPA as part of the permittee's whole effluent toxicity (WET) reports. Precipitation and instream flow data can be found on the USGS website at: www.usgs.gov.

Comment 6A:

We request additional time for compliance with the copper limit. Given the inherent difficulty of complying with such a low copper limit, the Town requests that the limit be changed to "Report Maximum Daily" or that a much higher interim limit be established in order to give the Town time to evaluate sources of influent copper and the effects of implementing system wide corrosion control instream concentrations upstream of the discharge and to evaluate various treatment alternatives to meet the limit.

The treatment required to meet such a low copper limit would most likely involve chemical precipitation, and potentially ion exchange or reverse osmosis. The options of ion exchange and reverse osmosis are extremely expensive both in terms of capital cost as well as ongoing operation and maintenance costs and may result in a financial hardship on the ratepayers. The Town will need time to evaluate potential options in conjunction with the phosphorus removal upgrades, source reduction opportunities, and evaluate as well as potentially perform pilot scale testing of treatment technologies in order to determine the technically feasible and cost-effective upgrade. We request that the new limits for copper be suspended until the impact of the upgrades for phosphorus removal on effluent copper concentrations can be evaluated.

Response to Comment 6A:

EPA Region I agrees that the Town will need time to meet the new copper effluent limits. Since the timing is uncertain, EPA plans to work collaboratively with the Town to develop a reasonable schedule of compliance for copper with an interim limitation, after the final permit becomes effective. EPA anticipates that the Town will be covered by an Administrative Order (AO), rather than having a limit for copper with a compliance schedule in the permit. The AO will include an interim copper limit. While the AO is effective, the Town will be required to meet the interim limit, not the final permit limits for copper that are water quality based.

As was discussed with the Town and its consultant in June 2014[3], EPA acknowledges that the Town will need time to evaluate sources of influent copper, the effects of implementing system wide corrosion control, instream concentrations upstream of the discharge and, various treatment alternatives to meet the limit.

It is our understanding that the Town will likely explore potential source reduction opportunities and may perform pilot scale testing in order to formulate the Town's decisions on an upgrade. EPA strongly suggests and expects source reduction to be the primary focus, since there are likely additional copper sources that could be eliminated or reduced. When the Town's AO becomes effective, the new copper limitations will be suspended until the impact of the upgrades for phosphorus removal on effluent copper concentrations can be evaluated. If the Town determines the need to add additional treatment capabilities, and if the Town determines a cost associated with a necessary treatment option that is not affordable in accordance with EPA Economic Guidance, the Town may request additional time for compliance.

Comment 7A:

Part I.A. 1 (Page 3 of 19): *phosphorus limits, April 1 – October 31 effluent limitation*:
The draft permit includes a new limit for Total Phosphorus. The limit is a year-round load-based limit of 4.9 lbs/day. According to the Fact Sheet (pages 17-18), the equivalent load at the full design flow to achieve a protective in-stream water quality concentration of 100 ug/l is 6.13 lbs/day. However, this load was not included as the limit in the permit but was reduced to 4.9 lbs/day based on the assertion that less dilution would be available at lower WWTF flows and using the minimum monthly flow measured over the last five years.

Given that the WWTF may have higher discharge flows in the future, the limit presented in the permit should recognize that higher flows can allow a higher mass limitation due to increased dilution. To avoid antibacksliding constraints, we request that a footnote be added to allow for upward adjustment of this load as flows to the WWTF increase while still maintaining the water quality standards (Gold Book). In addition, phosphorus is not a toxic substance, and short-term interim periods of in- stream concentrations higher than 100 ug/l will not result in an exceedance of acute criteria. In addition, the fact sheet states that a correlation cannot be shown between the instream phosphorus concentrations and instream flow values. Given this uncertainty in the data and the longer timescale for eutrophication, we request that the load calculation be based on an annual average flow (or at minimum, on the average seasonal flow during the growing season of April–October) rather than the minimum month flow. We also request that the phosphorus permit limit be based on a seasonal rolling average load rather than a monthly load.

Response to Comment 7A:

EPA disagrees that a higher mass based load, based on a higher effluent flow rate, would be protective of water quality standards. The water quality goal for total phosphorus (100 ug/l) is a target that is not to be exceeded rather than a target for average conditions. Since the water quality target is not a long-term average, using long term average discharge or receiving water conditions would not be protective for the receiving water. Therefore, to achieve the goal of protecting water quality in the receiving water at all times, the permit limits are calculated assuming critical effluent and receiving water flow conditions.

