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 North Brookfield
Sewer Superintendent
P.O. Box 236
North Brookfield, MA 01535

is authorized to discharge from a facility located at

North Brookfield Wastewater Treatment Facility
59 East Brookfield Road
North Brookfield, MA 01535

to receiving waters named

Forgot-Me-Not Brook (Chicopee Watershed – 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 expire at midnight five years from the last day of the month preceding the effective date.

This permit supersedes the permit issued on March 19, 2007.

This permit consists of in **Part I (**17 pages including effluent limitations and monitoring requirements), **Attachment A** (USEPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol, February 2011, 8 pages), **Attachment B** (USEPA Region 1 Freshwater Chronic Toxicity Test Procedure and Protocol, March 2013, 7 pages) and **Part II (**21 pages including NPDES Part II Standard Conditions).

Signed this 30th day of January, 2019

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

/S/SIGNATURE ON FILE
_____
Lealdon Langley, Director
Massachusetts Wetland and Wastewater Programs
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 on the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number 001 to the Forget-Me-Not Brook. Such discharges shall be limited and monitored as specified below.

Effluent Characteristic		**Discharge Limitations**			**Monitoring Requirements**[1]	
Parameter	**Units**	**Average Monthly**	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type**
Treated Effluent Flow	MGD	0.76[2]	*********	*********	Continuous Recorder[2]	
Treated Effluent Flow	MGD	Report	*********	Report	Continuous Recorder[2]	
BOD_5[3] (Applicable May 1 – October 31)	mg/L lb/day	15 40	22 59	*********	1/Week[3]	24 Hour Composite[4]
BOD_5[3] (Applicable November 1 – April 30)	mg/L lb/day	30 80	45 120	*********	1/Week[3]	24 Hour Composite[4]
TSS[3] (Applicable May 1 – October 31)	mg/L lb/day	15 40	22 59	*********	1/Week[2]	24 Hour Composite[4]
TSS[3] (Applicable November 1 – April 30)	mg/L lb/day	30 80	45 120	*********	1/Week[2]	24 Hour Composite[4]
pH Range[5]	Standard Units	6.5 to 8.3 (See I.A.1.b., State Permit Conditions)			1/Day	Grab
Escherichia coli[5,6] (Applicable April 1- October 31)	Colonies/100 ml	126	*********	409	1/Week	Grab
Dissolved Oxygen[7]	mg/L	>6.0 (daily minimum)			1/Week	Grab
Ammonia-Nitrogen[8] (Applicable May 1 – October 31)	mg/L lb/day	1.0 6.3	1.5 9.5	*********	1/Week	24 Hour Composite[4]
Ammonia-Nitrogen[8] (Applicable November 1–April 30)	mg/L lb/day	7.09 45	Report Report	*********	1/Week	24 Hour Composite[4]

See pages 6, 7 and 8 for footnotes

A.1. During the period beginning on the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number 001 to the Forget-Me-Not Brook. Such discharges shall be limited and monitored as specified below.

Effluent Characteristic		**Discharge Limitations**			**Monitoring Requirements[2]**	
Parameter	**Units**	**Average Monthly**	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type**
Total Kjeldahl Nitrogen[8] Total Nitrate + Nitrite Nitrogen[8] Total Nitrogen[8,9]	mg/L	Report	***	Report	1/Month	24 Hour Composite[4]
Interim Limit (See I.B.2) Total Phosphorus[10] (Applicable April 1-October 31)	mg/L lb/day	0.2 Report	***	Report ***	1/Week	24 Hour Composite[4]
Total Phosphorus[10] (Applicable April 1-October 31)	mg/L lb/day	0.1 Report	***	Report ***	1/Week	24 Hour Composite[4]
Total Phosphorus[10] (November 1 – March 31)	mg/L lb/day	1.0 Report	***	Report Report	1/Month	24 Hour Composite[4]
Total Recoverable Aluminum[11]	µg/L	87	***	750	1/Month	24 Hour Composite[4]
Total Recoverable Copper[12]	µg/L	6.03	***	8.66	1/Month	24 Hour Composite[4]
Total Recoverable Zinc[13]	µg/L	77.78	***	77.78	1/Month	24 Hour Composite[4]

See pages 6, 7 and 8 for footnotes

A.1. During the period beginning on the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number 001 to the Forget-Me-Not Brook. Such discharges shall be limited and monitored as specified below.

Effluent Characteristic		**Effluent Reporting Requirements**			**Monitoring Requirements[2]**	
Parameter	**Units**	**Average Monthly**	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type**
Whole Effluent Toxicity[14,15,16] (*Ceriodaphnia dubia*)	%	Acute LC50 ≥ 100% Chronic C-NOEC ≥ 100%		4/Year		24 Hour Composite[4]
Hardness[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
Alkalinity[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
pH[17]	S.U.	*********	*********	Report	4/Year	Grab
Specific Conductance[17]	µmho/cm	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Solids[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Dissolved Solids[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
Ammonia Nitrogen as N[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Organic Carbon[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Residual Chlorine[17]	mg/L	*********	*********	Report	4/Year	Grab
Total Recoverable Aluminum[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Recoverable Cadmium[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Recoverable Copper[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Recoverable Lead[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Recoverable Nickel[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Recoverable Zinc[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]

See pages 6, 7 and 8 for footnotes

A.1. During the period beginning on the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number 001 to the Forget-Me-Not Brook. Such discharges shall be limited and monitored as specified below.

Ambient Characteristic		**Ambient Reporting Requirements**			**Monitoring Requirements[2]**	
Parameter	**Units**	**Average Monthly**	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type**
Hardness[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
Alkalinity[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
pH[17]	S.U.	*********	*********	Report	4/Year	Grab
Specific Conductance[17]	µmho/cm	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Solids[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Dissolved Solids[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
Ammonia Nitrogen as N[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Organic Carbon[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Residual Chlorine[17]	mg/L	*********	*********	Report	4/Year	Grab
Total Recoverable Aluminum[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Recoverable Cadmium[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Recoverable Copper[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Recoverable Lead[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Recoverable Nickel[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Recoverable Zinc[17]	mg/L	*********	*********	Report	4/Year	24 Hour Composite[4]

FOOTNOTES

1. 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 every month. Occasional deviation from 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 changes in sampling location must be reviewed and approved in writing by EPA and MassDEP.

Parameter	**Sample Location**
Flow	Effluent Parshall Flume
Influent BOD_5 and TSS	Following mechanical screen and prior to aerated grit chamber
BOD_5, TSS, pH, Ammonia-Nitrogen, Total Kjeldahl Nitrogen, Total Nitrate + Total Nitrite, Total Nitrogen, Total Phosphorus, Total Recoverable Aluminum, Total Recoverable Copper, Total Recoverable Zinc, and Whole Effluent Toxicity	Following the effluent parshall flume, prior to post-aeration (fish ladder)
Escherichia coli	Following post aeration (fish ladder)
Dissolved Oxygen	Following post aeration (fish ladder)
Whole Effluent Toxicity Dilution Water	Upstream of WWTF on upper side of East Brookfield Road Bridge

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

   The annual average, monthly average, and the maximum daily flows shall be reported. The limit of 0.76 MGD is an annual average, which shall be reported as a twelve-month 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 previous eleven months.

3. Sampling is required for influent and effluent.

4. A 24-hour composite will consist of at least twenty-four (24) grab samples taken during one consectutive24-hour period, either collected at equal intervals or combined proportional to flow or continuously collected proportional to flow.

5. State certification requirement.

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

7. Dissolved oxygen of the effluent shall be monitored immediately following the post-aeration fish ladder prior to discharge to Forget-Me-Not Brook.

8. Ammonia nitrogen, total Kjeldahl nitrogen and total nitrate + nitrite 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/nitrite nitrogen).

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

   Total Nitrogen (lb/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 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.

9. See **Part I.B.1**. for requirements to evaluate and implement optimization of nitrogen removal.

10. 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.

11. The minimum level (ML) for aluminum is defined as 20 µg/L. An EPA-approved method with an equivalent or lower ML shall be used. Compliance/non-compliance will be determined based on 20 µg/L. Sampling results less than the detection limit shall be reported as "[<detection limit]" on the discharge monitoring report.

12. The minimal level (ML) for copper is defined as 3 µg/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 µg/L. Compliance/non-compliance will be determined based on 3 µg/L. Sampling results less than the detection limit shall be reported as "[<detection limit]" on the discharge monitoring report.

13. The minimal level (ML) for zinc is defined as 10 µg/L. This value is the minimum level for zinc using the Inductively Coupled Plasma analytical method 1640. This method or another EPA-approved method with an equivalent or lower ML shall be used for effluent limitations less than 10 µg/L. Compliance/non-compliance will be determined based on 10 µg/L . Sampling results less than the detection limit shall be reported as "[<detection limit]" on the discharge monitoring report.

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

    C-NOEC (chronic-no observed effect concentration) is defined as the highest concentration of toxicant or 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 "100% or greater" limit is defined as a sample which is composed on 100% (or greater) effluent, the remainder being dilution water.

15. The permittee shall conduct 48-hour static acute toxicity tests and chronic toxicity tests on effluent samples following the February 2011 USEPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol (**Attachment A**) and March 2013 USEPA Region 1 Freshwater Chronic Toxicity Test Procedure and Protocol (**Attachment B**), respectively. The test speciesis Daphnid (*Ceriodaphnia dubia*). Toxicity test samples shall be collected and tests completed on Daphnid four times per year during the calendar quarters ending March 31st, June 30th, September 30th, and December 31st.

Test Dates during the month:	Submit Results By:	Test Species	Acute Limit, LC_{50}	Chronic Limit, NOEC
March June September December	April 30th July 31st October 31st January 31st	Ceriodaphnia dubia (Dubia) See Attachments B and C	≥100%	≥100%

16. This permit shall be modified, or alternatively, revoked and reissued to incorporate additional toxicity testing requirements, including chemical specific limits such as for metals, if the results of the toxicity tests indicate the discharge causes an exceedance of any State water quality criterion. Results from these toxicity tests are considered "New Information" and the permit may be modified as provided in 40 CFR Section 122.62(a)(2).

17. For each whole effluent toxicity (WET) test, the permittee shall report on the appropriate discharge monitoring report, (DMR), the concentrations of the hardness, ammonia nitrogen as nitrogen and total recoverable aluminum, cadmium, copper, lead, nickel, and zinc found in the 100 percent effluent sample. All these aforementioned chemical parameters shall be determined to at least the minimum quantification level shown in **Attachment A**. The permittee should note that all chemical parameter results must be reported in the appropriate toxicity report.

Part I.A.1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

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

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 shall maintain a minimum monthly average of 85 percent removal of both BOD_5 and TSS. The percent removal shall be based on a comparison of the average monthly influent and effluent concentrations.

f. When the effluent discharged for a period of 3 consecutive months exceeds 80 percent of the 0.76 MGD design flow (0.608 MGD), the permittee shall submit to the permitting authorities a projection of loadings up to the time when the design capacity of the treatment facility will be reached, and a program for maintaining satisfactory treatment levels consistent with approved water quality management plans. Before the design flow will be reached, or whenever treatment necessary to achieve permit limits cannot be assured, the permittee may be required to submit plans for facility improvements.

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

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

2. All POTWs must provide adequate notice to both EPA-Region 1 and the Massachusetts Department of Environmental Protection (MassDEP) of the following:

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

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

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

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

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 toxics 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 permitttees' annual nitrogen report under Part I.B.1.b, if both reports are submitted to EPA and 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 meet a monthly average total phosphorus interim limit of 0.2 mg/L during the summer period (April 1 – October 31) until the permittee is in compliance with the monthly average total phosphorus limit of 0.1 mg/L during the summer period. The winter (November 1 – March 31) monthly average total phosphorous limit of 1.0 mg/L is effective upon the effective date of the permit.

   b. The permittee shall evaluate the ability of the existing treatment facilities, with small capital improvements, to achieve the summer monthly average total phosphorus limitations of 0.1 mg/L 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 this effluent limitation. The evaluation shall include optimization of chemical dosing, including use of alternate chemicals if necessary.

   c. If the permittee concludes that the existing facilities can achieve the summer 0.1 mg/ monthly average limits, the limit will become effective **24 months from the effective date of the permit**.

   d. If the permittee concludes that the existing facilities cannot achieve the summer 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.

e. Until the limit is achieved, the Town shall submit reports 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

The permit authorizes discharges only from the outfall listed in Part I.A.1 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 shall be reported to EPA and MassDEP in accordance with Part II, Section D.1.e. of the General Requirements of this permit (twenty four hour reporting).

D. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

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

1. Maintenance Staff

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

2. Preventative Maintenance Program

   The permittee shall maintain an ongoing preventative maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure. The program shall include an inspection program designed to identify all potential and actual unauthorized discharges. This requirement shall be described in the Collection System O&M Plan required pursuant to Section 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 the 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 goals, staffing, information management, and legal authorities;
(2) A description of the overall condition of the collection system including a list of 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.7. below.

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

(1) The required submittal from paragraph 5.a. above, updated to reflect current information;
(2) A preventative maintenance and monitoring program for the collection system;
(3) Sufficient staffing to properly operate and maintain the sanitary sewer collection system;
(4) Sufficient funding and the source(s) of funding for implementing the plan;
(5) Identification of known and suspected overflows and back-ups, including combined manholes, a description of the cause of the identified overflows and back-ups, and a plan for addressing the overflows and back-ups consistent with the requirements of this permit;
(6) A description of the permittees program for preventing I/I related effluent violations and all unauthorized discharges of wastewater, including overflows and by-passes and the ongoing program to identify and remove sources of I/I. The program shall include an inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts; and
(7) An educational public outreach program for all aspects of I/I control, particularly private inflow.

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 first annual report is due the first March 31st following submittal of the collection system O&M Plan required by Part I.D.5.b. of this permit. The summary report shall, at a minimum, include:

   a. A description of the staffing levels maintained during the year;
   b. A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year;
   c. Expenditures for any collection system maintenance activities and corrective actions taken during the previous year;
   d. A map with areas identified for investigation/action in the coming year;
   e. If treatment plant flow has reached 80% of the 0.76 MGD design flow (0.608 MGD) based on the daily flow for three consecutive months or there have been capacity related overflows, submit a calculation of the maximum daily, weekly, and monthly infiltration and the maximum daily, weekly, and monthly inflow for the reporting year; and
   f. A summary of unauthorized discharges during the past year and their causes and a report of any corrective actions taken as a result of the unauthorized discharges reported pursuant to the Unauthorized Discharges section of this permit.

E. ALTERNATIVE POWER SOURCE

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

F. 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 Part 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 Part 503 apply to facilities which perform one or more of the following use or disposal practices.

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

4. The 40 CFR Part 503 conditions do not apply to facilities which place sludge within a municipal solid

waste landfill. These conditions do not apply to facilities which do not dispose of sewage sludge during the life of the permit, but rather treat the sludge , or are otherwise excluded under 40 CFR Section 503.6.

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

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

   Which of the 40 CFR Part 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 1999), may be used by the permittee to assist it in determining the applicable requirements.[1]

6. The sludge shall be monitored for pollutant concentrations (all Part 503 methods) and pathogen reduction and vector attraction 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 than 1,500 1/Quarter
   - 1,500 to less than 15,000 6/Year
   - 15,000 plus 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.

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))

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[1] 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.

by **February 19** (*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.

G. 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 and MassDEP as NetDMR attachments rather than as hard copies. Permittees shall continue to send hard copies of WET reports to MassDEP (See G.6 for address) until further notice from MassDEP. (See Part I.H. for more information on state permit conditions.) 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 Pre-treatment Related Reports

   All reports and information required of the permittee in the Industrial Users and Pretreatment Program section of this permit shall be submitted to the Office of Ecosystem Protection's Pretreatment Coordinator in Region 1 EPA's Office of Ecosystem Protection (OEP). These requests, reports and notices include:

   a. Annual Pretreatment Reports,
   b. Pretreatment Reports Reassessment of Technically Based Industrial Discharge Limits Form,
   c. Revisions to Industrial Discharge Limits,

d. Report describing Pretreatment Program activities, and
e. Proposed changes to a Pretreatment Program

This information shall be submitted to EPA/OEP as a hard copy at the following address:

U.S. Environmental Protection Agency
Office of Ecosystem Protection
Regional Pretreatment Coordinator
5 Post Office Square - Suite 100 (OEP06-03)
Boston, MA 02109-3912

4. 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

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

5. 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 (OES04-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

6. State Reporting

Copies of toxicity test only shall be submitted to:

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

H. 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, §§26-53, and 314 C.M.R. 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 C.M.R. 3.11.

3. Each Agency will have the independent right to enforce the terms and conditions for 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 thios 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

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^{o}C.

IV. DILUTION WATER

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

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

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

and

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

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

See the most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/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 (^{o}C)	20 $\pm$ 1^{o}C or 25 $\pm$ 1^{o}C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hour light, 8 hour dark
5.	Test chamber size	Minimum 30 ml
6.	Test solution volume	Minimum 15 ml
7.	Age of test organisms	1-24 hours (neonates)
8.	No. of daphnids per test chamber	5
9.	No. of replicate test chambers per treatment	4
10.	Total no. daphnids per test concentration	20
11.	Feeding regime	As per manual, lightly feed YCT and Selenastrum to newly released organisms while holding prior to initiating test
12.	Aeration	None
13.	Dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q^{R} or equivalent deionized water and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC
15.	Number of dilutions	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution

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

Footnotes:

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

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

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

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

Footnotes:

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

VI. CHEMICAL ANALYSIS

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

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

Notes:

1. Hardness may be determined by:
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 2340B (hardness by calculation)
     - Method 2340C (titration)
2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 4500-CL E Low Level Amperometric Titration
     - Method 4500-CL G DPD Colorimetric Method
3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing.

VII. TOXICITY TEST DATA ANALYSIS

LC50 Median Lethal Concentration (Determined at 48 Hours)

Methods of Estimation:

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

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

No Observed Acute Effect Level (NOAEL)

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

VIII. TOXICITY TEST REPORTING

A report of the results will include the following:

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

ATTACHMENT B

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^{o} 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
(April 26, 2018)[1]

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[1] Updated July 17, 2018 to fix typographical errors.

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 or Act) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

a. The Permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage 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, or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

b. Penalties for Violations of Permit Conditions: The Director will adjust the civil and administrative penalties listed below in accordance with the Civil Monetary Penalty Inflation Adjustment Rule (83 Fed. Reg. 1190-1194 (January 10, 2018) and the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note. See Pub. L.114-74, Section 701 (Nov. 2, 2015)). These requirements help ensure that EPA penalties keep pace with inflation. Under the above-cited 2015 amendments to inflationary adjustment law, EPA must review its statutory civil penalties each year and adjust them as necessary.

(1) Criminal Penalties

(a) *Negligent Violations.* The CWA provides that any person who negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to criminal penalties of not less than $2,500 nor more than $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation or by imprisonment of not more than 2 years, or both.

(b) *Knowing Violations.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act 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. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both.

(c) *Knowing Endangerment.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 303, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he or she is placing another person in imminent danger of death or serious bodily injury shall upon conviction be subject to a fine of not more than $250,000 or by imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing

endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the Act, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.

(d) *False Statement.* 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. The Act further 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 non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

(2) *Civil Penalties*. The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed the maximum amounts authorized by Section 309(d) of the Act, the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note, and 40 C.F.R. Part 19. *See* Pub. L.114-74, Section 701 (Nov. 2, 2015); 83 Fed. Reg. 1190 (January 10, 2018).

(3) *Administrative Penalties*. The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty as follows:

(a) *Class I Penalty.* Not to exceed the maximum amounts authorized by Section 309(g)(2)(A) of the Act, the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note, and 40 C.F.R. Part 19. *See* Pub. L.114-74, Section 701 (Nov. 2, 2015); 83 Fed. Reg. 1190 (January 10, 2018).

(b) *Class II Penalty.* Not to exceed the maximum amounts authorized by Section 309(g)(2)(B) of the Act the 2015 amendments to the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note, and 40 C.F.R. Part 19. *See* Pub. L.114-74, Section 701 (Nov. 2, 2015); 83 Fed. Reg. 1190 (January 10, 2018).

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 a notification of planned changes or anticipated noncompliance does not stay any permit

condition.

3. Duty to Provide Information

The Permittee shall furnish to the Director, within a reasonable time, any information which the Director 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 Director, upon request, copies of records required to be kept by this permit.

4. 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).

5. Property Rights

This permit does not convey any property rights of any sort, or any exclusive privilege.

6. Confidentiality of Information

a. In accordance with 40 C.F.R. 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 C.F.R. 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.

c. Information required by NPDES application forms provided by the Director under 40 C.F.R. § 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.

7. Duty to Reapply

If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, 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 Director. (The Director shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

8. State Authorities

Nothing in Parts 122, 123, or 124 precludes more stringent State regulation of any activity

covered by the regulations in 40 C.F.R. Parts 122, 123, and 124, whether or not under an approved State program.

9. Other Laws

The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations.

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. 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 which are installed by a Permittee 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 reasonably be 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 provisions of paragraphs (c) and (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. As of December 21, 2020 all notices submitted in compliance with this Section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to report electronically if specified by a particular permit or if required to do so by state law.

(2) *Unanticipated bypass*. The Permittee shall submit notice of an unanticipated bypass as required in paragraph D.1.e. of this part (24-hour notice). As of December 21, 2020 all notices submitted in compliance with this Section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to report electronically if specified by a particular permit or required to do so by law.

d. *Prohibition of bypass.*

(1) Bypass is prohibited, and the Director may take enforcement action against a Permittee for bypass, unless:

(a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(b) 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

(c) The Permittee submitted notices as required under paragraph 4.c of this Section.

(2) The Director may approve an anticipated bypass, after considering its adverse effects, if the Director 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; and
(3) The Permittee submitted notice of the upset as required in paragraph D.1.e.2.b. (24-hour notice).
(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.

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 of 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 5 years (or longer as required by 40 C.F.R. § 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. This period may be extended by request of the Director 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 must be conducted according to test procedures approved under 40 C.F.R. § 136 unless another method is required under 40 C.F.R. Subchapters N or O.

e. The Clean Water Act 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 Director, 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 Clean Water Act, any substances or parameters at any location.

D. REPORTING REQUIREMENTS

1. Reporting Requirements

a. *Planned Changes*. The Permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only 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 C.F.R. § 122.29(b); or

(2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements at 40 C.F.R. § 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 that are 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 Director 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 Director. The Director 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 Clean Water Act. *See* 40 C.F.R. § 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. As of December 21, 2016 all reports and forms submitted in compliance with this Section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to report electronically if specified by a particular permit or if required to do so by State law.

(2) If the Permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 C.F.R. § 136, or another method required for an industry-specific waste stream under 40 C.F.R. Subchapters N or O, the results of such 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 report shall also be provided within 5 days of the time the Permittee becomes aware of the circumstances. The written report 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. For noncompliance events related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports must include the data described above (with the exception of time of discovery) as well as the type of event (combined sewer overflows, sanitary sewer overflows, or bypass events), type of sewer overflow structure (e.g., manhole, combined sewer overflow outfall), discharge volumes untreated by the treatment works treating domestic sewage, types of human health and environmental impacts of the sewer overflow event, and whether the noncompliance was related to wet weather. As of December 21, 2020 all

reports related to combined sewer overflows, sanitary sewer overflows, or bypass events submitted in compliance with this section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases Subpart D to Part 3), § 122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to electronically submit reports related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section by a particular permit or if required to do so by state law. The Director may also require Permittees to electronically submit reports not related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section.

(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 C.F.R. § 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 Director in the permit to be reported within 24 hours. *See* 40 C.F.R. § 122.44(g).

(3) The Director may waive the written report on a case-by-case basis for reports under paragraph D.1.e. of this Section if the oral report has been received within 24 hours.

f. *Compliance Schedules.* Reports of compliance or noncompliance with, or 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. For noncompliance events related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports shall contain the information described in paragraph D.1.e. and the applicable required data in Appendix A to 40 C.F.R. Part 127. As of December 21, 2020 all reports related to combined sewer overflows, sanitary sewer overflows, or bypass events submitted in compliance with this section must be submitted electronically by the Permittee to the Director or initial recipient, as defined in 40 C.F.R. § 127.2(b), in compliance with this Section and 40 C.F.R. Part 3 (including, in all cases, Subpart D to Part 3), §122.22, and 40 C.F.R. Part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of Part 127, Permittees may be required to electronically submit reports related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section by a particular permit or if required to do so by state law. The Director may also require Permittees to electronically submit reports not related to combined sewer overflows, sanitary sewer overflows, or bypass events under 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 Director, it shall promptly submit such facts or information.

i. *Identification of the initial recipient for NPDES electronic reporting data*. The owner, operator, or the duly authorized representative of an NPDES-regulated entity is required to electronically submit the required NPDES information (as specified in Appendix A to 40 C.F.R. Part 127) to the appropriate initial recipient, as determined by EPA, and as defined in 40 C.F.R. § 127.2(b). EPA will identify and publish the list of initial recipients on its Web site and in the FEDERAL REGISTER, by state and by NPDES data group (see 40 C.F.R. § 127.2(c) of this Chapter). EPA will update and maintain this listing.

2. Signatory Requirement

a. All applications, reports, or information submitted to the Director shall be signed and certified. *See* 40 C.F.R. §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 non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

3. Availability of Reports.

Except for data determined to be confidential under paragraph A.6. 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 Director. 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.

E. DEFINITIONS AND ABBREVIATIONS

1. General Definitions

For more definitions related to sludge use and disposal requirements, see EPA Region 1's NPDES Permit Sludge Compliance Guidance document (4 November 1999, modified to add regulatory definitions, April 2018).

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 under the CWA, 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 or 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.

Approved program or *approved State* means a State or interstate program which has been approved or authorized by EPA under Part 123.

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" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that 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.

Bypass see B.4.a.1 above.

C-NOEC or *"Chronic (Long-term Exposure Test) – No Observed Effect Concentration" means* 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.

Class I sludge management facility is any publicly owned treatment works (POTW), as defined in 40 C.F.R. § 501.2, required to have an approved pretreatment program under 40 C.F.R. § 403.8 (a) (including any POTW located in a State that has elected to assume local program responsibilities pursuant to 40 C.F.R. § 403.10 (e)) and any treatment works treating domestic sewage, as defined in 40 C.F.R. § 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 its sewage sludge use or disposal practice to affect public health and the environment adversely.

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) Public Law 92-500, as amended by Public Law 95-217, Public Law 95-576, Public Law 96-483and Public Law 97-117, 33 U.S.C. 1251 *et seq*.

CWA and regulations means the Clean Water Act (CWA) and applicable regulations promulgated thereunder. In the case of an approved State program, it includes State program requirements.

Daily Discharge means the "discharge of a pollutant" measured during a 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.

Direct Discharge means the "discharge of a pollutant."

Director means the Regional Administrator or an authorized representative. In the case of a permit also issued under Massachusetts' authority, it also refers to the Director of the Division of Watershed Management, Department of Environmental Protection, Commonwealth of Massachusetts.

Discharge

(a) When used without qualification, *discharge* means the "discharge of a pollutant."

(b) As used in the definitions for "interference" and "pass through," *discharge* means the introduction of pollutants into a POTW from any non-domestic source regulated under Section 307(b), (c) or (d) of the Act.

Discharge Monitoring Report ("DMR") means the EPA uniform 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.

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 Director 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."

Environmental Protection Agency ("EPA") means the United States Environmental Protection

Agency.

Grab Sample means an individual sample collected in a period of less than 15 minutes.

Hazardous substance means any substance designated under 40 C.F.R. Part 116 pursuant to Section 311 of CWA.

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

Indirect discharger means a nondomestic discharger introducing "pollutants" to a "publicly owned treatment works."

Interference means a discharge (see definition above) 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, 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 that is not a land application unit, surface impoundment, injection well, or waste pile.

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

LC_{50} means 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.

Maximum daily discharge limitation means the highest allowable "daily discharge."

Municipal solid waste landfill (MSWLF) unit means a discrete area of land or an excavation that receives household waste, and that is not a land application unit, surface impoundment, injection well, or waste pile, as those terms are defined under 40 C.F.R. § 257.2. A MSWLF unit also may receive other types of RCRA Subtitle D wastes, such as commercial solid waste, nonhazardous sludge, very small quantity generator waste and industrial solid waste. Such a landfill may be

publicly or privately owned. A MSWLF unit may be a new MSWLF unit, an existing MSWLF unit or a lateral expansion. A construction and demolition landfill that receives residential lead-based paint waste and does not receive any other household waste is not a MSWLF unit.

Municipality

(a) When used without qualification *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 tribal organization, or a designated and approved management agency under Section 208 of CWA.

(b) As related to sludge use and disposal, *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.

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 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 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 Director 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 Director shall consider the factors specified in 40 C.F.R. §§ 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 (see definition above) 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).

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

Permit means an authorization, license, or equivalent control document issued by EPA or an "approved State" to implement the requirements of Parts 122, 123, and 124. "Permit" includes an NPDES "general permit" (40 C.F.R § 122.28). "Permit" does not include any permit which has not yet been the subject of final agency action, such as a "draft permit" or "proposed permit."

Person means 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 measured at 25° Centigrade or measured at another temperature and then converted to an equivalent value at 25° Centigrade.

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 C.F.R. § 122.3).

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 C.F.R. Part 122.

Privately owned treatment works means any device or system which is (a) used to treat wastes from any facility whose operator is not the operator of the treatment works and (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 a treatment works as defined by Section 212 of the Act, which is owned by a State or municipality (as defined by Section 504(4) of the Act). This definition includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes and other conveyances only if they convey wastewater to a POTW Treatment Plant. The term also means the municipality as defined in Section 502(4) of the Act, which has jurisdiction over the indirect discharges to and the discharges from such a treatment works.

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

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

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, semi-solid, or liquid residue removed during the treatment of municipal waste water or domestic sewage. Sewage sludge includes, but is not limited to, solids removed during primary, secondary, or advanced waste water treatment, scum, septage, portable toilet pumpings, type III marine sanitation device pumpings (33 C.F.R. 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 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 C.F.R. § 122.2.

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; finished materials such as metallic products; 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 Section 313 of title III of SARA; 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 C.F.R. §§ 110.10 and 117.21) or Section 102 of CERCLA (*see* 40 C.F.R. § 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 C.F.R. § 122.1(b)(2).

State means any of the 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Commonwealth of the Northern Mariana Islands, the Trust Territory of the Pacific Islands, or an Indian Tribe as defined in the regulations which meets the requirements of 40 C.F.R. § 123.31.

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.

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 that is used for collecting and conveying storm water and that is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant.

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

Toxic pollutant 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 waste water 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 waste water 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 Director may designate any person subject to the standards for sewage sludge use and

disposal in 40 C.F.R. 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 C.F.R. Part 503.

Upset see B.5.a. above.

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

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

Waters of the United States or waters of the U.S. 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 the 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 CWA (other than cooling ponds as defined in 40 C.F.R. § 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States. Waters of the United States do not include prior converted cropland.

Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

Wetlands means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient 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.

*Zone of Initial Dilution (*ZID) means the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports, provided that the ZID may not be larger than allowed by mixing zone restrictions in applicable water quality standards.

2. 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 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
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)
µg/L	Microgram(s) per liter
WET	"Whole effluent toxicity"
ZID	Zone of Initial Dilution

January 30, 2019
RESPONSE TO COMMENTS
NPDES PERMIT NO. MA0101061
NORTH BROOKFIELD WASTEWATER TREATMENT FACILITY
NORTH BROOKFIELD, MASSACHUSETTS

In accordance with the provisions of 40 C.F.R. §124.17, this document presents EPA's responses to comments received on the draft National Pollutant Discharge Elimination System ("NPDES") Permit # MA0101061. The response to comments explains and supports the United States Environmental Protection Agency ("EPA") and the Massachusetts Department of Environmental Protection ("MassDEP") (together, the "Agencies") determinations that form the basis of the Final Permit. On August 22, 2017, EPA and MassDEP released a draft NPDES permit # MA0101061 for public notice and comment for North Brookfield Wastewater Treatment Facility. The public comment period for this Draft Permit ended on September 20, 2017.

EPA and MassDEP received comments from Kleinfelder, on behalf of the Town of North Brookfield (the "permittee" or the "Town") dated September 18, 2017, and from the Connecticut River Conservancy (formerly the Connecticut River Watershed Council) dated September 20, 2017. Following a review of the comments received, EPA has made a final decision to issue the permit authorizing this discharge. Although EPA's knowledge of the facility has benefited from the various comments and additional information submitted, the information and arguments presented did not raise any substantial new questions concerning the permit. In accordance with the provision of 40 C.F.R. § 124.17, the comments received and EPA's responses to those comments, including a description of any changes made to the permit as a result of those comments, as well as any clarifications EPA considers necessary, are described below.

A copy of the Final Permit may be obtained by writing or calling Michele Barden of EPA's NPDES Municipal Permits Branch (Mail Code: OEP06-1), Office of Ecosystem Protection, 5 Post Office Square, Suite 100, Boston, MA 02109-3912; Telephone: (617) 918-1539; Email barden.michele@epa.gov. Copies of the Final Permit and the Response to Comments may also be obtained from the EPA Region 1 web site at http://www3.epa.gov/region1/npdes/index.html .

Summary of Changes to the Final Permit

1. The reporting frequency for total nitrogen in Table A.1 has been changed to monthly to match the frequency in Footnote 8 of the Permit.

   The North Brookfield WWTF has a design flow of 0.76 MGD. Consistent with other NPDES permits for facilities with a design flow greater than 100,000 gpd and less than 1.0 MGD in the Connecticut River Watershed, EPA established a sampling and monitoring frequency of monthly. The language in Table A.1 is a typographical error and has been corrected in the Final Permit.

