AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

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

The City of Manchester, New Hampshire

is authorized to discharge from the Wastewater Treatment Plant located at:

300 Winston Street Manchester, New Hampshire 03103	**and**	**15 Combined Sewer Overflows (CSOs)**

to receiving waters named:

Merrimack River – Outfall 001 (Wastewater Treatment Plant) and CSO Outfall Nos. 011, 018, 031, 044, 045, 046, 047, 050, 052, 053, 055; (Hydrologic Basin Code 01070006)
Piscataquog River – CSOs 039 and 051; (Hydrologic Basin Code 01070006)
Tannery Brook (also known as Baker Brook) – CSO 043; (Hydrologic Basin Code 01070006)
Ray Brook – CSO 054; (Hydrologic Basin Code 01070006)

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

The Town of Goffstown, the Town of Bedford and the Town of Londonderry are co-permittees for activities required in Part I.B. (Unauthorized Discharges), Part I.C. (Operation and Maintenance of the Sewer System), and Part I.D. (Alternate Power Source). The responsible municipal departments are:

Town of Goffstown, Chairman Goffstown Sewer Commission 16 Main Street Goffstown, NH 03045	**Town of Bedford Town Manager 24 North Amherst Road Bedford, NH 03110**	**Town of Londonderry Town Manager 268 B Mammoth Road Londonderry, NH 03053**

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

This permit expires at midnight, five (5) years from the last day of the month preceding the effective date.

This permit supersedes the permit issued on September 25, 2008.

This permit consists of **Part I** (24 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); **Attachment C** (USEPA Region 1 Reassessment of Technically Based Industrial Discharge Limits, 9 pages); **Attachment D** (USEPA Region 1 NPDES Permit Requirement for Industrial Pretreatment Annual Report, 2 pages)); **Attachment E** (CSO Discharge Points, 1 page) and **Part II (**25 pages including NPDES Part II Standard Conditions).

Signed this 11th day of February, 2015

/S/SIGNATURE ON FILE

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

PART I
A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1.a. During the period beginning on the effective date and lasting through expiration, the permittee is authorized to discharge treated domestic and industrial wastewater from outfall serial number 001 to the Merrimack River. Such discharges shall be limited and monitored by the permittee, as specified below. Samples taken in compliance with the monitoring requirements specified below shall be taken at a location that provides a representative analysis of the discharge.

Effluent Characteristic	Discharge Limitations			Monitoring Requirements	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Flow[1]; mgd	Report	---	Report	Continuous Recorder[1]	
$CBOD_5$; mg/l (lb/day)	25 (7,090)	40 (11,350)	45 (12,770)	1/Day[3]	24 Hour Composite
TSS; mg/l (lb/day)	30 (8,510)	45 (12,770)	50 (14,190)	1/Day[3]	24 Hour Composite
pH Range[2]; Standard Units	6.5 to 8.0 (See I.J.5., State Permit Conditions)			1/Day	Grab
Total Residual Chlorine[4,6]; mg/l	0.13	---	0.22	2/Day	Grab
Escherichia coli[4,5]; Colonies/100 ml	126	---	406	1/Day	Grab
Total Phosphorus; lb/d (Applicable April 1-October 31)	236	---	Report	2/Month	Grab
Total Phosphorus; mg/l	Report	---	Report	2/Month	Grab
Total Recoverable Copper; ug/l	24	---	Report	2/Month	Grab
Whole Effluent Toxicity[7,8,9]; Percent	Acute $LC_{50} \geq 100\%$ Chronic C-NOEC $\geq 8.5\%$			1/Quarter	24 Hour Composite
Hardness[10]; mg/l	---	---	Report	1/Quarter	24 Hour Composite
Ammonia Nitrogen as N[10]; mg/l	---	---	Report	1/Quarter	24 Hour Composite
Total Recoverable Aluminum[10]; mg/l	---	---	Report	1/Quarter	24 Hour Composite
Total Recoverable Cadmium[10]; mg/l	---	---	Report	1/Quarter	24 Hour Composite
Total Recoverable Copper[10] mg/l	---	---	Report	1/Quarter	24 Hour Composite
Total Recoverable Lead[10]; mg/l	---	---	Report	1/Quarter	24 Hour Composite
Total Recoverable Nickel[10]; mg/l	---	---	Report	1/Quarter	24 Hour Composite
Total Recoverable Zinc[10]; mg/l	---	---	Report	1/Quarter	24 Hour Composite

PART I
A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (Continued)

1.b. During the period beginning on the effective date of the permit and lasting through the expiration date, the permittee is authorized to discharge storm water runoff and wastewater into the Merrimack River from Combined Sewer Outfalls serial numbers 011, 018, 031, 044, 045, 046, 047, 050, 052, 053, and 055, into the Piscataquog River from Outfalls serial numbers 039 and 051, into Tannery Brook from Outfall serial number 043, and into Ray Brook from Outfall serial number 054. (Refer to Attachment E, "CSO Discharge Points") These discharges are authorized only during wet weather. Such discharges shall be monitored by the permittee as specified below. Samples specified below shall be taken at a location that provides a representative analysis of the effluent.

Effluent Characteristic	Discharge Limitation	Monitoring Requirement	
	Wet-Weather Event Maximum	Measurement Frequency	Sample Type
Escherichia coli [11] (Colonies per 100 ml)	1,000	1/Year	Grab

See pages 4 and 5 for footnotes

FOOTNOTES

1. The effluent flow shall be continuously measured and recorded using a flow meter and totalizer. The permittee shall also attach to its discharge monitoring report a table showing the total daily effluent flow discharged from the POTW, the total daily flow receiving secondary treatment and the total daily flow receiving only primary treatment and disinfection. Bypasses shall not occur below influent flows of 34 mgd. When bypass occurs, the blended effluent shall be subject to the effluent limitations in Part I.A.1.a above.

2. State certification requirement.

3. The effluent and influent shall be sampled daily using 24-hour composite samples.

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

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

6. Total residual chlorine shall be measured using any one of the approved methods in 40 CFR Part 136 with a minimum detection level below the permit limit.

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

   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 8.5% or greater limit is defined as a sample which is composed of 8.5% (or greater) effluent, the remainder being dilution water.

8. 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 four times per year during the calendar quarters ending March 31st, June 30th, September 30th, and December 31st. Toxicity test results are to be postmarked by the 15th day of the month following the end of the quarter sampled.

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

10. For each whole effluent toxicity test, the permittee shall report on the appropriate discharge monitoring report (DMR) the concentrations of the hardness, ammonia nitrogen as nitrogen, 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 **Attachments A and B**. Also the permittee should note that all chemical parameter results must still be reported in the appropriate toxicity report.

11. The permittee shall sample each CSO outfall listed in **Attachment E** once per year. The sampling shall occur during a wet-weather discharge event. One grab sample shall be obtained one-half hour after the outfall starts discharging. If more than one sample is collected per outfall per wet weather event, the maximum value for Escherichia coli shall be determined by calculating the geometric mean [refer to footnote (5)]. Results from the sampling shall be reported with each December DMR, which is due by January 15th. If an individual CSO does not discharge or does not discharge sufficiently to collect a sample during the calendar year, report "C" for that outfall on the December DMR.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

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

3. The discharge shall be adequately treated to ensure that the surface water remains free from pollutants in concentrations or combinations that settle to form harmful deposits, float as foam, debris, scum or other visible pollutants. It shall be adequately treated to ensure that the surface waters remain free from pollutants which produce odor, color, taste or turbidity in the receiving waters which is not naturally occurring and would render it unsuitable for its designated uses.

4. The permittee's treatment facility shall maintain a minimum monthly average of 85 percent removal of both $CBOD_5$ and TSS during dry weather. Dry weather is defined as any calendar day on which there is less than 0.1 inches of rainfall and no snow melt. The percent removal shall be calculated using the average monthly influent and effluent concentrations for samples collected during dry weather days.

   The permittee shall attach to its discharge monitoring reports the daily precipitation from

the nearest National Weather Service gage, or a gage accepted by the permitting authority.

5. When the effluent discharged for a period of 3 consecutive months exceeds 80 percent of the 34 mgd design flow (27.2 mgd), the permittee shall submit to the permitting authorities a projection of loadings up to the time when the design capacity of the treatment facility will be reached, and a program for maintaining satisfactory treatment levels consistent with approved water quality management plans. Before the design flow will be reached, or whenever treatment necessary to achieve permit limits cannot be assured, the permittee may be required to submit plans for facility improvements.

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

7. All POTWs must provide adequate notice to both EPA-Region 1 and the New Hampshire Department of Environmental Services, Water Division (NHDES-WD) of the following:

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

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

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

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

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

B. UNAUTHORIZED DISCHARGES

This permit authorizes discharges only from the outfall(s) listed in Part I.A.1.a and the CSOs listed in Part I.A.1.b, 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 NHDES in accordance with Part II, Section D.1.e of the General Requirements of this permit (twenty four hour reporting).

C. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

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

1 Maintenance Staff

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

2. Preventative Maintenance Program

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

3. Infiltration/Inflow

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

4. Collection System Mapping

In accordance with the requirements in the 2008 permit, the permittee and co-permittees prepared maps of the sewer collection systems they own. The collection system maps shall be kept up-to-date and available for review by federal, state, and local agencies as well as the public. Such map(s) shall include, but not be limited to the following:

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

5. Collection System Operation and Maintenance Plan

In accordance with the requirements in the 2008 permit, the permittee and co-permittees prepared and submitted Collection System Operation and Maintenance Plans. The plans shall be kept up-to-date and available for review by federal, state, and local agencies. The plans shall include the information listed below. The bolded language is information that has been added to the 2008 permit requirements.

a. **A description of the collection system management goals, staffing, information management, and legal authorities;**
b. A preventative maintenance and monitoring program for the collection system;
c. Sufficient staffing to properly operate and maintain the collection system;
d. Sufficient funding and the source(s) of funding for implementing the plan;
e. Identification of known and suspected overflows **and back-ups**, including combined manholes, a description of the cause of the identified overflows **and back-ups**, and a plan for addressing the overflows **and back-ups** consistent with the requirements of this permit;
f. **A description of the permittee's and co-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
g. An educational public outreach program for all aspects of I/I control, particularly private inflow.

6. Annual Reporting Requirement

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

a. A description of the staffing levels maintained during the year;
b. A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year;
c. Expenditures for any collection system maintenance activities and corrective actions taken during the previous year;
d. A map with areas identified for investigation/action in the coming year;
e. If average monthly treatment plant flow has reached 80% of the 34 mgd design flow (27.2 mgd) based on the actual average daily flow for three consecutive months or there have been capacity related overflows, submit a calculation of the maximum daily, weekly, and monthly infiltration and the maximum daily, weekly, and monthly inflow for the reporting year; and

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

D. ALTERNATE POWER SOURCE

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

E. INDUSTRIAL USER CONDITIONS

1. Limitations for Industrial Users:

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

   b. The permittee shall develop and enforce specific effluent limits (local limits) for Industrial Users(s) and all other users as necessary, which together with appropriate changes in the POTW Treatment Plant's facilities or operation, are essential to ensure continued compliance with the POTW's NPDES permit or sludge use or disposal practices. Specific local limits shall not be developed and enforced without individual notice to persons or groups who have requested such notice and an opportunity to respond. Within 180 days of the effective date of this permit, the permittee shall prepare and submit a written technical evaluation to the EPA analyzing the need to revise local limits. As part of this evaluation, the permittee shall assess how the POTW performs with respect to influent and effluent pollutants, water quality concerns, sludge quality, sludge processing concerns/inhibition, biomonitoring results, activated sludge inhibition, worker health and safety, and collection system concerns. In preparing this evaluation, the permittee shall complete and submit the attached form (see **Attachment C** – Reassessment of Technically Based Industrial Discharge Limits) with the technical evaluation to assist in determining whether existing local limits need to be revised. Justifications and conclusions should be based on actual plant data if available and should be included in the report. Should the evaluation reveal the need to revise local limits, the permittee shall complete the revisions within 120 days of notification by EPA and submit the revisions to EPA for approval. The Permittee shall carry out the local limits revisions in accordance with EPA's Local Limit Development Guidance (July 2004).