[3] Phone conference on June 30, 2014 with Susan Guswa of Tighe & Bond, George Harding of EPA's Compliance Section, and Janet Deshais of EPA's Municipal Permits Section, to discuss the Town's proposed copper limits, possible compliance schedule for copper in the permit or an Administrative Order after the permit becomes effective.

With the respect to the permittee's request for effluent limits based on a seasonal rolling average; federal regulations at 40 CFR 122.45(d) require that effluent limits for continuous discharges from publicly owned treatment works be expressed as average monthly and average weekly discharge limitations, unless impracticable. EPA finds that the mass-based loading limit, which requires the permittee to achieve average monthly phosphorus concentrations of approximately 1.9 to 2.4 mg/l at the current range of average monthly flows (0.25 to 0.314 mgd, based on January 1, 2014 to March 31, 2016) and 0.48 mg/l at the design flow, is practicable. Therefore, the average monthly total phosphorus limit in the final permit has not been changed.

Comment 8A:

November 1 – March 31 effluent limitation:
The Fact Sheet states: "permits also include a monthly average phosphorus limit of 1.0 mg/l for the period of November through March. However, since a monthly average phosphorus limit of 4.9 lbs per day would be protective and prevent water quality exceedances…during the winter period." Given that the WWTF may have higher discharge flows in the future, the limit presented in the permit should recognize that higher flows can allow a higher mass limitation due to increased dilution. Therefore, we respectfully request EPA add a footnote to the effluent limitation for the November 1 – March 31 total phosphorus limitation of 4.9 lbs/day. We request this footnote clarify that the winter limits will be adjusted to maintain protectiveness but not cause the facility to meet an equivalent discharge concentration of less than 1 mg/l in the winter. For example, if the mass limit is maintained at 4.9 lbs/day, then once annual average flows from the WWTF consistently exceed 0.6 mgd, then the winter limit will be modified to 1 mg/l

Response to Comment 8A:

The total phosphorus limitation of 4.9 lbs/day has been determined to be protective for the receiving water, and any future changes in flow and/or our understanding of the instream levels necessary to fully protect water quality uses could lead to a different total phosphorus permit limit that may be more or less restrictive. If it is determined that a different proposed limit should less restrictive, then the new limit will need to be consistent with antidegradation and antibacksliding regulations.

Comment 9A:

Part I.A.1 (Page 3 of 19): *orthophosphate monitoring*
The draft permit includes reporting requirements for dissolved ortho-phosphorus. The only basis for this effluent limitation provided in the Fact Sheet is "the once per month monitoring frequency for ortho-phosphorus during the winter period is consistent with other NPDES permits in the region." We do not think this justification for monitoring is adequate. We request that EPA clarify why this monitoring requirement is included and why ortho-phosphorus is specifically a concern in the winter months?

We have reviewed the National Recommended Water Quality Criteria and the Ecological Nutrient Criteria Documents and there is no standard for dissolved ortho-phosphorus.

This additional sampling and analysis for orthophosphate is an undue burden on the Town, and we request that the requirement for orthophosphate monitoring be removed from the permit.

In addition, the draft permit contains a year-round limit for total phosphorus also with monthly monitoring requirements in the winter.

Response to Comment 9A:

A seasonal (November 1st – March 31st) once per month monitoring requirement for dissolved orthophosphorus was proposed on page 3 of the draft permit. This requirement has been removed from the draft permit and is not included in the final permit.

Comment 10A:

Part I.A.I (Page 3 of 19): *Whole effluent toxicity test frequency*
The draft permit requires Whole Effluent Toxicity testing to be completed four times per year. As stated in the fact sheet on page 28, "pursuant to EPA Region I Policy, and MassDEP's *Implementation Policy for the Control of Toxic Pollutants in Surface Waters* (February 1990), dischargers having a dilution factor less than 10 are required to conduct acute and chronic toxicity testing four times per year unless there are passing results over an extended period of time." Based on review of the data included in the fact sheet (Attachment A), between Quarter 1 2009 and Quarter 4 2013, all Chronic (C-NOEC) test results all passed with the exception of one instance where the result was 13, just missing the effluent limitation of ">13". In addition, review of data from Quarter 1 2014 through Quarter 1 2015 show all Chronic tests have continued to report a result of 100%.