2. The final sentence in Footnote 15 referencing the postmark date has been removed. It is typographic error and relic language prior to the use of NetDMR.

3. The language requiring the testing of *Pimephales promelas* in Footnote 15 has been removed. It was included in error. The requirement is not in the Fact Sheet or in Table A.1 on page 3 of 17 of the Draft Permit.

4. The reporting language in Part G.2 (Part F.2 in the Draft Permit) of the Final Permit has been updated. The only hard copies required by MassDEP are for WET Testing Reports which should be sent to the MassDEP office in Worcester.

5. Formatting and numbering errors have been corrected.

Response to Public Comments

Comments are reproduced below as received; they have not been edited.

A. The following comments were received from James F. Cosgrove, Jr., P.E., Vice President/Principal and Mark J. Thompson, P.E., Senior Project Manager, Kleinfelder on behalf of the Town of North Brookfield:

Comment A.1:

"On behalf of the Town of North Brookfield, I have prepared this comment letter to address several issues identified when reviewing the Draft National Pollutant Discharge Elimination System (NPDES) permit (Permit) dated August 16, 2017, for the North Brookfield Wastewater Treatment Facility. We very much appreciate having the opportunity to review the draft permit before it is finalized, and we hope to work these issues out with you prior to issuance of the final permit.

Below are our comments on the draft permit. At the end of each specific parameter section, is a proposed resolution:"

Response A.1:

In accordance with 40 C.F.R. § 124.17, EPA has prepared this Response to Comments which includes a description and response to all significant comments.

Comment A.2.a:

1. **Phosphorus Effluent Limitations** – The current Permit for the North Brookfield Facility contains a total phosphorus concentration limit of 0.2 mg/L monthly average during the period of April 1-October 31, and a 1.0 mg/L concentration limit during the period November 1-March 31. In this Draft Permit, USEPA has proposed a new limit of 0.1 mg/L, effective April 1-October 31.

We believe this proposed, more stringent limitation is not appropriate due to a number of environmental and regulatory outstanding issues. These issues are outlined below and include inconsistency with an area-wide plan, lack of consistency with the narrative Massachusetts (MA) water quality criteria, inappropriate use of the federal numeric criteria and inappropriate determination of available dilution.

a) Water Quality Management Plan Limitations

In accordance with the Fact Sheet (page 15 of 40), "In 1981, the Massachusetts Department of Environmental Quality Engineering published the Chicopee River Basin Water Quality Management Plan which included a total phosphorus wasteload allocation for the North Brookfield WWTF." Limits were established for total phosphorus at 1.0 mg/L (May 1-October 31). In accordance with the Federal Clean Water Act Section 208(e), no permit for any point source may be issued which is inconsistent with the applicable area-wide plan. Inasmuch as the Chicopee River Water Basin Water Quality Management Plan establishes a warm weather limit of 1.0 mg/L for total phosphorus, and no cold weather limit, we believe it would be inconsistent to impose an alternate limitation without first amending the appropriate water quality management plan.

Response A.2.a:

EPA disagrees with the commenter that the total phosphorus effluent limit in the permit is inconsistent with the requirements of the Chicopee River Basin Water Quality Management Plan or the Clean Water Act. Among the numerous considerations required by federal regulations at 40 C.F.R. § 122.44(d), (including the 40 C.F.R. §122.44(d)(6) requirement to "Ensure consistency with the requirements of a Water Quality Management plan approved by EPA under section 208(b) of the CWA") is a requirement in 40 C.F.R. §122.44(d)(1)(i) that limitations control all pollutants which "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality." Therefore, the effluent limits must satisfy *both* the wasteload allocation (WLA) *and* the requirement to meet the narrative nutrient criteria. If the WLA and the water quality based effluent limit are not the same, the more stringent limitation must be incorporated into the permit. Here, the narrative nutrient criterion is more stringent than the WLA, therefore the narrative criterion was the basis for the total phosphorus effluent limit.

EPA agrees with the commenter that total phosphorus was identified as a pollutant of concern for this discharge in 1981 when a WLA for total phosphorus was established in the Chicopee River Basin Water Quality Management Plan. However, federal regulation at 40 C.F.R. 122.44 requires that technology based effluent limits be applied unless water quality based effluent limits are necessary to ensure that water quality standards are met. Therefore, in the 2007 Permit EPA established a more stringent total phosphorus effluent limit than the limit contained in the 1981 Water Quality Management Plan. The effluent limit in the 2007 Permit was a technology-based effluent limit (TBEL) of 0.2 mg/L of total phosphorus, which represented the "highest and

best practical treatment" in accordance with 314 CMR 4.05(c)[1]. The 2007 Fact Sheet stated, "[w]hen MassDEP adopts numeric nutrient criteria, a TMDL is completed, or additional water quality information shows that the phosphorus limits are not stringent enough to meet water quality standards, more stringent limits may be imposed." As discussed in greater depth below, the MassDEP collected new ambient data in the Summer of 2008 which was used in deriving the lower water quality based effluent limit in the Draft Permit.

The new phosphorus effluent limit meets the requirements to be consistent with a water quality management plan *and* to prevent an excursion above the water quality standard because it is at least as protective at the WLA and because it meets the numeric interpretation of the narrative nutrient criteria, as explained in the Fact Sheet and this Response to Comments.

Comment A.2.b:

b) Inappropriate application of the MA narrative criteria

The Massachusetts Surface Water Quality Standards (MA SWQS) at 314 CMR 4.05(5) c, do not contain numeric limitation applicable to this waterbody segment but do contain narrative criteria for nutrients as follows:

"Nutrients. Unless naturally occurring, all surface waters shall be free from nutrients in concentrations that would cause or contribute to impairment of existing or designated uses and shall not exceed the site specific criteria developed in a TMDL or as otherwise established by the Department pursuant to 314 CMR 4.00. Any existing point source discharge containing nutrients in concentrations that would cause or contribute to cultural eutrophication, including the excessive growth of aquatic plants or algae, in any surface water shall be provided with most appropriate treatment as determined by the Department, including, where necessary, highest and best practicable treatment (HBPT) for POTWs and BAT for non POTWS, to remove such nutrients to ensure protection of existing and designated uses. Human activities that result in the nonpoint source discharge of nutrients to any surface water may be required to be provided with cost effective and reasonable best management practices for nonpoint source control."

There are a number of issues raised by this narrative criteria that have not been appropriately addressed in the draft permit. These issues include:

- The Draft permit fails to establish what specific existing and designated uses are impaired;
- The Draft permit fails to establish whether the eutrophication is naturally occurring or man-made;

[1] Federal regulation at 40 C.F.R. 122.44 requires that technology based effluent limits be applied unless water quality based effluent limits are necessary to ensure that water quality standards are met. In the 2007 permit, the technology based effluent limit of 0.2 mg/L was applied and ensured that the WLA would also be met.

- The Draft permit fails to establish highest and best practicable treatment (HBPT) for this discharger;
- The Draft permit fails to establish if the cause of eutrophication is due to the point source discharge, non-point source, or other factors.

Response A.2.b:

As explained in Fact Sheet (see Section V.B.3 on page 6), the Clean Water Act ("CWA" or the "Act") requires that permits include effluent limitations if there is reasonable potential to cause or contribute to a violation of Water Quality Standards (WQSs). Reasonable potential can include, but is not limited to, a situation where there is a listed impairment. Other circumstances include where the water body is impaired, by other measurements available to us, but has not been listed, or, and as applicable here, if the discharge could, under critical conditions cause or contribute to a violation. Federal regulations *require* that EPA develop water quality-based effluent limitations "necessary to achieve water quality standards," 40 C.F.R. § 122.44(d)(1), and limits "derived from, and [that comply] with" water quality standards, id. § 122.44(d)(1)(vii). These requirements implement Clean Water Act section 301(b)(1)(C), which mandates inclusion of "any more stringent limitation, including those necessary to meet water quality standards" in NPDES permits. *See Upper Blackstone Water Pollution Abatement Dist. v. EPA*, 690 F.3d 9, 14-15 (1st Cir. 2012). Therefore, a water-quality based effluent limit for total phosphorous is appropriate and necessary based on the Agency's determination that the facility has the reasonable potential to cause or contribute to a violation.

The seasonal total phosphorus effluent limitation of 0.1 mg/L monthly average during the period of April 1 – October 31 is necessary to ensure that the water quality standards for Forget-Me-Not Brook are not violated. The Fact Sheet (pages 24-26) provides an analysis of reasonable potential for the effluent to cause or contribute to a violation of the WQS and a full and detailed explanation of the derivation of the new seasonal total phosphorus limit.

EPA disagrees with the commenter's implication that in order to include a TP effluent limit in a permit, EPA must first "establish if the cause of eutrophication is due to the point source discharge, non-point source, or other factors." As discussed, 40 C.F.R. §122.44(d)(1)(i) requires effluent limitations for all pollutants which "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality." (Emphasis added). EPA need not determine that the facility is the sole cause of any potential water quality excursion in order to impose a numeric effluent limit. It is sufficient that EPA has determined that the facility has the reasonable potential to, at a minimum, contribute to such an excursion. *See City of Taunton v. EPA,* 895 F.3d 120, 136 (1st Cir. 2018) ("the EPA did not need to show causation … to support its conclusion that [a waterbody] was nutrient impaired. Rather, the EPA needed only to conclude that further discharge of nitrogen [from the facility] has the "reasonable potential to cause, or contribute to an excursion above any State water standard.").

During site visits conducted in the summer of 2016, EPA observed flocculant algae in a pool just downstream of the North Brookfield WWTF discharge. The algae was not observed upstream of the discharge; and therefore, was found to be 'caused or contributed to' by the effluent from the

North Brookfield WWTF. Further information on the observations from site visits in July and August of 2016 can be found in Response A.2.h and Attachment A of this Response to Comments.

Comment A.2.c:

c) Highest and Best Practical Treatment

The MA SWQS at 314 CMR 4.02 definitions, defines Highest and Best Practical Treatment as:

"Highest and Best Practical Treatment (HBPT). The best practicable waste treatment technology for publicly owned treatment works that is the most appropriate means available on a regional basis for controlling the direct discharge of toxic and nonconventional pollutants to navigable waters. HBPT effluent limitation guidelines reflect the best performance technologies for a particular pollutant or group of pollutants that are economically achievable."

As noted in item (b) above, the MA SWQS allow for the application of HBPT when imposing NPDES permit requirements for nutrients at POTWs. The Draft Permit fails to establish what is HBPT for the North Brookfield facility, what is the "best performance technologies for a pollutant or group of pollutants" and of most concern, whether such treatment is economically achievable. The North Brookfield service community is significantly limited in population, and any increase in costs associated with meeting a more stringent nutrient limitation needs to be carefully evaluated against the determination of what is economically achievable for this community.

Response A.2.c:

EPA disagrees that it must base its numeric effluent limit for phosphorous on the "highest and best practical treatment" (HBPT) level as contained in 314 C.M.R. 4.05(c). Massachusetts' narrative criteria for nutrients is a water quality-based standard, not a technology-based standard. "[I]t is well-settled law that technological considerations are not a factor in setting water quality-based effluent limits." *In re Mass. Corr. Inst. – Bridgewater*, 2000 EPA App. LEXIS 35, *11 (E.A.B. Oct. 16, 2000). Because EPA has determined the facility's discharge of phosphorous has the reasonable potential to violate the state's water quality-based nutrients standard, it must set effluent limits for phosphorous "without regard to [the facility's] technological capacity." *In re Town of Milford*, 2001 EPA App. LEXIS 42, *16-17 (E.A.B. July 9, 2001).

In other words, Massachusetts' HBPT language does not constitute a narrative nutrient criterion that must be accounted for in setting water quality-based effluent limits. Federal regulations at 40 C.F.R. 131.3(b) define criteria as:

> "elements of State water quality standards, expressed as constituent concentration, levels or narrative statements, representing a quality of water that supports a particular use. When criteria are met, water quality will generally protect the use."

The element of Massachusetts water quality standards that provides the narrative nutrient criteria is only the first sentence of 314 C.M.R. 4.05(c) which states:

> "Unless naturally occurring, all surface waters shall be free from nutrients in concentrations that would cause or contribute to impairment of existing or designated uses and shall not exceed the site-specific criteria developed in a TMDL or as otherwise established by the Department pursuant to 314 4.00."

The remainder of the language in 314 C.M.R. 4.05(c) is Massachusetts regulatory language that provides narrative minimum treatment requirements for point source and nonpoint source nutrient discharges and does not represent a quality of water that supports a designated or existing use. Therefore, EPA correctly sets the effluent limit based on its determination of what level is necessary to ensure the discharge will not cause or contribute to the impairment of existing or designated uses.

EPA appreciates the financial limitations of a small community such as North Brookfield. However, the Clean Water Act requires that water quality-based limits be established at levels necessary to attain water quality criteria and that cost and feasibility are not to be factored into that analysis. *See Upper Blackstone Water Pollution Abatement Dist. v. EPA*, 690 F.3d 9, 33 (1st Cir. 2012); *In re City of Taunton*, NPDES Appeal No. 15-08, slip op. at 88 (EAB May 3, 2016); *In re City of Moscow, ID* 10 E.A.D. 135, 168 (EAB 2001); *In re City of Fayetteville, Ark.,* 2 E.A.D. 594, 600-601 (CJO 1988) (Section 301(b)(1)(C) "requires unequivocal compliance with applicable water quality standards, and does not make any exceptions for cost or technological feasibility."). Cost is a consideration relative to implementation of the permit limits and can be a factor in development of compliance schedules where a determination is made, as is the case here, that immediate attainment of water quality-based limits is not possible. In other words, while cost is not taken into account as a consideration when *establishing* water quality-based effluent limitations, it can be a factor when *implementing* limits (i.e., through reasonable schedules of compliance in permits or administrative enforcement orders).

Comment A.2.d:

d) Inappropriate determination of 7Q10 flow

> Please see section 7 [Comment A.8 in this Response to Comments] below for a complete discussion of this issue. A determination of an appropriate dilution factor for this discharger will have a significant impact on any proposed numeric criteria for TP.

Response A.2.d:

EPA's response to this comment is contained in its response to the more fully developed Comment A.8, as referenced in this comment.

Comment A.2.e:

e) USEPA choice of 0.1 mg/L for phosphorus is based on literature search

In accordance with the Fact Sheet page 25 of 40, USEPA states:

> "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." USEPA asserts that in accordance with the 1986 EPA Quality Criteria for Water (the 'Gold Book'), "…0.1 mg/L would apply for the downstream of the discharge."

First, we would like the opportunity to examine what other "nationally recommended criteria and other technical guidance" USEPA has used to determine that 0.1 mg/L downstream of the discharge is appropriate. Specifically, the following items were not appropriately addressed in the Fact Sheet:

- Was there any other 'nationally recommended criteria and other technical guidance' that EPA used in addition to the "Gold Book"?
- What was the specific cause of any determined eutrophication in the waterway? Is it naturally occurring? Due to non-point source? Due to excessive nitrogen? Other factors?
- "EPA is not aware of any evidence that Forget-Me-Not Brook is unusually susceptible to eutrophication." What was the extent of investigation that USEPA utilized before coming to this conclusion?
- Sampling data is presented in the Fact Sheet, detailing 5 data points upstream and 5 data points downstream of the discharge. Under what environmental conditions were these samples taken (ambient temperature, stream flow, recent precipitation etc., time of day etc)? In all but one downstream sample, the ambient stream level for total phosphorus is significantly below 0.1 mg/L, which suggests there is ample assimilative capacity in the waterbody for the current levels of phosphorus discharged from the North Brookfield facility.

Response A.2.e:

With regards to the sources used to select a numeric interpretation of Massachusetts' narrative nutrient criteria, EPA regulation at 40 C.F.R. § 122.44(d)(1)(vi), clearly address the requirement to interpret a narrative criterion in order to establish effluent limits in NPDES permits:

> "(vi) Where a State has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard, the permitting authority must establish effluent limits using one or more options:
> (A) Establish effluent limits using a calculated numeric water quality criterion for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and will fully protect the designated use. Such a criterion may be derived using a proposed State criterion, or an explicit State policy or regulation interpreting its narrative water quality criterion, supplemented with other relevant information which may include: EPA's Water Quality Standards Handbook, October 1983, risk assessment data, exposure data, information about the pollutant from the Food and Drug Administration, and current EPA criteria documents; or
> (B) Establish effluent limits on a case-by-case basis using EPA's water quality criteria, published under section 304(a) of the CWA supplemented where necessary by other relevant information; or
> (C) Establish effluent limitations on an indicator parameter for the pollutant of concern, provided:
> (*1*) The permit identifies which pollutants are intended to be controlled by the use of the effluent limitation;
> (*2*) The fact sheet required by §124.56 sets forth the basis for the limit, including a finding that compliance with the effluent limit on the indicator parameter will result in controls on the pollutant of concern which are sufficient to attain and maintain applicable water quality standards;
> (*3*) The permit requires all effluent and ambient monitoring necessary to show that during the term of the permit the limit on the indicator parameter continues to attain and maintain applicable water quality standards; and
> (*4*) The permit contains a reopener clause allowing the permitting authority to modify or revoke and reissue the permit if the limits on the indicator no longer attain and maintain applicable water quality standards.

Since Massachusetts lacks a state numeric criterion, or an explicit State policy or regulation interpreting its narrative nutrient water quality criteria, EPA looked to information and guidelines published by EPA pursuant to Section 304(a) of the Clean Water Act, supplemented by on-site observations. *See* 40 C.F.R. § 122.44(d)(1)(vi)(B). EPA's *1986 Quality Criteria for Water* ("Gold Book") recommends in-stream phosphorus concentrations of no greater than 50 µg/L in any stream entering a lake or reservoir, 100 µg/L for any stream not discharging directly to lakes or impoundments, and 25 µg/L within a lake or reservoir. EPA has also released "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. *Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams,* December 2000 (EPA-822-B-00-022). The published criteria represent conditions in waters in that ecoregion that are minimally impacted by human activities, and thus representative of water without cultural eutrophication. The North Brookfield WWTF is within Ecoregion XIV, Eastern Coastal Plains, level III ecoregion 59. The recommended total phosphorus criterion for this ecoregion is 31.25 µg/L.

EPA chose to rely on the Gold Book threshold of 100 µg/L rather than the ecoregion criteria of 31.25 µg/L because the former was developed from an effects-based approach, versus the ecoregion criteria that were developed on the basis of reference conditions. The effects-based approach is taken because it is often more directly associated with an impairment to a designated use (e.g. fishing, swimming). The effects-based approach provides a threshold value above which adverse effects (i.e. water quality impairments) are likely to occur. It applies empirical observations of a causal variable (e.g. phosphorus) and a response variable (e.g. chlorophyll *a*) associated with designated use impairments. In contrast, the ecoregion reference-based values are statistically derived from a comparison of median total phosphorus concentrations in a population of rivers in the same ecoregion class. They are a quantitative set of river characteristics (physical, chemical and biological) that represent minimally impacted conditions. The propriety of using the Gold Book is further bolstered by the fact that MassDEP uses its recommended criteria as a screening tool, when nutrient data is available, to determine whether waters are impaired under CWA § 303(d).[2]

The effects-based Gold Book threshold is a general target applicable in free-flowing streams. As noted in the Gold Book and in the Fact Sheet (see page 25), 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. 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 as factors that could reduce the susceptibility of a flowing water to eutrophication.[3]

In this case, EPA and MassDEP did observe potentially ameliorating shading conditions in the receiving water at the point of discharge, but no indication that the shading was preventing the phosphorus loading from the North Brookfield WWTF from causing or contributing to eutrophication in the brook. During the site visits on July 6, 2016 and August 10, 2016 staff were able to walk directly in the streambed for a short distance and observed substantial canopy

[2] MassDEP, 2015, "Final Massachusetts Year 2014 Integrated List of Waters", p. 23.

[3] 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 water 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.

growth which limited light intensity, a factor known to reduce aquatic vegetation growth even with high nutrient concentrations[4]. At the point of discharge, there is nearly 100% canopy. However, as the brook flows downstream, approximately 15 feet or so, the canopy opens up to 50-80% before entering the downstream wetland. There was no observable silt or color that might reduce growth. Regardless of the canopy, EPA observed aquatic vegetation in the stream just downstream from the point of discharge which are documented in the photographs in Appendix B of the Fact Sheet. All photos in Attachment A of this Response to Comments were taken between the point of discharge and a short distance (~15 feet) downstream from the discharge. The terrestrial vegetation became very dense at that point and made it impossible to walk further downstream. EPA has updated the captions on the photographs and a revised version of Fact Sheet Appendix B is attached to this Response to Comments as Attachment A.

With regard to the comment regarding the sampling data, the 2017 Fact Sheet (pages 25-26) discussed that new water quality data is now available in a report entitled *Technical Memorandum: Chicopee River Watershed 2008, DWM Water Quality Monitoring Data*[5], which was published in May 2013 and is available at http://www.mass.gov/eea/docs/dep/water/resources/wqreports/cn-323-1tm-2008-chicopeewaterquality.pdf. During the Summer of 2008, the MassDEP collected five (5) rounds of sampling data at forty-nine (49) stations in the Chicopee River Watershed including two (2) stations; DB08 – Forget-Me-Not Brook at East Brookfield Road/Donovan Road Intersection (approximately 1100 feet upstream of the North Brookfield WWTF discharge) and DB07 – Forget-Me-Not Brook west of East Brookfield Road (approximately 100 feet downstream of the North Brookfield WWTF discharge), which bracket the North Brookfield WWTF.

The total phosphorus data, summarized in Table 1, shows that ambient concentrations of total phosphorus downstream of the North Brookfield WWTF are higher than those upstream of the WWTF during every sampling date. One ambient sample exceeded the Gold Book standard of 100 µg/L even though streamflow was nearly four (4) times the critical 7Q10 flow and the discharge from the WWTF was just over half the permitted design flow.

Table 1: Instream total phosphorus concentrations from 2017 Fact Sheet, p 26.

	DB08 (W-1040) 1100' upstream of WWTF	DB07 (W-1039) 1300' downstream of WWTF
5/20/2008	0.016	0.050
6/17/2008	0.031	0.058
7/22/2008	0.032	0.140
8/19/2008	0.025	0.060
9/23/2008	0.018	0.045

The environmental conditions at the time of the MassDEP sampling are available in the technical memorandum cited above; therefore, EPA did not replicate the full data tables. To be fully responsive to the comments, EPA has summarized the relevant data in Tables 2 through 5. Again, full details are contained in the technical memorandum linked above.

[4] USDA, NRCS, National Water and Climate Center, 1999, "A Procedure to Estimate the Response of Aquatic Systems to Changes in Phosphorus and Nitrogen Inputs", p.6.
[5]Reardon, Matthew, MassDEP – Division of Watershed Management, 2013, "Technical Memorandum: Chicopee River Watershed 2008, DWM Water Quality Monitoring Data", DWM Control Number CN 323.1

Table 2: Total monthly precipitation in 2008 and monthly average precipitation for 1981 to 2010 at the Worcester Airport weather station (NOAA 2013a, NOAA 2013b), adapted from MassDEP, Chicopee River Watershed 2008 Water Quality Technical Memorandum p. 34.

Month	Worcester Airport 2008 Total Monthly Precipitation (in)	Worcester Airport Monthly Average Precipitation (1981-2010) (in)	Worcester Airport 2008 Precipitation as Percent of Monthly Average Precipitation (1981-2010)
May	2.45	4.19	58%
June	5.56	4.19	133%
July	7.96	4.23	188%
August	3.53	3.71	95%
September	9.22	3.93	235%

Table 3: Precipitation and discharge – The precipitation totals (inches) and daily average discharge (cubic feet per second) with percent exceeded on the water quality survey dates. Percent exceeded is the percent of time that the discharge was equaled or exceeded during the period of record for the stream gage, adapted from Chicopee River Watershed 2008 Water Quality Technical Memorandum, p.36-39, additional data is available in the memorandum.

	Precipitation (inches)		Discharge (cfs) (% exceeded)	Discharge (cfs) (% exceeded)	Discharge (cfs) (% exceeded)	Discharge (cfs) (% exceeded)	Discharge (cfs) (% exceeded)	Discharge (cfs) (% exceeded)
Date	Worcester Airport	Springfield/ Chicopee Airport	USGS 01174500 East Branch Swift River near Hardwick	USGS 01172500 Ware River near Barre	USGS 01173500 Ware River at Gibbs Crossing	USGS 01175670 Sevenmile River near Spencer	USGS 01176000 Quaboag River at West Brimfield	USGS 01177000 Chicopee River at Indian Orchard
5/20/2008	T	T	75 (35%)	80 (42%)	264 (44%)	23 (22%)	243 (40%)	1190 (29%)
6/17/2008	0.16	0.01	40 (56%)	27 (72%)	122 (70%)	5.6 (67%)	117 (65%)	664 (52%)
7/22/2008	0.95	2.32	63 (41%)	16 (81%)	104 (74%)	5.8 (66%)	70 (79%)	313 (80%)
8/19/2008	0.05	0.07	37 (58%)	47 (59%)	207 (53%)	4.6 (71%)	293 (33%)	972 (37%)
9/23/2008	0	0.01	35 (60%)	29 (71%)	195 (55%)	5.4 (68%)	292 (33%)	887 (41%)

Table 4: 2008 MassDEP Chicopee River Watershed in-situ *attended probe data, adapted from MassDEP Study, p.87*

Station ID	Unique ID	Water Body	Date	Time	Flow Condition	Sampling Depth (meters)	Temperature (degrees C)	pH	Specific Conductivity	Total Dissolved Solids (mg/L)	Dissolved Oxygen (mg/L)	Saturation (%)
DB07	W1039	Forget-Me-Not Brook	6/13/2008	11:00	Flowing	0.3	18.4	7.6	513	328	7.9	85
DB07	W1039	Forget-Me-Not Brook	6/16/2008	10:45	Flowing	0.2	16.7	7.6	399	255	8.3	87
DB07	W1039	Forget-Me-Not Brook	7/18/2008	10:51	Flowing	0.2	22.1	7.6	571	365	7.7	89
DB07	W1039	Forget-Me-Not Brook	7/21/2008	11:10	Flowing	0.2	21.8	7.2	280	180	8.1	94
DB07	W1039	Forget-Me-Not Brook	8/15/2008	10:35	Flowing	0.1	18.3	7.3	321	205	8.5	92
DB07	W1039	Forget-Me-Not Brook	8/18/2008	9:02	Flowing	0.1	18.0				7.9	85

Table 5: 2008 MassDEP Chicopee River Watershed summary of unattended probe temperature data, adapted from MassDEP Study, p.97

Station ID	Unique ID	Water Body	Flow Condition	Date	Deployment Duration (Hours)	Average (deg. C)	Minimum (deg. C)	Maximum (deg. C)	Mean of the Dailey Maximum (deg. C)	Amount of time > 20 deg C (Hrs)	Percentage of Tome > 20 deg. C (%)	Amount of Time > 28.3 deg. C (Hours)	Average Daily Amount of Time > 20 deg. C (Hours)
DB07	W1039	Forget-Me-Not Brook	Flowing	6/13/2008	71.0	18.1	15.8	20.7	19.5	11.8	17%	0.0	2.4
DB07	W1039	Forget-Me-Not Brook	Flowing	7/18/2008	72.0	22.1	19.8	24.6	24.3	68.9	96%	0.0	22.5
DB07	W1039	Forget-Me-Not Brook	Flowing	8/15/2008	70.0	18.7	16.5	20.5	20.5	11.7	17%	0.0	5.4

EPA disagrees that the ambient data demonstrates ample assimilative remaining in the receiving water for North Brookfield's current or permitted load of phosphorus. The 100 µg/L total phosphorus Gold Book recommendation is an acute value which should not be exceeded, rather than a seasonal average recommendation. Therefore, if met under critical conditions (for example, at 7Q10 ambient flow and design effluent flow), the values should be lower under non-critical or average conditions and designated uses met consistently. However, as stated above, the acute Gold Book recommendation was greatly exceeded in the July 2008 sample under non-critical conditions (ambient flow was 4 times the 7Q10 flow and effluent flow was less than the design flow). Therefore, the ambient data supports EPA's analysis which concluded that under critical conditions, there is reasonable potential for the facility's discharge to cause or contribute to a violation of the Massachusetts narrative nutrient criteria.

Comment A.2.f:

f) Gold Book Threshold

In accordance with the Fact Sheet page 25 of 40, USEPA has determined that the MA SWQS narrative criteria is insufficient for this discharger, and has utilized the "Gold Book Threshold" to determine that 0.1 mg/L total phosphorus downstream of the discharger is the appropriate numeric criteria. We raise the following issues and concerns:

- What is the basis to determine that the narrative criteria is not appropriate and/or sufficient for this discharger?
- What is the basis to determine that the North Brookfield Facility's effluent is the cause of any eutrophication in the stream (as opposed to excessive nitrogen, non-point source, naturally occurring etc.)?
- As stated in the Fact Sheet, "while in some others a higher total phosphorus threshold could be assimilated without inducing a eutrophic response." What analysis has EPA conducted to determine that a high phosphorus threshold could not be assimilated in this waterway without inducing a eutrophic response?
- In the Fact Sheet it states: "EPA is not aware of evidence of factors that reducing eutrophic response in forget me not brook [*sic*] downstream of the discharge." What analysis or investigation has EPA undertaken to reach this conclusion?

Response A.2.f:

With regard to the first comment, EPA did not determine that the State's narrative criterion is "not appropriate and/or sufficient." Rather, EPA determined that the discharger has the reasonable potential to cause or contribute to an excursion above the State's narrative criterion.

Therefore, as explained above, EPA regulations at 40 C.F.R. § 122.44(d)(1)(vi) clearly require EPA to establish numeric effluent limits in the NPDES permit. The remaining comments are repetitive of comments to which EPA responds above.

Comment A.2.g:

g) Limiting Nutrient Analysis

USEPA has determined, based on a literature search, the MA SWQS narrative is not appropriate for this discharger, and that a numeric criteria of 0.1 mg/L is appropriate. A more appropriate determination would be made by doing a site-specific study. Such a study would more fully evaluate the stream conditions, specific to Forget-Me-Not Brook.

We suggest EPA conduct a study which would measure and apply "response indicators" to determine whether any designated uses are being rendered unsuitable by phosphorus or its related impacts of excessive algae or low dissolved oxygen conditions.

As described in a technical manual developed in New Jersey (EPA Region 2) USEPA recommends the use of chemical response indicators, such as dissolved oxygen and turbidity, as well as biological response indicators, such as algal biomass (i.e. measured as Chlorophyll a (Chl a)) and turbidity (U.S. EPA, 1996 and USEPA 1999a). The purpose of a water quality indicator is to provide a quantitative estimate of where ambient water quality supports the designated uses. Different indicators may be needed for different uses (e.g. dissolved oxygen concentration for aquatic life support; as opposed to quantity of algae biomass {chlorophyll a} for recreational uses). The mechanism for phosphorus to cause use-impairment is most often excessive primary productivity leading to cultural (i.e. human caused) eutrophication.

Phosphorus is a required nutrient for plants and algae but is considered a pollutant when it stimulates excessive primary production. Symptoms of cultural eutrophication (primary impacts) include oxygen supersaturation during the day, oxygen depletion during the night, and high sedimentation rate. Algae are catalysts for these processes. Secondary biological impacts can include loss of biodiversity and structural changes to communities. Nutrient enrichment due to human activity can accelerate the natural aging process of surface waters.

It is also important to consider that excessive primary production occurs primarily in depositional areas such as impoundments and under summer low flow conditions. Excessive primary production may be manifested as blooms of floating algae (seston), attached algae (periphyton) or dense aquatic vegetation which in turn affect diurnal oxygen dynamics. In order to determine whether total phosphorus has not rendered the waters unsuitable for the designated uses, we would recommend that data be collected and evaluated from three areas of analysis:

1. Chemical and Physical Water Quality
2. Diurnal Dissolved Oxygen
3. Biomass Measurements
    i. Phytoplankton (measured as Chl a)
    ii. Periphyton (measured as Chl a)

Primary producers are those organisms that convert light to energy and thereby form the base of the food web, primarily algae and plants. Chlorophyll a, the dominant pigment in algal cells, is fairly easy to measure and is a valuable surrogate for algal biomass. Chlorophyll a is desirable as an indicator because algae are either the direct (e.g. nuisance algal blooms) or indirect (e.g. high/low dissolved oxygen and pH and high turbidity) cause of most problems related to excessive nutrient enrichment. USEPA has offered guidance for monitoring algal biomass and nutrients in streams and rivers (USEPA 1998a) and lakes (USEPA, 1990). More detailed monitoring methods are summarized in "Protocol for Developing Nutrient Criteria" (USEPA 1999a) and "Rapid Bioassessment Protocols" (USEPA 1999b).

Algal biomass can vary greatly in time and space within the same stream; so to reduce variability, the focus should be on algal sampling in representative sections of the stream (i.e. in flowing riffles and not pools). However, the three locations chosen should be as close as possible to the pool diurnal DO stations. To ensure that a representative portion of the reach is covered, samples must be distributed over a reach of at least 100 meters and chosen in a stratified random approach as described in USGS's National Water-Quality Assessment (NAWQA) protocols (http://water.usgs.gov/nawqa/protocols/OFR02-150.pdf). Prior to determining the monitoring location, a distance of at least a few hundred meters must be examined upstream and downstream of the proposed monitoring location to ensure that the selected sampling point is typical of the reach being characterized.