2. Industrial Pretreatment Program

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

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

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

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

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

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

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

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

e. The permittee must modify its pretreatment program to conform to all changes in the Federal Regulations that pertain to the implementation and enforcement of the Industrial Pretreatment Program. The permittee must provide EPA, in writing, within 180 days of the effective date of this permit, proposed changes to the permittee's pretreatment program deemed necessary to assure conformity with current Federal Regulations. At a minimum, the permittee must address in its written submission the following areas: (1) enforcement response plan; (2) revised sewer use ordinances; (3) slug control evaluations. The permittee will implement these proposed changes pending EPA's approval under 40 C.F.R. § 403.18.

F. SLUDGE CONDITIONS

1. Standard Conditions

   a. The permittee shall comply with all existing federal and state laws and regulations that apply to sewage sludge use and disposal practices and the Clean Water Act section 405(d) technical standards.

   b. The permittee shall comply with the more stringent of either the state or federal requirements.

   c. No person shall fire sewage sludge in a sewage sludge incinerator except in compliance with the requirements of 40 CFR Part 503 subpart E.

2. Pollutant Limitations

   a. Firing of sewage sludge shall not violate the requirements of the National Emission Standard for beryllium in 40 CFR Part 61, subpart C - 10 grams per 24-hour period.

   b. Firing of sewage sludge shall not violate the requirements in the National Emission Standard for mercury in 40 CFR Part 61, subpart E - 3200 grams per 24-hour period.

   c. The daily concentration of the metals in the sewage sludge fed to the incinerator shall not exceed the limits specified below (dry weight basis):

	Maximum Daily
Arsenic	8,573 mg/kg
Cadmium	43,416 mg/kg
Chromium	1,423,398 mg/kg
Lead	262,781 mg/kg
Nickel	213,643 mg/kg

3. Operational Standards

   a. The exit gas from the sewage sludge incinerator stack shall be monitored continuously for carbon monoxide.

   b. The monthly average concentration of carbon monoxide in the exit gas from the sewage sludge incinerator, corrected for zero percent moisture and to seven percent oxygen, shall not exceed - **100 ppm on a volumetric basis.**

   c. The CO concentration shall be corrected to zero percent moisture using the correction factor below:

$$\text{Correction factor} = \frac{1}{(1-X)}$$

Where: X = decimal fraction of the percent moisture in the sewage sludge incinerator exit gas in hundredths.

d. The measured CO concentration shall be corrected to seven percent oxygen using the correction factor below:

$$\text{Correction factor} = \frac{14}{(21-Y)}$$

Where: Y = percent oxygen concentration in the sewage sludge incinerator stack exit gas (dry volume/dry volume).

e. The measured CO value shall be multiplied by the correction factors in items **c** and **d**. The corrected CO value shall be used to determine compliance with paragraph b.

4. Management Practices

a. An instrument that continuously measures and records the carbon monoxide concentration in the sewage sludge incinerator stack exit gas shall be installed, calibrated, operated and maintained for each incinerator in accordance with the manufacturer's written instructions.

b. An instrument that continuously measures and records the oxygen concentration in the sewage sludge incinerator stack exit gas shall be installed, calibrated, operated and maintained for each incinerator in accordance with the manufacture's written instructions.

c. An instrument that continuously measures and records information used to determine the moisture content in the sewage sludge incinerator stack exit gas shall be installed, calibrated, operated and maintained for each incinerator in accordance with the manufacture's written instructions.

d. An instrument that continuously measures and records combustion temperatures shall be installed, calibrated, operated and maintained for each incinerator in accordance with the manufacture's written instructions.

e. Upon completion of the testing to demonstrate compliance with the performance specifications, but not later than 90 days from the effective date of this permit, the operator of the incinerators shall submit to EPA - Region 1 a certification stating that the continuous emissions monitoring system meets the performance specifications detailed in the above referenced guidance.

f. Operation of the incinerator shall not cause the operating combustion temperature

for the incinerator to exceed the performance test combustion temperature by more than 20 percent.

g. Any air pollution control devices shall be appropriate for the type of incinerator and operating parameters for the air pollution control device shall be adequate to indicate proper performance of the air pollution control device. For incinerators subject to the requirements of 40 CFR subpart O, operation of the air pollution control device shall not violate the air pollution control device requirements of that part.

h. Sewage sludge shall not be fired in an incinerator if it is likely to adversely affect a threatened or endangered species listed under Section 4 of the Endangered Species Act or its designated critical habitat.

i. The permittee shall notify the EPA and NHDES if any continuous emission monitoring equipment is shut down or broken down for more than 72 hours while the incinerator continues to operate.

j. Notification shall include the following:

(1) The reason for the shut down or break down;
(2) Steps taken to restore the system;
(3) Expected length of the down time; and
(4) The expected length of the incinerator operation during the down time of the monitoring system.

k. Break downs or shut downs of less than 72 hours shall be recorded in the operations log along with an explanation of the event.

l. Copies of all manufacturer's instructions shall be kept on file and be available during inspections.

5. Monitoring Frequency

a. The frequency of monitoring beryllium shall be as required in 40 CFR Part 61, subpart C.

b. The frequency of monitoring mercury shall be as required in 40 CFR Part 61, subpart E.

c. The pollutants in paragraph 2c shall be monitored three times per year.

d. After the sewage sludge has been monitored for the pollutants in paragraph 2c for two years at the frequency specified above, the permittee may request a reduction in the monitoring frequency.

e. The operating parameters for the air pollution control devices shall be monitored

at the following frequency - **1/day**.

f. The CO concentration in the exit gas, the oxygen concentration in the exit gas, information from the instrument used to determine moisture content, and combustion temperatures shall be **continuously** monitored.

6. Sampling and Analysis

a. The sewage shall be sampled at a location which is prior to entering the incinerator and provides a representative sample of the sewage sludge being incinerated.

b. The sewage sludge shall be analyzed using "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA publication SW-846, Second Edition (1982) with Updates I (April 1984) and II (April 1985) and Third Edition (November 1986) with Revision I (December 1987).

c. If emission testing is done for demonstration of NESHAPS, testing shall be in accordance with Method 101A in 40 CFR Part 60, Appendix B, "Determination of Particulate and Gaseous Mercury Emissions from Sewage Sludge Incinerators".

d. Sewage sludge samples for mercury shall be sampled and analyzed using Method 105 in 40 CFR Part 61, Appendix B, "Determination of Mercury in Wastewater Treatment Plant Sewage Sludge".

7. Record Keeping Requirements

The permittee is required to keep records for the following:

a. Report the maximum concentration of each pollutant listed in paragraph 2(c) above;

b. Report the average monthly CO concentration in the exit gas from the incinerator stack;

c. Information that demonstrates compliance with the National Emission Standard for beryllium;

d. Information that demonstrates compliance with the National Emission Standard for mercury. If sludge sampling is used, include calculation for compliance demonstration;

e. The operating combustion temperature for the sewage sludge incinerator;

f. Report the average monthly operating values for the air pollution control devices operating parameters;

g. The oxygen concentration and the information used to measure moisture content in the exit gas from the sewage sludge incinerator. Report the oxygen concentration and percent moisture results which were used to determine the CO values reported in paragraph 8b;

h. Record the average daily and average monthly sewage sludge feed rate to the incinerator;

i. The stack height of the incinerator;

j. The dispersion factor for the site where the incinerator is located;

k. The control efficiency for arsenic, lead, chromium, cadmium and nickel;

l. A calibration and maintenance log for the instruments used to measure the CO concentration and the oxygen concentration in the exit gas; the information need to determine moisture content in the exit gas, and the combustion temperatures.

8. Reporting

The permittee shall report the information in paragraphs 7 (a) through (l) annually by February 19 to EPA and NHDES.

G. COMBINED SEWER OVERFLOWS

1. Effluent Limitations

a. During wet weather, the permittee is authorized to discharge stormwater/wastewater from combined sewer outfalls listed in Part I.A.1.b above, subject to the following effluent limitations.

(1) The discharges shall receive treatment at a level providing Best Practicable Control Technology Currently Available (BPT), Best Conventional Pollutant Control Technology (BCT) to control and abate conventional pollutants and Best Available Technology Economically Achievable (BAT) to control and abate non-conventional and toxic pollutants. The EPA has made a Best Professional Judgment (BPJ) determination that BPT, BCT, and BAT for combined sewer overflow (CSO) control include the implementation of Nine Minimum Controls (NMC) specified below:

(a) Proper operation and regular maintenance programs for the sewer system and the combined sewer overflows.

(b) Maximum use of the collection system for storage.

(c) Review and modification of the pretreatment program to assure CSO impacts are minimized.

(d) Maximization of flow to the POTW for treatment.

(e) Prohibition of dry weather overflows from CSOs.

(f) Control of solid and floatable materials in CSO.

(g) Pollution prevention programs that focus on contaminant reduction activities.

(h) Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts.

(i) Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.

(2) The Permittee shall continue implementation of the NMCs listed in Section I.G.1.a.(1) of this permit. These NMCs provided the basis for the Permittee's NMC document originally submitted to the EPA on May 8, 1995, and any amendments thereto.

b. The permittee shall submit to the EPA by January 15th of each year a report that demonstrates the continual implementation of the NMCs for the previous twelve months. This report must include a detailed description and evaluation of specific activities the permittee has undertaken in the past year to continue implementation and maintenance of the NMCs. The report must include the minimum requirements set forth in Part I.G. This report shall detail, if the case arises, why the permittee was unable to monitor any of the CSOs listed in Part I.A.1.b of this permit. The report shall also document planned activities and any additional controls the permittee can feasibly implement.

2. Unauthorized Discharges

a. The permittee and co-permittees are authorized to discharge only in accordance with the terms and conditions of this permit and only from those outfalls listed in Part I.A.1.b of this permit. Discharges of wastewater from any other point source are not authorized under this permit.

b. Dry weather overflows are prohibited. All dry weather domestic, commercial or industrial discharges from a CSO must be reported to the EPA and NHDES within 24 hours in accordance with the reporting requirements for a plant bypass (Part II.B.4 Bypass of this permit).

c. The State of New Hampshire and EPA have the right to inspect any CSO related structure or outfall at any time without prior notification to the permittee

d. The CSO discharges shall not cause violations of Federal or State Water Quality Standards.

3. Monitoring Requirements

a. The permittee shall continue to quantify and record all discharges from combined sewer outfalls. Quantification may be through direct measurement or estimation. When an estimation technique is used, such as an updated version of the SWMM model already developed for the City's Long-Term Control Plan (LTCP), the permittee shall make reasonable efforts (i.e., gaging, measurements, visual observations, tell-tale monitorings, etc.) to verify the validity of the estimation technique. If the SWMM model is used, it must be updated to reflect current conditions in the City's collection and treatment systems used for CSO abatement. The following information must be recorded for each combined sewer outfall for each discharge event:

(1) Date of discharge
(2) Estimated duration (hours) of discharge;
(3) Estimated volume (gallons) of discharge; and
(4) National Weather Service precipitation data from the nearest gage where precipitation is available at daily (24- hour) intervals and the nearest gage where precipitation is available at one-hour intervals. Cumulative precipitation per discharge event shall be calculated.

b. The permittee shall submit to the EPA on January 15th of each year a certification to the State and EPA which states that the previous twelve monthly inspections were conducted, results recorded, and records maintained.

The permittee shall maintain all records of discharges for at least six years after the effective date of this permit.

4. Reopener/Additional CSO Control Measures

This permit may be modified or reissued upon the completion of a long-term CSO control plan. Such modification may include performance standards for the selected controls, post construction water quality assessment program, monitoring for compliance with water quality standards, and a reopener clause to be used in the event that the selected CSO controls fail to meet water quality standards. Section 301(b)(1)(C) requires that a permit include limits that may be necessary to protect Federal and State water quality standards.

H. SPECIAL CONDITIONS

1. WET Test Frequency Adjustment

The permittee may submit a written request to the EPA-Region 1 requesting a reduction

in the frequency (to not less than once per year) of required toxicity testing, after completion of a minimum of the most recent four (4) successive toxicity tests of effluent, all of which must be valid tests and demonstrate compliance with the permit limits for whole effluent toxicity. Until written notice is received by certified mail from the EPA-Region 1 indicating that the WET testing requirement has been changed, the permittee is required to continue testing at the frequency specified in the respective permit.