	LC50%	A-NOEC%
Feb-14	>100	100
May-14	>100	100
Aug-14	>100	100
Nov-14	>100	100
Feb-15	>100	100

Given that only all but one of the 25 chronic tests completed since the start 2009 have passed, we request the draft permit only require WET testing two times per year.

Based on review of numerous other recently finalized and recently public noticed permits, if EPA is unwilling to reduce the WET testing frequency to twice a year, we request the following language be added to the WET testing footnote #13: "After submitting one year and a minimum of four consecutive sets of WET test results, all of which demonstrate compliance with the WET permit limits, the permittee may request a reduction in the WET testing requirements. The permittee is required to continue testing at the frequency specified in the permit until notice is received by certified mail from the EPA that the WET testing requirement has been changed."

Response to Comment 10A:

Although it is correct that all acute tests and all but one of the chronic tests completed since the start of 2009 have passed, EPA also considered the following factors before making a final permit decision: (1) the available dilution, (2) the available capacity for additional domestic or industrial wastewater, and (3) were there any reductions of WET testing in the past. Since the Quaboag River has a low dilution ratio of less than 10:1 at the point of discharge, the discharge is considered a high risk for toxicity. The second factor EPA considered, also adds an additional risk for toxicity, since this facility can accept up to 1.0 mgd of additional domestic or industrial wastewater during the life of the permit. Therefore, since the overall risk of unexpected toxicity for this discharge is relatively high compared to other discharges, and since the WET testing requirements were already reduced to testing only the *ceriodaphnia dubia* in the past, the final permit has not been changed in this regard. If the whole effluent toxicity test results

continue to pass after the new protocols for WET testing are performed in accordance with the final permit, the permitting agencies may decide to reduce the toxicity testing requirements at the next permit renewal decision.

Comment 11A:

Part I.A.1.h (Page 8 of 19): *Report for future flow increases*
Please note that the requirement for the Flow Planning Report (i.e., "If the average annual flow in any calendar year exceeds 80 percent of the facility's design flow [80% = 1.2 mgd], the permittee will submit a report to MassDEP by March 31st of the following calendar year describing its plans for further flow increases and describing how it will maintain compliance with the flow limit and all other effluent limitations and conditions.") is duplicative with the Annual Collection System O&M Report requirement presented in Part I.o.6.e.(Page 13). It appears the Flow Planning Report should be included as part of the Annual Collection System O&M Report. If this is correct, please revise the permit to remove this duplication. If it is supposed to be a separate report, please clarify and revise the permit accordingly.

Response to Comment 11A:

Part I.A.1.h. states that the permittee is required to submit their Flow Planning Report to the MassDEP, only if the average annual flow in any calendar year exceeds 80 percent of the facility's design flow. This report should be submitted if this threshold is met, and this report needs to only be submitted to the MassDEP which can be sent in a separate submission. Part I.A.1.h in the final permit has been revised to clarify that the permittee is not required to submit this report to EPA.

EPA acknowledges that there may be some overlap between the contents of the Annual Collection System O&M Report and the Flow Planning Report. If it becomes necessary to prepare a Flow Planning Report, the permittee may choose to reference applicable materials in their most recent Annual Collection System O&M Report in the Flow Planning Report.

Comment 12A:

Part I.B.1.b (Page 9 of 19): *Annual nitrogen reports*
Please revise the final permit to clarify when the nitrogen annual reporting must begin. We believe it is most efficient and most reasonable to require this reporting requirement to begin after submittal of the initial nitrogen optimization report (required by Part I.B.1.a of the draft permit).

Response to Comment 12A:

The permittee is required to submit an annual total nitrogen report by February 1st each year. This report may be combined with the permittee's initial nitrogen optimization report if they are both submitted by February 1st. The final permit has been clarified under Part I.B.1.a. in this regard.

Comment 13A:

Various: *Schedule for Reports and Studies*
We are substantially concerned by the amount of work needed to be completed during the first three years of the permit term. Table 4 presents the permit requirements and associated timelines for completion:

Table 4: Draft Permit Requirements and Timelines for Completion

Permit Part	Requirement	Due Date	Year 1	Year 2	Year 3	Year 4	Year 5
Part I.B.1.a (p.9)	Nitrogen Optimization Report	12 months after effective date		★			
Part I.B.1.b (p.9)	Annual Nitrogen Report	Annually on Feb 1	★	★	★	★	★
Part I.B.2.a (p.9)	Phosphorus Removal Study	24 months after effective date			★		
Part I.B.2.b and c (p.10)	Design and Construction of Phosphorus Removal Facilities	36 months after effective date				★	
Part I.B.1.d (p.10)	Annual Phosphorus Removal Reports	12, 24,and [36] months after effective date		★	★	★	
Part I.D.4. (p.11)	Collection System Mapping	30 months after effective date			★		
Part I.D.5.a (p.12)	Collection System Operation and Maintenance Plan – Phase I	6 months after effective date	★				
Part I.D.5.b (p.12-13)	Collection System Operation and Maintenance Plan – Phase II	24 months after effective date			★		
Part I.D.6.a (p.13)	Collection System O&M Plan Annual Reporting	Annually on March 31	★	★	★	★	★

Additionally, this table does not reflect the extensive effort and costs that will be incurred to meet the total copper limit, likely under an Administrative Order process.

We respectively request that EPA provide an additional two years (24 months) for the Collection System Mapping, and the Collection System Operation and Maintenance Plan Development.

We also request that the timeline for design and construction of improvements necessary to meet the new phosphorus limit be extended to three years rather than one year to allow for funding authorization, design, MassDEP approval, bidding, construction and commissioning. Twelve months after completion of the study (36 months from the effective date of the permit) is inadequate.

Response to Comment 13A:

The permitting agencies understand your concern with the amount of work required within a short timeframe. We expect the Town will be able to meet the limit of 4.9 lbs/day through chemical addition with relatively minor capital costs, and this would be able to be accomplished within the first two years allowed by the permit. If it is determined that this facility will need a major upgrade in order to meet this new permit limitation, the permittee should report this finding to the permitting agencies within the first two years of the permit. The final permit has been changed to allow an additional two years to complete a major upgrade of the facility. This additional two years will be allowed for the design and construction of treatment facilities that are more involved than the addition of chemical storage and dosing equipment.

Twenty-four months for completion and full implementation of the Collection System Mapping and the Collection System Operation and Maintenance Plan is a common permit requirement. However, if there are extenuating circumstances that prevent the completion and implementation of this Plan, the permittee may submit a formal, written request for an extension. The permitting agencies would be willing to work out a reasonable extended schedule, if extenuating circumstances develop during the life of the permit.

Attachment A
Procedures for a pH Adjustment Demonstration Project

This document describes the procedures to be undertaken by any permittee requesting an adjustment of the pH limits in their NPDES permit. These limits may be adjusted as long as the pH of the effluent remains between 6.0 - 9.0 standard units (S.U.) and the pH of the receiving water remains between 6.5 - 8.0 or as naturally occurs. Please note that a pH limits adjustment is valid only for the duration of the existing NPDES permit. A subsequent pH limits adjustment demonstration project can be conducted and submitted with a NPDES permit reapplication or anytime thereafter (in accordance with the State Permit Conditions and Special Conditions sections of the NPDES permit).

For discharges to fresh water receiving waters each demonstration project must be conducted twice over the period of a year, once during the spring months (between March and April when receiving water flows are high) and once during the summer months (between July and August when receiving water flows are low).

For discharges to marine/estuarine receiving waters the demonstration project must be completed only once during a 1% occurrence spring tide, which is a tide with the maximum range of depths between the high and low tides.

- When the requested pH limit is low (down to 6.0) the study must be conducted when runoff conditions are greatest (during March/April or October/November) and during last 2 hours of ebb tide (just before slack low tide).

- When the requested pH limit is high (up to 9.0) the study must be conducted when runoff conditions are lowest (during July and August) and during the last 2 hours of flood tide (just prior to slack high tide).

The project calls for use of grab and composite samples of the effluent, and grab samples of the receiving water. The procedure is as follows:

1. Calibrate the pH meter using two-point-calibration (per the manufacturer's procedure) and verify the calibration using a pH standard close to either pH 6.0 or pH 9.0 (depending on whether you are conducting the pH demonstration project to lower the permit limit to pH 6.0 or raise the permit limit to pH 9.0. Record the results on a lab bench sheet. Also record on the lab bench sheet all sampling date and times, the name of the sampler(s), the name of the analyst(s), and the start and end times for each analysis.

2. Collect a grab and a 24-hour composite sample of the effluent and a grab sample of the receiving water (upgradient of the outfall location). Five liter sample volumes typically suffice. Facilities with secondary treatment using sand filtration or lagoons need not collect a 24-hour composite sample of the effluent because of the relative uniformity of effluent quality.