Diurnal dissolved oxygen indicates that phosphorus is rendering the water unsuitable for aquatic life use if there are dissolved oxygen fluctuations of 3 mg/L or ore (indicative of photosynthetic activity) in a 24 hour period, and one of the following events occur at any time during the course of the study:

- The minimum DO criteria is violated greater than 10% of the time based on continuous monitoring during any 24 hour sampling period; or
- The DO daily average violates the applicable 24-hour criteria

Response A.2.g:

EPA finds that the studies[6,7] conducted by MassDEP in 2008 are appropriate and were designed with the objectives that "[t]he results of the 2008 Chicopee River Watershed water quality monitoring factor into regulatory actions taken by the MassDEP and the United States

[6] Reardon, "Technical Memorandum: Chicopee River Watershed 2008, DWM Water Quality Monitoring Data"
[7] Reardon, "Technical Memorandum CN 323.2, Chicopee River Watershed, 2008 Benthic Macroinvertebrate Bioassessment"

Environmental Protection Agency (US EPA), are incorporated into DWM [MassDEP Division of Watershed Management] Water Quality Assessment Reports and are used to update Sections 305(b) and 303(d) reporting elements of the Clean Water Act (CWA). Additionally, these data are used in the development of total maximum daily loads (TMDLs) to address waters not attaining water quality standards and to aid in the development of National Pollutant Discharge Elimination System (NPDES) permits."[8] These data were collected following a sampling plan[9] and EPA-approved Quality Assurance Project Plan (QAPP)[10]. These studies represent the best available science at the time of permit issuance. "[N]either the CWA nor EPA regulations permit the EPA to delay issuance of a new permit indefinitely until better science can be developed." *Upper Blackstone Water Pollution Abatement Dist. v. EPA*, 690 F.3d at 37.

The chemical response indicator approach suggested by the permittee is recommended for impairment assessment. As discussed in Response A.2.b, a water quality based effluent limit may be necessary to address the potential for an impairment during critical conditions even if there is not already a designated use impairment. EPA uses the reasonable potential approach to determine if water quality based effluent limits are required.

If the Permittee opts to conduct any additional studies they should consult with MassDEP and EPA to assure the study will meet standards necessary for use in future permitting decisions.

Comment A.2.h:

h) Stream Pictures are not labeled

There are a number of photographs contained in the Draft Permit, Appendix B of Forget-Me-Not Brook. In order to be informative to a visual assessment determination, it is necessary to know whether the photographs were taken above the discharge location, and other considerations such as whether any tributaries enter the stream in the vicinity of the photographs and the discharge, recent precipitation, significant non-point sources, bank erosion and local vegetation.

Response A.2.h:

As explained in response A.2.e, EPA has updated the captions on the photographs and a revised version of Fact Sheet Appendix B is attached to this Response to Comments as Attachment A.

[8] Reardon, "Technical Memorandum: Chicopee River Watershed 2008, DWM Water Quality Monitoring Data", p.3.
[9] Reardon, "*Sampling Plan for Year 2008 Surface Water Monitoring in the Chicopee River Basin"*
[10] MassDEP, 2005, "*QUALITY ASSURANCE PROGRAM PLAN, Surface Water Monitoring & Assessment, MA DEP-Division of Watershed Management, 2005-2009"*

Staff from EPA and MassDEP conducted site visits to the Forget-Me-Not Brook to evaluate the stream conditions and provide context by which to understand the existing data from DMRs and WET Reports as well as the MassDEP reports.

The photographs were taken by staff to document their observations not to conduct an assessment. All the photographs included in the Attachment A of this Response to Comments were taken in a small area between the point of discharge and approximately 15 feet downstream which was as far as EPA and MassDEP could walk due to dense terrestrial vegetation[11]. There is a small bridge and road upstream from the point of discharge. The road is a potential source of non-point pollution, however, is not a likely source of nutrients.

The North Brookfield WWTF collects its ambient samples on the upstream side of the bridge. There are no tributaries that enter Forget-Me-Not Brook between this ambient sampling location and the point of discharge. There is a small tributary that enters Forget-Me-Not Brook approximately 625 feet upstream of the bridge. A second tributary enters the brook approximately 1100 feet downstream, just before Forget-Me-Not Brook and Dunn Brook join and become Dunn Brook. There was no bank erosion noted which is consistent with character of Forget-Me-Not Brook as a low flow, low gradient stream as observed in the field and documented in the photographs. The area where the photographs were taken is largely forested. Specifics of the terrestrial vegetation, however, were not noted.

Comment A.2.i:

i) Expression of Phosphorus Limitations

Phosphorus in the waterway, when demonstrated to be the cause of cultural eutrophication, does so over a period of time, and more specifically, over a targeted growing season. Unlike toxics, which are regulated on a weekly, and sometimes daily basis, and which can cause acute and immediate widespread human health and environmental harm when exceeded, the impacts of phosphorus are measured by excessive plant and algae growth. Eutrophication and other secondary impacts do not normally fluctuate on a daily or hourly basis. Therefore, regulatory control of phosphorus through seasonal loadings is uniquely suited to provide a balance between economic feasibility and environmental goals.

USEPA Headquarters, in a memorandum dated March 16, 2011 from Nancy K. Stoner to all USEPA Regional Administrators (attached), calls on all Regions to work with their states to control nutrients (nitrogen and phosphorus) specifically through reduction of *loadings*. The memo provides the framework through which this is to be accomplished, and consistently call on the EPA Regions to work toward nutrient loading reductions using the following stepwise approach:

a) Prioritize watersheds on a statewide basis for nitrogen and phosphorus loading reductions;

[11] Jennifer Wood, MassDEP, personal communication, September 26, 2018

b) Set watershed load reduction goals;
c) Ensure effectiveness of point source permits in targeted/priority sub-watersheds (specifically to municipal POTWs, the means targeted loading reduction goals.)

While we are most interested to examine the USEPA watershed prioritization utilized within the State of Massachusetts, and the targeted load reduction goals for each watershed (and specific to our facility), at this time, we believe it would be sufficient to know that the North Brookfield Facility is complying with the nutrient load reduction goals of USEPA by implementing a load only, seasonal average requirement in our permit.

Response A.2.i:

The March 16, 2011 memorandum from Nancy K. Stoner, Acting Assistant Administrator, Office of Water, EPA states: "[t]his memorandum reaffirms EPA's commitment to partnering with states and collaborating with stakeholders to make greater progress in accelerating the reduction of nitrogen and phosphorus loadings to our nation's waters." EPA continues to see itself as a partner, providing technical assistance and collaboration. States are encouraged to follow the framework attached to the memorandum. The framework was provided "as a planning tool, intended to initiate conversation with states, tribes, other partners and stakeholders on how to proceed to achieve near- and long-term reductions in nitrogen and phosphorus pollution in our nation's water…EPA will support states that follow the framework but, at the same time, will retain all its authorities under the Clean Water Act."

MassDEP prepared a Nutrient Management Report[12] which provides a brief description of the programs and regulations that are being used to prevent nutrient pollution and restore impaired waters. MassDEP also has prepared a map that provides additional information about the State's efforts. It is noted that the map identifies the segment of Forget-Me-Not Brook, immediately downstream of the North Brookfield WWTF, as "Nutrient Impaired without a TMDL". The map can be found at: http://www.mass.gov/eea/docs/dep/water/resources/n-thru-y/nmrmap.pdf (retrieved 11/26/2018).

The Massachusetts Report stresses that the MA SWQS "provide the legal framework for protection and enhancement of water resources through the enforcement of nutrient controls." It notes that 145 NPDES facilities in Massachusetts have effluent limits or required monitoring for either phosphorus, nitrogen or both.[13] MassDEP further notes that approximately 70% of these facilities have effluent limits for total phosphorus and 50% of those limits require seasonal limits of less than 0.2 mg/L. It is clear that the inclusion of seasonal effluent limits for total phosphorus is a key element of MassDEP's nutrient management toolbox; however, the effluent limits for

[12] MassDEP, "Massachusetts Nutrient Management Plan 2013" formerly at http://www.mass.gov/eea/agencies/massdep/water/watersheds/massachusetts-nutrient-management-report-2013.html (retrieved 1/18/2018)

[13] This information is based on US EPA Integrated Compliance Information System (ICIS) data for Massachusetts FY11 and may not represent complete information. The count of 145 includes most of the major WWTPs in Massachusetts.

total phosphorus in Massachusetts permits are monthly average limits that apply monthly during a season rather than "seasonal average' limits

EPA disagrees that a "load only seasonal average" total phosphorus effluent limit would necessarily be sufficiently protective under the assumptions used to derive the concentration based effluent limit of 0.1 mg/L. The 100 µg/L total phosphorus Gold Book recommendation is an acute value which should not be exceeded, rather than a seasonal average recommendation. Therefore, if met under critical conditions (for example, at 7Q10 ambient flow and design effluent flow), the values should be lower under non-critical or average conditions for designated uses to be met.

A loading based effluent limit for total phosphorus is derived from the WQBEL that is based on concentration. Using the upstream median total phosphorus concentration of 0.025 mg/L and the lowest of the summer period monthly average effluent flow of 0.296 MGD yields a mass based limit of 0.27 lb/d.

$$Q_dC_d + Q_sC_s = Q_rC_r$$

and

$$M_d = Q_dC_d * 8.345$$

Substituting (Q_dC_d) with (M_d/8.345) in the first equation and solving for M_d results in:

$$M_d = (Q_rC_r - Q_sC_s) * 8.345$$

where:

M_d = mass-based effluent limit
Q_d = effluent flow in mgd (lowest effluent summer monthly average flow = 0.296 MGD)
C_d = effluent phosphorus concentration in mg/L
Q_s = upstream 7Q10 flow (0.032 MGD)
C_s = upstream ambient phosphorus concentration (0.025 mg/L)
Q_r = downstream 7Q10 flow ($Q_s + Q_d = 0.328$)
C_r = downstream ambient phosphorus concentration (Gold Book target = 0.100 mg/L)
8.345 = factor to convert from MGD * mg/L to lb/d

While there are instances where EPA has developed mass-based limits for total phosphorus, the allowable discharge of 0.27 lb/day is equivalent to approximately 0.043 mg/L at design flow which is not necessarily achievable, so EPA set the effluent limit at 0.1 mg/L. It is important to remember that the effluent is a significant portion of the streamflow of Forget-Me-Not Brook.

Comment A.2.j:

Requested Resolution of Issues:

The imposition of a numeric criteria of 0.1 mg/L for phosphorus is not supported in the Draft Permit or Fact Sheet, as demonstrated above. While an EPA detailed resolution of each of the specific items noted above would be appropriate, the North Brookfield Facility also understands the importance of nutrient control, and is willing to support maintaining such controls. Based on the stream sampling outlined in the draft permit, it appears that the stream has sufficient assimilative capacity to maintain ambient levels of total phosphorus downstream of the discharges to below 0.1 mg/L under most conditions. The North Brookfield Facility would be willing to retain the 0.2 mg/L warm weather limit, and the 1.0 mg/L cold weather limit; however, we do request that these limitations be converted to load only (based on permitted flow) and be imposed as a seasonal average (not a monthly average).

Response A.2.j:

As explained in the various responses above, EPA has reasonably determined that a numeric effluent limit of 0.1 mg/L is necessary to achieve the state's narrative water quality standard for total phosphorous.

Comment A.3:

Nitrogen Requirements – Neither the current NPDES permit, nor the proposed Draft NPDES permit, contains effluent limitations for nitrogen. We agree with this determination, as this discharger is governed by an approved Total Maximum Daily Load (TMDL), which does not require the North Brookfield Facility to have effluent limitations for nitrogen. As detailed in the Fact Sheet pages 22 and 23, in December 2000, the Connecticut Department of Energy and Environmental Protection completed a TMDL for addressing nitrogen-driven eutrophication impacts in Long Island Sound. That TMDL required wasteload allocations (WLAs) for point source discharges in Massachusetts, New Hampshire and Vermont to achieve an aggregate reduction of 25% reduction from the baseline total nitrogen loading estimated in the TMDL.

As further detailed in the Fact Sheet, EPA states: "The TMDL target of a 25% 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%.

This is indeed good news, and the North Brookfield facility, as well as other facilities in the study area, are to be commended. Not only were the goals of the TMDL achieved but these goals were exceeded by nearly 50%.

The above notwithstanding, as detailed in the Fact Sheet, EPA would like to "ensure that aggregate nitrogen loading from out-of-basin point sources does not exceed the TMDL target of

a 25% reduction. EPA intends to include a condition…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 be required to implement optimization measures sufficient to ensure that their nitrogen loads do not increase above annual average total nitrogen load present in 2004-2005, which USEPA has determined is 119 lbs/day."

We have several concerns regarding this approach, shown below:

- The TMDL load reduction of 25% has been achieved, and in fact, has been achieved with a nearly 50% safety factor. On what technical or regulatory basis has EPA determined that facilities must now hold the load to 2004-2005 levels?

- Based upon the contents of the Fact Sheet, it appears that the TMDL was very specific in requiring that the aggregate load be reduced – not that any specific facility would need to "hold-the-load" at a targeted numeric criteria. On what regulatory or technical basis is USEPA requiring a discharger specific reduction?

- Based upon what study, indicators, analysis or other site specific study has EPA relied upon to determine that "holding the load" at all affected facilities in a three state region is necessary to achieve TMDL compliance (which has already been achieved)?

- What is the regulatory basis to determine that 119 lbs/day is the appropriate load, when integrated into an aggregate reduction spread across a three state region?

- What is the regulatory basis that EPA used to require the North Brookfield facility to determine alternative methods for nitrogen reduction, with no corresponding regulatory supported, water quality based effluent limitation?

<u>Proposed Resolution:</u>

While an EPA detailed resolution of each of the specific items noted above would be appropriate, the North Brookfield Facility understands the importance of nutrient control, and it willing to support maintaining such controls. We request that the facility maintain the current nitrogen concentration in the discharge, which has been highly successful in meeting the goals of the TMDL. In the event that EPA determines nitrogen limitations are necessary, such a determination should be made through amending the governing TMDL.

In accordance with the premise of the NPDES Program as established under the Clean Water Act, the permitting authority shall establish effluent limitations appropriate to the waterbody, and the affected discharger shall take the steps necessary, within the associated regulatory framework, to meet them. Until such time as a regulatory, scientific and environmentally supported water quality based effluent limitation for nitrogen is developed, we do not believe it is prudent use of the regulated communities' limited funds to develop alternate treatment methods.

North Brookfield is amenable to maintaining nutrient concentrations at current levels.

Response A.3:

The permit requires the permittee to 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 a description of recommended operational changes. Although EPA encourages the permittee to optimize its process such that there is no increase in total nitrogen from the existing average daily load (estimated to be 119 lbs/day based on 2004-2005 DMR data), the optimization element of the permit does not mandate achievement of any specific load number. The comments appear to misconstrue the optimization permit element as requiring achievement of a specific nitrogen level. It does not.

EPA is requiring the optimization analysis 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 has included permit conditions for existing treatment facilities in Massachusetts and New Hampshire that discharge to the Connecticut, Housatonic and Thames River watersheds. These conditions require 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. EPA has worked with the State of Vermont to ensure that similar requirements are included in their discharge permits for dischargers also located in the applicable watersheds.

This requirement does not require the facility to invest in new treatment technology, but to evaluate alternatives for operating the existing equipment in such a way that it reduces nitrogen discharges.[14] EPA expects that North Brookfield should be able to readily optimize operation. With a 2011-2016 five-year average effluent flow of 0.35 MGD, North Brookfield is currently operating at well below its flow limit of 0.76 MGD and the 2004-2005 average effluent flow of 0.62 MGD. Unsurprisingly, due the reduction in flow, the 2011-2016 average nitrogen loading (54.8 lb/day) is well below the existing average daily load, even though average total nitrogen concentrations have gone up slightly (23.1 mg/L in 2004-2005 and 24.6 in 2011-2016)[15].

EPA agrees with the assessment that the 25% reduction in nitrogen loads from the 1998 baseline estimate of out-of-basin point sources required in the Long Island Sound TMDL is currently being met. However, the Long Island Sound remains an impaired water body. Thus, at a minimum, maintaining the aggregate load reductions already achieved, is critical to restoring water quality and designated uses in Long Island Sound. EPA determines that the optimization requirement in the permit is necessary to ensure that North Brookfield's discharge complies with the WLA in the TMDL.

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[14] For example, the permittee may refer to EPA's "Case Studies on Implementing Low-Cost Modifications to Improve Nutrient Reduction at Wastewater Treatment Plants" [EPA-841-R-15-004, August 2015] https://www.epa.gov/sites/production/files/2015-08/documents/case_studies_on_implementing_low-cost_modification_to_improve_potw_nutrient_reduction-combined_508_-_august.pdf

[15] EPA identified an error (incorrect units identified in column headers) in the nitrogen data provided in the Discharge Monitoring Report Summary in Appendix A of the 2017 Fact Sheet. A corrected data summary for Total Nitrogen is provided in Attachment B of this Response to Comments.

Comment A.4:

Copper – As detailed in the Fact Sheet page 31 and 32, EPA has determined that the appropriate copper criteria for this discharger is 8.66 µg/L acute and 6.03 µg/L chronic. The current permit includes a monthly average copper limitation of 5.2 µg/L and a daily maximum of 7.3 µg/L. North Brookfield has not been able to achieve these limitations and is under an Administrative Order requiring interim limits for copper of a monthly average 20 µg/L, with no daily maximum.

The proposed draft permit now contains newly calculated copper effluent limitations of 6.0 µg/L average monthly limit and 8.7 µg/L daily maximum.

There are several issues noted with the establishment of copper limitations for this facility. These include:

- The MA SWQS establish a site-specific copper limit for Dunn Brook of an acute value of 25.7 µg/L and chronic of 18.1 µg/L. As noted in page 16 of 40 of the Fact Sheet, Dunn Brook is approximately 0.3 miles downstream of the facility discharge. Further, as also detailed on page 16 of the Fact Sheet, the Dunn Brook watershed was utilized to determine the appropriate 7Q10 flow for Forget Me Not Brook, thereby supporting the close relationship of these waterbodies.

- The EPA determined the site specific criteria without consideration of the site specific characteristics of the waterway. A number of widely accepted EPA methods to determine a more appropriate site specific copper limitation are available such as a Water Effects Ratio (WER) Study and Biotic Ligand Model (BLM). Such studies would be more appropriately be able to determine site-specific limitations for this discharger, and will be better suited to achieve the environmental goals.

Proposed Resolution:

Inasmuch as a site specific copper criteria has been established for Dunn Brook, which is located only 0.3 miles downstream of the discharge, we believe the use of this adopted criteria is appropriate for Forget-Me-Not Brook. We suggest that a new water quality based effluent limitation (WQBEL) for copper be developed based on the Dunn Brook criteria. If the newly calculated limit cannot be a met by North Brookfield, it should be provided the opportunity to conduct a site specific water quality study to determine the most appropriate WQBEL for the facility.

Response A.4:

EPA recognizes that Dunn Brook is a short distance downstream from the North Brookfield WWTF discharge. However, the Dunn Brook is a different stream segment than the Forget-Me-Not Brook. Because site-specific criteria are assigned by waterbody (*see* MA SWQS at 314 CMR 4.06, Table 28), EPA does not look to the Dunn Brook, a different waterbody than the receiving water, for any applicable site-specific criteria.

Moreover, no site-specific criteria for Dunn Brook have been approved by EPA. Pursuant to 40 C.F.R. § 131.21, EPA does not apply a criterion that has not been approved by EPA. Therefore, even if the site-specific criterion was applicable to the receiving water, EPA cannot use the site-specific criteria for Dunn Brook in an EPA-issued NPDES Permit and must use the EPA approved WQS.

Contrary to the comment, EPA did not establish a site-specific criterion for Forget-Me-Not Brook. As explained in the Fact Sheet, MA SWQS at 314 CMR 4.05(5)(e) states "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 concentration for the affected waters, unless the Department either establishes a site specific criterion or determines that naturally occurring background concentrations are higher." Therefore the 2002 National Recommended Water Quality Criteria for copper are the Massachusetts adopted criteria. As detailed in the Fact Sheet, EPA used the available hardness data to determine the applicable copper criteria from the 2002 National Recommended Water Quality Criteria.

EPA recognizes that the facility has not been able to meet their existing limits in the 2007 Permit and is under an Administrative Order. Once the Final Permit is issued, EPA would advise the Permittee work with EPA Region 1's Office of Environmental Stewardship to develop interim limits in a new Administrative Order, if warranted. A site-specific water quality study can be an element of the Administrative Order.

Comment A.5:

Zinc – In the Fact Sheet page 32 of 40, EPA states that the acute and chronic water quality criteria for zinc is 77.8 µg/L. EPA does not state the source of this criteria, although we assume it is based upon EPA federal criteria.

- Please provide the regulatory basis for the determination of a water quality criterion for zinc of 77.8 µg/L

- Please provide the regulatory basis for determining that this criteria is the most appropriate criteria for Forget-Me-Not Brook.

- As stated in the Fact Sheet page 27 of 40, "The theoretical hardness of Forget-Me-Not Brook 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…" We are uncomfortable with EPA relying on hardness data collected for WET testing purposes without better understanding the conditions under which these samples were collected.

Proposed Resolution:

The North Brookfield facility requests the opportunity to collect additional hardness data to be utilized in the determination of a more appropriate zinc limitation. The North Brookfield facility also reserves the right to object to the use of the 77.8 µg/L criteria, at such time as the EPA provides the regulatory basis for utilizing this criteria.

Response A.5:

Section VI.B.3.b of the Fact Sheet, pages 26-32, discussed in detail, EPA's determination of the applicable water quality criteria for metals. As explained in the Fact Sheet, MA SWQS at 314 CMR 4.05(5)(e) states "For pollutants not otherwise listed in 314 C.M.R. 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 concentration for the affected waters, unless the Department either establishes a site specific criterion or determines that naturally occurring background concentrations are higher." Zinc is not a pollutant listed in 314 C.M.R. 4.00, therefore the 2002 National Recommended Water Quality Criteria for zinc are the Massachusetts adopted criteria.

The full process followed for all metals is laid out in the Fact Sheet on pages 26-29. In summary, EPA determined the theoretical hardness of Forget-Me-Not Brook downstream of the treatment plant during critical low flow periods. 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 2011-2016. The median effluent hardness was 60.7 mg/L as $CaCO_3$ and the median ambient hardness was 44.9 mg/L as $CaCO_3$ which resulted in a downstream hardness of 60.05 mg/L as $CaCO_3$.

From the Fact Sheet, page 28:

> The following table presents the factors used to determine the acute and chronic total recoverable criteria for each metal [from the National Water Quality Criteria: 2002].

Table 6: Factors Used to Determine the Acute and Chronic Total Recoverable Criteria for Metals from 2017 Fact Sheet, page 28

	Parameters				Total Recoverable Criteria	
Metal	**ma**	**ba**	**mc**	**bc**	**Acute Criteria* (CMC) (µg/L)**	**Chronic Criteria** (CCC) (µg/L)**
Aluminum	-----	-----	-----	-----	750	87
Cadmium	1.0166	-3.9240	0.7409	-4.7190	1.27	0.19
Copper	0.9422	-1.7000	0.8545	-1.702	8.66	6.03
Lead	1.273	-1.46	1.273	-4.705	42.66	1.66
Nickel	0.846	2.255	0.846	0.0584	304.76	33.88
Zinc	0.8473	0.884	0.8473	0.884	77.78	77.78

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

The whole effluent toxicity test samples are required to be collected by the permittee as a NPDES permit condition. EPA requires that the permittee use 40 C.F.R. § 136 methods and meet the sampling, analysis, and reporting requirements in the protocol attached to the 2007 NPDES permit. The NPDES Part II Standard Conditions, which was also attached to the 2007 Permit, detail the monitoring requirements including the requirement that "Samples and measurement taken for the purpose of monitoring shall be representative of the monitored activity" (see Part II.C.1.a). The hardness data used to calculate the theoretical hardness was collected during the months of June and August 2012-2016 and reported by the Permittee.

Comment A.6:

Aluminum - The Fact Sheet (page 31of 40) proposes to retain the current aluminum effluent limitation of 750 µg/L acute and 87 µg/L chronic. While no basis for this criteria is contained in the fact sheet, it is assumed that the number is based upon federal criteria.

As contained in the EPA's July, 2017 "Draft Aquatic Life Ambient Water Quality Criteria for Aluminum in Fresh Water":
https://www.epa.gov/sites/production/files/2017-07/documents/aluminum-draft-criteria-factsheet.pdf

"The recommend level of aluminum in freshwater depends on a site's water quality parameters. Unlike the fixed values found in the 1988 criteria document, these criteria use Multiple Linear Regression (MLR) model to normalize the data, and the criteria are based on a site's pH, DOC, and hardness. See Table 1 for a comparison of existing and draft criteria values."

Under the proposed EPA criteria, (MLR normalized to pH = 7, hardness = 100 mg/L, DOC – 1 mg/L) **acute and chronic criteria would be 1400 µg/L and 390 µg/L, respectively.**

Proposed Resolution:

We suggest that the permit contain a re-opener clause, that upon EPA adoption of the revised aluminum criteria, this permit may be modified to utilize those criteria.

Response A.6:

Section VI.B.3.b of the Fact Sheet, pages 26-32, discussed in detail, EPA's determination of the applicable water quality criteria for metals. The MA SWQS at 314 CMR 4.05(5)(e) states "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 concentration for the affected waters, unless the Department either establishes a site specific criterion or determines that naturally occurring background concentrations are higher." Aluminum is not a pollutant listed in 314 C.M.R. 4.00, therefore the 2002 National Recommended Water Quality Criteria for aluminum are the Massachusetts adopted criteria. EPA acknowledges that the permittee is currently subject to interim limits under an Administrative

Order of Consent with EPA. These limits are 210 µg/L average monthly and report only daily maximum.

The full process followed for all metals is laid out in the Fact Sheet on pages 26-29.

EPA is aware of ongoing efforts by MassDEP to revise the Massachusetts aluminum criteria based, at least in part, on new EPA aluminum criteria recommendations.[16] MassDEP has informed EPA that it expects to propose the revisions to its aluminum criteria in 2019.

EPA's aluminum criteria recommendations indicate that the new aluminum criteria recommendations may be higher than the current recommendations. Because MassDEP has indicated to EPA that its planned revisions to its aluminum criteria will be based on EPA's recommended criteria, EPA reasonably expects its new criteria may also be higher, depending on site-specific ambient water quality characteristics. If new aluminum criteria are adopted by Massachusetts and approved by EPA, the permittee may apply for a permit modification to amend the permit based on the new criteria. If warranted by the new criteria, EPA may be able to relax the new effluent limit consistent with antibacksliding and anti-degradation requirements.

Comment A.7:

Biochemical Oxygen Demand (BOD5) and Total Suspended Solids (TSS)

In the fact sheet page 17 of 40, EPA describes that concentration limitation for both BOD5 and TSS have been retained from the current permit. Upon further evaluation, this appears disingenuous, as EPA has rolled back the loadings for these parameters to pre-1981 levels. The Fact Sheet uses the annual average design flow of 0.32 mgd (the design flow at the time of the 1981 WLA) to determine loadings for both BOD5 and TSS.

EPA has based this evaluation upon the fact that a permit modification in 1995 was issued to address an increase in flow from 0.32 mgd to 0.76 mgd, and that EPA had failed to conduct an anti-degradation analysis at that time.

We take great exception to EPA's unilateral application of load limits rolled back to conditions present over 20 years ago, due to the fact that EPA failed to conduct the appropriate study at that time.

Proposed Resolution:

EPA should allow an opportunity for the appropriate anti-degradation study to be conducted on Forget-Me-Not Brook. New, more stringent load limits for BOD and TSS should not be imposed until such time as the appropriate anti-degradation study is conducted.

[16] More information about EPA's aluminum criteria recommendations is available at: https://www.epa.gov/wqc/aquatic-life-criteria-aluminum.

Response A.7:

The concentration limits for BOD_5 and TSS are the same as in the 2007 Permit and are consistent with the 1981 WLA for the period of May 1 through October 31 and the secondary treatment requirements at 40 C.F.R. § 133.102 for the period of November 1 through April 30. The Draft Permit did propose a reduction in the mass-based limits for BOD_5 and TSS in response to an effluent flow increase that was permitted in 1995 but not properly addressed by MassDEP with regard to its antidegradation requirements and implementation policy.

EPA stated in the Fact Sheet, on page 16 (with regard to the 1995 flow increase), on page 17 (for BOD_5) and on page 18 (for TSS), that it would be necessary to reduce the loadings for BOD_5 and TSS to assure that the Massachusetts antidegradation policy was met. Although the antidegradation issue should have been addressed when the flow increase was authorized in 1995, this error does not nullify the need to conduct an antidegradation analysis at all. A review of DMR data shows that the facility is currently discharging BOD_5 at levels well within loading limits and that the limits are currently achievable by the WWTF (See Table 7: BOD_5 and TSS Loading Limits compared to current performance.). EPA has maintained the loading limits in the Final Permit.

Table 7: BOD_5 and TSS Loading Limits compared to current performance.

Parameter	Loading Limit in 2007 Permit	Loading Limit in 2018 Final Permit	Reported DMR Loadings 2011-2016
Average Monthly BOD5 (May 1-October 31)	95 lbs/day	40 lbs/day	Avg = 8.35 lbs/day (1.6-22.8 lbs/day)
Average Weekly BOD5 (May 1-October 31)	139 lbs/day	59 lbs/day	Avg = 15.5 lb/day (4.9-25.2 lbs/day)
Average Monthly BOD5 (November 1-April 30)	190 lbs/day	80 lbs/day	Avg = 12 lbs/day (2.4-27.6 lbs/day)
Average Weekly BOD5 (November 1-April 30	285 lbs/day	120 lbs/day	Avg = 20.3 lbs/day (3.3-51.3 lbs/day)
Average Monthly TSS (May 1-October 31)	95 lbs/day	40 lbs/day	Avg = 6.28 lbs/day (2.4-27 lbs/day)
Average Weekly TSS (May 1-October 31)	139 lbs/day	59 lbs/day	Avg = 12.6 lbs/day (2-23.6 lbs/day)
Average Monthly TSS (November 1-April 30)	190 lbs/day	80 lbs/day	Avg = 14.2 lbs/day (3.1-52 lbs/day)
Average Weekly TSS (November 1 - April 30)	285 lbs/day	120 lbs/day	Avg = 20.3 lbs/day (3.3-51.3 lbs/day)

Comment A.8:

Dilution Determination

In the fact sheet page 16 of 40, EPA states: "The 7Q10 flow used in the draft permit has been extrapolated from two U.S. Geological Survey gage stations in the area of Dunn Brook…The total drainage area for the Dunn Brook watershed is about 6.35 square miles; the drainage area upstream of the discharge is about 1 square mile. Using the low-flow factor of 0.05 cfs/mi^2, yields a receiving water 7Q10 flow of about 0.05 cfs…" The resulting dilution factor is 1.0.

North Brookfield objects to this manner of determining the 7Q10 for Forget-Me-Not Brook.

Proposed Resolution:

A site-specific 7Q10 determination for this waterbody should be conducted so that the appropriate dilution factors may be applied to the calculated WQBELs contained in the permit.

Response A.8:

The commenter's proposed resolution is a site-specific determination of the 7Q10 for Forget-Me-Not Brook. EPA used data from the Dunn Brook Watershed, of which the Forgot-Me-Not Brook is a part. Therefore, EPA did utilize site-specific data for this evaluation.

The use of a low flow factor from nearby gaged waterbodies is an accepted method to determine 7Q10 on ungaged streams[17]. EPA used the data that was available at the time of this permit issuance. "[N]either the CWA nor EPA regulations permit the EPA to delay issuance of a new permit indefinitely until better science can be developed." *Upper Blackstone Water Pollution Abatement Dist. v. EPA*, 690 F.3d at 37. It is consistent with the dilution factor used in both the 1995 and 2006 Fact Sheets as well.

Funding for the establishment of a stream gage on a 1.26 square mile drainage area is uncertain. There have been cases where an individual party has funded the establishment of a stream gage via an agreement with USGS. EPA is unclear if this is the scenario that the commenter is proposing. If so, the permittee should initiate discussions with USGS. In the interim, based on current available data, EPA will proceed with establishing WQBELs using the dilution factor determined by the manual method. Data provided from a new steam gage could be used in a later permitting action.

Comment A.9:

Page 7 of 17, number 8: Total Nitrogen (TN) is to be reported monthly, but measured quarterly, which doesn't make sense. Also, the TN load is to be calculated based on monthly TN concentration and flow. With a single quarterly data point the TN load can only be accurately calculated based on concentration and flow for that day.

Response A.9:

The North Brookfield WWTF has a design flow of 0.76 MGD. Consistent with other NPDES permits for facilities with a design flow less than 1.0 MGD in the Connecticut River Watershed, EPA established a monitoring frequency of monthly. The language in the table is a typographical error and has been corrected in the Final Permit.

[17] Ries, Kernell G. and Paul J. Friesz, USGS, 2000, "Methods for Estimating Low-Flow Statistics for Massachusetts Streams, Water Resources Investigations Report 00-4135

Comment A.10:

Page 7 of 17, number 10: Chemical dosing rate (gallons per day) for phosphorus removal is currently reported on the DEP monthly report. Is that sufficient?

Response A.10:

The chemical dosing rate on the MassDEP monthly report is sufficient. The permittee may submit the MassDEP monthly report to EPA as a report via NetDMR to satisfy this Permit requirement.

Comment A.11:

Page 8 of 17, number 15: The text of the paragraph says quarterly toxicity text results are to be postmarked by the 15th of the month but the table says the toxicity test results are to be reported quarterly on the last day of the month. Please clarify.

Response A.11:

EPA has removed the sentence referencing the postmark date. It is a typographic error and relic language prior to the use of NetDMR.