2. pH Limit Adjustment

The permittee may submit a written request to the EPA-Region 1 requesting a change in the permitted pH limit range to be not less restrictive than 6.0 to 9.0 Standard Units found in the applicable National Effluent Limitation Guideline (Secondary Treatment Regulations in 40 CFR Part 133) for this facility. The permittee's written request must include the State's approval letter containing an original signature (no copies). The State's letter shall state that the permittee has demonstrated to the State's satisfaction that as long as discharges to the receiving water from a specific outfall are within a specific numeric pH range the naturally occurring receiving water pH will be unaltered. That letter must specify for each outfall the associated numeric pH limit range. Until written notice is received by certified mail from the EPA-Region 1 indicating the pH limit range has been changed, the permittee is required to meet the permitted pH limit range in the respective permit.

I. 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 NHDES 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 and the Use of NetDMR

Beginning the effective date of the permit the permittee must submit its monthly monitoring data in discharge monitoring reports (DMRs) to EPA and NHDES no later than the 15th day of the month following the completed reporting period. **For a period of six months from the effective date of the permit**, the permittee may submit its monthly monitoring data in DMRs to EPA and NHDES either in hard copy form, as described in Part I.I.5, or in DMRs electronically submitted using NetDMR. NetDMR is a web-based tool that allows permittees to electronically submit DMRs and other required reports via a secure internet connection. NetDMR is accessed from: http://www.epa.gov/netdmr. **Beginning no later than six months after the effective date of the permit**, the permittee shall begin reporting monthly monitoring data using NetDMR, unless, in accordance with Part I.I.7, the facility is able to demonstrate a

reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for submitting DMRs. The permittee must continue to use the NetDMR after the permittee begins to do so. When a permittee begins submitting reports using NetDMR, hard copies to EPA and NHDES will no longer be required.

2. Submittal of Reports as NetDMR Attachments

After the permittee begins submitting DMR reports to EPA and NHDES electronically using NetDMR, the permittee shall electronically submit all reports to EPA and NHDES as NetDMR attachments rather than as hard copies, unless otherwise specified in this permit. (See Part I.I.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. Request for changes in sampling location
B. Request for reduction in testing frequency

C. Request for reduction in WET testing requirement
D. 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. Collection System Operation and Maintenance (O&M) Plan (from co-permittee)
D. Report on annual activities related to O&M Plan (from co-permittee)
E. Reports and DMRs submitted prior to the use of NetDMR
F. Sludge monitoring reports

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

U.S. Environmental Protection Agency
Office or Environmental Stewardship (OES)
Water Technical Unit
5 Post Office Square, Suite 100 (OES04-4)
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

Unless otherwise specified in this permit, duplicate signed copies of all reports, information, requests or notifications described in this permit, including the reports,

information, requests or notifications described in Parts I.I.3, I.I.4, and I.I.5 also shall be submitted to the State electronically via email to the permittee's assigned NPDES inspector at NHDES-WD or in hard copy to the following address:

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

7. Submittal of NetDMR Opt-Out Requests

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

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

And

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

8. Verbal Reports and Verbal Notifications

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

U.S. Environmental Protection Agency
Office of Environmental Stewardship
617-918-1510

Verbal reports and verbal notifications shall be made to the permittee's assigned NPDES

inspector at NHDES –WD.

9. Water Supply Community Notification

The permittee shall notify the downstream water supply community listed below of any emergency condition, plant upset, bypass, CSO discharge or other system failure which has the potential to violate permit limits and affect harvesting of shellfish or the quality of water to be withdrawn for drinking water purposes. This notification should be made as soon as possible, and in anticipation of such an event, if feasible, without taking away from any response time necessary to attempt to alleviate the situation. The permittee shall follow up with a written notification within 10 days to the contact below. This notification shall include the reason for the emergency, any sampling information, any visual data recorded, a description of how the situation was handled, and when it would be considered to no longer be an emergency situation. Below is the contact and phone number of the drinking water supplier which will be contacted:

Pennichuck Water Treatment Plant
25 Manchester Street
Merrimack, NH 03054
Tel.: 603-913-2370 (24-hr.)

J. STATE PERMIT CONDITIONS

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

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

3. EPA shall have the right to enforce the terms and conditions of this permit pursuant to federal law and NHDES-WD shall have the right to enforce the permit pursuant to state law, if the permit is adopted. Any modification, suspension, or revocation of this permit shall be effective only with respect to the agency taking such action, and shall not affect the validity or status of the permit as issued by the other agency.

4. Pursuant to New Hampshire Statute RSA 485-A13,I(c), any person responsible for a bypass or upset at a *wastewater facility* shall give immediate notice of a bypass or upset to all public or privately owned water systems drawing water from the same receiving water and located within 20 miles downstream of the point of discharge regardless of whether or not it is on the same receiving water or on another surface water to which the receiving water is tributary. Wastewater facility is defined at RSA 485-A:2XIX as the structures, equipment, and processes required to collect, convey, and treat domestic and

industrial wastes, and dispose of the effluent and sludge. The permittee shall maintain a list of persons, and their telephone numbers, who are to be notified immediately by telephone. In addition, written notification, which shall be postmarked within 3 days of the bypass or upset, shall be sent to such persons.

5. The pH range of 6.5 to 8.0 Standard Units (S.U.) must be achieved in the final effluent unless the permittee can demonstrate to NHDES-WD: (1) that the range should be widened due to naturally occurring conditions in the receiving water or (2) that the naturally occurring receiving water pH is not significantly altered by the permittee's discharge. The scope of any demonstration project must receive prior approval from NHDES-WD. In no case, shall the above procedure result in pH limits outside the range of 6.0 – 9.0 S.U., which is the federal effluent limitation guideline regulation for pH for secondary treatment and is found in 40 CFR 133.102(c).

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

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

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

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

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

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

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

7. For each new or increased discharge of industrial waste to the POTW, the permittee shall submit, in accordance with Env-Ws 305.10(b) an "Industrial Wastewater Discharge Request Application" approved by the permittee in accordance with Env-Wq 305.14(a). The "Industrial Wastewater Discharge Request Application" shall be prepared in accordance with Env-Wq 305.10.

8. Pursuant to Env-Wq 305.21, at a frequency no less than every five years, the permittee shall submit to NHDES:

   a. A copy of its current sewer use ordinance if it has been revised without NHDES approval subsequent to any previous submittal to the department or a certification that no changes have been made. The sewer use ordinance shall include local limits pursuant to Env-Wq 305.04(a).

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

c. A list of all permitted indirect dischargers; and

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

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

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

USEPA REGION 1 FRESHWATER ACUTE TOXICITY TEST PROCEDURE AND PROTOCOL

I. GENERAL REQUIREMENTS

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

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

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

II. METHODS

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

http://water.epa.gov/scitech/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

EPA - New England

Reassessment of Technically Based Industrial Discharge Limits

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

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

Please read direction below before filling out form.

ITEM I.

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

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

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

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

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

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

ITEM II.

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

ITEM III.

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

ITEM IV.

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

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

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

ITEM V.

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

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

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

Item VI.

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

(Item VI. continued)

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

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

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

ITEM VII.

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

ITEM VIII.

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

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

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

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

REASSESSMENT OF TECHNICALLY BASED LOCAL LIMITS (TBLLs)

POTW Name & Address : _____

NPDES PERMIT # : _____

Date EPA approved current TBLLs : _____

Date EPA approved current Sewer Use Ordinance : _____

ITEM I.

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

ITEM II.

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

ITEM III.

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

ITEM IV.

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

_____

_____

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

If yes, explain.

_____

_____

ITEM V.

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

ITEM VI.

Using current POTW effluent sampling data, fill in Column (1). In Column (2A) list what the Water Quality Standards (Gold Book Criteria) were at the time your existing TBLLs were developed. List in Column (2B) current Gold Book values multiplied by the dilution ratio used in your new/reissued NPDES permit.

Pollutant	Column (1) Effluent Data Analyses		Columns (2A) (2B) Water Quality Criteria (Gold Book) From TBLLs Today	
	Maximum (ug/l)	Average (ug/l)	(ug/l)	(ug/l)
Arsenic				
*Cadmium				
*Chromium				
*Copper				
Cyanide				
*Lead				
Mercury				
*Nickel				
Silver				
*Zinc				
Other (List)				

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

ITEM VII.

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

ITEM VIII.

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

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

NPDES PERMIT REQUIREMENT
FOR
INDUSTRIAL PRETREATMENT ANNUAL REPORT

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

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

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

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

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

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

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

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

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

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

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

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

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

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

CSO DISCHARGE POINTS

COMBINED SEWER OUTFALL NUMBER	LOCATION	RECEIVING WATER
011	Schiller Street	Merrimack River
018	Turner/Ferry Streets	Merrimack River
031	Stark Brook	Merrimack River
039	Third Street	Piscataquog River
043	Tannery Brook	Merrimack River
044	Cemetery Brook	Merrimack River
045	Granite Street	Merrimack River
046	Bridge Street (East)	Merrimack River
047	Pennacook Street	Merrimack River
050	WWTP Manhole #1	Merrimack River
051	West Side Pumping Station Emergency Overflow	Piscataquog River
052	WWTP Manhole #2	Merrimack River
053	Walnut/North Streets and Canal/West Pennacook Streets	Merrimack River
054	Ray Brook	Merrimack River
055	Dunbar Street	Merrimack River

NPDES PART II STANDARD CONDITIONS
(January, 2007)

TABLE OF CONTENTS

PART II. A. GENERAL REQUIREMENTS

1. Duty to Comply

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

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

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

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

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

2. Permit Actions

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

3. Duty to Provide Information

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

4. Reopener Clause

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

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

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

5. Oil and Hazardous Substance Liability

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

6. Property Rights

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

7. Confidentiality of Information

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

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

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

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

8. Duty to Reapply

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

9. State Authorities

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

10. Other Laws

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

PART II. B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

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

2. Need to Halt or Reduce Not a Defense

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

3. Duty to Mitigate

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

4. Bypass

a. Definitions

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

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

b. Bypass not exceeding limitations

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

c. Notice

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

d. Prohibition of bypass

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

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

5. Upset

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

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

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

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

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

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

PART II. C. MONITORING REQUIREMENTS

1. Monitoring and Records

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

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

c. Records of monitoring information shall include:

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

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

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

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

2. Inspection and Entry

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

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

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

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

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

PART II. D. REPORTING REQUIREMENTS

1. Reporting Requirements

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

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

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

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

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

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

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

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

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

e. Twenty-four hour reporting.

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

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

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

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

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

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

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

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

2. Signatory Requirement

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

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

3. Availability of Reports.

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

PART II. E. DEFINITIONS AND ABBREVIATIONS

1. Definitions for Individual NPDES Permits including Storm Water Requirements

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

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

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

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

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

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

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

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

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

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

Construction Activities - The following definitions apply to construction activities:

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

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

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

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

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

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

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

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

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

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

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

Discharge of a pollutant means:

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

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

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

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

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

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

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

EPA means the United States "Environmental Protection Agency".

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

NPDES means "National Pollutant Discharge Elimination System".

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

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

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

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

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

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

(a) Sewage from vessels; or

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Waters of the United States means:

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

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

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

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

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

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

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

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

(f) The territorial sea; and

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Feed crops are crops produced primarily for consumption by animals.

Fiber crops are crops such as flax and cotton.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Range land is open land with indigenous vegetation.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3. Commonly Used Abbreviations

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

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

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

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

FACT SHEET

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

NPDES PERMIT NO.: NH0100447

PUBLIC NOTICE START/FINISH DATE: September 19, 2014 – October 18, 2014

NAME AND MAILING ADDRESS OF APPLICANT:

City of Manchester, NH - WWTF
300 Winston Street
Manchester, New Hampshire 03103

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

City of Manchester, NH - WWTF
300 Winston Street
Manchester, New Hampshire 03103

The Town of Goffstown, the Town of Bedford and the Town of Londonderry are co-permittees for specific activities required by the permit as set forth in Section IV.H of this fact sheet and Section I.B., I.C., and I.D. of the draft permit. The responsible municipal departments are:

Town of Goffstown, Chairman
Goffstown Sewer Commission
16 Main Street
Goffstown, NH 03045

Town of Bedford
Town Manager
24 North Amherst Road
Bedford, New Hampshire 03110

Town of Londonderry
Town Manager
268 B Mammoth Road
Londonderry, NH 03053

RECEIVING WATER: Merrimack River, Piscataquog River, Tannery Brook (also known as Bakers Brook), Ray Brook

CLASSIFICATION: B

TABLE OF CONTENTS

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

The above named applicant has applied to the U.S. Environmental Protection Agency (EPA) for reissuance of its NPDES permit to discharge treated effluent from Outfall 001 into the Merrimack River and for the periodic discharge from 15 combined sewer overflows (CSOs) into the Merrimack River, Piscataquog River, Tannery Brook, and Ray Brook.