3. Record the collection date and time for each sample. Work as rapidly as possible to minimize sample holding time.

4. Measure the pH of all samples (effluent grab sample, effluent composite sample, if needed and receiving water grab sample) using the method described in Standard Methods, 18th, 19th or 20th Edition (or a method allowed in 40 CFR 136), and record the pH of the samples on the attached form. The samples must be stirred, but the rate of stirring should minimize the air transfer rate at the air water interface of the sample.

5. Adjust the pH of the effluent sample(s) (either the effluent grab sample or both the grab and composite effluent samples) to either a pH of 6.0 or 9.0 depending on whether you are seeking to adjust the pH limit to 6.0 or 9.0. The pH of a sample can be adjusted with either sulfuric acid or sodium hydroxide of such strength that the quantity of reagent does not dilute the sample by more that 0.5%.

6. Taking precautions to minimize sample agitation, mix the receiving water and effluent samples in four separate (glass) containers in the following proportions:

   - 1 @ the facility's dilution factor
   - 1 @ 20% above the facility's dilution factor (1.2 x dilution factor)
   - 1 @ 20% below the facility's dilution factor (0.8 x dilution factor)
   - 1 @ 40% below the facility's dilution factor (0.6 x dilution factor)

For example, if the facility's dilution factor is 100, then the four dilution factors used for the study would be as follows: 100, 120, 80, and 60. The volume of each effluent/receiving water mixture should be no less than 500 ml to provide adequate volume for proper mixing, and measurement of pH. To calculate the volume of effluent needed to prepare each of the four mixtures, divide the total mixture volume (500 ml) by the dilution factor. For example, for a dilution factor of 100, divide 500 ml by 100 to calculate the effluent volume that will be needed (5 ml). The 5 ml of effluent should then be diluted (using receiving water) to 500 ml to prepare a mixture representative of the 100:1 dilution factor. The following effluent and receiving water volumes would be combined to prepare each of the four mixtures in the above example:

Dilution Factor	Effluent Volume (ml)	Receiving Water Volume (ml)	Combined Volume (ml)
60	8.33	491.67	500
80	6.25	493.75	500
100	5.0	495.0	500
120	4.17	495.83	500

Please provide a description of the critical low flow of the receiving stream, verify your facility's dilution factor, and calculate the volumes of effluent and receiving water that should be combined for each of the four mixtures. Please contact MassDEP if you would like assistance.

7. Measure the pH of each mixture per Standard Methods, 18th, 19th or 20th Edition (or a method allowed in 40 CFR 136) and record the information on the attached form.

8. Recheck the calibration of the pH meter by measuring the pH of a standard (again, either pH 6.0 or pH 9.0) and record the information on the lab bench sheet.

9. For discharges to fresh water receiving waters, repeat Steps 1-8 for samples collected sometime during the second season.

10. Submit a report with a copy (or copies) of the attached form (one for each sampling date) and the lab bench sheet(s) to MassDEP and EPA. The report must include a narrative justification for adjusting the pH range and an interpretation/conclusion about the data.

Date:	Start Time:	End Time:
pH of Receiving Water Grab Sample:		(1)
pH of Effluent Grab Sample:		(2)
pH of Effluent Composite Sample:		(3)

	Effluent Grab Sample	Effluent Comp. Sample
pH (after pH adjustment):	(4)	(5)

Serial Dilution		Volume of pH Adjusted Effluent (ml)	Volume of Receiving Water (ml)	Resultant pH Data	
				Effluent Grab /Receiving Water Mixture	Effluent Composite /Receiving Water Mixture
D1: 40% below actual design dilution factor	(6)	(10)	(14)	(18)	(22)
D2: 20% below actual design dilution factor	(7)	(11)	(15)	(19)	(23)
D3: at actual design dilution factor	(8)	(12)	(16)	(20)	(24)
D4: 20% above actual design dilution factor	(9)	(13)	(17)	(21)	(25)

(1): record the pH of a representative upstream receiving water grab sample; for tidal waters also note the salinity
(2): record the pH of a representative effluent grab sample
(3): record the pH of a representative effluent composite sample
(4): record the pH of the representative effluent grab sample after pH adjustment (should be either pH 6.0 or 9.0)
(5): record the pH of the representative effluent composite sample after pH adjustment (should be either pH 6.0 or 9.0)
(6)-(9): record the four dilutions, and note the volumes used to make up the dilutions (10)-(17): record the resultant pH of each mixture (18)-(25).

Notes/Comments:_____
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