Comment A.12:

Page 8 of 17, number 15: As noted on page 34 of 40 toxicity testing on the fathead minnow has been added. It was not included in our current permit because the water upstream of our discharge killed the fathead minnows, and Ceriodaphnia dubia is the more sensitive species. We therefore request that fathead minnow be removed from the toxicity testing requirements.

Response A.12:

EPA has removed the language requiring the testing of *Pimephales promelas* on page 8, number 15. It was included in error. The requirement is not in the Fact Sheet or in Table A.1 on page 3 of 17 of the Draft Permit.

Comment A.13:

Page 13 of 17, number 15: Paragraphs 1 and 2 states hard copies of DMRs don't have to be submitted. DEP tells us they still need hard copies.

Response A.13:

EPA has discussed this with MassDEP and the only hard copies required by MassDEP are WET Testing Reports which should be sent to the MassDEP office in Worcester. EPA has updated this language in the Final Permit.

Comments submitted by Andrea F. Donlon, River Steward, Connecticut River Conservancy, on September 20, 2017.

Comment B.1:

I am submitting comment on the draft National Pollutant Discharge Elimination System (NPDES) permit for North Brookfield Wastewater Treatment Plant on behalf of the Connecticut River Conservancy (CRC), formerly known as the Connecticut River Watershed Council. The draft permit replaces the existing permit issued in 2007. Our organization is interested in improving water quality throughout the entire Connecticut River basin. The facility discharges treated domestic wastewater to Forget-Me-Not Brook, which flows to Dunn Brook, to the Quabog River, then the Chicopee River, a major tributary to the Connecticut River. As stated in the Fact Sheet, Forget-Me-Not Brook is listed in the 2014 MA Integrated List of Waters as impaired for aquatic macroinvertebrate bioassessments, E. coli, taste and odor, and whole effluent toxicity (WET), however the listing is based on data from 2008. Our comments are below.

Response B.1:

EPA acknowledges receipt of these comments.

Comment B.2:

CRC agrees with EPA's decision to decrease the seasonal monthly and weekly mass-based limits for biochemical oxygen demand (BOD_5) and total suspended solids (TSS) to address antidegradation concerns caused by the 1995 increase in design flow.

Response B.2:

EPA has retained the mass-based limits as proposed in the Draft Permit.

Comment B.3:

CRC understands that the increased discharge limit for winter ammonia is proposed to correct a previous calculation error.

Response B.3:

EPA acknowledges the comment.

Comment B.4:

CRC concurs with the dissolved oxygen limit change from a daily limit of >0.5 mg/L to 0.6 mg/L

Response B.4:

EPA acknowledges the comment and notes the dissolved oxygen limit was raised from 5.0 mg/L to 6.0 mg/L. The limit has been retained in the final permit.

Comment B.5:

CRC recommends that the sampling frequency for nitrogen compounds (TKN, nitrite + nitrate, and TN) should be increased from quarterly to monthly. Our rationale is that monthly sampling is consistent with other NPDES permits in the Connecticut River watershed, and will provide EPA better data with which to use for implementing its nitrogen reduction strategy. We do recognize that increased sampling and analysis comes with increased costs to the facility.

Response B.5:

EPA has clarified that the sampling frequency is monthly which is consistent with other facilities with flows greater than 0.1 MGD and less than 1.0 MGD in the Connecticut River Watershed.

Comment B.6:

CRC concurs with the proposed new total phosphorus limit of 0.1 mg/L between April 1 and October 31. This is something we advocated in our 2006 comment letter during the last permit revision.

Response B.6:

EPA acknowledges the comment and advises that a more in-depth explanation for the more stringent limit can be found in the Response to Comment A.2.

Comment B.7:

CRC concurs with the new special conditions for nitrogen and total phosphorus in Part I.A. of the permit.

Response B.7:

EPA acknowledges the comment.

Comment B.8:

Part I.F.2 states that the permittee shall continue to send hard copies of reports to MassDEP and refers to Part I.G.6 of the permit for information on state reporting. However, part I.G only includes provision 1-3, and does not include a section 6. The draft permit lacks the usual list of MassDEP addresses that reports need to be submitted to. CRC recommends that the final permit add the addresses for clarity.

Response B.8:

EPA has recently updated the Reporting section of the Permit. EPA has discussed with MassDEP which reports should be submitted as hard copies and they requested that only WET Testing Reports should be sent to the MassDEP office in Worcester. EPA has updated this language in the Final Permit.

Attachment A

Updated Fact Sheet Appendix B

Figure 1: North Brookfield Outfall at the rocks and boards. Site has 100% canopy.

Figure 2: Macrophyte and periphyton growth in Forget-Me-Not Brook, downstream of the North Brookfield WWTF, where the canopy opens.

Figure 3: Periphyton amd macrophytes attached to rocks and streambed of Forget-Me-Not Brook, just downstream on the North Brookfield WWTF, where the canopy open.

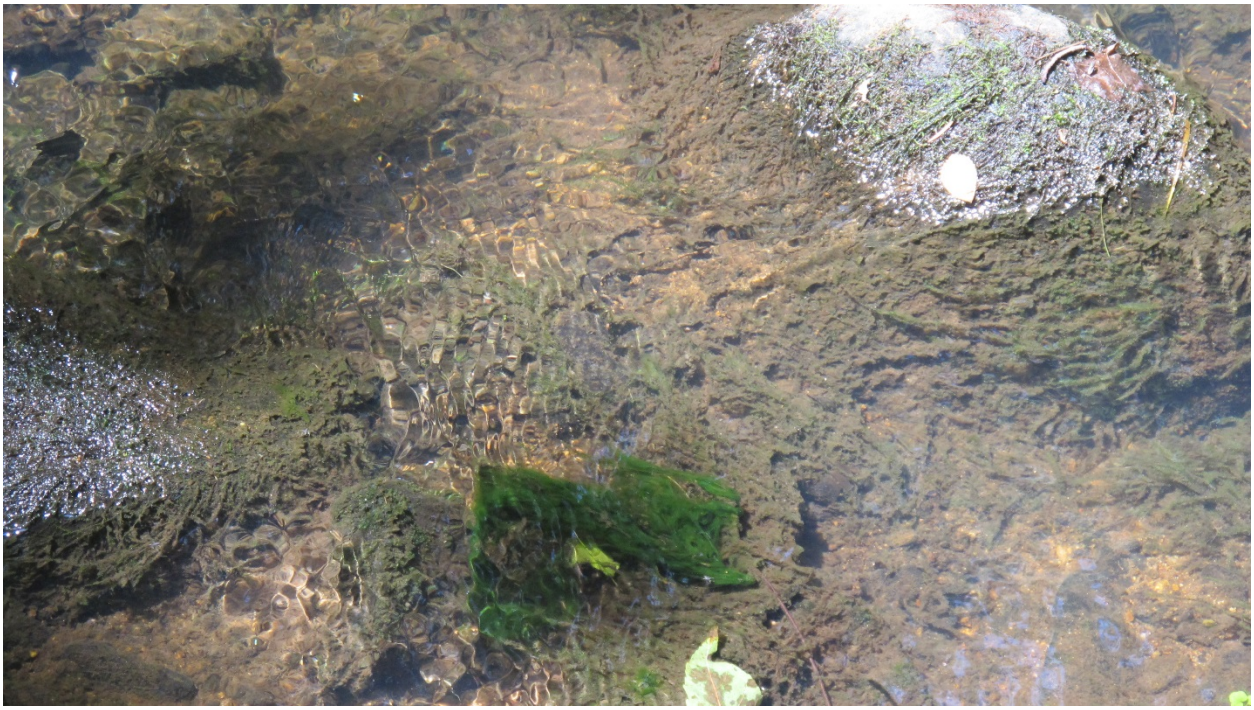

Figure 4: Periphyton and macrophytes on substrate in Forget-Me-Not Brook just downstream on the North Brookfield WWTF, where the canopy opens.

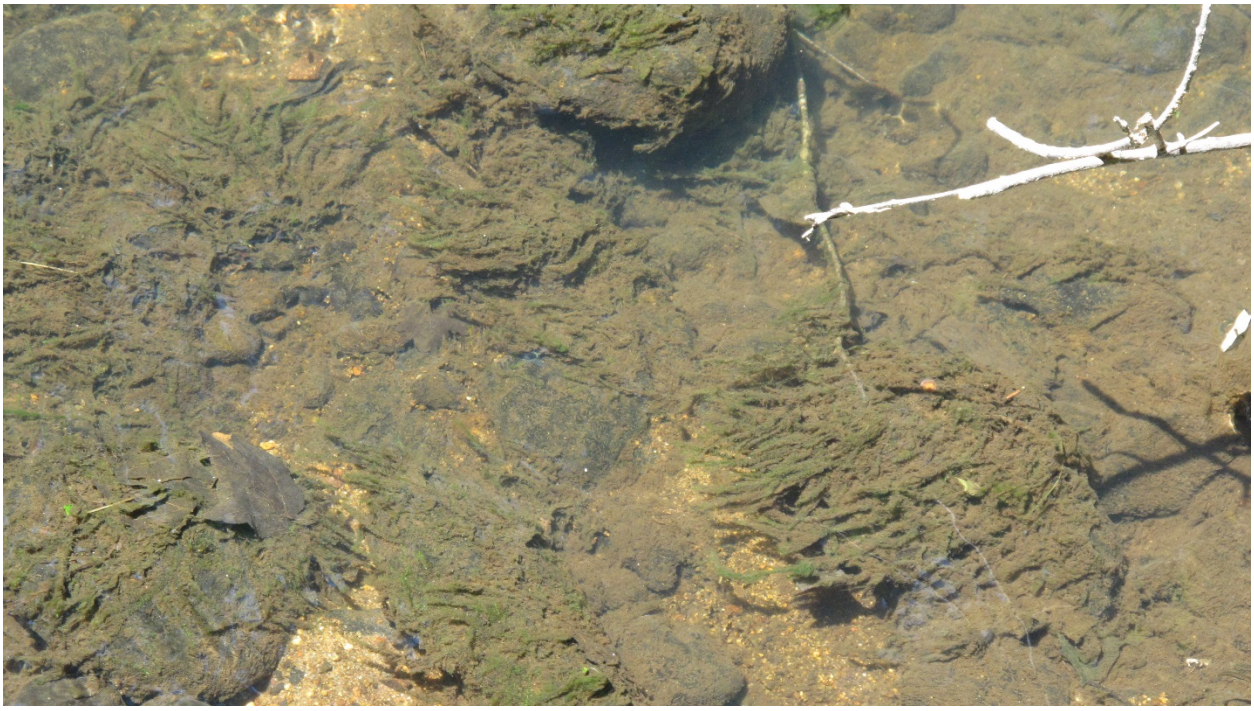

Figure 5: Periphyton and macrophytes on rocks and substrate of Forget-Me-Not Brook, just downstream of the North Brookfield WWTF, where the canopy opens.

Figure 6: Macrophytes in Forget-Me-Not Brook, just downstream of the North Brookfield WWTF, where the canopy opens.

Attachment B

Updated Fact Sheet Appendix A: Total Nitrogen Summary

North Brookfield Wastewater Treatment Facility
Effluent Total Nitrogen November 2011 to August 2016

	Flow	TKN		Nitrite + Nitrate		Total Nitrogen		Total Nitrogen (based on rolling average)
	MGD	mg/L	lb/d	mg/L	lb/d	mg/L	lb/d	lb/d
	Average Monthly (Rolling Average)	Average Monthly	Average Monthly	Average Monthly	Average Monthly	Average Monthly	Average Monthly	
Effluent Limits	0.76	Report	Report	Report	Report	Calculated	Calculated	Calculated
August 2016	0.298	0	0	35	58.1	35	58.1	10.4
May 2016	0.311	0	0	20.3	51.3	20.3	51.3	6.3
February 2016	0.326	0	0	21	51.5	21	51.5	6.8
November 2015	0.324	0	0	30	53.8	30	53.8	9.7
August 2015	0.334	7.7	17.3	36	74	43.7	91.3	14.6
May 2015	0.329	0	0	17	41.8	17	41.8	5.6
February 2015	0.349	0	0	30	14.8	30	14.8	10.5
November 2014	0.339	2	4.2	31	73.2	33	77.4	11.2
August 2014	0.329	0	0	38	72.6	38	72.6	12.5
May 2014	0.373	0.85	2.9	15	50.9	15.85	53.8	5.9
February 2014	0.347	0	0	19	44.2	19	44.2	6.6
November 2013	0.357	3.5	6.2	19	33.7	22.5	39.9	8.0
August 2013	0.37	1.3	2.5	27	52.7	28.3	55.2	10.5
May 2013	0.332	2	5.39	30	80.8	32	86.19	10.6
February 2013	0.304	1.2	3.15	19	49.9	20.2	53.05	6.1
November 2012	0.321	1.8	4.4	15	36.9	16.8	41.3	5.4
August 2012	0.396	1.9	3.4	15	26.8	16.9	30.2	6.7
May 2012	0.416	3	10	20	66.9	23	76.9	9.6
February 2012	0.487	1.7	4.6	16	43.5	17.7	48.1	8.6
November 2011	0.464	5.1	22.6	7.2	31.9	12.3	54.5	5.7
Minimum	0.298	0	0	7.2	14.8	12.3	14.8	5.4
Maximum	0.487	7.7	22.6	38.0	80.8	43.7	91.3	14.6
Average	0.355	1.6	4.3	23.0	50.5	24.6	54.8	8.6
Number	20	20	20	20	20	20	20	20

All non-detects have been included in the calculations as zeros.

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 North Brookfield
Sewer Superintendent
P.O. Box 236
North Brookfield, MA 01535

is authorized to discharge from a facility located at

North Brookfield Wastewater Treatment Facility
59 East Brookfield Road
North Brookfield, MA 01535

to receiving waters named

Forgot-Me-Not Brook (Chicopee Watershed – 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 expire at midnight five years from the last day of the month preceding the effective date.

This permit supersedes the permit issued on March 19, 2007.

This permit consists of in **Part I (**17 pages including effluent limitations and monitoring requirements), **Attachment A** (USEPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol, February 2011, 8 pages), **Attachment B** (USEPA Region 1 Freshwater Chronic Toxicity Test Procedure and Protocol, March 2013, 7 pages) and **Part II (**25 pages including NPDES Part II Standard Conditions).

Signed this day of

_____	_____
Arthur V. Johnson, III, Acting Director Office of Ecosystem Protection Environmental Protection Agency Boston, MA	Lealdon Langley, Director Massachusetts Wetland and Wastewater Programs 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 on the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number 001 to the Forget-Me-Not Brook. Such discharges shall be limited and monitored as specified below.

Effluent Characteristic		**Discharge Limitations**			**Monitoring Requirements**[1]	
Parameter	**Units**	**Average Monthly**	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type**
Treated Effluent Flow	MGD	0.76[2]	*********	*********	Continuous Recorder[2]	
Treated Effluent Flow	MGD	Report	*********	Report	Continuous Recorder[2]	
BOD_5[3] (Applicable May 1 – October 31)	mg/l lbs/day	15 40	22 59	*********	1/Week[3]	24 Hour Composite[4]
BOD_5[3] (Applicable November 1 – April 30)	mg/l lbs/day	30 80	45 120	*********	1/Week[3]	24 Hour Composite[4]
TSS[3] (Applicable May 1 – October 31)	mg/l lbs/day	15 40	22 59	*********	1/Week[2]	24 Hour Composite[4]
TSS[3] (Applicable November 1 – April 30)	mg/l lbs/day	30 80	45 120	*********	1/Week[2]	24 Hour Composite[4]
pH Range[5]	Standard Units	6.5 to 8.3 (See I.A.1.b., State Permit Conditions)			1/Day	Grab
Escherichia coli[5,6] (Applicable April 1- October 31)	Colonies/100 ml	126	*********	409	1/Week	Grab
Dissolved Oxygen[7]	mg/l	>6.0 (daily minimum)			1/Week	Grab
Ammonia-Nitrogen[8] (Applicable May 1 – October 31)	mg/l lbs/day	1.0 6.3	1.5 9.5	*********	1/Week	24 Hour Composite[4]
Ammonia-Nitrogen[8] (Applicable November 1–April 30)	mg/l lbs/day	7.09 45	Report Report	*********	1/Week	24 Hour Composite[4]

See pages 6, 7 and 8 for footnotes

A.1. During the period beginning on the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number 001 to the Forget-Me-Not Brook. Such discharges shall be limited and monitored as specified below.

Effluent Characteristic		**Discharge Limitations**			**Monitoring Requirements[2]**	
Parameter	**Units**	**Average Monthly**	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type**
Total Kjeldahl Nitrogen[8] Total Nitrate + Nitrite Nitrogen[8] Total Nitrogen[8,9]	mg/l	Report	***	Report	1/Quarter	24 Hour Composite[4]
Interim Limit (See I.B.2) Total Phosphorus[10] (Applicable April 1-October 31)	mg/l lbs/day	0.2 Report	***	Report ***	1/Week	24 Hour Composite[4]
Total Phosphorus[10] (Applicable April 1-October 31)	mg/l lbs/day	0.1 Report	***	Report ***	1/Week	24 Hour Composite[4]
Total Phosphorus[10] (November 1 – March 31)	mg/l lbs/day	1.0 Report	***	Report Report	1/Month	24 Hour Composite[4]
Total Recoverable Aluminum[11]	ug/l	87	***	750	1/Month	24 Hour Composite[4]
Total Recoverable Copper[12]	ug/l	6.03	***	8.66	1/Month	24 Hour Composite[4]
Total Recoverable Zinc[13]	ug/l	77.78	***	77.78	1/Month	24 Hour Composite[4]

See pages 6, 7 and 8 for footnotes

A.1. During the period beginning on the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number 001 to the Forget-Me-Not Brook. Such discharges shall be limited and monitored as specified below.

Effluent Characteristic		**Effluent Reporting Requirements**			**Monitoring Requirements[2]**	
Parameter	**Units**	**Average Monthly**	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type**
Whole Effluent Toxicity[14,15,16] (*Ceriodaphnia dubia*)	%	Acute LC50 ≥ 100% Chronic C-NOEC ≥ 100%		4/Year		24 Hour Composite[4]
Hardness[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
Alkalinity[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
pH[17]	S.U.	*********	*********	Report	4/Year	Grab
Specific Conductance[17]	µmho/cm	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Solids[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Dissolved Solids[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
Ammonia Nitrogen as N[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Organic Carbon[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Residual Chlorine[17]	mg/l	*********	*********	Report	4/Year	Grab
Total Recoverable Aluminum[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Recoverable Cadmium[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Recoverable Copper[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Recoverable Lead[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Recoverable Nickel[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Recoverable Zinc[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]

See pages 6, 7 and 8 for footnotes

A.1. During the period beginning on the effective date and lasting through expiration, the permittee is authorized to discharge treated effluent from outfall serial number 001 to the Forget-Me-Not Brook. Such discharges shall be limited and monitored as specified below.

Ambient Characteristic		**Ambient Reporting Requirements**			**Monitoring Requirements[2]**	
Parameter	**Units**	**Average Monthly**	**Average Weekly**	**Maximum Daily**	**Measurement Frequency**	**Sample Type**
Whole Effluent Toxicity[14,15,16] (*Ceriodaphnia dubia*)	%	Acute LC50 ≥ 100% Chronic C-NOEC ≥ 100%		4/Year		24 Hour Composite[4]
Hardness[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
Alkalinity[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
pH[17]	S.U.	*********	*********	Report	4/Year	Grab
Specific Conductance[17]	µmho/cm	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Solids[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Dissolved Solids[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
Ammonia Nitrogen as N[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Organic Carbon[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Residual Chlorine[17]	mg/l	*********	*********	Report	4/Year	Grab
Total Recoverable Aluminum[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Recoverable Cadmium[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Recoverable Copper[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Recoverable Lead[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Recoverable Nickel[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]
Total Recoverable Zinc[17]	mg/l	*********	*********	Report	4/Year	24 Hour Composite[4]

FOOTNOTES

1. 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 every month. Occasional deviation from 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 changes in sampling location must be reviewed and approved in writing by EPA and MassDEP.

Parameter	**Sample Location**
Flow	Effluent Parshall Flume
Influent BOD_5 and TSS	Following mechanical screen and prior to aerated grit chamber
BOD_5, TSS, pH, Ammonia-Nitrogen, Total Kjeldahl Nitrogen, Total Nitrate + Total Nitrite, Total Nitrogen, Total Phosphorus, Total Recoverable Aluminum, Total Recoverable Copper, Total Recoverable Zinc, and Whole Effluent Toxicity	Following the effluent parshall flume, prior to post-aeration (fish ladder)
Escherichia coli	Following post aeration (fish ladder)
Dissolved Oxygen	Following post aeration (fish ladder)
Whole Effluent Toxicity Dilution Water	Upstream of WWTF on upper side of East Brookfield Road Bridge

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

   The annual average, monthly average, and the maximum daily flows shall be reported. The limit of 0.76 MGD is an annual average, which shall be reported as a twelve-month 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 previous eleven months.

3. Sampling is required for influent and effluent.

4. A 24-hour composite will consist of at least twenty-four (24) grab samples taken during one consectutive24-hour period, either collected at equal intervals or combined proportional to flow or continuously collected proportional to flow.

5. State certification requirement.

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

7. Dissolved oxygen of the effluent shall be monitored immediately following the post-aeration fish

ladder prior to discharge to Forget-Me-Not Brook.

8. Ammonia nitrogen, total Kjeldahl nitrogen and total nitrate + nitrite 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/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 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.

9. See **Part I.B.1**. for requirements to evaluate and implement optimization of nitrogen removal.

10. 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.

11. The minimum level (ML) for aluminum is defined as 20 ug/l. An EPA-approved method with an equivalent or lower ML shall be used. Compliance/non-compliance will be determined based on 20 ug/l. Sampling results less than the detection limit shall be reported as “[<detection limit]” on the discharge monitoring report.

12. The minimal 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 3 ug/l . Sampling results less than the detection limit shall be reported as “[<detection limit]” on the discharge monitoring report.

13. The minimal level (ML) for zinc is defined as 10 ug/l. This value is the minimum level for zinc using the Inductively Coupled Plasma analytical method 1640. This method or another EPA-approved method with an equivalent or lower ML shall be used for effluent limitations less than 10 ug/l. Compliance/non-compliance will be determined based on 10 ug/l . Sampling results less than the detection limit shall be reported as “[<detection limit]” on the discharge monitoring report.

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

    C-NOEC (chronic-no observed effect concentration) is defined as the highest concentration of toxicant or 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 "100% or greater" limit is defined as a sample which is composed on 100% (or greater) effluent, the remainder being dilution water.

15. The permittee shall conduct 48-hour static acute toxicity tests and chronic toxicity tests on effluent samples following the February 2011 USEPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol (**Attachment A**) and March 2013 USEPA Region 1 Freshwater Chronic Toxicity Test Procedure and Protocol (**Attachment B**), respectively. The two species for these tests are the Daphnid (*Ceriodaphnia dubia*) and the Fathead Minnow (*Pimephales promelas*). Toxicity test samples shall be collected and tests completed on Daphnid four times per year during the calendar quarters ending March 31st, June 30th, September 30th, and December 31st. Toxicity test samples shall be collected and tests completed on Fathead Minnow one time per year during the calendar quarter ending September 30th and shall be concurrent with the testing of Daphnid for that quarter. Toxicity test results are to be postmarked by the 15th day of the month following the end of the quarter sampled (i.e., October 15th).

Test Dates during the month:	Submit Results By:	Test Species	Acute Limit, LC_{50}	Chronic Limit, NOEC
March June September December	April 30th July 31st October 31st January 31st	Ceriodaphnia dubia (Dubia) See Attachments B and C	≥100%	≥100%

16. This permit shall be modified, or alternatively, revoked and reissued to incorporate additional toxicity testing requirements, including chemical specific limits such as for metals, if the results of the toxicity tests indicate the discharge causes an exceedance of any State water quality criterion. Results from these toxicity tests are considered "New Information" and the permit may be modified as provided in 40 CFR Section 122.62(a)(2).

17. For each whole effluent toxicity (WET) test, the permittee shall report on the appropriate discharge monitoring report, (DMR), the concentrations of the hardness, ammonia nitrogen as nitrogen and total recoverable aluminum, cadmium, copper, lead, nickel, and zinc found in the 100 percent effluent sample. All these aforementioned chemical parameters shall be determined to at least the minimum quantification level shown in **Attachment A**. The permittee should note that all chemical parameter results must be reported in the appropriate toxicity report.

Part I.A.1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

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

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 shall maintain a minimum monthly average of 85 percent removal of both BOD_5 and TSS. The percent removal shall be based on a comparison of the average monthly influent and effluent concentrations.

f. When the effluent discharged for a period of 3 consecutive months exceeds 80 percent of the 0.76 MGD design flow (0.608 MGD), the permittee shall submit to the permitting authorities a projection of loadings up to the time when the design capacity of the treatment facility will be reached, and a program for maintaining satisfactory treatment levels consistent with approved water quality management plans. Before the design flow will be reached, or whenever treatment necessary to achieve permit limits cannot be assured, the permittee may be required to submit plans for facility improvements.

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

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

1. All POTWs must provide adequate notice to both EPA-Region 1 and the Massachusetts Department of Environmental Protection (MassDEP) of the following:

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

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

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

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

2. 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.

3. Toxics Control

    a. The permittee will not discharge any pollutant or combination of pollutants in toxics 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.

4. 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.

A. 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 permitttees' annual nitrogen report under Part I.B.1.b, if both reports are submitted to EPA and 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 meet a monthly average total phosphorus interim limit of 0.2 mg/l during the summer period (April 1 – October 31) until the permittee is in compliance with the monthly average total phosphorus limit of 0.1 mg/l during the summer period. The winter (November 1 – March 31) monthly average total phosphorous limit of 1.0 mg/l is effective upon the effective date of the permit.

b. The permittee shall evaluate the ability of the existing treatment facilities, with small capital improvements, to achieve the summer monthly average total phosphorus limitations of 0.1 mg/l 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 this effluent limitation. The evaluation shall include optimization of chemical dosing, including use of alternate chemicals if necessary.

c. If the permittee concludes that the existing facilities can achieve the summer 0.1 mg/ monthly average limits, the limit will become effective **24 months from the effective date of the permit**.

d. If the permittee concludes that the existing facilities cannot achieve the summer 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.

e. Until the limit is achieved, the Town shall submit reports 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.

B. UNAUTHORIZED DISCHARGES

The permit authorizes discharges only from the outfall listed in Part I.A.1 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 shall be reported to EPA and MassDEP in accordance with Part II, Section D.1.e. of the General Requirements of this permit (twenty four hour reporting).

D. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

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

1 Maintenance Staff

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

2. Preventative Maintenance Program

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

3. Infiltration/Inflow

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

4. Collection System Mapping

Within 30 months of the effective date of this permit, the permittee shall prepare a map of the 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 goals, staffing, information management, and legal authorities;
(2) A description of the overall condition of the collection system including a list of 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.7. below.

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

(1) The required submittal from paragraph 5.a. above, updated to reflect current information;
(2) A preventative maintenance and monitoring program for the collection system;
(3) Sufficient staffing to properly operate and maintain the sanitary sewer collection system;
(4) Sufficient funding and the source(s) of funding for implementing the plan;
(5) Identification of known and suspected overflows and back-ups, including combined manholes, a description of the cause of the identified overflows and

back-ups, and a plan for addressing the overflows and back-ups consistent with the requirements of this permit;

(6) A description of the permittees program for preventing I/I related effluent violations and all unauthorized discharges of wastewater, including overflows and by-passes and the ongoing program to identify and remove sources of I/I. The program shall include an inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts; and

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

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 first annual report is due the first March 31st following submittal of the collection system O&M Plan required by Part I.C.5.b. of this permit. The summary report shall, at a minimum, include:

a. A description of the staffing levels maintained during the year;
b. A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year;
c. Expenditures for any collection system maintenance activities and corrective actions taken during the previous year;
d. A map with areas identified for investigation/action in the coming year;
e. If treatment plant flow has reached 80% of the 0.76 mgd design flow (0.608 mgd) based on the daily flow for three consecutive months or there have been capacity related overflows, submit a calculation of the maximum daily, weekly, and monthly infiltration and the maximum daily, weekly, and monthly inflow for the reporting year; and
f. A summary of unauthorized discharges during the past year and their causes and a report of any corrective actions taken as a result of the unauthorized discharges reported pursuant to the Unauthorized Discharges section of this permit.

7. Alternate Power Source

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

E. 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 Part 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 Part 503 apply to facilities which perform one or more of the following use or disposal practices.

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

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

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

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

   Which of the 40 CFR Part 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 1999), may be used by the permittee to assist it in determining the applicable requirements.[1]

6. The sludge shall be monitored for pollutant concentrations (all Part 503 methods) and pathogen reduction and vector attraction 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 than 1,500 — 1/Quarter
   - 1,500 to less than 15,000 — 6/Year
   - 15,000 plus — 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

[1] 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.

"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.

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 19** (*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.G.6. 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 Pre-treatment Related Reports

All reports and information required of the permittee in the Industrial Users and Pretreatment Program section of this permit shall be submitted to the Office of Ecosystem Protection's Pretreatment Coordinator in Region 1 EPA's Office of Ecosystem Protection (OEP). These requests, reports and notices include:

A. Annual Pretreatment Reports,
B. Pretreatment Reports Reassessment of Technically Based Industrial Discharge Limits Form,
C. Revisions to Industrial Discharge Limits,
D. Report describing Pretreatment Program activities, and
E. Proposed changes to a Pretreatment Program

This information shall be submitted to EPA/OEP as a hard copy at the following address:

U.S. Environmental Protection Agency
Office of Ecosystem Protection
Regional Pretreatment Coordinator
5 Post Office Square - Suite 100 (OEP06-03)
Boston, MA 02109-3912

4. 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

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

5. 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 (OES04-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

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, §§26-53, and 314 C.M.R. 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 C.M.R. 3.11.

3. Each Agency will have the independent right to enforce the terms and conditions for 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 thios 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.

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^{o}C.

IV. DILUTION WATER

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

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

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

and

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

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

See the most current annual DMR instructions which can be found on the EPA Region 1 website at http://www.epa.gov/region1/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 (^{o}C)	20 $\pm$ 1^{o}C or 25 $\pm$ 1^{o}C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hour light, 8 hour dark
5.	Test chamber size	Minimum 30 ml
6.	Test solution volume	Minimum 15 ml
7.	Age of test organisms	1-24 hours (neonates)
8.	No. of daphnids per test chamber	5
9.	No. of replicate test chambers per treatment	4
10.	Total no. daphnids per test concentration	20
11.	Feeding regime	As per manual, lightly feed YCT and Selenastrum to newly released organisms while holding prior to initiating test
12.	Aeration	None
13.	Dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q^{R} or equivalent deionized water and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC
15.	Number of dilutions	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution

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

Footnotes:

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

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

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

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

Footnotes:

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

VI. CHEMICAL ANALYSIS

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

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

Notes:

1. Hardness may be determined by:
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 2340B (hardness by calculation)
     - Method 2340C (titration)
2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 4500-CL E Low Level Amperometric Titration
     - Method 4500-CL G DPD Colorimetric Method
3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing.

VII. TOXICITY TEST DATA ANALYSIS

LC50 Median Lethal Concentration (Determined at 48 Hours)

Methods of Estimation:

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

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

No Observed Acute Effect Level (NOAEL)

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

VIII. TOXICITY TEST REPORTING

A report of the results will include the following:

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

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^{o} 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)

TABLE OF CONTENTS

PART II. A. GENERAL REQUIREMENTS

1. Duty to Comply

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

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

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

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

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

2. Permit Actions

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

3. Duty to Provide Information

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

4. Reopener Clause

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

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

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

5. Oil and Hazardous Substance Liability

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

6. Property Rights

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

7. Confidentiality of Information

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

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

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

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

8. Duty to Reapply

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

9. State Authorities

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

10. Other Laws

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

PART II. B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

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

2. Need to Halt or Reduce Not a Defense

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

3. Duty to Mitigate

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

4. Bypass

a. Definitions

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

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

b. Bypass not exceeding limitations

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

c. Notice

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

d. Prohibition of bypass

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

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

5. Upset

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

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

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

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

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

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

PART II. C. MONITORING REQUIREMENTS

1. Monitoring and Records

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

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

c. Records of monitoring information shall include:

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

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

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

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

2. Inspection and Entry

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

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

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

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

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

PART II. D. REPORTING REQUIREMENTS

1. Reporting Requirements

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

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

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

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

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

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

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

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

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

e. Twenty-four hour reporting.

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

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

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

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

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

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

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

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

2. Signatory Requirement

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

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

3. Availability of Reports.

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

PART II. E. DEFINITIONS AND ABBREVIATIONS

1. Definitions for Individual NPDES Permits including Storm Water Requirements

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

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

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

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

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

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

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

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

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

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

Construction Activities - The following definitions apply to construction activities:

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

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

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

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

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

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

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

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

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

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

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

Discharge of a pollutant means:

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

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

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

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

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

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

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

EPA means the United States "Environmental Protection Agency".

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

NPDES means "National Pollutant Discharge Elimination System".

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

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

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

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

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

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

(a) Sewage from vessels; or

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Waters of the United States means:

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

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

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

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

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

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

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

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

(f) The territorial sea; and

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Feed crops are crops produced primarily for consumption by animals.