This facility is engaged in the collection and treatment of domestic, commercial and industrial wastewaters from the City of Manchester (109,000 served) and from the Towns of Londonderry (23,000 served), Bedford (6,000 served), and Goffstown (17,000 served). Accordingly, the Towns of Londonderry, Bedford, and Goffstown have been named co-permittees for conditions related to unauthorized discharges, operation and maintenance of the sewer system, and alternate power sources. Each co-permittee is directly responsible for complying with the permit conditions for collection systems it owns and operates. The collection system serving the facility includes combined sewers, which collect both sewage and storm water runoff. The collection system consists of approximately 385 miles of pipeline, of which 45% are combined sewers.

According to the City's NPDES Application, there are 18 significant industrial users (including 6 categorical industrial users) discharging to the City's collection system. The total process wastewater flow from industries in Manchester is approximately 1 million gallons per day (mgd) and the wastewater flow from industries in the towns of co-permittees are an additional 1 mgd, comprising a total of approximately 2 mgd or 10 percent of the total average monthly flow to the treatment plant. Septage (sludge pumped from septic tanks and brought to the treatment plant by septage haulers) accounts for less than 0.1 percent of the total average treatment plant flow.

The City's wastewater treatment facility (WWTF) is a 34 mgd conventional activated sludge facility. In September 2000, the City completed construction of a bypass of its existing secondary treatment works. This bypass allows the treatment plant to accept wet weather flows up to 70 mgd into the treatment plant, with flows up to 34 mgd receiving full secondary treatment and flows between 34 and 70 mgd receiving primary treatment (i.e., primary clarification and removal of solids and floatables) and disinfection (Note that disinfection occurs in chlorine contact tanks after the bypassed flow is blended with the flow receiving secondary treatment). This increase in wet weather flow capacity reduces the magnitude and frequency of untreated wastewater discharges through CSOs. The addition of this bypass was part of Phase 1 of the Long-Term Control Plan discussed in section V.B below. The bypass is authorized during wet weather based on there being "no feasible alternative" until further CSO abatement projects are completed under future implementation of the Long-Term Control Plan.

Manchester's existing permit was issued on September 25, 2008, became effective on December 1, 2008 and expired on November 30, 2013. Since the applicant filed a complete application for permit reissuance within the time period prescribed in 40 Code of Federal Regulations (CFR) Section 122.6, the existing permit ("2008 permit") was administratively extended and will be in effect until the new permit becomes effective.

In the proximity of the Manchester WWTF, impaired water quality conditions persist in the Merrimack and Piscataquog Rivers and have resulted in its listing in the State of New Hampshire's 2012 *Final List of Threatened or Impaired Waters That Require a TMDL*, also referred to as the 303(d) list. The following is a summary of the river segments near the Manchester WWTF and their impairments:

Assesment Unit Name	Assesment Unit ID	Designated Use Description	Parameter Name
Merrimack River	NHRIV700060803-14-02	Aquatic Life	Aluminum
			Dissolved oxygen saturation
			pH
		Primary Contact Recreation	Escherichia coli
Piscataquog River	NHRIV700060607-22	Aquatic Life	
		Primary & Secondary Contact Recreation	Escherichia coli
Ray Brook	NHRIV700060802-15	Aquatic Life	Chloride
		Primary Contact Recreation	Escherichia coli
Baker Brook	NHRIV700060803-08	Aquatic Life	Chloride

The location of the facility, CSO outfalls and receiving water are shown in Attachment A.

II. Description of Discharge.

A quantitative description of significant effluent parameters based on Discharge Monitoring Reports (DMRs) is shown in Attachment B. The data are from January 2009 through November 2013.

III. Limitations and Conditions

Effluent limitations and monitoring requirements are found in PART I of the draft NPDES permit. The permit contains limitations for carbonaceous biochemical oxygen demand (CBOD), total suspended solids (TSS), pH, total residual chlorine (TRC), *E. coli* bacteria, total phosphorus, total recoverable copper, total recoverable lead, and whole effluent toxicity (LC-50 and C-NOEC). Additionally, monitoring requirements are included for flow, hardness, ammonia nitrogen, and the following total recoverable metals: aluminum, cadmium, copper, lead, nickel, and zinc.

IV. Permit Basis and Explanation of Effluent Limitation Derivation.

A. General Regulatory Background

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

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

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

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

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

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

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

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

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

B. Introduction

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

1. Reasonable Potential

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

2. Anti-backsliding

Section 402(o) of the CWA generally provides that the effluent limitations of a renewed, reissued, or modified permit must be at least as stringent as the comparable effluent limitations in the previous permit. Unless certain limited exceptions are met, "backsliding" from effluent limitations contained in previously issued permits is prohibited. EPA has also promulgated anti-backsliding regulations which are found at 40 C.F.R. § 122.44(l). Unless applicable anti-

backsliding requirements are met, the limits and conditions in the reissued permit must be at least as stringent as those in the previous permit.

3. State Certification

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

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

C. Flow

The Manchester WWTF has a design flow of 34 mgd. This flow rate is used to calculate available dilution as discussed below. If the effluent flow rate exceeds 80 percent of the 34 mgd design flow (27.2 mgd) for a period of three (3) consecutive months then the permittee must notify EPA and the NHDES-WD and implement a program to maintain satisfactory treatment levels. Bypasses are not authorized for influent flows less than 34 mgd.

At present, the average monthly discharge from the treatment facility is approximately 21 mgd (see Attachment B).

D. Conventional Pollutants

1. $CBOD_5$ and TSS

An analysis of the monitoring data from January 2009 through November 2013 shows that the average monthly effluent flow from the Manchester WWTF is 21 mgd.

The average monthly and average weekly effluent limitations for five-day carbonaceous biochemical oxygen demand ($CBOD_5$) of 25 mg/l and 40 mg/l, respectively in the draft permit are based on the secondary treatment regulations for POTWs found at 40 CFR § 133.102(a) and (b). The average monthly and average weekly effluent limitations for total suspended solids (TSS) of 30 mg/l and 45 mg/l, respectively in the draft permit are based on the secondary treatment regulations for POTWs found at 40 CFR § 133.102(a) and (b). The maximum daily limitations for $CBOD_5$ (45 mg/l) and TSS (50 mg/l) in the existing permit, which were based on state certification requirements, have been maintained in the draft permit. The draft permit also contains average monthly, average weekly, and maximum daily mass-based limits for $CBOD_5$ and TSS, in accordance with the requirements of 40 CFR § 122.45(f). The concentration-based limits (mg/l) were converted to mass-based limits (lb/d) using the WWTF design flow of 34 mgd and the conversion factor of 8.345, shown below.

$CBOD_5$ Monthly Average Limit = 25 mg/l x 34 mgd x 8.345 = 7,090 lb/d
$CBOD_5$ Weekly Average Limit = 40 mg/l x 34 mgd x 8.345 = 11,350 lb/d
$CBOD_5$ Daily Maximum Limit = 45 mg/l x 34 mgd x 8.345 = 12,770 lb/d
TSS Monthly Average Limit = 30 mg/l x 34 mgd x 8.345 = 8,510 lb/d
TSS Weekly Average Limit = 45 mg/l x 34 mgd x 8.345 = 12,770 lb/d
TSS Daily Maximum Limit = 50 mg/l x 34 mgd x 8.345 = 14,190 lb/d

The draft permit also carries forth the requirement in the 2008 permit for obtaining an 85% reduction of $CBOD_5$ and TSS, in accordance with the requirements of 40 CFR § 133.102(a)(4)(iii) and (b)(3). The provisions of 40 CFR § 133.103(a) allows for the application of an exception to the 85% $CBOD_5$ and TSS removal requirement in the event that a treatment works receiving flow from combined sewers is not able to achieve this level of $CBOD_5$ and TSS reduction during wet weather events. Achieving such reductions is difficult during such periods when influent flows are diluted and the secondary treatment capacity at the plant is exceeded.

Therefore, an exception to the 85% $CBOD_5$ and TSS removal requirement during wet weather events has been incorporated into the draft permit in accordance with 40 CFR § 133.103(a). Specifically, the draft permit requires that the 30-day average percent removal of $CBOD_5$ and TSS be no less than 85% during periods of dry weather, which is defined as any calendar day on which there is less than 0.1 inch of rainfall and no snow melt. However, the concentration-based effluent limitations for $CBOD_5$ and TSS need to be met under dry or wet weather conditions. The facility has demonstrated compliance with these limitations even when flows are greater than 34 mgd (see Attachment B).

The limitations and requirements pertaining to $CBOD_5$ and TSS in the draft permit are the same as those in the existing permit and are therefore consistent with the antibacksliding requirements found at 40 CFR § 122.44(l).

2. pH

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

The draft permit includes a provision allowing a relaxation of the pH limits if the permittee

performs an in-stream dilution study that demonstrates that the in-stream standards for pH would be protected. If the State approves results from a pH demonstration study, this permit's pH limit range may be relaxed. The notification of the relaxation must be made by certified letter to the permittee from EPA-Region 1. The pH limit range cannot be less restrictive than 6.0 - 9.0 S.U., the limitations included in the applicable National Effluent Limitation Guideline (Secondary Treatment Regulations in 40 CFR Part 133) for the facility.

3. Escherichia coli

The Outfall 001 average monthly and maximum daily limitations for *Escherichia coli* bacteria of 126 and 406 colony forming units per 100 ml, respectively, are in accordance with Class B water quality standards established by the State of New Hampshire in RSA 485-A:8.II and the anti-backsliding requirements mentioned above.

The average monthly and maximum daily limitations for *Escherichia coli* bacteria (*E. coli*) are based on requirements in the State's Statutes (N.H. RSA 485-A:8) for non-designated beach area, and Env-Wq 1703.06 (b), which requires that bacteria criteria shall be applied at the end of a wastewater treatment facility's discharge pipe. The average monthly discharge of *E. coli* is determined by calculating the geometric mean. Effluent limitations for *E. coli* in the draft permit are the same as the limits in the 2008 permit and, therefore, are in accordance with antibacksliding requirements found in 40 CFR §122.44(1).

These E. coli limits apply to the discharge from Outfall 001 during both dry and wet weather at flows greater than 34 mgd when secondary treatment is bypassed by the flow in excess of 34 mgd. This CSO-related bypass flow receives primary treatment and disinfection.

During the review period (see Attachment B) the facility had 12 daily maximum violations and 1 monthly average violation of its *E. coli* permit limits.

The compliance monitoring frequency for Outfall 001 for *E. coli* in the draft permit is 1/day. Samples for *E. coli* compliance monitoring must be taken concurrently with samples for total residual chlorine.

The *Escherichia coli* bacteria for the combined sewer overflows (CSOs) of 1000 colony forming units per 100 ml are based on Env-Wq 1703.06 (c).

The *E. coli* bacteria limits are currently not being met for the CSO outfalls (see Attachment B). EPA has issued an order to the City to, among other things, address this non-compliance through a Long-Term Control Plan.

The compliance monitoring frequency for the CSO outfalls for *E. coli* in the draft permit is 1/year.

E. Non-Conventional and Toxic Pollutants

Water quality based limits for specific toxic pollutants were determined from numeric chemical specific criteria derived from extensive scientific studies. The EPA has summarized and published specific toxic pollutants and their associated toxicity criteria in *Quality Criteria for Water*, 1986, EPA440/5-86-001 as amended, commonly known as the federal "Gold Book".

Each pollutant generally includes an acute aquatic life criterion to protect against short term effects, such as death, and a chronic aquatic life criteria to protect against long term effects, such as poor reproduction or impaired growth. New Hampshire adopted these "Gold Book" criteria, with certain exceptions, and included them as part of the State's Surface Water Quality Regulations adopted on December 10, 1999. EPA uses these pollutant specific criteria along with available dilution in the receiving water to determine a pollutant specific draft permit limit.