Fiber crops are crops such as flax and cotton.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Range land is open land with indigenous vegetation.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3. Commonly Used Abbreviations

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

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

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

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND - REGION I
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FACT SHEET

DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES PURSUANT TO THE CLEAN WATER ACT (CWA)

NPDES PERMIT NUMBER: **MA0101061**

PUBLIC NOTICE START AND END DATES: August 22, 2017 – September 20, 2017

NAME AND MAILING ADDRESS OF APPLICANT:

Town of North Brookfield
P.O. Box 236
North Brookfield, MA 01535

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

North Brookfield Wastewater Treatment Facility
59 East Brookfield Road
North Brookfield, MA 01535

RECEIVING WATERS: **Forget-Me-Not-Brook (MA36-28)**
Chicopee Watershed - USGS Code: 01080204

RECEIVING WATER CLASSIFICATION: **Class B - Warm Water Fishery**

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APPENDICES

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 permit currently in effect was issued on March 19, 2007 with an effective date of June 1, 2007 and expired on May 31, 2012. As of June 1, 2012, the expired permit (hereinafter referred to as the "current permit") was administratively extended because the applicant filed a complete application for permit reissuance as required by 40 Code of Federal Regulations (CFR) §122.6.

II. TYPE OF FACILITY AND DISCHARGE LOCATION

The North Brookfield Wastewater Treatment Facility (WWTF) is an advanced wastewater treatment facility which is engaged in the collection and treatment of municipal wastewater. Currently, the facility serves approximately 2,900 residents in the Town of North Brookfield (about 60 % of the town's population) with the collection system primarily focused in the town center (Route 67 corridor).

The facility has a design flow of 0.76 MGD, the annual average daily flow reported in the 2011 application was 0.432 MGD and the average for the last 5 years has been 0.355 MGD. The system is a separate system with no combined sewers. Wastewater is comprised of mostly domestic sewage with some commercial sewage and some septage[1]. There are no significant industrial users.

The treated effluent is discharged to Forget-Me-Not Brook (See Figure 1).

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

Outfall	Description of Discharge	Outfall Location
001	Advanced Wastewater Treatment Plant Effluent	N 42° 14' 57"/ W 72° 4' 34"

III. DESCRIPTION OF DISCHARGE

A quantitative description of the discharge in terms of effluent parameters, based on monitoring data submitted by the permittee from October 2011 through September 2016 is provided in Appendix A of this fact sheet.

IV. LIMITATIONS AND CONDITIONS

The draft permit contains effluent limits for outfall serial number 001 for treated effluent flow, biochemical oxygen demand (BOD_5), total suspended solids (TSS), pH, *Escherichia coli* (*E. coli*), dissolved oxygen (DO), ammonia nitrogen, total phosphorus, total copper, total zinc, total aluminum, and whole effluent toxicity ("WET"). The draft permit also contains effluent

[1] From Annual Report page 87-88 at
http://www.northbrookfield.net/sites/northbrookfieldma/files/uploads/2015_annual_report.pdf

monitoring requirements for total kjeldahl nitrogen, nitrite nitrogen, nitrate nitrogen, and total recoverable metals (aluminum, cadmium, copper, lead, nickel and zinc). These proposed limitations and conditions, the basis of which are discussed throughout this fact sheet, may be found in Part I of the draft permit.

V. STATUTORY AND REGULATORY AUTHORITY

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) established 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). The regulations governing EPA's NPDES permit program are generally found in 40 C.F.R. §§122, 124, 125, and 136.

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, and 131).

A. TECHNOLOGY BASED EFFLUENT LIMITS

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 owned 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.

Under Section 301(b)(1) of the CWA, POTWs must have achieved effluent limits based upon secondary treatment technology by July 1, 1997. Since 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).

B. WATER QUALITY-BASED EFFLUENT LIMITS (WQBELs)

Water quality-based effluent limits are developed and incorporated in NPDES permits 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).

1. Water Quality Standards

The CWA requires that each State develop water quality standards (WQSs) for all water bodies within the State. See CWA § 303. WQSs 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 antidegradation provision, focused on protecting existing and designated 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. The applicable state WQSs can be found in Title 314 of the Code of Massachusetts Regulations, Chapter 4 (314 CMR 4.00).

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 WQSs 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. Maximum daily limits are generally derived from the acute aquatic life criteria, and the average monthly limit is generally derived from the chronic aquatic life criteria. Chemical-specific limits are established in accordance with 40 CFR §122.44(d) and §122.45(d). 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).

2. Assessment and Listing of Waters and TMDLs.

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 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 of threatened doe 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.

A TMDL is a pollution budget and includes a calculation of the maximum amount of a pollutant that can occur in a waterbody and allocates the necessary reductions to one or more pollutant sources, including point source discharges, such as wastewater treatment plants. A TMDL serves as a planning tool and potential starting point for restoration or protection activities with the ultimate goal of attaining or maintaining water quality standards. See 40 C.F.R. §130.7.

For impaired waters where a TMDL has been developed for a particular pollutant and the TMDL includes a waste load allocation for a NPDES permitted discharge, the effluent limit in the permit may not exceed the waste load allocation. See 40 C.F.R. §122.44(d)(1)(vii)(B).

3. Reasonable Potential

Pursuant to 40 C.F.R. § 122.44(d)(1), NPDES permits must contain any requirements in addition to technology-based limits necessary to achieve water quality standards established under Section 303 of the CWA. In addition, limitations "must control any pollutant or pollutant parameter (conventional, non-conventional, or toxic) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any water quality standard, including State narrative criteria for water quality" (40 C.F.R. § 122.44(d)(1)(i)). There is reasonable potential to cause or contribute to an excursion of WQSs ("reasonable potential") if the actual or projected instream concentration exceeds the applicable criterion. If there is reasonable potential for a particular pollutant, then a WQBEL must be derived for that pollutant.

In evaluating 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 by the permit's reissuance application; 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.

4. 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.

5. 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 by the state in which the discharge originates or that certification has been deemed to be waived its right to such certification. EPA has requested permit certification by the State pursuant to 40 CFR §124.53 and expects that the draft permit will be certified. 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).

In accordance with the regulations found at 40 C.F.R. §131.12, the Massachusetts Department of Environmental Protection (MassDEP) has developed and adopted statewide anti-degradation policy to maintain and protect existing in-stream water quality. The Massachusetts Anti-Degradation Provisions are found at 314 CMR 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.

EPA may not issue a permit unless the Massachusetts Department of Environmental Protection (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 it is deemed that the state has waived its right to such certification. Regulations governing state certification are set forth in 40 CFR §124.53 and §124.55. EPA has requested permit certification by the State pursuant to 40 CFR §124.53 and expects that the draft permit will be certified.

C. EFFLUENT FLOW

Sewage treatment plant discharge is encompassed within the definition of "pollutant" and is subject to regulation under the CWA. The CWA defines "pollutant" to mean, *inter alia*,

"municipal . . . waste" and "sewage…discharged into water." 33 U.S.C. § 1362(6).

EPA may use design flow of wastewater effluent both to determine the necessity for effluent limitations in the permit that comply with the Act, and to calculate the limits themselves. EPA practice is to use design flow as a reasonable and important worst-case condition in EPA's reasonable potential and water quality-based effluent limitations (WQBEL) calculations to ensure compliance with water quality standards under Section 301(b)(1)(C). Should the wastewater effluent flow exceed the flow assumed in these calculations, the instream dilution would decrease and the calculated effluent limits may not be protective of WQS. Further, pollutants that do not have the reasonable potential to exceed WQS at the lower wastewater discharge flow may have reasonable potential at a higher flow due to the decreased dilution. In order to ensure that the assumptions underlying the Region's reasonable potential analyses and derivation of permit effluent limitations remain sound for the duration of the permit, the Region may ensure its "worst-case" wastewater effluent flow assumption through imposition of permit conditions for wastewater effluent flow. Thus, the wastewater effluent flow limit is a component of WQBELs because the WQBELs are premised on a maximum level of flow. In addition, the wastewater effluent flow limit is necessary to ensure that other pollutants remain at levels that do not have a reasonable potential to exceed WQS.

Using a facility's design flow in the derivation of pollutant effluent limitations, including conditions to limit wastewater effluent flow, is consistent with, and anticipated by NPDES permit regulations. Regarding the calculation of effluent limitations for POTWs, 40 C.F.R. § 122.45(b)(1) provides, "permit effluent limitations…shall be calculated based on design flow." POTW permit applications are required to include the design flow of the treatment facility. *Id.* § 122.21(j)(1)(vi).

Similarly, EPA's reasonable potential regulations require EPA to consider "where appropriate, the dilution of the effluent in the receiving water," 40 C.F.R. § 122.44(d)(1)(ii), which is a function of *both* the wastewater effluent flow and receiving water flow. EPA guidance directs that this "reasonable potential" analysis be based on "worst-case" conditions. EPA accordingly is authorized to carry out its reasonable potential calculations by presuming that a plant is operating at its design flow when assessing reasonable potential.

The limitation on wastewater effluent flow is within EPA's authority to condition a permit in order to carry out the objectives of the Act. *See* CWA §§ Sections 402(a)(2) and 301(b)(1)(C); 40 C.F.R. §§ 122.4(a) and (d); 122.43 and 122.44(d). A condition on the discharge designed to protect EPA's WQBEL and reasonable potential calculations is encompassed by the references to "condition" and "limitations" in 402 and 301 and implementing regulations, as they are designed to assure compliance with applicable water quality regulations, including antidegradation. Regulating the quantity of pollutants in the discharge through a restriction on the quantity of wastewater effluent is consistent with the overall structure and purposes of the CWA.

In addition, as provided in Part II.B.1 of this permit and 40 C.F.R. § 122.41(e), the permittee is required to properly operate and maintain all facilities and systems of treatment and control. Operating the facilities wastewater treatment systems as designed includes operating within the

facility's design wastewater effluent flow. Thus, the permit's wastewater effluent flow limitation is necessary to ensure proper facility operation, which in turn is a requirement applicable to all NPDES permits. *See* 40 C.F.R. § 122.41.

EPA has also included the wastewater effluent flow limit in the permit to minimize or prevent infiltration and inflow (I/I) that may result in unauthorized discharges and compromise proper operation and maintenance of the facility. Improper operation and maintenance may result in non-compliance with permit effluent limitations. Infiltration is groundwater that enters the collection system though physical defects such as cracked pipes or deteriorated joints. Inflow is extraneous flow added to the collection system 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 available for treatment and the operating efficiency of the treatment works and to properly operate and maintain the treatment works.

Furthermore, the extraneous flow due to significant I/I greatly increases the potential for sanitary sewer overflows (SSOs) in separate systems. Consequently, the effluent flow limit is a permit condition that relates to the permittee's duty to mitigate (*i.e.*, minimize or prevent any discharge in violation of the permit which has a reasonable likelihood of adversely affecting human health or the environment) and to properly operate and maintain the treatment works. *See* 40 C.F.R. §§ 122.41(d) and (e).

D. ESSENTIAL FISH HABITAT

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 Service (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, feeding, 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 C.F.R. § 600.910(a). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

EFH is only designated for fish 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.

E. ENDANGERED SPECIES ACT

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA), grants authority and imposes requirements on Federal agencies regarding endangered or threatened species of fish,

wildlife, or plants (listed species) and habitat of such species that has been designated as critical (a "critical habitat.").

Section 7(a)(2) of the CWA requires every Federal agency, in consultation with and with the assurance of the Secretary of Interior, to insure that any action it authorizes, funds or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The United States Fish and Wildlife Service (USFWS) administers Section 7 consultations for freshwater species. The National Marine Fisheries Service (NMFS) administers Section 7 consultations for freshwater species.

VI. PERMIT BASIS AND EXPLANATION OF EFFLUENT LIMITATION DERIVATION

A. BACKGROUND

1. Treatment Process Description

The North Brookfield Wastewater Treatment Facility (WWTF) is an activated sludge treatment plant. Influent enters the facility and flows through a mechanical screen. The influent is then split into four (4) aeration basins. Sodium hydroxide (25% solution) is pumped into the aeration basins for pH control. Sodium Aluminate is added to the wastewater just prior to the clarifiers for phosphorus removal. Flows are split into two secondary clarifiers. Effluent from the secondary clarifiers then flows through a cloth filter system to remove the remaining solids in the effluent. The effluent is disinfected by ultraviolet light and then flows through a parshall flume for measurement, then down a cascade for dissolved oxygen enhancement and finally into Forget-Me-Not Brook. A flow diagram of the treatment facility is shown in Figure 2.

Waste sludge is pumped from the clarifiers' return sludge lines to an aerated sludge holding tank and then dewatered following chemical addition. The dried sludge is transported under contract with a private hauler for incineration. The average mass of sludge shipped for incineration in 2011was 142.6 dry metric tons.

2. Collection System Description

The North Brookfield WWTP is served by a separate sewer system. A separate sanitary sewer conveys domestic, industrial and commercial sewage, but not stormwater. 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 the wastewater treatment plant and the storm sewers discharge to a local water body.

3. Compliance History During Current Permit Term

a) 2008 Findings of Violation and Order for Compliance

On September 24, 2008, shortly after the issuance of the 2007 NPDES permit, EPA issued an Order[2] to the Town of North Brookfield based on the findings that since June 2007 (the effective date of the permit) the Town had discharged "wastewater containing ammonia-nitrogen, total phosphorus, total aluminum, total copper and total zinc in excess of the concentration limits set forth in the Permit." The Permittee's requirements under that Order include the following:

1. Within 90 days of the receipt of this Order, the Permittee shall submit to the EPA and the Massachusetts Department of Environmental Protection (the "MassDEP"); 1) a summary of its assessment, evaluation and implementation of the interim and long-term measures included in its December 7, 2004 letter report[3] (a response to a 2004 enforcement order[4] for zinc which included an interim limit for zinc of 150 ug/L) to EPA and MassDEP and 2) a Scope of Work (the "SOW") listing the engineering evaluations that the Town will conduct to develop recommendations for achieving compliance with the Permit's water quality based effluent limits. The SOW shall, at a minimum, include the following:
    a) Additional monitoring of the Town's and its customer communities' septage during various seasons to assess the variability of metals concentrations in the Town's septage and septage received from its customer communities;
    b) Re-evaluation of alternative water treatment corrosion control chemicals or control technologies that could be employed to reduce the Town's Water Treatment Plant's metals contributions to the Facility, including a discussion of any equipment or chemical changes and associated costs:
    c) Evaluation of the use of alternative chemicals used to control phosphorus at the Town's Facility;
    d) Evaluation of alternative treatment technologies and upgrades necessary to achieve compliance with the Permit; and
    e) A schedule (the "Schedule") for the preparation of a comprehensive engineering report that recommends specific interim and long-term corrective measures to achieve and maintain compliance with the Permit.

2. The Schedule submitted pursuant to Paragraph III.1.d. of this Order shall be incorporated and enforceable hereunder upon the Schedule's approval by and as amended by EPA.

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[2] From Susan Studlien, Director, Office of Environmental Stewardship, EPA Region 1, September 24, 2008, "In the matter of the Town of North Brookfield, Massachusetts, NPDES Permit No. MA0101061, Proceedings under Section 309(a)(3) of the Clean Water Act, as amended, 33 U.S.C. §1319(a)(3), Docket No. 08-009, Findings of Violation and Order for Compliance"

[3] From David Michelsen, P.E., Senior Project Manager, SEA Consultants to Linda Gray Brolin, EPA-New England, Office of Environmental Stewardship and Robert Kimball, MassDEP, Central Regional Office, December 7, 2007, RE: North Brookfield Zinc Report, SEA Reference No: 2004083.01-A.

[4] From Stephen S. Perkins, Director, Office of Environmental Stewardship, EPA Region 1. January 21, 2004, "In the matter of the Town of North Brookfield, Massachusetts, NPDES Permit No. MA0101061, Proceedings under Section 309(a)(3) of the Clean Water Act, as amended, 33 U.S.C. §1319(a)(3), Docket No. 04-01, Findings of Violation and Order for Compliance"

3. Upon the effective date of this Order, the Permittee shall at a minimum comply with the interim effluent limitations for total copper, total zinc, and total aluminum set forth in Attachment 1 of this order. The Permittee shall also comply with all other effluent limitations, monitoring requirements and other conditions specified in the Permit for parameters not addressed in Attachment 1.

Table 1: Attachment 1 from Order Dated September 24, 2008; Interim Metals Limits

Parameter	Monthly Average Concentration (ug/L)	Daily Maximum Concentration (ug/L)	Measurement Frequency	Sample Type
Total Copper	20	Report	Monthly	24-Hour Composite
Total Zinc	160	Report	Monthly	24-Hour Composite
Total Aluminum	210	Report	Monthly	24-Hour Composite

Since the issuance of the Order, the Permittee has had no violations of the interim total copper limit but has reported five (5) violations of the interim total zinc limit and nineteen (19) violations of the interim total aluminum limit.

In compliance with the September 2008 Order, the Town of North Brookfield submitted a report dated December 15, 2008[5] summarizing its activities since 2002 including the development and implementation of an infiltration and inflow (I/I) control plan which reduced flows by 30%; identified difficulties with getting nitrification to kick-in following the winter months; identified sodium aluminate as the best of the reviewed options for phosphorus removal; and noted that metals removal has not been optimized because of cost considerations and requested site specific criteria for copper, zinc and aluminum.

The Town submitted a second letter, dated December 22, 2008[6], which included a letter from the sewer superintendent summarizing a December 2008 Letter Report and a Scope of Work prepared by the Town's consultant including a schedule which was incorporated and enforceable under the 2008 Order. The schedule; however, did not include a timeline for achieving the metals limits.

b) 2015 Compliance Inspection and MassDEP Notice of Non-compliance (NON)

MassDEP sent the Permittee an inspection report and recommendations[7], dated September 24, 2015, as the result of a compliance inspection conducted on September 1, 2015. According to the report, MassDEP found that the facility had been operating well but having "sporadic ammonia

[5] From Rodney S. Jenkins, Sewer Superintendent, Town of North Brookfield to Douglas Koopman, EPA-Region 1, December 15, 2008, Subject: NPDES Permit No. MA0101061
[6] From Town of North Brookfield Sewer Commissioners to Douglas Koopman, EPA-Region 1, December 22, 2008, RE: NPDES Permit Number MA0101061, Town of North Brookfield, Metals Removal Consent Order.
[7] From David Boyer, P.E. Section Chief, Wastewater Program, MassDEP-Central Region Office to Rodney Jenkins, Superintendent, North Brookfield Wastewater Treatment Facility, RE: North Brookfield – BWR – MA0101061, 314 CMR 12.00 – Compliance Inspection.

violations". MassDEP also noted that the facility is now 20 years old and in need of some upgrades and modifications. The letter instructed the Town to address the following issues:

1. Immediately begin taking pH readings of all loads of septage.
2. Recommendation for installation of a supervisory control and data acquisition (SCADA) system at the plant to provide automatic control of blowers and chemical feed based off a DO probe and flow meters.
3. Adjust the influent flow meter accordingly to function as intended or consider relocation to allow for flow pacing of chemicals.
4. Connect variable frequency drive (VFD) blowers to a DO probe so the aeration basins maintain optimum DO levels for sufficient treatment throughout a 24-hour period.
5. Improve method of introducing septage into the treatment system to minimize process upsets. Control of septage is needed to even out the wastewater load being treated.
6. Some electrical cords are running overland and pose a safety concern. A permanent electrical solution shall be implemented that complies with electrical codes.

On October 26, 2015, the MassDEP issued an NON[8] for ammonia violations and failure to collect pH readings of each load of septage. The NON required the Town to take the following actions:

1. Immediately begin collecting pH readings and information on each load of septage discharged to the North Brookfield WWTF and keep the information in a log that is readily available upon request.
2. On or before December 31, 2015, submit an evaluation report on potential causes and/or sources of ammonia violations and recommended modifications or upgrades to the WWTF in order to return to compliance.
3. On or before March 1, 2016, submit a corrective plan with a schedule to address the modifications or upgrades to the WWTF that were identified or recommended in the evaluation report.

A final evaluation report[9] was submitted by North Brookfield's consultant on June 30, 2016, which specifically notes that the facility has not had an ammonia violation since receipt of the NON. "An industrial septage source, which had a very high strength septage, appears to be the major reason for the ammonia violations in 2013-2015." The following recommendations were made:

- Continue to not accept unusually high strength or poisonous septage sources.
- Manage the amount of septage receiving to a level that the WWTF can adequately treat.
- Maintain a good log of septage receiving.

[8] From David Boyer, P.E., Section Chief, Wastewater Program, MassDEP-Central Region Office to Rodney Jenkins, Superintendent, North Brookfield WWTF, RE: North Brookfield – BWR – MA0101061, North Brookfield WWTF, 314 CMR 12.00 – Operations/Septage, NON-CE-15-1N023, Notice of Noncompliance.
[9] From Zhijian (Jason) Tang and Mark Thompson, Kleinfelder Inc. to Margaret Webber and David Boyer, MassDEP, June 30, 2016, "North Brookfield, MA WWTF Ammonia Violation Evaluation Final Report"

- Closely monitor aeration system operation and performance.
- Maintain adequate pH in the aeration tanks.

The report notes that "most of the recommendations already have been, or can be, implemented relatively quickly by plant personnel. Automatic control of aeration and pH adjustment can be implemented when the plant conducts upgrades anticipated to be necessary once a new NPDES permit is issued to replace the expired permit."

4. Receiving Water

The North Brookfield WWTF discharges into Forget-Me-Not Brook, a tributary of the Quaboag River, within Segment MA36-28. This segment is 1.3 miles in length and travels from the North Brookfield WWTF to the confluence with Dunn Brook in East Brookfield/Brookfield. Dunn Brook then flows into the Quaboag River. The Quaboag River is part of the Chicopee River Watershed, which flows to the Connecticut River and discharges to Long Island Sound.

Forget-Me-Not Brook has been classified as a Class B warm water fishery in 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° Fahrenheit (20° 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 MassDEP's Massachusetts Year 2014 Integrated List of Waters (2014 Integrated List), the 303(d) list, includes the Forget-Me-Not Brook as a Massachusetts Category 5 Water and in need of a total maximum daily load (TMDL) assessment due to aquatic macroinvertebrate bioassessments, Escherichia coli, Taste and Odor and Whole Effluent Toxicity (WET). This assessment is based on the sampling results of the 2008 Quaboag River Survey conducted by MassDEP.

In 1981, the Massachusetts Department of Environmental Quality Engineering (DEQE) published the Chicopee River Basin Water Quality Management Plan which included a wasteload allocation (WLA) for the North Brookfield WWTF. Given the limited assimilative capacity of the receiving waters, limits more stringent than secondary treatment requirements were required for the following parameters in Table 2.

Table 2: Limits in 1981 MA DEQE Wasteload Allocation

Flow (MGD)	BOD_5 (mg/L)	TSS (mg/L)	Ammonia Nitrogen* (mg/L)	Total Phosphorus* (mg/L)	Dissolved Oxygen (mg/L)
0.5	15	15	1.0	1.0	6.0

*WLA apply the limits only April 1-October 15. MassDEP has revised the "summer" or "growing season" as May 1 through October 31. EPA has adopted these dates in applying the WLA limits.

In 1995, North Brookfield upgraded the facility and increased the design flow from 0.32 MGD to 0.76 MGD. The 1995 permit authorized the increase in flow; however, it did not address the antidegradation issues presented by the flow increase. EPA regulation at 40 CFR § 131.12 requires states to develop and adopt antidegradation policy and methods for implementing such policy. Massachusetts' antidegradation "policy" is set forth in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00.

EPA has proposed effluent limits in the draft permit that ensure that the increased discharge results in no more than an insignificant degradation of water quality in the Forget-Me-Not Brook and the downstream waters.

5. 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 on the 7 day, 10-year low flow (7Q10 flow) of the receiving water (314 CMR 4.03(3)(1)). The 7Q10 low flow is the mean low flow over 7 consecutive days, recurring every 10 years.

The 7Q10 flow used in the draft permit has been extrapolated from two U.S. Geological Survey gage stations in the area of Dunn Brook (which does not have a permanent flow gage station). The discharge is located about 1.5 miles downstream from the headwaters of Forget-Me-Not Brook, which joins Dunn Brook about 0.3 miles downstream of the discharge. The total drainage area for the Dunn Brook watershed is about 6.35 square miles; the drainage area upstream of the discharge is about 1 square mile. Using a low-flow factor of 0.05 cfs/mi^2 yields a receiving water 7Q10 flow of about 0.05 cfs (0.032 MGD).

Given the 7Q10 flow of 0.05 cfs and the facility's design flow is 0.76 million gallons per day (mgd) or 1.41 cubic feet per second (cfs), the dilution factor was calculated by dividing the total flow of the receiving water downstream of the discharge by the discharge design flow as shown below:

$$\text{Dilution factor (DF)} = \frac{\text{(Receiving water 7Q10 + discharge design flow)}}{\text{discharge design flow}}$$

$$DF = (0.032\ MGD + 0.76\ MGD)/0.76\ MGD$$
$$DF = 0.792/0.76 = 1.0$$

B. EFFLUENT LIMITATION AND MONITORING REQUIREMENTS

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 2011 to 2016 was used to evaluate the discharge during the effluent limitations development process (see **Appendices A and B)**.

1. Wastewater Effluent Flow

The proposed wastewater effluent flow limit is based on the average daily design flow of the treatment plant, which is 0.76 mgd. Flow is to be measured continuously. The permittee shall report the annual average monthly flow using the annual rolling average method (See Permit Footnote 1). The average monthly and maximum daily flow for each month shall also be reported.

A review of DMR data, from October 2011 through September 2016 shows that the reported monthly flows have been in compliance with the 0.76 mgd flow limit. The annual average flow was 0.348 mgd with a range of 0.032 to 0.49 mgd.

2. Conventional Pollutants

a) Biochemical Oxygen Demand (BOD_5)

The draft permit proposes the same BOD_5 concentration limits as in the current permit. The summer limits were established in the 1981 wasteload allocation; the average monthly limit is 15 mg/L and the average weekly limit is 22 mg/L. The applicable period is May 1 through October 31, a slight adjustment from the period defined in the WLA. During the period, November 1-April 30, the average monthly limit is 30 mg/L and the average weekly limit is 45 mg/L based on the secondary treatment standards in 40 C.F.R. §133.102. The monitoring frequency remains once per week.

As previously stated, EPA has reduced the mass-based limits for BOD_5 to address antidegradation concerns caused by the 1995 increase in design flow from 0.32 MGD to 0.76 MGD. The mass-based limits are calculated using the original design flow of 0.32 MGD.

BOD Mass Loading Calculations:

> Calculations of maximum allowable loads for average monthly, average weekly and maximum daily BOD_5 are based on the following equation:
>
> $$L = C \times DF \times 8.34$$
>
> Where:

L = Maximum allowable load in lbs/day.
C = Maximum allowable effluent concentration for reporting period in mg/L. Reporting periods are average monthly and weekly and daily maximum.
DF = Annual average design flow of facility (0.32 mgd) at the time of 1981 WLA.
8.34 = Factor to convert effluent concentration in mg/L and design flow in MGD to lbs/day.

(Concentration limit) [15] X 8.34 (Constant) X 0.32 (Design flow) = 40 lbs/day
(Concentration limit) [22] X 8.34 (Constant) X 0.32 (Design flow) = 59 lbs/day

(Concentration limit) [30] X 8.34 (Constant) X 0.32 (Design flow) = 80 lbs/day
(Concentration limit) [45] X 8.34 (Constant) X 0.32 (Design flow) = 120 lbs/day

A review of DMR data submitted over the last 60 months shows that there have been no permit violations of BOD_5 concentration limits. Based on the DMR data, the average values during the period May 1 – October 31 for BOD_5 monthly average and weekly average were 3.57 mg/L (range 1.3-6.1 mg/L; n=60) and 5.44 mg/L (2.2-9.5 mg/L; n=60), respectively. Based on the DMR data, the average values during the period November 1 – April 30 for BOD_5 monthly average and weekly average were 3.50 mg/L (range 1.2-6.6 mg/L; n=60) and 5.48 mg/L (1.5-11 mg/L; n=60), respectively. It is also noted that there would have been no violations of the recalculated mass-based limits during this 5-year review period.

b) Total Suspended Solids (TSS)

The draft permit proposes the same TSS concentration limits as in the current permit. The summer limits were established in the 1981 wasteload allocation; the average monthly limit is 15 mg/L and the average weekly limit is 22 mg/L. The applicable period is May 1 through October 31, a slight adjustment from the period defined in the WLA. During the period, November 1-April 30, the average monthly limit is 30 mg/L and the average weekly limit is 45 mg/L based on the secondary treatment standards in 40 C.F.R. §133.102. The monitoring frequency remains once per week.

As previously stated, EPA has reduced the mass-based limits for TSS to address antidegradation concerns caused by the 1995 increase in design flow from 0.32 MGD to 0.76 MGD. The mass-based limits are calculated using the original design flow of 0.32 MGD.

TSS Mass Loading Calculations:

Calculations of maximum allowable loads for average monthly, average weekly and maximum daily TSS are based on the following equation:

$$L = C \times DF \times 8.34$$

Where:

L = Maximum allowable load in lbs/day.
C = Maximum allowable effluent concentration for reporting period in mg/L.

Reporting periods are average monthly and weekly and daily maximum.
DF = Annual average design flow of facility (0.32 mgd) at the time of 1981 WLA.
8.34 = Factor to convert effluent concentration in mg/L and design flow in MGD to lbs/day.

(Concentration limit) [15] X 8.34 (Constant) X 0.32 (Design flow) = 40 lbs/day
(Concentration limit) [22] X 8.34 (Constant) X 0.32 (Design flow) = 59 lbs/day

(Concentration limit) [30] X 8.34 (Constant) X 0.32 (Design flow) = 80 lbs/day
(Concentration limit) [45] X 8.34 (Constant) X 0.32 (Design flow) = 120 lbs/day

A review of DMR data submitted over the review period shows that there have been no permit violations of TSS concentration limits. Based on the DMR data, the average values during the period May 1 – October 31 for TSS monthly average and weekly average were 2.44 mg/L (range 1.2-8.7 mg/L; n=27) and 3.65 mg/L (1.71-10.8 mg/L; n=27), respectively. Based on the DMR data, the average values during the period November 1 – April 30 for TSS monthly average and weekly average were 3.85 mg/L (range 1.5-9.2 mg/L; n=30) and 5.95 mg/L (2.1-17.8 mg/L; n=30), respectively. It is also noted that there would have been no violations of the recalculated mass-based limits during this 5-year review period.

Eighty-Five Percent (85%) BOD_5 and TSS Removal Requirement

The provisions of 40 CFR §133.102(a)(3), (4) and (b)(3) requires that the 30-day average percent removal for BOD_5 and TSS be not less than 85%. This requirement was included in the previous permit and has been carried forward into the draft permit.

A review of DMR data shows that BOD_5 and TSS removal percentages average 98 % and 98%, respectively. There have been no violations of the 85% removal requirement for BOD_5 or TSS over the last 60 months.

c) pH

Consistent with the current permit, the draft permit includes pH limitations which are required by state water quality standards are 314 CMR 4.05(3)(b)(3). The pH of the effluent shall not be less than 6.5 or greater than 8.3 standard units at any time. The monitoring frequency is once per daily.

A review of DMR data submitted over the last 60 months shows that there has been no violation of the pH limitations. Based on the DMR data, the pH values have ranged from 6.5-7.7 standard units.

d) Bacteria

The current permit, issued in March 2007, includes effluent limitations for bacteria using fecal coliform bacteria as the indicator bacteria to protect seasonal recreational uses in the receiving water from April 1st through October 31st. A review of DMR data shows that the permittee has been in compliance with the average monthly and maximum daily fecal coliform limits of the current permit (200 cfu/100 ml and 400 cfu/100 ml, respectively). The monthly geometric mean

fecal coliform bacteria count ranged from 1.3-87 cfu/100 ml. The maximum fecal coliform count reported over the last 60 months was 337 cfu/100 ml.

The current permit also included reporting only requirements for *Escherichia coli (E. coli)* since the Massachusetts was, at that time, anticipating EPA approval of newly adopted recreational criteria based on *E. coli* rather than fecal coliform. *E. coli* counts, although only a reporting requirement, were also less than the MA SWQS criteria. The monthly *E. coli* geometric mean ranged from 1-81 and the maximum value reported was 81 cfu/100 ml.

Consistent with Massachusetts' new bacteria criteria, which were approved by EPA on September 19, 2007, the bacteria limits proposed in the draft permit for Outfall 001 are 126 colony forming units (cfu) of *E.coli* per 100 milliliters (ml) as a geometric mean and 409 cfu of *E.coli* per 100 ml maximum daily value (this is the 90% distribution of the geometric mean of 126 cfu/100 ml). The proposed monitoring frequency is once per week which is the same as in the current permit. As in the current permit, the bacteria limits apply from April 1st through October 31st. Due to the change in the Massachusetts bacteria criteria, there is no effluent limit or monitoring requirements for fecal coliform in the draft permit.

e) Dissolved Oxygen

The current permit includes a dissolved oxygen minimum limit of 5.0 mg/L. This requirement was established to assure that dissolved oxygen levels remain above the state water quality standard of 5.0 mg/L particularly during low flow periods. The 1981 Wasteload Assessment requires a minimum dissolved oxygen limit of 6.0 mg/L. The draft permit proposes a dissolved oxygen limit of 6.0 mg/L to be consistent with the WLA.

3. Non-conventional Pollutants

a) 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 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).

Ammonia Nitrogen (NH_3-N)

Summer Ammonia Limits

The current permit includes warm weather seasonal ammonia limits which were established to address the need to reduce the oxygen demanding component of the nitrogen cycle and also reflect a need to reduce ammonia toxicity. As such, the current permit includes a monthly average limit of 1.0 mg/L and an average weekly limit of 1.5 mg/L for ammonia-nitrogen during

the warm weather period, defined as May 1- October 31. These limits were initially established in the 1981 wasteload allocation.

Winter Ammonia Limits
The limit for the cold weather period (November 1 through April 30) was established to prevent toxicity. The calculations were made using EPA-recommended ammonia criteria from the document: *Update of Ammonia Water Quality Criteria for Ammonia,* 1999 (EPA 822-R-99-014). These are the freshwater ammonia criteria in EPA's *National Recommended Water Quality Criteria,* 2002 (EPA 822-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)).

The current permit includes a cold weather chronic ammonia-nitrogen cold weather limit of 5.4 mg/L based on using a pH of 7.0, assuming a wintertime temperature of 15 degrees, salmonids present and 30Q10 low flow conditions. EPA has recalculated the chronic ammonia limit based on an updated ambient data and 30Q10 low flow conditions as follows:

Forget-Me-Not Brook, estimate of 30Q10 for the period of November 1 to April 30:

The 30Q10 is defined as the mean stream flow for thirty consecutive days with a ten-year recurrence interval. The Quaboag and Spencer gage data indicates that the summer 30Q10 flow to 7Q10 flow ratio is on average 1.5 and that the winter period low flows are on average 2.5 times the summer low flows. This would result in a winter 30Q10 flow of approximately 0.05 cfs * 1.5 * 2.5 = 0.19 cfs and a winter dilution of 1.2.

Chronic Ammonia-Nitrogen Cold Weather Limit:

Critical instream temperature = 14° C (winter instream temperature)
Critical instream pH = 7.0 (winter instream pH, based on ambient WET testing report data)
Chronic ammonia criteria (chronic criteria for Early Life Stages Present) = 5.91 mg/L

Therefore, the ammonia-nitrogen monthly average winter limit:
(30Q10 winter dilution factor * winter instream ammonia criterion)
(1.2 * 5.91 mg/L) = 7.09 mg/L

Acute Ammonia-Nitrogen Cold Weather Limit:
The current permit does not include an effluent limit based on the acute criteria because, in previous permitting analyses, there was found to be no reasonable potential to cause or contribute to a violation of the acute criteria in the winter. As can be seen from DMR summary in Appendix A, weekly average ammonia levels were 1.463 mg/L.

Critical instream pH = 7.0 (winter instream pH)
Acute ammonia criteria (acute criteria for salmonids present) = 24.1 mg/L

In order to determine whether the effluent has the reasonable potential to cause or contribute to an exceedance above the in-stream water quality criteria for ammonia nitrogen, the following

mass-balance is used to project the in-stream concentration downstream from the discharge.

$$Q_dC_d + Q_sC_s = Q_rC_r$$

$$C_r = \frac{Q_dC_d + Q_sC_s}{Q_r}$$

Where:
Q_d = effluent flow (design flow = 0.76 mgd =1.176 cfs)
C_d = effluent ammonia nitrogen in mg/L (4.87 mg/L; 95th percentile)
Q_s = upstream 7Q10 low flow (0.05 cfs)
C_s = median upstream cold weather ammonia nitrogen concentration (0.08 mg/L)
Q_r = streamflow downstream, after discharge ($Q_d + Q^s$ = 1.226 cfs)
C_r = downstream pollutant concentration in mg/L

C_r = 4.67 mg/L < 24.1 mg/L so there is no reasonable potential.

Reasonable potential is then determined by comparing this resultant in-stream concentration (for both acute and chronic conditions) with the criteria. EPA's *Technical Support Document for Water Quality Based Toxics Control* (EPA/5-5/2-90-001, March 1991), commonly known as the "TSD," describes the statistical approach in determining if there is reasonable potential for an excursion above the maximum allowable concentration (see Appendix D of the Fact Sheet). If this is reasonable (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). Note that if a limit is calculated to be lower than the criterion, then the limit is set at the criterion.

The current permit includes a cold weather chronic ammonia-nitrogen cold weather limit of 5.4 mg/L; however, a review of the previous fact sheet shows that the calculation was incorrect. The updated 30Q10 dilution factor is 1.2. Using a pH of 7.0 and an estimated instream temperature of 14° Celsius which were determined based on recent WET data, the applicable chronic criteria is 5.91 mg/L which when multiplied by 1.2 is 7.09 mg/L. EPA believes that this is the appropriate cold weather chronic limit and is not subject to anti-backsliding because the previous limit was established in error.

The calculated total ammonia-nitrogen limit for the draft permit is 7.09 mg/L in the winter. The summer limit is 1.0 mg/L monthly average and 1.5 mg/L weekly average as established in the 1981 wasteload allocation.

Total Nitrogen

Forget-me-not Brook is a tributary to the Quaboag River which is tributary to the Connecticut River. In December 2000, the Connecticut Department of Energy and Environmental Protection (CT DEEP) 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% 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 below). The estimated 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 2004-2005 information and including all POTWs in the watershed. The following table summarizes the estimated baseline loadings, TMDL target loadings, and estimated current loadings:

Table 3: Estimated Point Source Nitrogen Loadings to the Connecticut, Housatonic and Thames Rivers Watersheds

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 DEEP "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 Appendix **C**.

The TMDL target of a 25% 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%.

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 % reduction is maintained or increased. Such a requirement has been included in this permit. EPA also intends to work with the State of Vermont to ensure that similar requirements are included in its discharge permits.

Specifically, the 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 or 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 the MassDEP **within one year of the effective date** of the permit, along with a description of past and ongoing optimization efforts. The permit also requires implementation of optimization methods sufficient to ensure

that there is no increase in total nitrogen compared to the existing average daily load. The annual average total nitrogen load from this facility (2004 – 2005) is estimated to be 119 lbs/day (see Attachment C). The 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 draft permit includes a requirement for the facility to be operated in such a way that discharges of total nitrogen are minimized. The draft permit also includes average monthly and maximum daily reporting requirements for total nitrogen (TN), ammonia nitrogen, total Kjeldahl nitrogen (TKN), total nitrite nitrogen (NO_2), and total nitrate nitrogen (NO_3).

EPA and state agencies continue to assess nitrogen loads to the Connecticut River and Long Island Sound and are likely to incorporate total nitrogen limits in future permit modifications or reissuances as may be necessary to ensure receiving water quality. In December 2015, EPA signed a letter detailing an EPA nitrogen reduction strategy for waters in the Long Island Sound watershed. The strategy recognizes that more work must be done to reduce nitrogen levels, further improve DO conditions, and attain other related water quality standards in Long Island Sound. EPA has identified the Connecticut Riverine System as the priority system in the Performance Work Statement (more information can be found at http://longislandsoundstudy.net/issues-actions/water-quality/nitrogen-strategy/). EPA will work to establish thresholds for Western Long Island Sound and several coastal embayments, including the Connecticut River. Once thresholds are set for a particular sub-watershed, EPA will proceed to develop the corresponding allocations and a permitting schedule.

Although not a permit requirement, it is recommended that any facilities planning that might be conducted for this facility should consider alternatives for further enhancing nitrogen reduction.

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 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) requires 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 develop 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 to lakes or impoundments, and 0.025 mg/L within a lake or reservoir. For this segment of Forget-Me-Not Brook, the 0.1 mg/L 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. North Brookfield is located within Ecoregion XIV, Eastern Coastal Plains. The recommended total phosphorus criteria 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 31.25 ug/L (0.03125 mg/L).

EPA uses the effects-based Gold Book threshold as 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 Forget-Me-Not Brook is unusually susceptible to eutrophication impacts, so that the 100 ug/L threshold appears sufficient in this receiving water. EPA is not aware of evidence of factors that are reducing eutrophic response in Forget-Me-Not Brook downstream of the discharge.

Elevated concentration 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 2008[10] reported five summer in-stream phosphorus concentrations collected at Stations DB08 (Unique ID W1040) located 110' upstream of the North Brookfield WWTF and DB07 (Unique ID W1039), located about 1300 feet downstream of the North Brookfield WWTF.

[10] Reardon, Matthew, MassDEP, Division of Watershed Management, 2013, "Technical Memorandum: Chicopee River Watershed 2008 DWM Water Quality Monitoring Data," DWM Control Number CN 323.1.

Table 4: Instream total phosphorus concentrations (mg/L)

	DB08 (W-1040) 1100' upstream of WWTF	DB07 (W-1039) 1300' downstream of WWTF
5/20/2008	0.016	0.050
6/17/2008	0.031	0.058
7/22/2008	0.032	0.140
8/19/2008	0.025	0.060
9/23/2008	0.018	0.045

Data collected in the summer of 2008 shows that the ambient concentrations downstream of the North Brookfield WWTF are approximately 1.8-4.4 times higher than upstream concentrations. There was one sample (140 ug/L) collected on July 22, 2008 that exceeded the 100 ug/L Gold Book standard. Streamflow at nearby gages in the area of Dunn Brook were just less than 4 times 7Q10 and treatment plant flow was just over half design flow on that date. Both these factors 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 Region 1 and MassDEP conducted a site visit to the WWTF and receiving waters on July 6, 2016 (See Appendix B for photographs from site visit).

Given that the dilution factor is 1, the required effluent limit that would ensure attainment of an instream concentration of 100 ug/L under 7Q10 flow conditions and the treatment plant discharging at full treatment plant design flow is 0.1 mg/L. The draft permit proposes an average monthly limit of 0.1 mg/L for the warm weather period (April 1 – October 31) and the 1.0 mg/L average monthly limit during the cold weather period (November 1-March 31).

The current treatment facility will be unable to achieve the warm weather effluent limit of 0.1 mg/L without changes to the treatment process. EPA has included an interim total phosphorus limit of 0.2 mg/L in the draft permit and this limit is consistent with the warm weather limit in the current permit. A compliance schedule to achieve 0.1 mg/L is detailed in the draft permit, see Part I.B.2.

b) Metals

Certain metals in water can be toxic to aquatic life. There is a need to limit toxic metals 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 from 2011 to 2016) 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, Chapter 3, Section 3.6 and Appendix J, EPA 2012 [EPA

823-B-12-002]. Also see https://www.epa.gov/sites/production/files/2014-10/documents/handbook-chapter3.pdf). As a result, water quality criteria are established in terms of dissolved metals.

However, many inorganic components of domestic wastewater, including metals, are in 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 12.45(c) require, with limits exceptions, that metals limits in NPDES permits be expressed as total recoverable metals.

The facility's effluent concentrations (from Appendix A) were characterized assuming a lognormal distribution in order to determine the estimated 95th percentile of the daily maximum (See Appendix E). 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 criteria. Thus, the downstream hardness should be used.*

The theoretical hardness of Forget-Me-Not Brook 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 2011-2016 (i.e., see Table 4, below).

Table 5: Forget-Me-Not Brook and North Brookfield WWTF Hardness

WET Period	Effluent Hardness, mg/L (as $CaCO_3$)	Ambient Hardness, mg/L (data collected upstream)
6/2012	45.3	49.2
9/2012	61.4	49.3
6/2013	60	40.5
9/2013	48.3	41.5
6/2014	65.6	35.2
9/2014	66	135
6/2015	62.2	46.1
9/2015	57.1	43.7
6/2016	61.9	43.4
9/2016	59.8	167
Median	60.7	44.9

Calculation of hardness in the receiving water:

$$Cr = \frac{QdCd+QsCs}{Qr} = \frac{(1.176\ cfs)(60.7\ mg/L) + (0.05\ cfs)(44.9\ mg/L)}{(0.05\ cfs + 1.176\ cfs)} = 60.05\ mg/L$$

Where:

Qs = 7Q10 river stream flow upsteam of facility = 0.05 cfs
Qd = Design discharge flow from facility = (0.76 mgd * 1.547) = 1.176 cfs
Qr = Combined stream flow (7Q10 + plant flow) = 0.05 cfs + 1.176 cfs = 1.226
Cs = Upstream hardness concentration = 44.9 mg/L
Cd = Plant discharge hardness concentration = 60.7 mg/L
Cr = Receiving water hardness concentration

Therefore, a hardness of 60.05 mg/L as $CaCo_3$ was used to calculate the water quality criteria for certain metals.

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

Table 6: Factors Used to Determine the Acute and Chronic Total Recoverable Criteria for Metals

	Parameters				**Total Recoverable Criteria**	
Metal	**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	1.27	0.19
Copper	0.9422	-1.7000	0.8545	-1.702	8.66	6.03
Lead	1.273	-1.46	1.273	-4.705	42.66	1.66
Nickel	0.846	2.255	0.846	0.0584	304.76	33.88
Zinc	0.8473	0.884	0.8473	0.884	77.78	77.78

*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 exceedance 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.

$$Q_dC_d + Q_sC_s = Q_rC_r$$

Rewritten as:

$$C_r = \frac{Q_dC_d + Q_sCs}{Q_r}$$

Where:
Q_d = design discharge flow from plant = (0.76 mgd * 1.547) = 1.176 cfs
C_d = effluent metals concentration, in ug/L (95^{th} percentile)
Qs = stream flow upstream of the plant = 0.05 cfs
Cs = upstream metals concentration, in ug/L (median)
Q_r = combined stream flow (7Q10 + plant flow) = (1.176 +0.05) = 1.226
Cr = 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 7 below for the results of this analysis with respect to cadmium, lead, and nickel.

Table 7: 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	cfs	cfs	ug/L	Acute (ug/L)	Chronic (ug/L)	Cr>Criteria	Acute (ug/L)	Chronic (ug/L)
Cadmium		0		0		0	1.27	0.19	N	N/A	N/A
Lead		1.22		0.6		1.19	42.66	1.66	N	N/A	N/A
Nickel		8.80		2		8.52	304.76	33.88	N	N/A	N/A

[1]Data from the 2011-2016 Whole Effluent Toxicity (WET) testing were used to calculate values for cadmium, lead, and nickel.
[2]Median upstream data taken from WET testing on Forget-Me-Not Brook just upstream from the North Brookfield WWTF (See Appendix E).

Since the concentration of cadmium, lead and nickel 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 all listed metals will continue to be required as part of the annual WET tests.

Aluminum

The acute and chronic water quality criterion 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 current permit includes both acute and chronic limits at criteria for total aluminum. Since the dilution factor remains 1.0, the draft permit continues the average monthly limits of 87 ug/L total and a maximum daily limit of 750 ug/L in order to protect aquatic life uses.

Cadmium

A review of cadmium data from the facility's WET tests were all reported as non-detect (at or less than 0.1 ug/L, the minimum level) as shown in Appendix A of the Fact Sheet. Since all of the available data are below the minimum level, and since data reported below the minimum level are unreliable, EPA determined that there is no reasonable potential to exceed the cadmium water quality criterion. Monitoring of cadmium will continue to be required as part of the annual WET tests. The permittee must continue to monitor using an analytical method that is "sufficiently sensitive" to assure that the effluent does not exceed the applicable chronic criteria of 0.19 ug/l and an acute criteria of 1.27 ug/l.

Copper

The applicable acute and chronic water quality criterion for copper is 8.66 ug/L and 6.03 ug/L, respectively and is expressed in terms of total recoverable metal in the water column. These criteria are higher than those used in calculating the previous permit limits because EPA used hardness data from WET testing reports which resulted in a calculated downstream hardness of 60.05 mg/L $CaCo_3$. The previous permit used a hardness of 50 mg/L $CaCo_3$.

The previous permit includes a monthly average copper limit of 5.2 ug/L and a maximum daily copper limit of 7.3 ug/L. The permittee has not been able to consistently achieve these limits and is current under an Administrative Order which includes interim limits for copper of a monthly average concentration of 20 ug/L and report only requirement for daily maximum concentration. Monthly average concentrations have ranged from 3.2 ug/L to 20 ug/L and averaged 8 ug/L from October 2011 through September 2016.

Based on the new estimation of ambient downstream hardness, EPA has revised the effluent limits for copper to an average monthly limit of 6.0 ug/L and a maximum daily limit of 8.7 ug/L. This increase in the effluent meets the requirements of antibacksliding because the new estimation of ambient downstream hardness is new information that changes the criteria. The increase also meets the antidegradation requirements because, where North Brookfield has been

discharging under an AO with an interim limit of 20 ug/L, no new or increase discharge of copper will actually occur.

Lead

Available lead data from the facility' WET tests are shown in Appendix A 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' WET tests are shown in Appendix A 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

The acute and chronic water quality criterion for zinc is 77.8 ug/L and is expressed in terms of total recoverable metal in the water column. These criteria are higher than those used in calculating the previous permit limits because EPA used hardness data from WET testing reports which resulted in a calculated downstream hardness of 60.1 mg/L $CaCo_3$. The previous permit used a hardness of 50 mg/L $CaCo_3$.

The reasonable analysis calculations for zinc indicate that there continues to be a reasonable potential to exceed both the acute and chronic water quality criterion and therefore both an acute and chronic effluent limits are proposed in the draft permit. Given that the dilution factor is 1, the effluent limits should be set at criteria.

The previous permit included a monthly average and maximum daily zinc limit of 66.6 ug/L. The permittee has not been able to consistently achieve these limits and is current under an Administrative Order which includes interim limits for zinc of a monthly average concentration of 160 ug/L and report only requirement for daily maximum concentration. Monthly average concentrations have ranged from 30 ug/L to 290 ug/L and averaged 88.6 ug/L from October 2011 through September 2016.

Based on the new estimation of ambient downstream hardness, EPA has revised the effluent limits for zinc to an average monthly limit of 77.8 ug/L and a maximum daily limit of 77.8 ug/L. This increase in the effluent meets the requirements of antibacksliding because the new estimation of ambient downstream hardness is new information that changes the criteria. The increase also meets the antidegradation requirements because, where North Brookfield has been discharging under and AO with an interim limit of 160 ug/L, no new or increase discharge of zinc will actually occur.

c) Whole Effluent Toxicity (WET)

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 statement 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 the site specific considerations. Site-specific limits, human health risk levels and permit limits will be established in accordance with 314 CMR 4.05(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 C.F.R. § 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 "Technical Support Document for Water Quality-Based Toxics Control", March, 1991.)

The MassDEP's Division of Watershed Management has a current toxics policy which requires toxicity testing for all major dischargers such as the North Brookfield WWTF (*Implementation Policy for the Control of Toxic Pollutants in Surface* Waters, MassDEP 1990). In addition, EPA recognizes that toxicity testing is required to assure that the synergetic effect of the pollutants in the discharge do 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 North Brookfield WWTF does not discharge combinations of toxic compounds into Forget-Me-Not Brook 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. 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 $\geq$ 100%). The permittee shall conduct the acute and chronic toxicity tests using the daphnid, *Ceriodaphnia dubia (C. dubia)*, as the test species. It is noted that as part of the 2007 permit issuance, EPA eliminated the required testing for the

fathead minnow (*Pimephales promelas*) based on WET Testing results. *Ceriodaphnia dubia* was found to be the more sensitive species. This is a reduction from the requirement for two species in the MA implementation policy. Toxicity testing must be performed in accordance with the EPA Region I test procedures and protocols specified in Attachments 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 per year. The required procedures for WET testing have changed since the last permit issuance. 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 was replaced by a standalone acute toxicity test. The acute toxicity testing protocol is Attachment B of the draft permit. EPA and 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 limitation for any pollutants.

The C-NOEC calculations are as follows:

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

VII. 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.

VIII. INFILTRATION/INFLOW (I/I)

Infiltration is groundwater that enters the collection system though physical defects such as cracked pipes, or deteriorated joints. Inflow is extraneous flow entering 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 to secondary treatment. It greatly increases the potential for sanitary sewer overflows (SSO) in separate systems, and combined sewer overflows in combined systems.

The draft permit includes a requirement for the permittee to control infiltration and inflow (I/I) within the sewer collections 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.

IX. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

The standard permit conditions for 'Proper Operation and Maintenance', found at 40 CFR §122.41(e), require the proper operation and maintenance of permitted wastewater systems and related 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 adversity affecting human health or the environment. EPA and MassDEP maintain that an I/I removal program is an integral component of ensuring permit 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.C. and I.D. 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 systems are not subject to I/I requirements) to the extent necessary to prevent SSOs and I/I related effluent violations at the wastewater treatment facility 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.

X. ESSENTIAL FISH HABITAT DETERMINATION (EFH)

Forget-Me-Not Brook is not covered by EFH designation for riverine systems and thus EPA has determined that a formal consultation with NMFS is not required.

XI. ENDANGERED 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 the 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 North Brookfield discharge and, therefore, a formal EPA 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 continue to electronically report monitoring results obtained during each calendar month as Discharge Monitoring Report (DMRs) to EPA and the state using NetDMR no later than the 15th day of the month following the completed reporting period.

NetDMR is a national web-based tool for regulated CWA 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.

In most cases, reports required under the permit shall be submitted to EPA as an electronic attachment through NetDMR. Certain exceptions are provided in the permit such as for providing written notifications required under the Part II Standard Permit Conditions. With the use of NetDMR to report DMRs and reports, the permittee is no longer be required to submit hard copies of DMRs or other reports to EPA and is 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. State reporting requirements are further explained in the draft permit.

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. STANDARD CONDITIONS

The standard conditions in Part II of the permit are based on 40 CFR Parts 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 Massachusetts Department of Environmental Protection (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 it is deemed that the state has waived its right to such certification. Regulations governing state certification are set forth in 40 CFR §124.53 and §124.55. EPA has requested permit certification by the State pursuant to 40 CFR §124.53 and expects that the draft permit will be certified.

XVI. PUBLIC COMMENT PERIOD 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 by the close of the public comment period, to Michele Cobban Barden, U.S. EPA, Office of Ecosystem Protection**,** Municipal Permits Branch, 5 Post Office Square, Suite 100, Boston, Massachusetts 02109-3912 or via email to barden.michele@epa.gov. Any person, prior to such date, may submit a request in writing for a public hearing to consider the Draft Permit to EPA and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public meeting may be held if the criteria stated in 40 C.F.R. § 124.12 are satisfied. In reaching a final decision on the Draft Permit, the EPA will respond to all significant comments and make these responses available to the public at EPA's Boston office.

Following the close of the comment period, and after any public hearings, if such hearings are held, the EPA will issue a Final Permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice. Within 30 days following the notice of the Final Permit decision, any interested person may submit a petition for review of the permit to EPA's Environmental Appeals Board consistent with 40 C.F.R. § 124.19 and/or submit a request for an adjudicatory hearing to MassDEP's Office of Appeals and Dispute Resolution consistent with 310 CMR 1.00.

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:

Michele Cobban Barden
EPA New England, Region1
5 Post Office Square, Suite-100 (OEP06-1)
Boston, MA 02109-3912
Telephone: (617) 918-1539, FAX: (617)918-0539
Email: barden.michele@epa.gov

Jennifer Wood
Massachusetts Department of Environmental Protection
Surface Water Discharge Permit Program
One Winter Street, 6th Floor
Boston, MA 02108
Telephone: (617) 654-6536
Email: Jennifer.wood@state.ma.us

August 16, 2017
Date

Arthur V. Johnson III, Acting Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency

Figure 1: Location of the North Brookfield WWTF

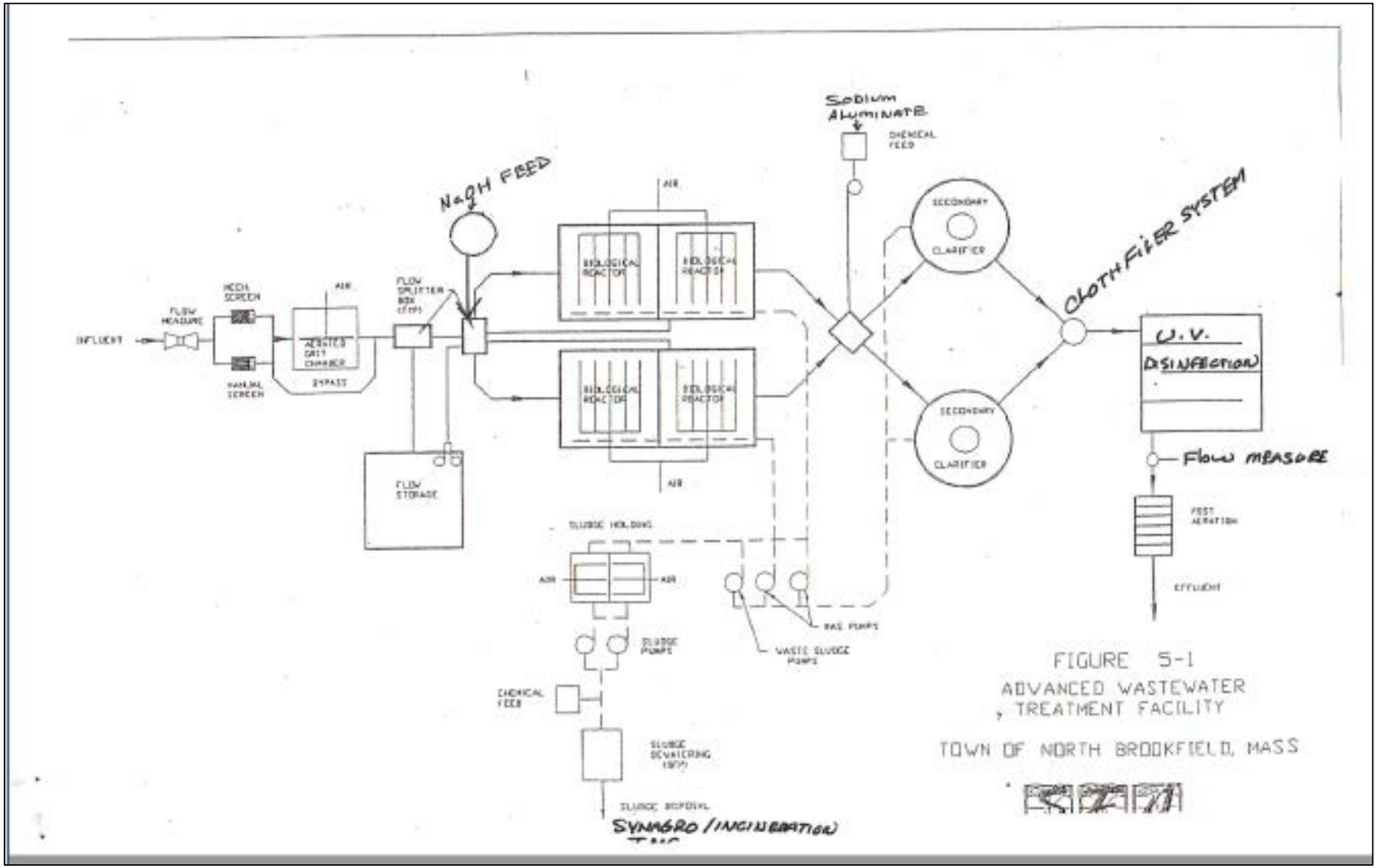

Figure 2: Flow diagram

Table 1: Effluent Data from DMRs

	Flow		BOD_5								BOD % Removal
	(MGD)		(mg/l)		lbs/day		mg/l		lbs/day		%
	Average Monthly (Rolling Average*)	Maximum Daily	Average Monthly (May 1-October 31)	Average Weekly (May 1-October 31)	Average Monthly (May 1-October 31)	Average Weekly (May 1-October 31)	Average Monthly (November 1 - April 30)	Average Weekly (November 1 - April 30)	Average Monthly (November 1 - April 30)	Average Weekly (November 1 - April 30)	Minimum
Effluent Limit	0.760	Report	15	22	95	139	30	45	190	285	85%
Sep-16	0.296	1.238	1	1.2	2	3.1	***	***	***	***	99%
Aug-16	0.298	1.238	1	1.2	1.6	2	***	***	***	***	99%
Jul-16	0.300	1.238	2.5	3	5.2	7.8	***	***	***	***	99%
Jun-16	0.306	1.238	1.9	2.6	3.7	4.9	***	***	***	***	99%
May-16	0.311	1.238	1.6	2.4	4.2	5.7	***	***	***	***	99%
Apr-16	0.310	1.238	***	***	***	***	2.8	4.3	11.6	30.3	99%
Mar-16	0.325	1.238	***	***	***	***	3.9	8.9	15.0	32.1	98%
Feb-16	0.326	1.238	***	***	***	***	2.7	4.6	13.1	47.5	98%
Jan-16	0.307	1.232	***	***	***	***	2.9	6.2	7.8	15.5	98%
Dec-15	0.305	1.232	***	***	***	***	1.3	2.1	3.8	6.5	99%
Nov-15	0.324	1.232	***	***	***	***	1.2	1.5	2.4	3.3	99%
Oct-15	0.330	1.232	2.5	2.7	5.2	6.1	***	***	***	***	99%
Sep-15	0.334	1.232	2.3	3.4	4.9	10.9	***	***	***	***	99%
Aug-15	0.334	1.232	1.3	2.2	2.3	4.3	***	***	***	***	99%
Jul-15	0.334	1.232	3.8	6.2	9.0	18.6	***	***	***	***	98%
Jun-15	0.331	1.232	3.0	4.6	6.7	10.6	***	***	***	***	99%
May-15	0.329	1.232	6.1	8.9	13.1	18.3	***	***	***	***	99%
Apr-15	0.345	1.232	***	***	***	***	5.4	10.3	25.6	51.3	98%
Mar-15	0.344	1.108	***	***	***	***	6.6	8.3	23.5	33.6	96%
Feb-15	0.349	1.98	***	***	***	***	6.5	8.2	13.3	16.2	97%
Jan-15	0.352	1.98	***	***	***	***	3.3	5	7.6	9.8	98%
Dec-14	0.357	1.98	***	***	***	***	1.7	2.2	8.4	17.3	99%
Nov-14	0.339	1.98	***	***	***	***	1.4	2.3	3.4	6.1	99%
Oct-14	0.333	1.98	2.9	4.2	5.9	6.8	***	***	***	***	99%
Sep-14	0.032	1.98	3.2	6	6.1	11.8	***	***	***	***	99%
Aug-14	0.329	1.98	1.9	3.9	3.7	6.2	***	***	***	***	99%
Jul-14	0.331	1.98	5	6.7	10.2	12.9	***	***	***	***	98%
Jun-14	0.337	1.98	4.8	8.8	11.6	23.5	***	***	***	***	98%
May-14	0.373	1.98	4.1	5.2	13	14.4	***	***	***	***	98%
Apr-14	0.365	1.98	***	***	***	***	4.8	8.4	27.6	38.8	97%
Mar-14	0.345	1.98	***	***	***	***	4.4	6.7	17.9	35.3	97%
Feb-14	0.347	1.565	***	***	***	***	6.1	11	12.5	21	97%
Jan-14	0.357	1.565	***	***	***	***	4.1	9.5	11.3	20.2	98%
Dec-13	0.356	1.565	***	***	***	***	2.2	3.4	5.2	9.9	99%
Nov-13	0.357	1.565	***	***	***	***	3.1	7.8	5.5	13.4	99%
Oct-13	0.363	1.565	4.2	8.8	7.9	18.3	***	***	***	***	99%
Sep-13	0.368	1.565	4.1	5.2	8.7	10.5	***	***	***	***	99%
Aug-13	0.370	1.565	2	2.9	3.9	6.2	***	***	***	***	99%
Jul-13	0.370	1.565	6	8	16	20	***	***	***	***	98%

Table 1: Effluent Data from DMRs continued

	Flow		BOD_5								BOD % Removal
	(MGD)		(mg/l)		lbs/day		mg/l		lbs/day		%
	Average Monthly (Rolling Average*)	Maximum Daily	Average Monthly (May 1-October 31)	Average Weekly (May 1-October 31)	Average Monthly (May 1-October 31)	Average Weekly (May 1-October 31)	Average Monthly (November 1 - April 30)	Average Weekly (November 1 - April 30)	Average Monthly (November 1 - April 30)	Average Weekly (November 1 - April 30)	Minimum
Effluent Limit	0.760	Report	15	22	95	139	30	45	190	285	85%
Jun-13	0.363	1.565	4.9	9.5	22.8	33.7	***	***	***	***	98%
May-13	0.332	1.42	3.7	5.8	11.6	25.2	***	***	***	***	98%
Apr-13	0.328	1.42	***	***	***	***	3.9	4.7	11.9	15.9	98%
Mar-13	0.321	1.42	***	***	***	***	4.6	5.7	23	21.6	97%
Feb-13	0.304	0.652	***	***	***	***	3.6	4.5	13.4	24.1	99%
Jan-13	0.299	0.651	***	***	***	***	3.1	5.3	9	12.4	98%
Dec-12	0.301	0.678	***	***	***	***	3	3.9	7.8	12.5	99%
Nov-12	0.321	1.156	***	***	***	***	2.9	5.8	6.7	12.5	99%
Oct-12	0.346	1.156	3.2	3.4	6.7	7.4	***	***	***	***	99%
Sep-12	0.364	1.156	3.8	4.8	7.7	10	***	***	***	***	99%
Aug-12	0.396	2.721	2	5	4.2	10.3	***	***	***	***	99%
Jul-12	0.410	2.579	4.1	4.5	7.8	8.9	***	***	***	***	99%
Jun-12	0.413	2.579	4.7	6.9	12.3	16.5	***	***	***	***	98%
May-12	0.416	2.821	4	8	10.8	21.7	***	***	***	***	98%
Apr-12	NR	NR	***	***	***	***	3.2	3.6	7.4	8.2	NODI
Mar-12	0.446	2.579	***	***	***	***	3.4	3.9	10.3	12.3	98%
Feb-12	0.487	3.137	***	***	***	***	2.7	3.2	7.5	11.3	98%
Jan-12	0.490	3.137	***	***	***	***	3.2	4.5	9.5	14.9	98%
Dec-11	0.478	3.137	***	***	***	***	3.4	4.1	19.1	31.3	98%
Nov-11	0.464	3.137	***	***	***	***	3.5	4.6	17.9	23.8	98%
Oct-11	0.445	0.848	5.3	6.4	21.7	23.6	***	***	***	***	98%
Min	0.032	0.651	1	1.2	1.6	4.9	1.2	1.5	2.4	3.3	96%
Max	0.49	3.137	6.1	9.5	22.8	25.2	6.6	11	27.6	51.3	99%
Avg	0.348	1.654	3.4	5.1	8.35	15.5	3.5	5.5	12.0	20.3	98%
N=	59	59	30	30	30	3	30	30	30	30	59
Exceedences	0	-	0	0	0	0	0	0	0	0	0