1. 7Q10 Flow and Available Dilution

The available dilution of the receiving water is determined by using the facility's design flow of 34 mgd and the annual 7-day mean low flow at the 10 year recurrence interval (7Q10) in the receiving water just above the treatment plant's outfall. The available dilution is reduced by 10 percent to account for the State's assimilative capacity reserve rule pursuant to NH Surface Water Quality Regulations Env-Wq 1705.01.

Manchester's POTW is located immediately downstream of a U.S. Geological Survey's gauging station (USGS Gage No. 01092000) on the Merrimack River near Goffs Falls, below Manchester with no significant surface water inflows between the POTW and the gauging station. Therefore, the 7Q10 flow at the facility (Q_{001}) is set as identical to the 7Q10 flow at the gauging station (Q_{Gage}), as follows. This 7Q10 value of **638.7 cfs** is based on gage data from 1941 – 2006 and is the same as the 7Q10 value used in the 2008 permit.

The dilution factor is then calculated using the following equation:

$$\text{Dilution Factor} = [(Q_{001} + Q_{PDF}) / (Q_{PDF})] \times 0.9$$

where:

Q_{001} = 7Q10 flow of the Merrimack River upstream of Outfall 001 = 638.7 cfs
Q_{PDF} = Treatment plant design flow = 34 mgd = 52.6 cfs
0.9 = Factor to reserve 10% of assimilative capacity.

$$\text{Dilution Factor} = [(638.7 + 52.6) / (52.6)] \times 0.9 = \mathbf{11.82}$$

This dilution factor is the same as in the 2008 permit and is applied in some of the analyses below.

2. Total Residual Chlorine

The New Hampshire water quality standards specify the chronic and acute aquatic-life criteria for total residual chlorine (TRC) as 0.011 mg/l and 0.019 mg/l, respectively, for freshwater; and 0.0075 mg/l and 0.013 mg/l, respectively, for marine water. Based upon available dilution, applicable TRC limits would be a monthly average limit of 0.13 mg/l (0.011 mg/l * 11.82) and a daily maximum limit of 0.22 mg/l (0.019 mg/l * 11.82).

The limitations and requirements pertaining to TRC in the draft permit are the same as those in the 2008 permit and are therefore consistent with the antibacksliding requirements of 40 CFR § 122.44(l).

3. Phosphorus

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

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

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

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

The New Hampshire Surface Water Quality Regulations contain a narrative criterion which states that phosphorus contained in an effluent shall not impair a water body's designated use. Specifically, Env-Wq 1703.14(b) states that, "Class B waters shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring." Env-Wq 1703.14 further states that, "Existing discharges containing either phosphorus or nitrogen which encourage cultural eutrophication shall be treated to remove phosphorus or nitrogen to ensure attainment and maintenance of water quality standards." Cultural eutrophication is defined in Env-Wq 1702.15 as, "…the human-induced addition of wastes containing nutrients which results in excessive plant growth and/or decrease in dissolved

oxygen." Although numeric nutrient criteria have not yet been developed in New Hampshire, a total phosphorus concentration of 0.050 mg/l is considered by the NHDES as a level of potential concern (NHVRAP & NHDES Piscataquog Report, April 2008).

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

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

The Manchester WWTF has been reporting monthly average total phosphorus (TP) concentration based on its 2008 permit. During the review period (Jan 2009 through November 2013) the facility reported 58 TP measurements, ranging from 0.58 mg/l to 3.75 mg/l (95^{th} percentile is 3.74 mg/l).

In addition, the most recent 'Upper Merrimack and Pemigewasset River Study Field Program' (MPR-Study) that was conducted between 2009 and 2012 and funded by the U.S. Army Corps of Engineers (USACOE) as well as several municipalities, including Manchester, contains instream phosphorus data in the area of the Manchester WWTF discharge. The NHDES "One Stop" database provided in-stream sampling results from the MPR-Study just upstream of the Manchester WWTF outfall on July 27, 2010 and September 21, 2010. These samples were 20.26 ug/l and 28.45 ug/l, respectively. The median of these upstream samples is 24.36 ug/l (0.024 mg/l).

To determine if there is reasonable potential for the Manchester WWTF to cause or contribute to an exceedance of the Gold Book target (0.100 mg/l), a mass balance must be done solving for the projected downstream concentration. This mass balance, and the resulting downstream concentration are shown below.

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

where:

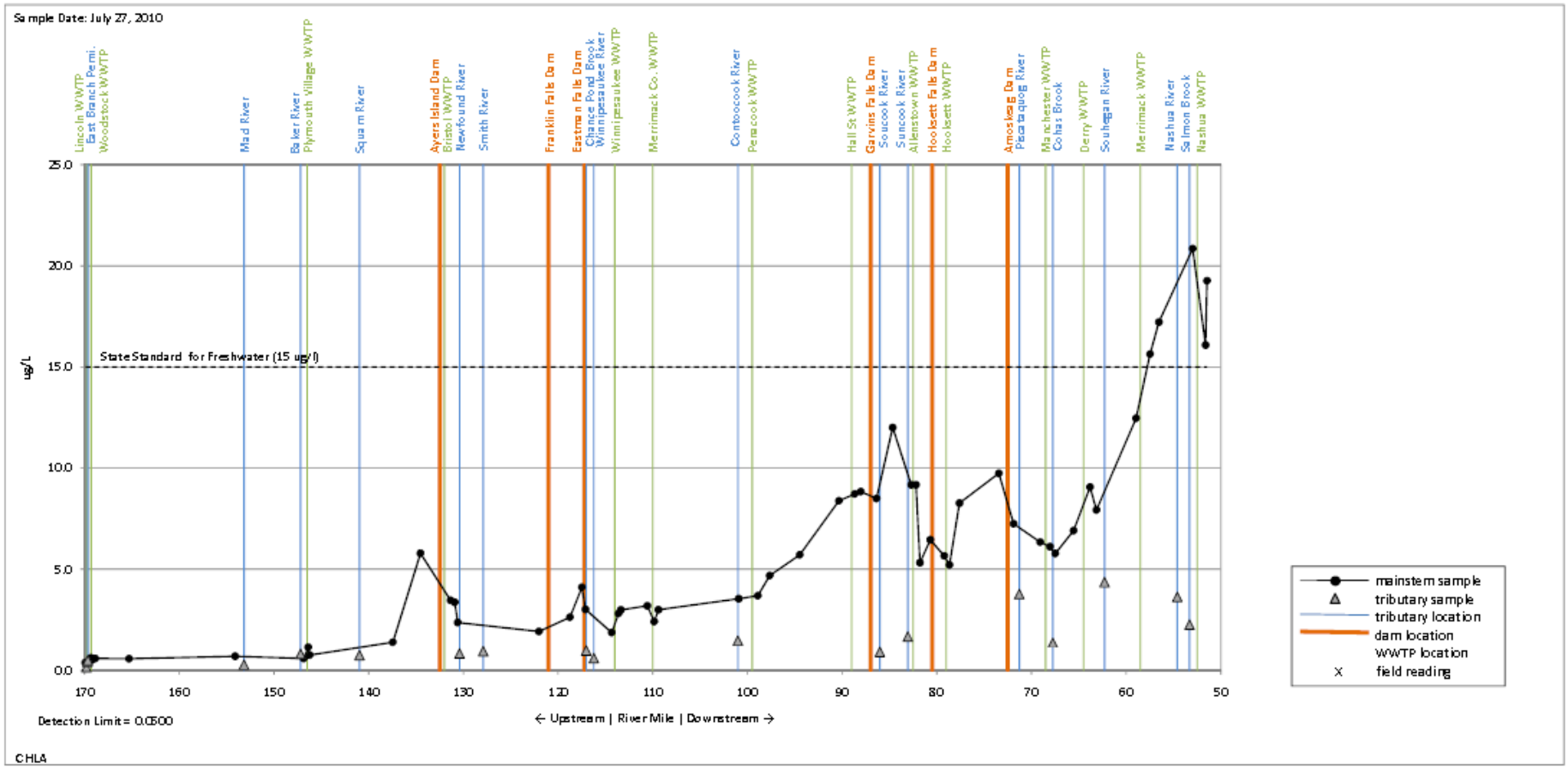
Q_d = design flow of facility (34 mgd)
C_d = 95^{th} percentile effluent phosphorus concentration (3.74 mg/l)

Q_S = upstream 7Q10 flow (638.7 cfs = 412.6 mgd)
C_S = upstream median river phosphorus concentration (0.024 mg/l)
Q_r = downstream 7Q10 flow ($Q_S + Q_d$ = 446.6 mgd)
C_r = downstream river phosphorus concentration (Gold Book target = 0.100 mg/l)

Based on the above equation, the resultant downstream river phosphorus concentration (C_r) is 0.31 mg/l. Since this exceeds 90% of the Gold Book target value of 0.100 mg/l (reserving 10% of the assimilative capacity in accordance with Env-Wq 1705.01), the facility does have the reasonable potential to cause or contribute to a violation of water quality standards.

Additionally, both dissolved oxygen (DO) and chlorophyll-a levels downstream of the Manchester WWTF discharge suggest eutrophic effects are present in the Merrimack River. DO saturation is impaired in the segment of the Merrimack River receiving the discharge (segment NHRIV700060803-14-02). Chlorophyll-a levels begin to increase appreciably downstream of the Manchester discharge and trigger impairment farther downstream near Nashua (segment NHRIV700061206-24), as shown in the table below from the *Upper Merrimack and Pemigewasset River Study Monitoring Data Report* (December 2012).

Mainstem, Tributary, and WWTP Effluent Samples
Chlorophyll-a



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

In complex river systems such as this, significant lag time might occur between loading of phosphorus and visible effects of that loading. Geological, physical and biological habitat factors that affect the extent and timing of algal response given adequate to high nutrient supply and non-toxic conditions include: current velocity, turbidity/color, open/closed canopy, stream depth, degree of scouring, degree of macroinvertebrate grazing, and depth to width ratio. *See Nutrient Criteria Technical Guidance Manual, Rivers and Streams* (July 2000) at 21. Hence, an instream exceedence of 0.1 mg/l TP just downstream of Manchester would likely cause or contribute to a chlorophyll-a impairment farther downstream, in this case near Nashua. Additionally, the DO impairment in the segment between Manchester and Nashua mentioned above is further evidence that eutrophication is occurring as the chlorophyll-a levels rise. These DO and chlorophyll-a impairments downstream of Manchester support the need for a TP permit limit in the draft permit.

Hence, the current discharge of phosphorus from the Manchester WWTF has the reasonable potential to cause or contribute to violations of water quality standards. To address this reasonable potential, a mass-based effluent limit for phosphorus will be imposed. To ensure a mass-based limit is protective under worst-case conditions, the limit is calculated using the lowest expected receiving water flow and effluent flow. Hence, the upstream 7Q10 receiving water flow (412.6 mgd) and the lowest monthly average effluent flow during the review period (12 mgd, see Attachment B) are used. The numeric mass-based limit is determined based upon the following mass balance equation:

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

rewritten as:

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

where:

M_d = mass-based phosphorus limit
Q_d = effluent flow in mgd (lowest effluent monthly average flow = 12 mgd)
C_d = effluent phosphorus concentration in mg/L
Q_S = upstream 7Q10 flow (412.6 mgd)
C_S = upstream river phosphorus concentration (0.024 mg/l)
Q_r = downstream 7Q10 flow ($Q_S + Q_d$ = 424.6 mgd)
C_r = downstream river phosphorus concentration (Gold Book target = 0.100 mg/l)
0.90 = factor to reserve 10 % assimilative capacity
8.345 = factor to convert from *mgd * mg/l* to *lb/d*

Solving for M_d gives the maximum allowable mass the facility may discharge without violating water quality standards. This allowable discharge is **236 lb/d**, which is equivalent to approximately 0.9 mg/l at design flow and approximately 2.4 mg/l at the lowest monthly average flow of 12 mgd. This mass-based limit is applied seasonally, from April 1st through October 31st, as a monthly average limit to be monitored twice per month, as indicated in the draft permit.

The analysis above was done using data from a study currently being conducted by the Army Corps of Engineers. This study is not yet completed and may result in recommended phosphorus allocations for point sources along the Merrimack River. It is the Region's position that, in making reasonable

potential determinations, no one source of information should necessarily be given definitive weight, nor should the absence of any particular information source necessarily preclude EPA from establishing an effluent limit. The approach of utilizing available technical materials generated by EPA and States, as supplemented by other information reasonably available at the time of permit reissuance, is also reasonable in light of federal regulations requiring EPA to include requirements that will achieve state water quality standards when reissuing a permit and prohibiting issuance of a permit when the imposition of conditions cannot ensure compliance with the applicable state water quality requirements of all affected States. *See* 40 C.F.R. §§ 122.4(d), 122.44(d)(1); *see also* CWA §§ 301(b)(1)(C) and 401(a)(2).

4. Metals

Certain metals in water can be toxic to aquatic life. There is a need to limit toxic metal concentrations in the effluent where aquatic life may be impacted. An evaluation of the concentration of metals in the facility's effluent and receiving water (from Whole Effluent Toxicity reports submitted between January 2009 and November 2013) was used to determine reasonable potential for effluent discharges to cause exceedances of the water quality criteria for aluminum, cadmium, copper, lead, nickel and zinc.

Metals may be present in both dissolved and particulate forms in the water column. 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. (Water Quality Standards Handbook: Second Edition, Chapter 3.6 and Appendix J, EPA 1994 [EPA 823-B-94-05a], http://www.epa.gov/waterscience/standards/ handbook/chapter03.html#section6). As a result, water quality criteria are established in terms of dissolved metals. However, regulations at 40 CFR 122.45(c) require, with limited exceptions, that metals limits in NPDES permits be expressed as total recoverable metals. This accounts for the potential for a transition from the particulate to dissolved form as the effluent mixes with the receiving water (*The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007]).

Although the water quality criteria for most metals is presented as either dissolved or total recoverable, in a letter from NHDES to EPA (dated July 1, 2014), NHDES stated that the aluminum criteria presented in the New Hampshire water quality regulations (Env-Wq-1700) should be applied in terms of acid-soluble aluminum. The letter goes on to say:

> *New Hampshire's aluminum criteria are based on EPA's 1988 ambient water quality criteria document for aluminum[1]. According to this document, acid-soluble aluminum is operationally defined as "[a]luminum that passes through a 0.45 um membrane filter after the sample has been acidified to a pH at between 1.5 and 2.0 with nitric acid" [2]. For the many reasons listed in the "Implementation" section of the EPA document, acid-soluble aluminum is considered a better measurement of the forms that are toxic to aquatic life or that can be readily converted to toxic forms under natural conditions.*

[1] Ambient Water Quality Criteria for Aluminum - 1988. United Stated Environmental Protection Agency. EPA 440/5-86-008. August 1988.

2 DES protocols require the sample to be acidified to this low pH and allowed to stand for l6 hours before analysis.

In order to express these criteria in terms of total recoverable aluminum, the fraction of acid-soluble to total recoverable aluminum in the receiving water must be determined. Based upon Manchester's 2008 permit (with a total recoverable aluminum limit of 87 ug/l) and EPA's subsequent Administrative Order (AO) in 2009, the City of Manchester was required to submit a report on the findings of one year of ambient aluminum and hardness data and a plan for either (a) filing a formal NPDES permit modification request of the limit; or (b) achieving and maintaining full compliance with the limit. The City of Manchester submitted this Aluminum Study Report (ASR) in February of 2011, requesting a formal permit modification of the aluminum limit. Based upon information presented in the ASR, EPA is reevaluating the aluminum limit in terms of acid soluble consistent with the interpretation of the criteria by NHDES. Acid-soluble aluminum (ASA) and total recoverable aluminum (TRA) data from the receiving water upstream of the discharge was provided in the ASR on pages 41-43. This data is summarized below:

Sample Date	ASA	TRA
	ug/l	ug/l
6/15/2009	103.9	257.6
6/16/2009	121.8	181.6
6/17/2009	114.8	170.1
6/18/2009	100	135
7/13/2009	64.7	83
7/14/2009	64.9	94.1
7/15/2009	71.7	80.8
7/16/2009	58.3	58.5
8/24/2009	49.6	99.5
8/25/2009	60.9	94
8/26/2009	60.1	106.8
8/27/2009	80.1	125.3
9/21/2009	44.1	52.6
9/22/2009	25.4	32.6
9/23/2009	26.4	28.8
9/24/2009	24.5	27.5
10/19/2009	59.4	66.2
10/20/2009	60.1	60.9
10/21/2009	55.1	58.7
10/22/2009	57.2	67.1
11/16/2009	204.7	250.6
11/17/2009	151.4	212.8
11/18/2009	121.1	143.8
11/19/2009	123.7	140.2
12/7/2009	175.7	222.6
12/8/2009	126.5	137.4
12/9/2009	101.7	115.1
12/10/2009	87.8	102.9
1/19/2010	43.7	51.7

1/20/2010	41.1	49.1
1/21/2010	40.1	49.2
1/22/2010	40.9	47.5
2/16/2010	46.6	58.5
2/17/2010	45.4	58.7
2/18/2010	46.5	61.8
2/19/2010	47.1	64.8
3/22/2010	137.5	207.4
3/23/2010	139	206.3
3/24/2010	174.7	314.7
3/25/2010	309	635.7
4/26/2010	82.8	89.4
4/27/2010	90	94.7
4/28/2010	83.6	84.7
4/29/2010	80.7	84.4
5/17/2010	70.5	86.6
5/18/2010	64.1	76.3
5/19/2010	57.4	779.9
5/20/2010	54.3	61.7
Median	64.8	88.0

Based upon the median ASA and TRA data, the fraction of acid-soluble to total recoverable aluminum in the receiving water is 0.74 (64.8 / 88.0). Hence, the acid-soluble aluminum criteria of 750 ug/l (acute) and 87 ug/l (chronic) can be converted to total recoverable criteria by dividing them by 0.74, giving total recoverable criteria of 1,014 ug/l (acute) and 118 ug/l (chronic). These criteria are applied in the analysis below.

For the remaining metals (cadmium, copper, lead, nickel and zinc), the effluent from Outfall 001 was characterized assuming a lognormal distribution in order to determine the estimated 95th percentile of the daily maximum (see Attachment C for details of this statistical approach). For metals with hardness-based water quality criteria, the criteria were determined using the equations in NH standards Env-Wq 1703.24, using the appropriate factors for the individual metals found in the NH Standards (see table below). The downstream hardness was calculated to be 15 mg/l as $CaCO_3$, using a mass balance equation with the design flow (34 mgd), receiving water 7Q10 (412.6 mgd), upstream median hardness (11 mg/l as $CaCO_3$) and effluent median hardness (64 mg/l as $CaCO_3$). Since this downstream hardness is below 25 mg/l, the total recoverable metals criteria was determined using the default value of 25 mg/l based on New Hampshire water quality standards found at Env-Wq 1703.22(f). The following table presents the acute and chronic total recoverable criteria for each metal.

Metal	Parameters				Total Recoverable Criteria	
	m_a	b_a	m_c	b_c	Acute Criteria (CMC)* (ug/L)	Chronic Criteria (CCC)** (ug/L)
Aluminum	--	--	--	--	1,014	118
Cadmium	1.1280	-3.6867	0.7852	-2.7150	0.9	0.8
Copper	0.9422	-1.7000	0.8545	-1.702	3.8	2.9
Lead	1.273	-1.46	1.273	-4.705	14.0	0.54
Nickel	0.846	2.255	0.846	0.0584	145.2	16.1
Zinc	0.8473	0.884	0.8473	0.884	37.0	37.0

* Acute Criteria (CMC) = $\exp\{m_a*\ln(\text{hardness})+b_a\}$
** Chronic Criteria (CCC) = $\exp\{m_c*\ln(\text{hardness})+b_c\}$

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.

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

rewritten as:

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

where:

Q_d = design flow of facility (34 mgd)
C_d = effluent metals concentration (95th percentile)
Q_S = upstream 7Q10 flow (412.6 mgd)
C_S = median upstream metals concentration
Q_r = downstream 7Q10 flow ($Q_s + Q_d$ = 446.6 mgd)
C_r = resulting downstream metals concentration

Reasonable potential is then determined by comparing the resulting downstream metals concentration (for both acute and chronic conditions) with the criteria for each metal multiplied by the factor 0.9 to reserve 10% assimilative capacity (Env-Wq 1705.01). 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 metals concentration (C_d) using the criterion times 0.9 as the downstream metals concentration (C_r). See the table below for the results of this analysis with respect to aluminum, cadmium, copper, lead, nickel and zinc.

Metal	Qd	Cd[1] (95th Percentile)	Qs	Cs[2] (Median)	Qr = Qs + Qd	Cr = (QdCd+QsCs)/Qr	Criteria * 0.9		Reasonable Potential	Limit = (Qr*Criteria*0.9 -Qs*Cs)/Qd	
	mgd	ug/l	mgd	ug/l	cfs	ug/l	Acute (ug/l)	Chronic (ug/l)	Cr > Criteria	Acute (ug/l)	Chronic (ug/l)
Aluminum	34	115.6	412.6	100	446.6	101.2	912	106	No	N/A	N/A
Cadmium		0		6		5.5	0.9	0.7	No [4]	N/A	N/A
Copper		26		5		6.6	3.4	2.6	Acute & Chronic	3.8[3]	2.9[3]
Lead		1.0		0.7		0.7	12.6	0.49	Chronic	N/A	0.54[3]
Nickel		2.5		0		0.2	130.7	14.5	No	N/A	N/A
Zinc		64.1		7		11.3	33.3	33.3	No	N/A	N/A

[1] Values represent the 95th percentile concentration from the toxicity measurements from the 2009-2013 WET testing noted above (see Attachment C).

[2] Median upstream data taken from the 2009-2013 WET testing results on the Merrimack River just upstream of the Manchester WWTF (see Attachment B). Note that the aluminum background data is the median value of all data from the ASR (presented above) as well as the WET tests.

[3] Since the median background concentration and the 95th percentile effluent from the facility both exceed the criterion, the limit is set at the criterion. The median background concentration above the criterion indicates that the receiving water does not have any remaining assimilative capacity; hence, any facility discharging into this receiving water at a concentration above that criterion would automatically be contributing to an exceedance of water quality standards.

4 Although the downstream cadmium concentration (C_r) exceeds the acute and chronic criteria, the discharge does not have reasonable potential to cause or contribute to a violation because the 95th percentile of the effluent does not exceed the acute or chronic criteria. Hence, the exceedence of water quality standards is solely due to upstream sources and a permit limit for cadmium is not required.

As indicated in the table above, based on the 95th percentile of the effluent concentrations and median upstream concentrations there is not reasonable potential (for either acute or chronic conditions) that the discharge of aluminum, cadmium, nickel or zinc will cause or contribute to an exceedance of the applicable water quality criteria. However, there is reasonable potential for copper (acute and chronic) and lead (chronic) to cause or contribute to an exceedance. Hence, the draft permit contains maximum daily (acute) and average monthly (chronic) limits at the concentrations shown in the table above. The limits for copper and lead are being established in the draft permit. An aluminum limit of 87 ug/l was established in the 2008 permit and is now being removed in the draft permit. This is acceptable based on the anti-backsliding exception of "new information" found at CWA Section 402(o)(2). The "new information" being considered here includes the City of Manchester's 2011 Aluminum Study Report as well as NHDES's 2014 letter regarding their water quality standards being in terms of acid soluble aluminum, both discussed above. Additionally, monitoring and reporting for all metals will continue to be required as part of the WET tests.

F. Whole Effluent Toxicity

EPA's Technical Support Document for Water Quality-Based Toxics Control, EPA/505/2-90-001, March 1991, recommends using an "integrated strategy" containing both a pollutant (chemical) specific approach and a whole effluent (biological) toxicity approach to control toxic pollutants from entering the nation's waterways from permitted discharges. EPA-Region 1 adopted this "integrated strategy" on July 1, 1991, for use in permit development and issuance. Both approaches are designed to protect aquatic life and human health.