NR=Not Reported

Table 1: Effluent Data from DMRs continued

	TSS								TSS % Removal	pH	
	(mg/l)		lbs/day		mg/l		lbs/day		%	(S.U)	
	Average Monthly (May 1-October 31)	Average Weekly (May 1-October 31)	Average Monthly (May 1-October 31)	Average Weekly (May 1-October 31)	Average Monthly (November 1 - April 30)	Average Weekly (November 1 - April 30)	Average Monthly (November 1 - April 30)	Average Weekly (November 1 - April 30)	Minimum	Minimum	Maximum
Effluent Limit	15	22	95	139	30	45	190	285	85%	6.5	8.3
Sep-16	1.5	2.1	3	3.1	***	***	***	***	99%	7.1	7.4
Aug-16	2	2.8	3.2	2	***	***	***	***	99%	7,1	7.4
Jul-16	3.7	7.2	8.8	7.8	***	***	***	***	99%	7.1	7.6
Jun-16	2.60	3.30	5.00	4.9	***	***	***	***	99%	6.9	7.6
May-16	2.90	8.60	7.30	5.7	***	***	***	***	99%	6.9	7.5
Apr-16	***	***	***	***	3.2	5.8	13.9	30.3	99%	6.6	7.3
Mar-16	***	***	***	***	3.7	5.3	14.8	32.1	98%	6.5	7.3
Feb-16	***	***	***	***	2.6	4	12.6	47.5	99%	6.6	7.1
Jan-16	***	***	***	***	3.2	10.2	8.4	15.5	98%	6.5	7.2
Dec-15	***	***	***	***	2.1	3.2	5.8	6.5	99%	6.5	7.1
Nov-15	***	***	***	***	1.7	2.3	3.1	3.3	99%	6.5	7.1
Oct-15	2.00	2.50	4.20	6.1	***	***	***	***	99%	6.5	7.2
Sep-15	2.30	3.80	4.70	10.9	***	***	***	***	99%	6.5	7.0
Aug-15	1.50	2.10	2.80	4.3	***	***	***	***	99%	6.5	7.0
Jul-15	1.80	2.60	4.20	18.6	***	***	***	***	99%	6.8	7.2
Jun-15	2.10	2.50	4.70	10.6	***	***	***	***	99%	6.9	7.6
May-15	3.40	4.10	7.60	18.3	***	***	***	***	99%	6.8	7.4
Apr-15	***	***	***	***	9.2	17.8	44.5	51.3	95%	6.5	7.1
Mar-15	***	***	***	***	7.3	9	27.3	33.6	97%	6.6	7.3
Feb-15	***	***	***	***	6.1	7.4	12.3	16.2	96%	6.8	7.2
Jan-15	***	***	***	***	3.4	6.2	7.7	9.8	98%	6.7	7.3
Dec-14	***	***	***	***	2	2.5	10	17.3	99%	6.5	7.2
Nov-14	***	***	***	***	1.5	2.1	3.5	6.1	99%	6.7	7.2
Oct-14	1.60	2.70	3.20	6.8	***	***	***	***	99%	6.8	7.6
Sep-14	1.30	1.70	2.40	11.8	***	***	***	***	99%	6.6	7.3
Aug-14	1.20	1.90	2.80	6.2	***	***	***	***	99%	6.7	7.2
Jul-14	2.60	4.10	5.20	12.9	***	***	***	***	99%	6.8	7.3
Jun-14	2.20	3.20	5.20	23.5	***	***	***	***	99%	6.9	7.2
May-14	8.70	10.80	27.00	14.4	***	***	***	***	96%	6.6	7.1
Apr-14	***	***	***	***	9	13.4	52	38.8	95%	6.6	7.2
Mar-14	***	***	***	***	4.7	6.2	18.6	35.3	97%		
Feb-14	***	***	***	***	4.8	9.5	9.7	21	97%	6.6	7.3
Jan-14	***	***	***	***	2.5	3.8	7.5	20.2	98%	6.5	7.2
Dec-13	***	***	***	***	2.5	3.8	5.6	9.9	99%	6.7	7.3
Nov-13	***	***	***	***	1.7	3	3.1	13.4	99%	6.8	7.3
Oct-13	3.00	4.70	5.40	18.3	***	***	***	***	99%	6.9	7.3
Sep-13	1.70	3.50	3.70	10.5	***	***	***	***	99%	6.9	7.5
Aug-13	1.70	2.70	3.40	6.2	***	***	***	***	99%	7.0	7.5
Jul-13	1.90	2.80	5.30	20	***	***	***	***	99%	6.8	7.5

Table 1: Effluent Data from DMRs continued

	TSS								TSS % Removal	pH	
	(mg/l)		lbs/day		mg/l		lbs/day		%	(S.U)	
	Average Monthly (May 1-October 31)	Average Weekly (May 1-October 31)	Average Monthly (May 1-October 31)	Average Weekly (May 1-October 31)	Average Monthly (November 1 - April 30)	Average Weekly (November 1 - April 30)	Average Monthly (November 1 - April 30)	Average Weekly (November 1 - April 30)	Minimum	Minimum	Maximum
Effluent Limit	15	22	95	139	30	45	190	285	85%	6.5	8.3
Jun-13	3.00	4.10	17.30	23.5	***	***	***	***	99%	6.6	7.3
May-13	2.70	3.30	8.40	14.4	***	***	***	***	99%	6.9	7.5
Apr-13	***	***	***	***	9	13.4	52	15.9	97%	6.9	7.4
Mar-13	***	***	***	***	4.7	6.2	18.6	21.6	97%	6.7	7.4
Feb-13	***	***	***	***	4.8	9.5	9.7	24.1	98%	6.8	7.3
Jan-13	***	***	***	***	2.5	3.8	7.5	12.4	99%	6.7	7.1
Dec-12	***	***	***	***	2.5	3.8	5.6	12.5	99%	6.8	7.2
Nov-12	***	***	***	***	1.7	3	3.1	12.5	99%	6.9	7.3
Oct-12	1.50	2.10	3.20	7.4	***	***	***	***	99%	7.0	7.4
Sep-12	2.60	3.60	5.40	10	***	***	***	***	99%	6.8	7.5
Aug-12	1.20	1.70	2.60	10.3	***	***	***	***	99%	7.1	7.6
Jul-12	1.70	2.30	3.20	8.9	***	***	***	***	99%	6.8	7.5
Jun-12	3.10	6.10	9.30	16.5	***	***	***	***	99%	6.6	7.5
May-12	2.20	2.60	6.30	21.7	***	***	***	***	99%	7.0	7.6
Apr-12	***	***	***	***	3.4	3.9	7.7	8.2	NR	7.0	7.7
Mar-12	***	***	***	***	2.1	2.8	6.5	12.3	99%	6.8	7.5
Feb-12	***	***	***	***	3.1	3.8	8.4	11.3	98%	6.8	7.2
Jan-12	***	***	***	***	3.6	4.6	10.8	14.9	98%	6.6	7.1
Dec-11	***	***	***	***	3.7	4.5	21.3	31.3	98%	6.8	7.1
Nov-11	***	***	***	***	3.1	3.6	15.7	23.8	99%	6.5	7.0
Oct-11	3.40	5.10	13.70	23.6	***	***	***	***	99%	6.7	7.4
Min	1.2	1.7	2.4	2	1.5	2.1	3.1	3.3	95%	6.5	7
Max	8.7	10.8	27	23.6	9.2	17.8	52	51.3	99%	7.1	7.7
Avg	2.4	3.7	6.28	12.6	3.8	5.9	14.2	20.3	98%	6.7	7.3
N=	30	30	30	30	30	30	30	30	59	58	59
Exceedences	0	0	0	0	0	0	0	0	0	0	0

Table 1: Effluent Data from DMRs continued

	Fecal Coliform		Escherichia Coli		Ammonia-Nitrogen							
	cfu/100 ml		cfu/100 ml		mg/l		lbs/day		mg/l		lbs/day	
	Average Monthly (April 1 – October 31)	Maximum Daily (April 1 – October 31)	Average Monthly (April 1 – October 31)	Maximum Daily (April 1 – October 31)	Average Monthly (May 1- October 31)	Average Weekly (May 1- October 31)	Average Monthly (May 1- October 31)	Average Weekly (May 1- October 31)	Average Monthly (November 1-March 31)	Average Weekly (November 1-March 31)	Average Monthly (November 1 - March 31)	Average Weekly (November 1-March 31)
Effluent Limit	200.0	400.0	Report	Report	1.00	1.50	6.30	9.5	5.40	Report	34.30	Report
Sep-16	58.4	207.0	3	3	0.05	0.12	0.12	0.25	***	***	***	***
Aug-16	150.5	210.0	5	5	0.07	0.10	0.11	0.31	***	***	***	***
Jul-16	61.7	136.0	1	1	0.04	0.06	0.09	0.17	***	***	***	***
Jun-16	29.9	96.0	1	1	0.08	0.16	0.16	0.27	***	***	***	***
May-16	9.5	28.0	14	14	0.06	0.09	0.15	0.31	***	***	***	***
Apr-16	6.4	12.0	2	2	***	***	***	***	0.04	0.05	0.18	0.57
Mar-16	***	***	***	***	***	***	***	***	0.09	0.28	0.34	1.01
Feb-16	***	***	***	***	***	***	***	***	0.15	0.71	0.97	7.33
Jan-16	***	***	***	***	***	***	***	***	0.12	0.25	0.38	0.74
Dec-15	***	***	***	***	***	***	***	***	0.16	0.22	0.45	0.85
Nov-15	***	***	***	***	***	***	***	***	0.35	0.86	0.71	1.87
Oct-15	41.8	178.0	81	81	3.12	10.4	7.26	26.71	***	***	***	***
Sep-15	23.8	87.0	11	11	3.30	8.80	5.80	15.3	***	***	***	***
Aug-15	30.3	79.0	NR	NR	1.70	5.30	3.20	11.1	***	***	***	***
Jul-15	25.4	42.0	1	1	0.72	5.52	2.10	16.57	***	***	***	***
Jun-15	9.9	20.0	NR	NR	1.99	5.66	4.60	13.6	***	***	***	***
May-15	20.7	42.0	NR	NR	0.93	1.70	2.30	4.3	***	***	***	***
Apr-15	NR	NR	NR	NR	***	***	***	***	1.80	2.00	8.30	19.9
Mar-15	***	***	***	***	***	***	***	***	0.22	0.35	0.81	1.57
Feb-15	***	***	***	***	***	***	***	***	0.07	0.09	0.14	0.16
Jan-15	***	***	***	***	***	***	***	***	0.18	0.23	0.18	0.23
Dec-14	***	***	***	***	***	***	***	***	1.30	5.70	9.30	44.3
Nov-14	***	***	***	***	***	***	***	***	0.48	1.04	1.20	2.8
Oct-14	22.9	46.0	1	1	0.19	0.59	0.52	1.83	***	***	***	***
Sep-14	38.4	105.0	13	13	0.62	2.14	1.20	4.2	***	***	***	***
Aug-14	31.8	NR	NR	NR	0.14	0.37	0.26	0.64	***	***	***	***
Jul-14	30.7	212.0	25	25	0.60	2.37	1.24	5.04	***	***	***	***
Jun-14	14.0	80.0	27	27	0.66	2.00	1.70	5.4	***	***	***	***
May-14	24.7	133.0	17	17	0.69	0.82	2.20	3.1	***	***	***	***
Apr-14	11.2	35.0	6	6	***	***	***	***	2.70	5.60	15.00	33.1
Mar-14	***	***	***	***	***	***	***	***	1.80	4.00	7.50	16.4
Feb-14	***	***	***	***	***	***	***	***	0.53	1.62	1.05	3.09
Jan-14	***	***	***	***	***	***	***	***	0.13	0.27	0.45	0.87
Dec-13	***	***	***	***	***	***	***	***	0.42	1.60	0.93	3.5
Nov-13	***	***	***	***	***	***	***	***	0.90	3.40	1.50	5.8
Oct-13	36.1	51.0	1	1	0.81	3.10	1.60	6.4	***	***	***	***
Sep-13	55.0	104.0	1	1	0.13	0.35	0.28	0.71	***	***	***	***
Aug-13	87.0	154.0	7	7	0.04	0.06	0.08	0.13	***	***	***	***

Table 1: Effluent Data from DMRs continued

	Fecal Coliform		Escherichia Coli		Ammonia-Nitrogen							
	cfu/100 ml	cfu/100 ml	cfu/100 ml	cfu/100 ml	mg/l		lbs/day		mg/L		lbs/day	
	Average Monthly	Maximum Daily	Average Monthly	Maximum Daily	Average Monthly (May 1-October 31)	Average Weekly (May 1- October 31)	Average Monthly (May 1-October 31)	Average Weekly (May 1- October 31)	Average Monthly (November 1-March 31)	Average Weekly (November 1-March 31)	Average Monthly (November 1 - March 31)	Average Weekly (November 1-March 31)
Effluent Limit	200.0	400.0	Report	Report	1.00	1.50	6.30	9.5	5.40	Report	34.30	Report
Jul-13	43.1	144.0	1	1	0.21	0.54	0.52	1.5	***	***	***	***
Jun-13	18.6	44.0	NR	NR	0.49	1.80	1.60	5.8	***	***	***	***
May-13	9.7	25.0	NR	NR	0.54	1.12	1.60	2.68	***	***	***	***
Apr-13	1.3	3.0	1	1	***	***	***	***	0.27	0.58	0.83	1.96
Mar-13	***	***	***	***	***	***	***	***	0.19	0.49	0.95	1.86
Feb-13	***	***	***	***	***	***	***	***	0.05	0.10	0.22	0.64
Jan-13	***	***	***	***	***	***	***	***	0.02	0.04	0.07	0.09
Dec-12	***	***	***	***	***	***	***	***	0.04	0.09	0.12	0.29
Nov-12	***	***	***	***	***	***	***	***	0.48	2.09	1.05	4.5
Oct-12	18.2	29.0	NR	NR	0.14	0.47	0.30	1	***	***	***	***
Sep-12	20.7	28.0	45	45	0.13	0.30	0.26	0.6	***	***	***	***
Aug-12	22.3	66.0	NR	NR	0.27	0.48	0.53	1.09	***	***	***	***
Jul-12	73.5	208.0	NR	NR	0.71	2.70	1.40	5.4	***	***	***	***
Jun-12	26.0	41.0	11	11	0.27	0.93	0.87	3.1	***	***	***	***
May-12	13.0	39.0	NR	NR	0.83	3.06	2.30	8.3	***	***	***	***
Apr-12	NR	NR	1	1	***	***	***	***	1.30	4.70	2.90	10.5
Mar-12	***	***	***	***	***	***	***	***	0.67	1.74	2.02	5.04
Feb-12	***	***	***	***	***	***	***	***	0.35	0.52	1.03	1.84
Jan-12	***	***	***	***	***	***	***	***	0.37	0.56	1.10	1.9
Dec-11	***	***	***	***	***	***	***	***	0.60	0.90	3.70	8.5
Nov-11	***	***	***	***	***	***	***	***	2.20	3.80	10.80	18
Oct-11	54.0	307.0	NR	NR	0.85	1.40	3.00	6.2	***	***	***	***
Min	1.3	3	1	1	0.04	0.06	0.08	0.25	0.02	0.04	0.07	0.09
Max	150.5	307	81	81	3.3	10.4	7.26	26.71	2.7	5.7	15	44.3
Avg	33.9	93.5	12	12	0.68	2.08	1.58	5.75	0.60	1.46	2.47	6.64
N=	33	32	23	23	30	30	30	24	30	30	30	30
Exceedences	0	0	-	-	4	13	1	5	0	-	0	1

Table 1: Effluent Data from DMRs continued

	TKN		Nitrite+Nitrate		sTotal Phosphorus						Dissolved Orthophosphorus	
	mg/l	lb/day	mg/l	lb/day	mg/l	mg/l	lb/day	mg/l	mg/l	lb/day	mg/l	mg/l
	Average Monthly	Average Monthly	Average Monthly	Average Monthly	Average Monthly (April 1 - October 31)	Maximum Daily (April 1 - October 31)	Average Monthly (April 1-October 31)	Average Monthly (November 1-March 31)	Maximum Daily (April 1 - October 31)	Average Monthly (November 1-March 31)	Average Monthly (November 1-March 31)	Daily Maximum (November 1-March 31)
Effluent Limit	Report	Report	Report	Report	0.20	Report	Report	1.00	Report	Report	Report	Report
Sep-16	***	***	***	***	0.09	0.12	0.18	***	***	***	***	***
Aug-16	NR	NR	58.1	35.0	0.09	0.12	0.14	***	***	***	***	***
Jul-16	***	***	***	***	0.12	0.19	0.27	***	***	***	***	***
Jun-16	***	***	***	***	0.12	0.12	0.21	***	***	***	***	***
May-16	NR	NR	51.3	20.3	0.10	0.12	0.24	***	***	***	***	***
Apr-16	***	***	***	***	0.15	0.19	0.56	***	***	***	***	***
Mar-16	***	***	***	***	***	***	***	0.12	0.12	0.52	0.07	0.07
Feb-16	NR	NR	51.5	21.0	***	***	***	0.18	0.18	0.48	0.32	0.32
Jan-16	***	***	***	***	***	***	***	0.38	0.38	0.95	0.70	0.70
Dec-15	***	***	***	***	***	***	***	0.54	0.54	1.26	0.49	0.49
Nov-15	NR	NR	53.8	30.0	***	***	***	0.13	0.13	0.28	0.26	0.26
Oct-15	***	***	***	***	0.11	0.14	0.24	***	***	***	***	***
Sep-15	***	***	***	***	0.11	0.15	0.23	***	***	***	***	***
Aug-15	17.30	7.70	74.0	36.0	0.09	0.12	0.16	***	***	***	***	***
Jul-15	***	***	***	***	0.11	0.18	0.26	***	***	***	***	***
Jun-15	***	***	***	***	0.11	0.14	0.23	***	***	***	***	***
May-15	NR	NR	41.8	17.0	0.15	0.17	0.34	***	***	***	***	***
Apr-15	***	***	***	***	0.26	0.45	1.26	***	***	***	***	***
Mar-15	***	***	***	***	***	***	***	0.42	0.42	0.88	0.18	0.18
Feb-15	NR	NR	14.8	30.0	***	***	***	0.30	0.30	0.62	0.14	0.14
Jan-15	***	***	***	***	***	***	***	0.16	0.16	0.44	0.12	0.12
Dec-14	***	***	***	***	***	***	***	0.14	0.14	0.65	0.42	0.42
Nov-14	4.70	2.00	73.2	31.0	***	***	***	0.10	0.10	0.21	0.05	0.05
Oct-14	***	***	***	***	0.07	0.08	0.16	***	***	***	***	***
Sep-14	***	***	***	***	0.09	0.10	0.17	***	***	***	***	***
Aug-14	NR	NR	72.6	38.0	0.12	0.15	0.24	***	***	***	***	***
Jul-14	***	***	***	***	0.12	0.16	0.24	***	***	***	***	***
Jun-14	***	***	***	***	0.12	0.20	0.30	***	***	***	***	***
May-14	2.90	0.85	50.9	15.0	0.27	0.37	0.86	***	***	***	***	***
Apr-14	***	***	***	***	0.23	0.37	1.30	***	***	***	***	***
Mar-14	***	***	***	***	***	***	***	0.16	0.16	0.35	0.18	0.18
Feb-14	***	***	44.2	19.0	***	***	***	0.17	0.17	0.39	0.23	0.23
Jan-14	***	***	***	***	***	***	***	0.18	0.18	0.53	0.28	0.28
Dec-13	***	***	***	***	***	***	***	0.26	0.26	0.57	0.27	0.27
Nov-13	6.20	3.50	33.7	19.0	***	***	***	0.23	0.23	0.40	0.12	0.12
Oct-13	***	***	***	***	0.13	0.19	0.23	***	***	***	***	***
Sep-13	***	***	***	***	0.11	0.15	0.23	***	***	***	***	***
Aug-13	2.50	1.30	52.7	27.0	0.06	0.07	0.12	***	***	***	***	***
Jul-13	***	***	***	***	0.10	0.14	0.25	***	***	***	***	***

Table 1: Effluent Data from DMRs continued

	TKN		Nitrite+Nitrate		Total Phosphorus						Dissolved Orthophosphorus	
	mg/l	lb/day	mg/l	lb/day	mg/l	mg/l	lb/day	mg/l	mg/l	lb/day	mg/l	mg/l
	Average Monthly	Average Monthly	Average Monthly	Average Monthly	Average Monthly (April 1 - October 31)	Maximum Daily (April 1 - October 31)	Average Monthly (April 1-October 31)	Average Monthly (November 1-March	Maximum Daily (April 1 - October 31)	Average Monthly (November 1-March 31)	Average Monthly (November 1-March 31)	Daily Maximum (November 1-March 31)
Effluent Limit	Report	Report	Report	Report	0.20	Report	Report	1.00	Report	Report	Report	Report
Jun-13	***	***	***	***	0.14	0.15	0.67	***	***	***	***	***
May-13	5.39	2.00	80.8	30.0	0.12	0.16	0.37	***	***	***	***	***
Apr-13	***	***	***	***	0.20	0.22	0.60	***	***	***	***	***
Mar-13	***	***	***	***	***	***	***	0.19	0.19	0.77	0.12	0.12
Feb-13	3.15	1.20	49.9	19.0	***	***	***	0.15	0.15	0.40	0.24	0.24
Jan-13	***	***	***	***	***	***	***	0.18	0.18	0.42	0.47	0.47
Dec-12	***	***	***	***	***	***	***	0.19	0.19	0.38	0.11	0.11
Nov-12	4.40	1.80	36.9	15.0	***	***	***	0.12	0.12	0.30	0.07	0.07
Oct-12	***	***	***	***	0.07	0.09	0.15	***	***	***	***	***
Sep-12	***	***	***	***	0.09	0.10	0.18	***	***	***	***	***
Aug-12	3.40	1.90	26.8	15.0	0.10	0.13	0.21	***	***	***	***	***
Jul-12	***	***	***	***	0.09	0.10	0.16	***	***	***	***	***
Jun-12	***	***	***	***	0.12	0.18	0.34	***	***	***	***	***
May-12	10.00	3.00	66.9	20.0	0.11	0.16	0.32	***	***	***	***	***
Apr-12	***	***	***	***	0.16	0.23	0.37	***	***	***	***	***
Mar-12	***	***	***	***	***	***	***	0.18	0.18	0.62	0.10	0.10
Feb-12	4.60	1.70	43.5	16.0	***	***	***	0.20	0.20	0.71	0.16	0.16
Jan-12	***	***	***	***	***	***	***	0.37	0.37	1.20	0.19	0.19
Dec-11	***	***	***	***	***	***	***	0.35	0.35	3.30	0.29	0.29
Nov-11	22.60	5.10	31.9	7.2	***	***	***	0.06	0.06	0.36	0.03	0.03
Oct-11	***	***	***	***	0.12	0.16	0.49	***	***	***	***	***
Min	2.5	0.85	14.8	7.2	0.06	0.07	0.12	0.06	0.06	0.21	0.03	0.03
Max	22.6	7.7	80.8	38	0.27	0.45	1.3	0.54	0.54	3.3	0.7	0.7
Avg	7.26	2.67	50.46	23.03	0.12	0.17	0.35	0.22	0.22	0.68	0.22	0.22
N=	12	12	20	20	35	35	35	25	25	25	25	25
Exceedences	-	-	-	-	3	-	-	0	-	-	-	-

Table 1: Effluent Data from DMRs continued

	Total Copper		Total Zinc		Total Aluminum		LC50-Ceriodaphnia	C-NOEC - Ceriodaphnia	Dissolved Oxygen
	ug/l		ug/l		ug/l		%	%	mg/l
	Average Monthly	Maximum Daily	Average Monthly	Maximum Daily	Average Monthly	Maximum Daily	Maximum Daily	Maximum Daily	Average Weekly (May 1-October 31)
Effluent Limit	5.2	7.3	67	67	87	750	100%	100%	5
Sep-16	10.0	10	55	55	180	180	***	***	6
Aug-16	8.8	8.8	56	56	260	260	100%	100%	6.6
Jul-16	7.9	7.9	56	56	340	340	***	***	5.9
Jun-16	7.0	7.2	46	46	170	170	***	***	6.2
May-16	4.8	4.8	45	45	100	100	100%	100%	6.8
Apr-16	3.8	3.8	59	59	170	170	***	***	***
Mar-16	4.0	4.0	110	110	150	150	***	***	***
Feb-16	6.4	6.4	120	120	170	170	100%	100%	***
Jan-16	12.0	12.0	140	140	380	380	***	***	***
Dec-15	8.2	8.2	89	89	130	130	***	***	***
Nov-15	10.0	10.0	120	120	140	140	100%	100%	***
Oct-15	5.4	5.4	42	42	240	240	***	***	6.3
Sep-15	20.0	20.0	110	110	170	170	***	***	5.8
Aug-15	12.0	12.0	200	200	150	150	100%	100%	6
Jul-15	5.2	5.2	48	48	170	170	***	***	6.2
Jun-15	5.2	5.2	42	42	130	130	***	***	5.8
May-15	4.6	4.6	51	51	220	220	100%	100%	6.4
Apr-15	5.5	5.5	88	88	330	330	***	***	***
Mar-15	19.0	19.0	180	180	410	410	***	***	***
Feb-15	19.0	19.0	140	140	170	170	100%	100%	***
Jan-15	5.5	5.5	54	54	67	67	***	***	***
Dec-14	4.2	4.2	56	56	43	43	***	***	***
Nov-14	10.0	10.0	180	180	61	61	100%	100%	***
Oct-14	8.3	8.3	62	62	120	120	***	***	6.5
Sep-14	8.3	8.3	58	58	190	190	***	***	5.6
Aug-14	9.1	9.1	58	58	240	240	100%	H	5.7
Jul-14	5.9	5.9	47	47	370	370	***	***	5.6
Jun-14	6.7	6.7	43	51	145	150	***	***	6.2
May-14	8.0	8.0	50	53	335	440	100%	100%	7.2
Apr-14	17.0	17.0	120	120	530	530	***	***	***
Mar-14	12.2	12.2	290	290	315	470	***	***	***
Feb-14	15.0	15.0	96	96	110	110	100%	100%	***
Jan-14	9.7	9.7	106	120	105	110	***	***	***
Dec-13	10.0	10.0	135	150	125	130	***	***	***
Nov-13	8.6	8.6	75	79	114	140	100%	100%	***
Oct-13	7.6	7.6	59	68	158	220	***	***	6
Sep-13	7.6	7.6	53	56	355	530	***	***	5.9
Aug-13	7.8	7.8	43	43	280	280	100%	100%	6.2
Jul-13	5.6	5.6	65	85	120	120	***	***	6.2

Table 1: Effluent Data from DMRs continued

	Total Copper		Total Zinc		Total Aluminum		LC50-Ceriodaphnia	C-NOEC - Ceriodaphnia	Dissolved Oxygen
	ug/l		ug/l		ug/l		%	%	mg/l
	Average Monthly	Maximum Daily	Average Monthly	Maximum Daily	Average Monthly	Maximum Daily	Maximum Daily	Maximum Daily	Average Weekly (May 1-October 31)
Effluent Limit	5.2	7.3	67	67	87	750	100%	100%	5
Jun-13	5.2	5.2	41	48	220	250	***	***	6.1
May-13	4.4	4.4	48	53	255	260	100%	100%	6.5
Apr-13	6.1	6.1	65	67	295	340	***	***	***
Mar-13	7.9	7.9	110	120	140	160	***	***	***
Feb-13	8.1	8.1	155	170	205	260	100%	100%	***
Jan-13	8.2	8.2	110	120	80	94	***	***	***
Dec-12	9.6	9.6	120	140	145	150	***	***	***
Nov-12	7.1	7.1	65	70	102	110	100%	100%	***
Oct-12	7.5	7.5	52	57	115	120	***	***	7.2
Sep-12	8.8	8.8	71	92	155	160	***	***	6.5
Aug-12	5.3	5.3	37	38	310	370	100%		5.5
Jul-12	9.3	9.3	198	300	135	150	***	***	5.7
Jun-12	6.5	6.5	53	55	114	130	***	***	6.2
May-12	3.2	3.2	45	47	78	94	100%	100%	6.7
Apr-12	6.2	6.2	57	68	135	150	***	***	***
Mar-12	4.8	4.8	103	111	130	140	***	***	***
Feb-12	7.2	7.2	110	120	115	130	100%	100%	***
Jan-12	7.3	7.3	119	140	79	80	***	***	***
Dec-11	5.7	5.7	115	140	80	96	***	***	***
Nov-11	4.0	4.0	67	91	56	65	100%	100%	***
Oct-11	4.4	4.4	30	31	108	130	***	***	6.8
Min	3.2	3.2	30	31	43	43	1	1	5.5
Max	20	20	290	300	530	530	1	1	7.2
Avg	8.05	8.05	87	93	185	199	1	1	6.2
N=	60	60	60	60	59	60	20	18	29
Exceedences	47	31	27	32	51	0	0	0	0

Table 2: Effluent Data from WET Testing Reports

	Total Recoverable Aluminum	Total Recoverable Cadmium	Total Recoverable Chromium	Total Recoverable Copper	Total Recoverable Lead	Total Recoverable Nickel	Total Recoverable Zinc	Ammonia as N
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
	Maximum Daily	Maximum Daily	Maximum Daily	Maximum Daily	Maximum Daily	Maximum Daily	Maximum Daily	Maximum Daily
Effluent Limit	Report	Report	Report	Report	Report	Report	Report	Report
9/1/2016	0.294	<0.0001		0.011	<0.0003	0.005	0.046	0.07
6/1/2016	0.113	<0.0001		0.007	<0.0003	0.004	0.042	0.11
3/1/2016	0.121	<0.0001		0.005	<0.0003	0.003	0.117	0.1
12/1/2015	0.13	<0.0001		0.01	<0.0003	0.005	0.106	0.14
9/1/2015	0.248	<0.0001		0.007	0.0008	0.009	0.201	0.12
6/1/2015	0.228	<0.0001		0.004	<0.0003	0.004	0.044	0.4
3/1/2015	0.31	<0.0001		0.022	<0.0003	0.012	0.197	2.15
12/1/2014	0.046	<0.002		0.011	0.0007	0.007	0.39	0.73
9/1/2014	0.205	<0.0002		0.017	0.0018	0.007	0.06	0.2
6/1/2014	0.164	<0.0002		0.006	<0.0005	0.003	0.077	0.29
3/12014	0.163	<0.0002		0.0127	<0.0005	0.0037	0.111	0.15
12/1/2013	0.088	<0.0002		0.0072	<0.0005	0.005	0.0794	0.14
9/1/2013	0.355	<0.0002		0.0107	<0.0005	0.0036	0.0442	0.13
6/1/2013	0.231	<0.0002		0.0055	<0.0005	0.0057	0.0447	0.06
3/1/2013	0.216	<0.0002		0.0076	<0.0005	0.0035	0.184	0.23
12/1/2012	0.147	<0.0002		0.0097	<0.0005	0.0038	0.0759	0.09
9/1/2012	0.154	<0.0002		0.0131	0.0005	0.0059	0.165	0.18
6/1/2012	0.446	<0.0002		<0.005	<0.0005	0.0055	0.0394	0.44
3/1/2012	0.1	<0.0002		0.0104	<0.0005	0.0041	0.119	0.25
12/1/2012	0.048	<0.0002		0.0044	<0.0005	0.0035	0.0858	0.8
Minimum	0.046			0.004	0.0005	0.003	0.0394	0.06
Maximum	0.446			0.022	0.0018	0.012	0.39	2.15
Number	20			19	4	20	20	20
Avg	0.19035			0.009542105	0.00095	0.005165	0.11142	0.339

Table 3: Ambient Data from WET Testing Reports

Reporting Qtr	Total Recoverable Aluminum	Total Recoverable Cadmium	Total Recoverable Chromium	Total Recoverable Copper	Total Recoverable Lead	Total Recoverable Nickel	Total Recoverable Zinc	Ammonia	Notes
	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	
9/1/2016	<0.010	<0.0001		0.002	<0.0003	0.005	0.018	<0.05	
6/1/2016	0.069	<0.0001		0.002	<0.0003	0.002	0.018	<0.05	
3/1/2016	0.037	<0.0001		<0.002	0.0003	0.004	0.017	<0.05	
12/1/2015	0.02	<0.0001		<0.002	<0.0003	0.002	0.009	0.08	
9/1/2015	0.058	<0.0001		<0.002	0.0004	<0.001	0.007	0.09	
6/1/2015	0.28	<0.0001		<0.002	0.0003	0.001	0.009	0.08	
3/1/2015									Frozen
12/1/2014	0.072	<0.0002		<0.001	<0.0005	0.002	0.018	0.07	
9/1/2014	0.022	<0.0002		0.001	<0.0005	0.002	0.012	0.11	
6/1/2014	0.041	<0.0002		0.001	<0.0005	0.001	0.013	0.13	
3/12014	0.105	<0.002		0.0018	0.0005	0.0007	0.0251	0.12	
12/1/2013	0.027	<0.0002		0.0007	<0.0005	0.0018	0.0074	0.08	
9/1/2013	0.079	<0.0002		0.0019	0.0011	0.0021	0.0048	0.08	
6/1/2013	0.081	<0.0002		0.0023	0.0008	0.0015	0.0112	0.08	
3/1/2013									Frozen
12/1/2012	0.106	<0.0002		0.0041	<0.0005	0.0017	0.0072	0.02	
9/1/2012	<0.005	<0.0002		0.0033	<0.0005	0.0027	0.0061	0.16	
6/1/2012	0.045	<0.0002		<0.005	0.0007	0.0032	0.0073	0.14	
3/1/2012	0.079	<0.0002		0.0047	0.0009	0.0013	0.0145	0.1	
12/1/2012	0.082	<0.0002		0.0017	<0.0005	0.0012	0.0087	<0.02	
Minimum	0.02			0.0007	0.0003	0.0007	0.0048	0.02	
Maximum	0.28			0.0047	0.0011	0.005	0.0251	0.16	
Median	0.0705			0.00195	0.0006	0.002	0.0101	0.085	
Count	16			12	8	17	18	14	