Pollutant- specific approaches to control toxics, such as those in the Gold Book and State regulations, address individual chemicals, whereas, a whole effluent toxicity (WET) approach to toxics control evaluates interactions between pollutants, thus rendering an "overall" or "aggregate" toxicity assessment of the effluent. Furthermore, WET measures the "additivity" and/or "antagonistic" effects of individual chemical pollutants while pollutant specific derived permit limits do not, thus the need for both approaches. In addition, the presence of an unknown toxic pollutant can be discovered and addressed through the process of WET testing.
New Hampshire law states that, "all surface waters shall be free from toxic substances or chemical constituents in concentrations or combination that injure or are inimical to plants, animals, humans, or aquatic life;...." (N.H. RSA 485-A:8, VI and the N.H. Code of Administrative Rules, PART Env-Wq 1703.21(a)(1)).

EPA-Region 1's current policy requires toxicity testing in all municipal permits with the type of toxicity test (acute and/or chronic) and effluent limitation based on a range of available dilution. EPA-Region 1's policy requires that secondary treatment facilities with a dilution factor between 10 and 20 meet an acute (LC50) toxicity limit of 100 percent effluent, and a chronic-no observed effect concentration (C-NOEC) toxicity limit equal to the receiving water concentration. Therefore, the draft permit includes both LC50 and C-NOEC limits.

The LC50 is defined as the percentage of effluent lethal to 50% of the test organisms during a specific length of time. In other words, 50 percent of the test organism must survive in a sample of 100 percent effluent. This limit is the same as in the 2008 permit.

The chronic-no observed effect concentration (C-NOEC) is defined as the highest concentration to which test organisms are exposed in a life cycle or partial life cycle test, which causes no adverse effect on growth, survival, or reproduction during a specific time of observation. Based on the dilution factor for the Manchester WWTF, the C-NOEC limit has been calculated according to the equation below.

$$\frac{1}{DilutionFactor} * 100\% = \frac{1}{11.82} * 100\% = 8.5\%$$

The test results (growth, survival or reproduction) at a specific time of observation as determined from hypothesis testing should exhibit a linear dose-response relationship. However, where the test results do not exhibit a linear dose-response relationship, the draft permit requires the permittee to report the lowest concentration where there is no observable effect.

In the 2008 permit, four (4) chronic and modified acute toxicity tests using two (2) species per test were required each year. The permittee has been able to show compliance with the LC50 and C-NOEC criteria for both *Ceriodaphnia dubia* (daphnid) and *Pimephales promelas* (fathead minnow). Only two toxicity violations (C-NOEC in 2nd quarter of 2009 and 2010) were reported between January 2009 and November 2013 (see Attachment B).

A modified acute toxicity test based on the 48-hour endpoint of the chronic test is no longer an acceptable acute toxicity test. Hence, the draft permit requires the permittee to conduct independent acute and chronic toxicity tests. The **two species** for these tests are the Daphnid (*Ceriodaphnia dubia*) and the Fathead Minnow (*Pimephales promelas*). Toxicity test samples shall be collected and tests completed **once per calendar quarter** and the results shall be submitted by the 15th of the month following each quarter (i.e., April, July, October, and January).

A special condition is included in the draft permit stating that if a permittee has consistently demonstrated on a maximum daily basis that its discharge, based on data for the most recent one-year period, or four sampling events, whichever yields the greater time period, causes no acute and chronic toxicity, the permitted limits will be considered eligible for a reduced frequency of toxicity testing. This reduction in testing frequency is evaluated on a case-by-case basis. EPA's current policy is that after completion of a minimum of four consecutive WET tests all of which must be valid tests and must demonstrate compliance with the permit limits for whole effluent toxicity, the permittee may submit a written request to EPA seeking a review of the toxicity test results. EPA's policy is to reduce the frequency of toxicity testing to no less than one (one-species) test per year. This special condition does not negate the permittee's right to request a permit modification at any time prior to the permit expiration.

The draft permit requires the permittee to continue reporting selected parameters from the chemical analysis of the WET tests' 100 percent effluent sample. Specifically, hardness, total recoverable aluminum, cadmium, copper, lead, nickel and zinc are to be reported on the appropriate DMR for entry into EPA's data base. EPA-Region 1 does not consider these

reporting requirements an unnecessary burden as reporting these constituents is already required with the submission of each toxicity testing report.

G. Pretreatment

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

Periodically, the Federal Pretreatment Regulations in 40 C.F.R. Part 403 are amended. Those amendments establish new requirements for implementation of the pretreatment program. Upon reissuance of this NPDES permit, the permittee is obligated to modify its pretreatment program to be consistent with the current Federal regulations. Those activities that the permittee must address include, but are not limited to, the following: (1) develop and enforce EPA approved specific effluent limits (technically-based local limits); (2) revise the local sewer use ordinance or regulation, as appropriate, to be consistent with Federal regulations; (3) develop an enforcement response plan; (4) implement a slug control evaluation program; (5) track significant noncompliance for industrial users; and (6) establish a definition of and track significant industrial users. These requirements are necessary to ensure continued compliance with the NPDES permit.

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

H. Operation and Maintenance

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

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

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

I. Sludge

Section 405(d) of the CWA requires that EPA develop technical standards regulating the use and disposal of sewage sludge. These regulations were signed on November 25, 1992, published in the Federal Register on February 19, 1993, and became effective on March 22, 1993. Domestic sludge, which is land applied, disposed of in a surface disposal unit or fired in a sewage sludge incinerator, is subject to Part 503 technical standards. Part 503 regulations have a self implementing provision, however, in that the CWA requires implementation through permits. Domestic sludge, which is disposed of in a municipal solid waste landfill, is in compliance with Part 503 regulations, provided that the sludge meets the quality criteria of the landfill and the landfill meets the requirements of 40 C.F.R. Part 258.

The draft permit has been conditioned to ensure that sewage sludge use and disposal practices meet the CWA Section 405(d) Technical Standards. In addition, EPA-Region 1 has prepared a 72-page document entitled "EPA Region I NPDES Permit Sludge Compliance Guidance" for use by the permittee in determining their appropriate sludge conditions for their chosen method of sewage sludge use or disposal practices. This guidance document is available upon request from EPA Region 1 and may be found at: http://www.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf. The permittee is required to submit an annual report to EPA and NHDES, by February 19th each year, containing the information specified in the Sludge Compliance Guidance document for their chosen method of sewage sludge use or disposal practices.

The City of Manchester owns and operates one fluidized bed incinerator. The incinerator has the following air pollution control devices: a venturi scrubber which removes particulate matter and volatile metals; a spray down scrubber which removes acid gases and additional metals; an electrodynamic venturi which removes fine particulates and metals. The City generates approximately 4500 dry metric tons of sewage sludge annually. In addition to sewage sludge, the City also incinerates scum. The resulting ash is disposed off site by private contract issued on an annual basis. At the present time ash removal and disposal is done by Resource Management Inc. Disposal of ash is not regulated by Part 503.

Subpart E of the Part 503 regulations outlines the standards for the incineration of sewage sludge. The permit contains general requirements, management practices, pollutant limitations, an operational standard, monitoring frequency, record keeping and reporting requirements implementing the provisions of the regulations. The basis of each provision is detailed below.

Pollutant Limitations:

The sludge standards regulate the following seven metals: mercury, beryllium, arsenic, cadmium, chromium, nickel and lead. The pollutant limits in the permit are based on the requirements in §503.43.

Mercury and beryllium are regulated by the National Emission Standard for Hazardous Air Pollutants (NESHAPs) found in 40 CFR Part 61. The permit requires that the firing of sewage sludge in the facility's incinerators does not cause the violation of the NESHAPs for mercury and beryllium. The NESHAP for beryllium applies to each incinerator. The NESHAP for mercury applies to the facility.

The allowable sludge concentrations for arsenic, cadmium, chromium, and nickel are calculated from Equation (5) in §503.43(d):

$$C = \frac{RSC \times 86{,}400}{DF \times (1 - CE) \times SF} \qquad \text{Eq. (5)}$$

Where:

C = Daily concentration of pollutant in sewage sludge in mg/kg of total solids (dry weight basis)
CE = control efficiency for the incinerator - based on performance tests
DF = dispersion factor in micrograms per cubic meter per gram per second
RSC = risk specific concentration in micrograms per cubic meter
SF = sewage sludge feed rate in metric tons per day (dry weight basis)

The parameters, with the exception of RSC, are site specific to the Manchester's incinerator. The RSC is derived for each pollutant based on a risk assessment.

The RSC is the allowable increase in the average daily ground level ambient air concentration for a pollutant above background levels that result from the firing of sewage sludge in an incinerator. It is equivalent to the amount of a pollutant that a person living near the incinerator can inhale with a probability of 1 in 10,000 that the person will contract cancer as a result of inhaling the pollutant. The RSC was calculated from the equation below, which is found in the *Technical Support Document for Sewage Sludge Incineration* (EPA 822/R-93-003, November 1992):

$$RSC = \frac{RL \times BW}{Q^* \times I_a} \times 10^3$$

Where:

RL = Risk Level, 10^{-4}
BW = body weight, 70 kg (154 lbs), this is the average weight of an adult male
Q^* = allowable dose of a pollutant from EPA's Integrated Risk Information System database

I_a = inhalation rate, 20 m/day, normal inhalation rate for an adult male.

The RSC calculated from this equation is intended to protect the "Highly Exposed Individual" (HEI). The HEI is a person who remains for an extended period of time, 70 years, at the point of maximum ground level pollutant concentration. The RSC values for the regulated metals are found in Tables 1 and 2 of § 503.43 and are presented below.

Pollutant	RSC (ug/m^3)
Arsenic	0.023
Cadmium	0.057
Chromium	0.65*
Nickel	2.0

*Chromium RSC based on fluidized bed with wet scrubber

The sludge feed rate, dispersion factor and control efficiency (based on performance stack test) are:

Sludge Feed Rate: 29.71 metric tons/day
Dispersion factor: 1.66 ug/m^3/g/sec

Pollutant	Control Efficiency (%)
Arsenic	99.53
Cadmium	99.77
Chromium	99.92
Lead	99.90
Nickel	98.36

Based on the above parameters, the concentration limits for each pollutant are calculated below using Equation (5) in §503.43(d):

Pollutant	Limit (mg/kg)
Arsenic	8,573
Cadmium	43,416
Chromium	1,423,398
Nickel	213,643

The pollutant limit for lead is calculated using equation (4) of §503.43:

$$C = \frac{0.1 \times NAAQS \times 86{,}400}{DF \times (1 - CE) \times SF} \qquad \text{Eq. (4)}$$

Instead of using an RSC, a percentage of the National Ambient Air Quality Standard (NAAQS) for lead was used. The NAAQS for lead (1.5 ug/m^3) is found in 40 CFR § 50.12. Although lead is classified as a probable human carcinogen, the Clean Air Science Advisory Committee of the Science Advisory Board recommended that the NAAQS for lead be based on the noncarcinogenic effects. Developmental neurotoxicity is considered to be the most sensitive end

point for lead exposure. The calculated concentration from equation (4) shown below also protects the HEI described above.

Pollutant	Limit (mg/kg)
Lead	262,781

The limits for arsenic, cadmium, chromium, nickel and lead are the same as in the 2008 permit, in accordance with antibacksliding requirements found at 40 CFR § 122.44(l). Based upon monitoring data submitted by the facility during the review period (January 2009 through November 2013), the facility has been able to consistently comply with these limits (see Attachment B).

Operational Standard:

The Part 503 regulations have an operational standard for total hydrocarbons (THC). Hydrocarbons are simple organic compounds containing carbon and hydrogen. The standard is designed to regulate organic emissions from sewage sludge incinerators. THC represent a subset of organic compounds and is used in the regulation since it is impractical to attempt to monitor sludges or stack emissions for all organic compounds which may be present.

The THC value must be corrected to seven percent oxygen and zero percent moisture. The correction to seven percent oxygen is used because seven percent is the standard amount of oxygen used to reference measurements of pollutant limits expressed as concentration; it is also equivalent to 50 percent excess air (excess air is air added to a system above the amount of air needed for complete combustion to occur); and without the correction, inaccurate readings may occur because the presence of the additional oxygen may dilute the THC reading. Similarly, the correction for moisture is needed since the presence of moisture can also dilute the actual THC reading. THC is conventionally expressed in terms of a dry volumetric basis, hence the need to set the standard based on zero moisture.