Figure 1: North Brookfield Outfall

Figure 2: Forget-Me-Not Brook

Figure 3: Periphyton amd macrophytes attached to rocks and streambed of Forget-Me-Not Brook

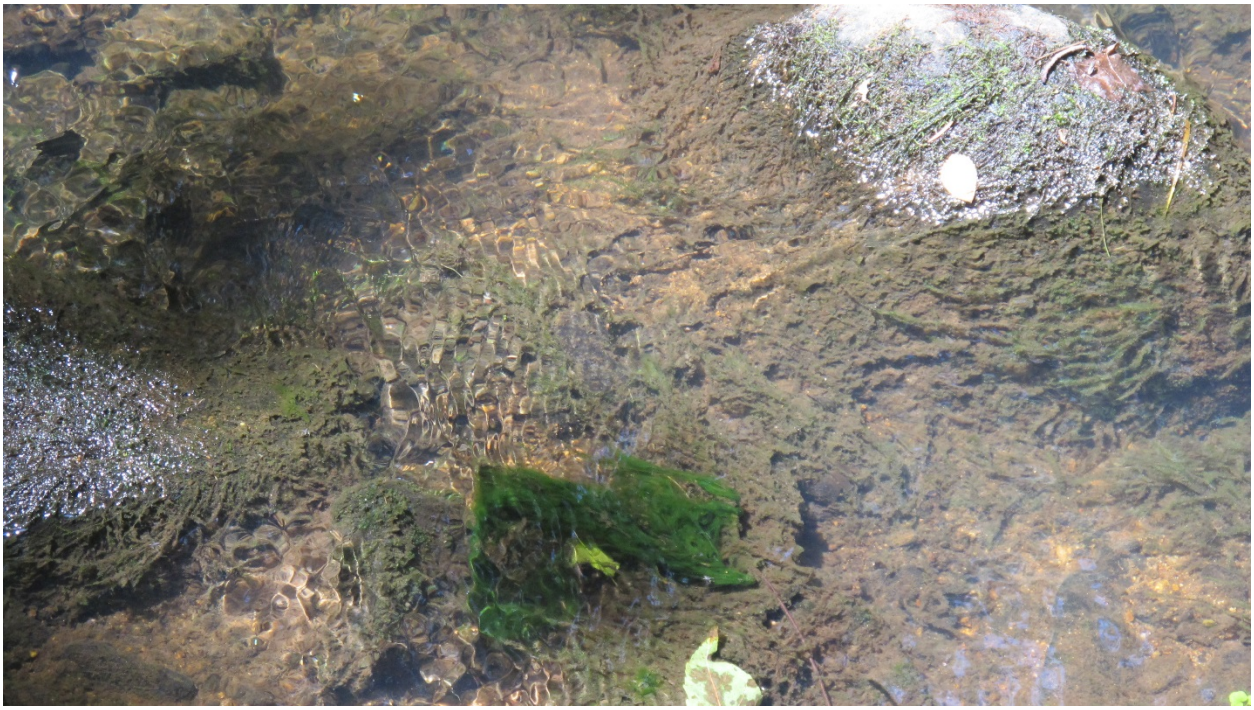

Figure 4: Periphyton and macrophytes on substrate in Forget-Me-Not Brook

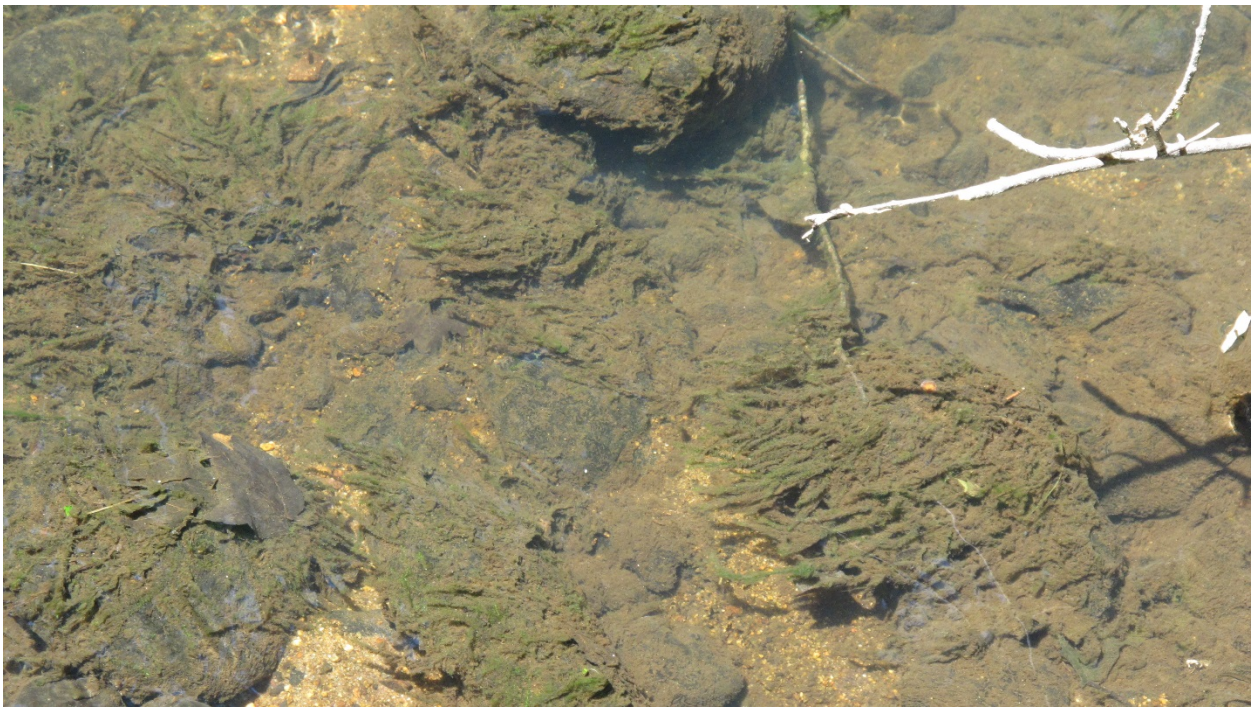

Figure 5: Periphyton and macrophytes on rocks and substrate of Forget-Me-Not Brook

Figure 6: Macrophytes in Forget-Me-Not Brook

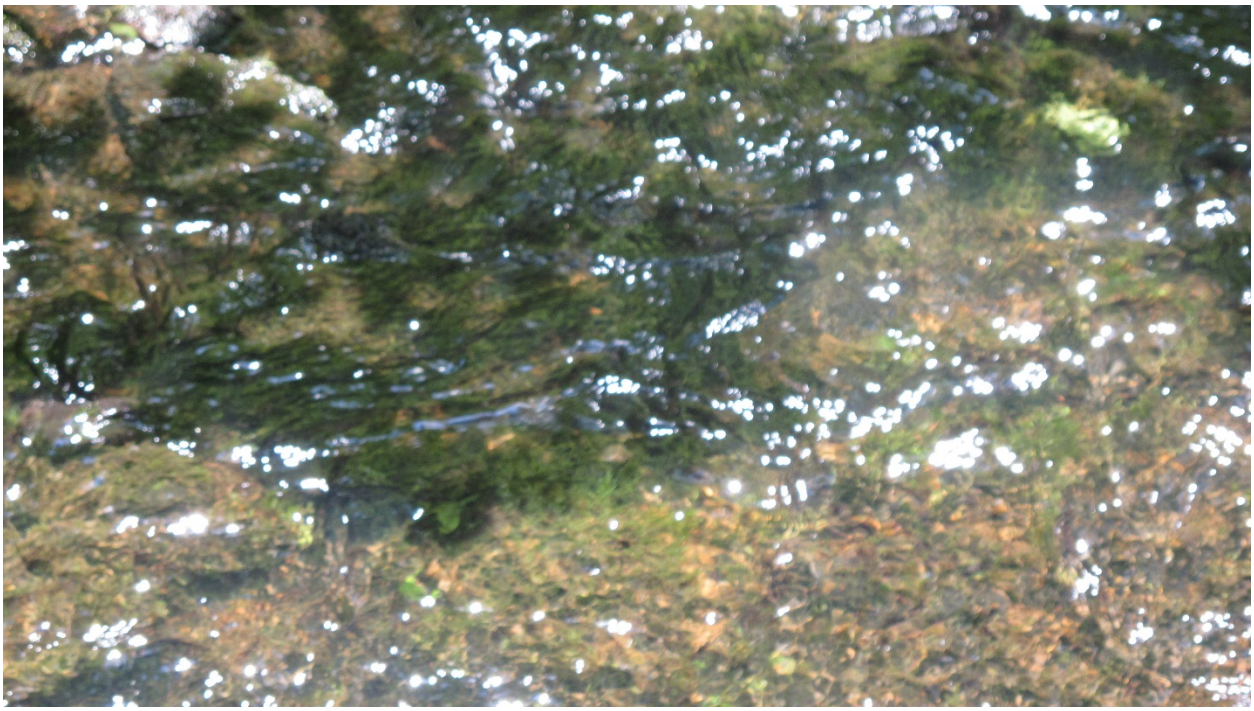

Exhibit A
Nitrogen Loads

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)

Statistical Approach to Characterizing the Effluent for Determining Reasonable Potential

EPA bases its determination of "reasonable potential" on a characterization of the upper bound of expected effluent concentrations based on a statistical analysis of the available monitoring data. As noted in the *Technical Support Document for Water Quality Based Toxics Control* (EPA 1991) ("TSD"), "[a]ll monitoring data, including results for concentrations of individual chemicals, have some degree of uncertainty associated with them. The more limited the amount of test data available, the larger the uncertainty." Thus with a limited data set, the maximum concentration that has been found in the samples may not reflect the full range of effluent concentration.

To account for this, EPA has developed a statistical approach to characterizing effluent variability when the monitoring dataset includes 10 or more samples.[1] As "experience has shown that daily pollutant discharges are generally lognormally distributed," *TSD* at App. E, EPA uses a lognormal distribution to model the shape of the observed data, unless analysis indicates a different distributional model provides a better fit to the data. The model parameters (mean and variance) are derived from the monitoring data. The model parameter μ is the mean of the natural logs of the monitoring data values, while σ is the standard deviation of the natural logs of the monitoring data values.

The lognormal distribution generally provides a good fit to environmental data because it is bounded on the lower end (i.e. you cannot have pollutant concentrations less than zero) and is positively skewed. It also has the practical benefit that if an original lognormal data set X is logarithmically transformed (i.e. Y = ln[X]) the resulting variable Y will be normally distributed. Then the upper percentile expected values of X can be calculated using the z-score of the standardized normal distribution (i.e. the normal distribution with mean = 0 and variance = 1), a common and relatively simple statistical calculation. The p_{th} percentile of X is estimated by

$$X_p = \exp(\mu_y + z_p \times \sigma_y),$$

where μ_y = mean of Y
σ_y = standard deviation of Y
Y = ln[X]
z_p = the z-score for percentile "p"

For the 95_{th} percentile, $z_{95} = 1.645$, so that

$$X_{95} = \exp(\mu_y + 1.645 \times \sigma_y)$$

The 95th percentile value is used to determine whether a discharge has a reasonable potential to cause or contribute to an exceedance of a water quality standard. The combination of the upper bound effluent concentration with dilution in the receiving water is calculated to determine whether the water quality criteria will be exceeded.

[1] A different statistical approach is applied where the monitoring data set includes less than 10 samples.

Datasets including non-detect values

The *TSD* also includes a procedure for determine such percentiles when the dataset includes non-detect results, based on a delta-lognormal distribution. In the delta-lognormal procedures, nondetect values are weighted in proportion to their occurrence in the data. The values above the detection limit are assumed to be lognormally distributed values.

The statistical derivation of the delta-lognormal upper bounds is quite complex and is set forth in the TSD at Appendix E. Calculation of the 95th percentile of the distribution, however, involves a relatively straightforward adjustment of the equations given above for the lognormal distribution, as follows.

For the deltalognormal, the pth percentile of X, referred to here as X_p*, is given by

$$X_p^* = \exp(\mu_y^* + z_p^* \times \sigma_y^*),$$

where μ^*= mean of Y values for data points above the detection limit;
σ_y^*= standard deviation of Y for data points above the detection limit;
$Y = \ln[X^*]$;
X^*= monitoring data above detection limit; and
z_p^* = an adjusted z score that is given by the equation:

$$z_p^* = \text{z-score}[(p - \delta)/(1 - \delta)]$$

where δ is the proportion of nondetects in the monitoring dataset.
k = total number of dataset
r = number of nondetect values in the dataset
$\delta = r/k$

For the 95th percentile, this takes the form of $z_p^* = \text{z-score}[(.95 - \delta)/(1 - \delta)]$. The resulting values of z_p^* for various values of δ is set forth in the table below; the calculation is easily performed in excel or other spreadsheet programs.

Example calculations of z_p^* for 95th percentile

δ	**(0.95 - δ)/ (1 - δ)**	**zp***
0	0.95	1.645
0.1	0.94	1.593
0.3	0.93	1.465
0.5	0.90	1.282
0.7	0.83	0.967

Reasonable Potential Analysis		
no ND, >10 data points, Lognormal distribution		
Dilution Factor:	1	
Date	Al (ug/L)	*Yi* lnAl (ug/L)
9/1/2016	294	5.6836
6/1/2016	113	4.7274
3/1/2016	121	4.7958
12/1/2015	130	4.8675
9/1/2015	248	5.5134
6/1/2015	228	5.4293
3/1/2015	310	5.7366
12/1/2014	46	3.8286
9/1/2014	205	5.3230
6/1/2014	164	5.0999
3/12014	163	5.0938
12/1/2013	88	4.4773
9/1/2013	355	5.8721
6/1/2013	231	5.4424
3/1/2013	216	5.3753
12/1/2012	147	4.9904
9/1/2012	154	5.0370
6/1/2012	446	6.1003
3/1/2012	100	4.6052
12/1/2012	48	3.8712
Sep-16	180	5.1930
Aug-16	260	5.5607
Jul-16	340	5.8289
Jun-16	170	5.1358
May-16	100	4.6052
Apr-16	170	5.1358
Mar-16	150	5.0106
Feb-16	170	5.1358
Jan-16	380	5.9402
Dec-15	130	4.8675
Nov-15	140	4.9416
Oct-15	240	5.4806
Sep-15	170	5.1358
Aug-15	150	5.0106
Jul-15	170	5.1358
Jun-15	130	4.8675
May-15	220	5.3936
Apr-15	330	5.7991
Mar-15	410	6.0162

Feb-15	170	5.1358
Jan-15	67	4.2047
Dec-14	43	3.7612
Nov-14	61	4.1109
Oct-14	120	4.7875
Sep-14	190	5.2470
Aug-14	240	5.4806
Jul-14	370	5.9135
Jun-14	150	5.0106
May-14	440	6.0868
Apr-14	530	6.2729
Mar-14	470	6.1527
Feb-14	110	4.7005
Jan-14	110	4.7005
Dec-13	130	4.8675
Nov-13	140	4.9416
Oct-13	220	5.3936
Sep-13	530	6.2729
Aug-13	280	5.6348
Jul-13	120	4.7875
Jun-13	250	5.5215
May-13	260	5.5607
Apr-13	340	5.8289
Mar-13	160	5.0752
Feb-13	260	5.5607
Jan-13	94	4.5433
Dec-12	150	5.0106
Nov-12	110	4.7005
Oct-12	120	4.7875
Sep-12	160	5.0752
Aug-12	370	5.9135
Jul-12	150	5.0106
Jun-12	130	4.8675
May-12	94	4.5433
Apr-12	150	5.0106
Mar-12	140	4.9416
Feb-12	130	4.8675
Jan-12	80	4.3820
Dec-11	96	4.5643
Nov-11	65	4.1744
Oct-11	130	4.8675

Al - (Lognormal distribution, no ND)			
Estimated Daily Maximum Effluent Concentration			
k = number of daily samples =		80	
u_y = Avg of Nat. Log of daily Discharge =		5.12919	
s_y = Std Dev. of Nat Log of daily discharge =		0.56285	
σ_y^2 = estimated variance = (SUM[$(y_i - u_y)^2$]) / (k-1) =		0.316804295	
cv(x)= Coefficient of Variation =		0.109735502	
99th Percentile Daily Max Estimate = exp (u_y + 2.326*s_y)			
Estimated Daily Max 99th percentile =		**625.3946**	**ug/L**
Estimated Daily Max including Dilution Factor =		**625.3946**	**ug/L**
95th Percentile Daily Max Estimate = exp (u_y + 1.645*s_y)			
Estimated Daily Max =		**426.2728**	**ug/L**
Estimated Daily Max including Dilution Factor =		**426.2728**	**ug/L**

Reasonable Potential Analysis			
data with ND, >10 samples, lognormal distribution			
Dilution Factor:	1		
Date	Cu* (ug/l)	lnCu (ug/l)	$(y_i - u_y)^2$
9/1/2016	11	2.3979	0.1306366
6/1/2016	7	1.9459	0.008199
3/1/2016	5	1.6094	0.1823465
12/1/2015	10	2.3026	0.0708234
9/1/2015	7	1.9459	0.008199
6/1/2015	4	1.3863	0.4227133
3/1/2015	22	3.0910	1.1121474
12/1/2014	11	2.3979	0.1306366
9/1/2014	17	2.8332	0.6348184
6/1/2014	6	1.7918	0.0598776
3/12014	12.7	2.5416	0.25517
12/1/2013	7.2	1.9741	0.0038909
9/1/2013	10.7	2.3702	0.1114126
6/1/2013	5.5	1.7047	0.1100318
3/1/2013	7.6	2.0281	6.906E-05
12/1/2012	9.7	2.2721	0.0555391
9/1/2012	13.1	2.5726	0.2874609
6/1/2012	0		
3/1/2012	10.4	2.3418	0.093237
12/1/2012	4.4	1.4816	0.3078629
Sep-16	10	2.3026	0.0708234
Aug-16	8.8	2.1748	0.019125
Jul-16	7.9	2.0669	0.0009244
Jun-16	7.2	1.9741	0.0038909
May-16	4.8	1.5686	0.2188766
Apr-16	3.8	1.3350	0.4920425
Mar-16	4.0	1.3863	0.4227133
Feb-16	6.4	1.8563	0.0324578
Jan-16	12.0	2.4849	0.2011058
Dec-15	8.2	2.1041	0.00458
Nov-15	10.0	2.3026	0.0708234
Oct-15	5.4	1.6864	0.1225417

Sep-15	20.0	2.9957	0.9202063
Aug-15	12.0	2.4849	0.2011058
Jul-15	5.2	1.6487	0.1503887
Jun-15	5.2	1.6487	0.1503887
May-15	4.6	1.5261	0.2605104
Apr-15	5.5	1.7047	0.1100318
Mar-15	19.0	2.9444	0.8244286
Feb-15	19.0	2.9444	0.8244286
Jan-15	5.5	1.7047	0.1100318
Dec-14	4.2	1.4351	0.3616506
Nov-14	10.0	2.3026	0.0708234
Oct-14	8.3	2.1163	0.0063676
Sep-14	8.3	2.1163	0.0063676
Aug-14	9.1	2.2083	0.0295207
Jul-14	5.9	1.7750	0.0683854
Jun-14	6.7	1.9021	0.0180502
May-14	8.0	2.0794	0.0018475
Apr-14	17.0	2.8332	0.6348184
Mar-14	12.2	2.5014	0.2162041
Feb-14	15.0	2.7081	0.4510355
Jan-14	9.7	2.2721	0.0555391
Dec-13	10.0	2.3026	0.0708234
Nov-13	8.6	2.1518	0.013295
Oct-13	7.6	2.0281	6.906E-05
Sep-13	7.6	2.0281	6.906E-05
Aug-13	7.8	2.0541	0.0003121
Jul-13	5.6	1.7228	0.0984026
Jun-13	5.2	1.6487	0.1503887
May-13	4.4	1.4816	0.3078629
Apr-13	6.1	1.8083	0.0520614
Mar-13	7.9	2.0669	0.0009244
Feb-13	8.1	2.0919	0.0030698
Jan-13	8.2	2.1041	0.00458
Dec-12	9.6	2.2618	0.0507622
Nov-12	7.1	1.9601	0.0058314
Oct-12	7.5	2.0149	0.0004646
Sep-12	8.8	2.1748	0.019125
Aug-12	5.3	1.6677	0.1359778
Jul-12	9.3	2.2300	0.0374639
Jun-12	6.5	1.8718	0.0271117
May-12	3.2	1.1632	0.7626662
Apr-12	6.2	1.8245	0.0449055
Mar-12	4.8	1.5686	0.2188766
Feb-12	7.2	1.9741	0.0038909
Jan-12	7.3	1.9879	0.0023604

Dec-11	5.7	1.7405	0.0876114
Nov-11	4.0	1.3863	0.4227133
Oct-11	4.4	1.4816	0.3078629

Cu- (Lognormal distribution, ND)				
Daily Maximum Effluent Derivation (some measurements < detection limit)				
Detection Limit** =			5.0	
u_y = Avg of Nat. Log of daily Discharge (mg/L) =			2.03646	
S $(y_i - u)^2$ =			13.94659	
k = number of daily samples =			80	
r = number of non-detects =			1	
s_y^2 = estimated variance = $(S[(y_i - u_y)^2]) / (k-r-1)$ =			0.17880	
s_y = standard deviation = square root s_y^2 =			0.42285	
δ = number of nondetect values/number of samples =			0.01250	
z 99th percentile=z-score[(0.99-δ)/(1-δ)] =			2.32162	
z 95th percentile=z-score[(0.95-δ)/(1-δ)] =			1.638747665	
Daily Max = exp (u_y + z-score*s_y)				
99th Percentile Daily Max Estimate=			**20.4536**	**ug/l**
99th Percentile Daily Max Estimate including dilution factor=			**20.4536**	**ug/l**
95th Percentile Daily Max Estimate =			**15.3237**	**ug/l**
95th Percentile Daily Max Estimate including dilution factor=			**15.3237**	**ug/l**

Reasonable Potential Analysis			
data with ND, >10 samples, lognormal distribution			
Dilution Factor:	1		
Date	Pb* (ug/l)	lnPb (ug/l)	$(y_i - u_y)^2$
9/1/2016	0		
6/1/2016	0		
3/1/2016	0		
12/1/2015	0		
9/1/2015	0.8	-0.2231	0.0026883
6/1/2015	0		
3/1/2015	0		
12/1/2014	0.7	-0.3567	0.0343658
9/1/2014	1.8	0.5878	0.5762046
6/1/2014	0		
3/12014	0		
12/1/2013	0		
9/1/2013	0		
6/1/2013	0		
3/1/2013	0		
12/1/2012	0		
9/1/2012	0.5	-0.6931	0.27233
6/1/2012	0		
3/1/2012	0		
12/1/2012	0		

Pb- (Lognormal distribution, ND)				
Daily Maximum Effluent Derivation (some measurements < detection limit)				
Detection Limit** =			5.0	
u_y = Avg of Nat. Log of daily Discharge (mg/L) =			-0.17129	
S $(y_i - u)^2$ =			0.88559	
k = number of daily samples =			20	
r = number of non-detects =			16	
s_y^2 = estimated variance = $(S[(y_i - u_y)^2]) / (k-r-1)$ =			0.29520	
s_y = standard deviation = square root s_y^2 =			0.54332	
δ = number of nondetect values/number of samples =			0.80000	
z 99th percentile=z-score[(0.99-δ)/(1-δ)] =			1.64485	
z 95th percentile=z-score[(0.95-δ)/(1-δ)] =			0.67448975	
Daily Max = exp (u_y + z-score*s_y)				
99th Percentile Daily Max Estimate=			**2.0593**	**ug/l**
99th Percentile Daily Max Estimate including dilution factor=			**2.0593**	**ug/l**
95th Percentile Daily Max Estimate =			**1.2155**	**ug/l**
95th Percentile Daily Max Estimate including dilution factor=			**1.2155**	**ug/l**

Reasonable Potential Analysis			
no ND, >10 data points, Lognormal distribution			
Dilution Factor:	1		
Date	Ni (ug/L)	*Yi* lnNi (ug/L)	
9/1/2016	5	1.6094	
6/1/2016	4	1.3863	
3/1/2016	3	1.0986	
12/1/2015	5	1.6094	
9/1/2015	9	2.1972	
6/1/2015	4	1.3863	
3/1/2015	12	2.4849	
12/1/2014	7	1.9459	
9/1/2014	7	1.9459	
6/1/2014	3	1.0986	
3/12014	3.7	1.3083	
12/1/2013	5	1.6094	
9/1/2013	3.6	1.2809	
6/1/2013	5.7	1.7405	
3/1/2013	3.5	1.2528	
12/1/2012	3.8	1.3350	
9/1/2012	5.9	1.7750	
6/1/2012	5.5	1.7047	
3/1/2012	4.1	1.4110	
12/1/2012	3.5	1.2528	

Ni - (Lognormal distribution, no ND)		
Estimated Daily Maximum Effluent Concentration		
k = number of daily samples =	20	
u_y = Avg of Nat. Log of daily Discharge =	1.57165	
s_y = Std Dev. of Nat Log of daily discharge =	0.36654	
σ_y^2 = estimated variance = (SUM[$(y_i - u_y)^2$]) / (k-1) =	0.134349474	
cv(x)= Coefficient of Variation =	0.233217852	
99th Percentile Daily Max Estimate = exp (u_y + 2.326*s_y)		
Estimated Daily Max 99th percentile =	**11.2934**	**ug/L**
Estimated Daily Max including Dilution Factor =	**11.2934**	**ug/L**
95th Percentile Daily Max Estimate = exp (u_y + 1.645*s_y)		
Estimated Daily Max =	**8.7987**	**ug/L**
Estimated Daily Max including Dilution Factor =	**8.7987**	**ug/L**

Reasonable Potential Analysis			
no ND, >10 data points, Lognormal distribution			
Dilution Factor:	1		
Date	Zn (ug/L)	*Yi* lnZn (ug/L)	
9/1/2016	46	3.8286	
6/1/2016	42	3.7377	
3/1/2016	117	4.7622	
12/1/2015	106	4.6634	
9/1/2015	201	5.3033	
6/1/2015	44	3.7842	
3/1/2015	197	5.2832	
12/1/2014	390	5.9661	
9/1/2014	60	4.0943	
6/1/2014	77	4.3438	
3/12014	111	4.7095	
12/1/2013	79.4	4.3745	
9/1/2013	44.2	3.7887	
6/1/2013	44.7	3.8000	
3/1/2013	184	5.2149	
12/1/2012	75.9	4.3294	
9/1/2012	165	5.1059	
6/1/2012	39.4	3.6738	
3/1/2012	119	4.7791	
12/1/2012	85.8	4.4520	
Sep-16	55	4.0073	
Aug-16	56	4.0254	
Jul-16	56	4.0254	
Jun-16	46	3.8286	
May-16	45	3.8067	
Apr-16	59	4.0775	
Mar-16	110	4.7005	
Feb-16	120	4.7875	
Jan-16	140	4.9416	
Dec-15	89	4.4886	
Nov-15	120	4.7875	
Oct-15	42	3.7377	

Sep-15	110	4.7005	
Aug-15	200	5.2983	
Jul-15	48	3.8712	
Jun-15	42	3.7377	
May-15	51	3.9318	
Apr-15	88	4.4773	
Mar-15	180	5.1930	
Feb-15	140	4.9416	
Jan-15	54	3.9890	
Dec-14	56	4.0254	
Nov-14	180	5.1930	
Oct-14	62	4.1271	
Sep-14	58	4.0604	
Aug-14	58	4.0604	
Jul-14	47	3.8501	
Jun-14	51	3.9318	
May-14	53	3.9703	
Apr-14	120	4.7875	
Mar-14	290	5.6699	
Feb-14	96	4.5643	
Jan-14	120	4.7875	
Dec-13	150	5.0106	
Nov-13	79	4.3694	
Oct-13	68	4.2195	
Sep-13	56	4.0254	
Aug-13	43	3.7612	
Jul-13	85	4.4427	
Jun-13	48	3.8712	
May-13	53	3.9703	
Apr-13	67	4.2047	
Mar-13	120	4.7875	
Feb-13	170	5.1358	
Jan-13	120	4.7875	
Dec-12	140	4.9416	
Nov-12	70	4.2485	
Oct-12	57	4.0431	
Sep-12	92	4.5218	
Aug-12	38	3.6376	
Jul-12	300	5.7038	
Jun-12	55	4.0073	
May-12	47	3.8501	
Apr-12	68	4.2195	
Mar-12	111	4.7095	
Feb-12	120	4.7875	
Jan-12	140	4.9416	

Dec-11	140	4.9416	
Nov-11	91	4.5109	
Oct-11	31	3.4340	

Zn - (Lognormal distribution, no ND)		
Estimated Daily Maximum Effluent Concentration		
k = number of daily samples =	80	
u_y = Avg of Nat. Log of daily Discharge =	4.41827	
s_y = Std Dev. of Nat Log of daily discharge =	0.55624	
σ_y^2 = estimated variance = (SUM[$(y_i - u_y)^2$]) / (k-1) =	0.309402975	
cv(x)= Coefficient of Variation =	0.125895433	
99th Percentile Daily Max Estimate = exp (u_y + 2.326*s_y)		
Estimated Daily Max 99th percentile =	**302.5010**	**ug/L**
Estimated Daily Max including Dilution Factor =	**302.5010**	**ug/L**
95th Percentile Daily Max Estimate = exp (u_y + 1.645*s_y)		
Estimated Daily Max =	**207.1172**	**ug/L**
Estimated Daily Max including Dilution Factor =	**207.1172**	**ug/L**

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
COMMONWEALTH OF MASSACHUSETTS
1 WINTER STREET
BOSTON, MASSACHUSETTS 02108

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY – REGION 1
OFFICE OF ECOSYSTEM PROTECTION
5 POST OFFICE SQUARE
BOSTON, MASSACHUSETTS 02109

JOINT PUBLIC NOTICE OF A DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE INTO WATERS OF THE UNITED STATES UNDER SECTIONS 301 AND 402 OF THE CLEAN WATER ACT, AS AMENDED, AND SECTIONS 27 AND 43 OF THE MASSACHUSETTS CLEAN WATERS ACT, AS AMENDED, AND REQUEST FOR STATE CERTIFICATION UNDER SECTION 401 OF THE CLEAN WATER ACT.

PUBLIC NOTICE PERIOD: August 22, 2017 – September 20, 2017

PERMIT NUMBER: **MA0101061**

PUBLIC NOTICE NUMBER: MA-007-2017

NAME AND MAILING ADDRESS OF APPLICANT:

Town of North Brookfield
Sewer Superintendent
P.O. Box 236
North Brookfield, MA 01535

NAME AND ADDRESS OF THE FACILITY WHERE DISCHARGE OCCURS:

North Brookfield Wastewater Treatment Facility
59 East Brookfield Road
North Brookfield, MA 01535

RECEIVING WATER: Forget-Me-Not Brook (Class B)

The U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) have cooperated in the development of a draft permit for the North Brookfield WWTF which discharges treated domestic and commercial wastewater. The effluent limits and permit conditions imposed have been drafted to assure compliance with the Clean Water Act, 33 U.S.C. sections 1251 et seq., the Massachusetts Clean Waters Act, G.L. c. 21, §§ 26-53, 314 CMR 3.00, and State Surface Water Quality Standards at 314 CMR 4.00. EPA has requested that the State certify this draft permit pursuant to Section 401 of the Clean Water Act and expects that the draft permit will be certified.

INFORMATION ABOUT THE DRAFT PERMIT:

The draft permit and explanatory fact sheet may be obtained at no cost at http://www.epa.gov/region1/npdes/draft_permits_listing_ma.html or by contacting:

Michele Barden
U.S. Environmental Protection Agency – Region 1
5 Post Office Square, Suite 100 (OEP06-1)
Boston, MA 02109-3912
Telephone: (617) 918-1539
Barden.Michele@epa.gov

The administrative record containing all documents relating to this draft permit including all data submitted by the applicant may be inspected at the EPA Boston office mentioned above between 9:00 a.m. and 5:00 p.m., Monday through Friday, except holidays.

PUBLIC COMMENT AND REQUEST FOR PUBLIC HEARING:

All persons, including applicants, who believe any condition of this draft permit is inappropriate, must raise all issues and submit all available arguments and all supporting material for their arguments in full by September 20, 2017, to the address or email address listed above. Any person, prior to such date, may submit a request in writing to EPA and MassDEP for a public hearing to consider this draft permit. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on this draft permit, the Regional Administrator will respond to all significant comments and make the responses available to the public at EPA's Boston office.

FINAL PERMIT DECISION:

Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice.

LEALDON LANGLEY, DIRECTOR
MASSACHUSETTS WETLAND AND
WASTEWATER PROGRAMS
MASSACHUSETTS DEPARTMENT OF
ENVIRONMENTAL PROTECTION

ART V. JOHNSON, III, ACTING DIRECTOR
OFFICE OF ECOSYSTEM PROTECTION
EPA – REGION 1