On February 25, 1994, §503.40 was amended. The amendment allows facilities to monitor carbon monoxide (CO) instead of THC. A facility can monitor for CO if the facility can meet a monthly average concentration CO limit of 100 parts per million on a volumetric basis. This limit, like the THC limit, is corrected to seven percent oxygen and zero percent moisture. The City of Manchester monitors CO**.**

Management Practices:

The permit contains management practices based on §503.45. They pertain to the operation of the incinerator. The management practices include maintaining the instruments which monitor CO, oxygen and temperature; proper operation of all air pollution control devices; and notification to EPA when the continuous monitoring equipment is not operational for a period of 72 hours or more.

The permit requires notification to EPA and the state if any monitoring equipment is broken or shut down for longer than 72 hours. It also prohibits adversely affecting a threatened or

endangered species or their critical habitat. There are no known threatened or endangered species within the vicinity of the incinerator. Therefore, EPA has determined that the activity will not affect a threatened or endangered species.

The monitoring frequency is based on §503.46. The permittee is required to monitor heavy metals 6 times per year. The monitoring for mercury and beryllium is at the frequency required by 40 CFR Part 61. The record keeping requirements are based on §503.47.

J. Essential Fish Habitat and Endangered Species

1. Essential Fish Habitat

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

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

Essential fish habitat 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.

Anadromous Atlantic salmon (*Salmo salar*) is the only managed species with designated EFH within this section of the Merrimack River and its tributaries, the Piscatagoug River, Tannery Brook and Ray Brook. The receiving waters are classified by the State as warm water fisheries. While river conditions in this area may not be suitable as spawning or juvenile rearing habitat for Atlantic salmon, the area does serve as the only corridor for Atlantic salmon migrating to and from juvenile rearing habitats located in upstream tributaries. Adult Atlantic salmon returning to the river from the ocean do not make it up this far because they are collected at a dam in Lawrence, Massachusetts primarily for use as broodstock. EPA has concluded that the limits and conditions contained in this draft permit minimize adverse effects to Atlantic salmon EFH for the following reasons:

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

- The WWTF has a dilution factor of 11.82.
- The permit prohibits the discharge to cause a violation of state water quality standards.
- The permit prohibits the discharge of pollutants or combinations of pollutants in toxic amounts.
- Acute and chronic whole effluent toxicity tests will be conducted four times per year on Daphnid (*Ceriodaphnia dubia*) and Fathead minnow *(Pimephales promelas);* current results of the toxicity tests are in compliance with the permit limits.
- The permit contains water quality-based limits for total residual chlorine, phosphorus, copper, and lead.

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

2. Endangered Species

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

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

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

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

V. Combined Sewer Overflows

A. Manchester's Combined Sewer System

The City of Manchester owns and operates a wastewater collection system comprised of 55 percent sanitary sewers, which carry domestic, industrial, and commercial wastewater; and 45 percent combined sewers, which carry domestic, industrial, and commercial wastewater plus stormwater runoff. Manchester's wastewater collection system consists of ten pumping stations and approximately 385 miles of sewers. The WWTF serves the majority of Manchester along with portions of Bedford, Goffstown and Londonderry. Goffstown sewer system is combined and Bedford and Londonderry's are separate. There are 15 CSO outfalls remaining in the Manchester wastewater collection system and interceptor network. Of the 15 remaining CSO outfalls, 2 discharge to the Piscataquog River (adjacent to Bass Island and immediately upstream of the river's confluence with the Merrimack River), 2 discharge to the Merrimack River from the west side of the city, and 11 discharge to the Merrimack River from the east side of the city (including Tannery Brook and Ray Brook). During certain wet weather events, discharges of untreated sanitary wastewater and stormwater occur from the City's 15 combined sewer overflow outfalls ("CSOs") into the Piscataquog and Merrimack Rivers, as listed below and shown in Attachment A.

CSO Outfall #	CSO Regulator Name	Receiving Water	Pipe Diameter		
			Influent	Dry Weather Connector to Interceptor	Overflow to Receiving Water
011	Schiller Street	Merrimack River	18"	12"	12"
018	Turner/Ferry Streets	Merrimack River	36"/24"	36"	24"
031	Stark Brook (Elgin Avenue)	Merrimack River	48"	15"	54"
	Stark Brook (Sixth Avenue)	Merrimack River	18"	12"	18"
	Stark Brook (Eve Avenue)	Merrimack River	15"	12"	15"
039	Third Street	Piscataquog River	12"	12"	10"
043	Tannery Brook	Tannery Brook/Merrimack River	24"	24"	24'
044	Cemetery Brook (Primary)	Merrimack River	48"	30"	36"
	Cemetery Brook (Secondary)	Merrimack River	9' horseshoe	36"	9' horseshoe
045	Granite Street	Merrimack River	48"	18"	48"
046	Bridge Street	Merrimack River	60"	24"	60"
047	Pennacook Street	Merrimack River	72"	24"	72"
050	MH #1	Merrimack River	72"	72"	24"
051	West Side Pump Station	Piscataquog River	48"	60"	30"
052	MH #2	Merrimack River	72"	72"	24"
053	Walnut/North Street	Merrimack River	42"x63"	42"x63"	84"/96"
	Canal/W. Pennacook		84"	72"	72"/96"
054	Ray Brook	Ray Brook/Merrimack River	36"x24"	36"x24"	(2) 18"x28"
No #	Dunbar Street	Merrimack River	72"	72"	21"

The 2008 permit authorizes 13 CSOs subject to technology-based requirements (the nine

minimum controls described in Part VIII.B. of this fact sheet) and to requirements that the discharges may not cause violations of water quality standards. The remaining 2 CSOs (Ray Brook and Dunbar Street) are not authorized in the 2008 permit because they were discovered during system investigations after the development of that permit. The CSO at Ray Brook will henceforth be referred to as Outfall # 054 and the CSO on Dunbar Street will henceforth be referred to as Outfall # 055. (Refer to Attachment A)

B. Regulatory Framework

As noted above, Section 301(b)(1)(C) of the CWA of 1977 mandated compliance with water quality standards by July 1, 1977. Technology-based permit limits must be established for CSOs for best conventional pollutant control technology ("BCT") and best available technology economically achievable ("BAT") based on best professional judgment ("BPJ") in accordance with Section 301(b) and Section 402(a) of the Water Quality Act Amendments of 1987 ("WQA"). Additionally, permit conditions must also achieve compliance with applicable state water quality standards.

The framework for compliance with Clean Water Act ("CWA") requirements for CSOs is set forth in EPA's National CSO Control Policy ("CSO Policy"), which was published in the Federal Register on April 19, 1994 (59 Fed. Reg. 18688) and later added to the CWA in Section 402(q)(1). The CSO Policy sets forth the following objectives:

(1) To ensure that if the CSO discharges occur, they are only as a result of wet weather,

(2) To bring all wet weather CSO discharge points into compliance with the technology-based requirements of the CWA and applicable federal and state water quality standards, and

(3) To minimize water quality, aquatic biota, and human health impacts from wet weather flows.

Among the elements established to achieve these objectives, the CSO Policy set forth the minimum BCT/BAT controls (i.e., technology-based limits) that represent the BPJ of the Agency on a consistent, national basis. These are the Nine Minimum Controls ("NMCs") defined in the CSO Policy and set forth in Part I.B. of the draft permit: (1) proper operation and regular maintenance programs for the sewer system and the combined sewer overflows; (2) maximum use of the collection system for storage; (3) review and modification of the pretreatment programs to assure CSO impacts are minimized; (4) maximization of flow to the POTW for treatment; (5) prohibition of dry weather overflows; (6) control of solid and floatable materials in CSOs; (7) pollution prevention programs which focus on contaminant reduction activities; (8) public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts; and (9) monitoring to effectively characterize CSO impacts and the efficacy of CSO controls. The City has made significant progress on implementing the NMC pursuant to the requirements of the permittee's NMC document originally submitted to EPA on May 8, 1995 and the CSO Policy, as described below.

The CSO Policy recommends that each combined sewer system develop and implement a long-term CSO control plan ("LTCP") that will ultimately result in compliance with the requirements of the CWA. The City of Manchester's CSO abatement planning began in 1989 and a draft Long Term Control Plan ("LTCP") was completed and submitted in 1995. Subsequently, EPA and the City entered into an Administrative Compliance Order by Consent (Docket No. 99-06) in 1999 which required the implementation of the 10-year Phase I CSO abatement projects with an estimated cost of $58 million and the preparation and submittal of a Phase II LTCP. The overall goal of the order is to ultimately bring all wet weather discharges from CSOs into compliance with the requirements of the CWA and applicable state water quality standards. The order required the following:

- Separation of 14 CSO subareas (mostly on the west side of the city)
- Modifications at the WWTP to accept additional wet weather flow
- Hydraulic modifications to two CSO regulator weirs in the collection system
- Study of Cemetery Brook Basin to determine alternative treatment for CSO flows
- Implementation of a flow monitoring program to evaluate the effectiveness of the Phase I program
- Submittal of a Phase II LTCP based on all of the above by March 2010

The Table below shows that the Phase I projects have been completed and that Manchester has begun to implement Phase II recommendation.

Item #	Description	Status	Comments
1 and 2	WPCF Bypass Pipe	Complete	Project Completed 8/11/2000
3	Flow Monitoring Plan	Complete	
4	Piscataquog River CSO Abatement Projects		
	Theophile Street (033) - Full Separation	Complete	CSO eliminated 12/21/2000
	Electric Street (032) - Full Separation	Complete	CSO eliminated 11/11/2002
	Varney Street (036) - Full Separation	Complete	CSO eliminated 12/13/2002
	Sullivan Street (034) - Full Separation	Complete	CSO eliminated 11/11/2002
	South Main Street (S) (038) - Full Separation	Complete	CSO eliminated 9/28/2004
	South Main Street (N) (037) - Full Separation	Complete	CSO eliminated 7/27/2005
	Third Street (039) - Full Separation	Complete	CSO regulator will be evaluated during development of revised LTCP
5	Merrimack River CSO Abatement Projects		
	West Hancock Street (013) - Full Separation	Complete	CSO eliminated 9/7/2004
	Victoria Street (030) - Full Separation	Complete	CSO eliminated 10/28/2004
	West Bridge Street (022) - Full Separation	Complete	CSO eliminated 10/21/2005
	Bremer Street (024) - Full Separation	Complete	CSO eliminated 8/15/2007
	Poor Street (009) - Partial Separation	Complete	CSO eliminated 2/19/2008
	Crescent Road (042) - Full Separation	Complete	CSO eliminated 5/14/2008
	Schiller Street (011) - Full Separation	Complete	CSO regulator will be evaluated during development of revised LTCP
6	CSO Weir Modifications		
	Lorraine Street (025) - Raise Weir	Complete	CSO eliminated 7/17/2007
	Turner Street (018) - Raise Weir	Complete	CSO modifications were completed on July 30, 2009
7	Complete Phase 1 within 10 years	Complete	
8	Revisions Clause	N/A	
9	Schedule	Complete	
10 and 11	Further Evaluation/Study of Cemetery Brook	Complete	Final Report submitted 3/2005
12 and 13	Pilot Testing - Swirl Concentrators	N/A	Alternative not preferred
14	LTCP for Phase II	Ongoing	Due in March of 2010
15	SEPP	Complete	Summary Report submitted 12/2006
16	Progress Reports	Ongoing	Continue submitting semi-annual reports
17	Wet Weather Monitoring/Reporting at WPCF	Ongoing	Continue submitting semi-annual reports

Note that the LTCP for Phase II was submitted on March 12, 2010.

C. Permit Requirements

In accordance with the National CSO Policy, the draft permit contains the following conditions for the CSO discharges:

(i) Dry weather discharges from CSO outfalls are prohibited. Dry weather discharges must be immediately reported to EPA and NHDES.

(ii) During wet weather, the discharges must not cause any exceedance of water quality standards.

(iii) The permittee shall meet the technology-based Nine Minimum Controls described above and shall comply with the implementation levels as set forth in Part I.B. of

the draft permit.

(iv) Discharges from CSO outfalls to non-tidal waters shall not exceed 1,000 colonies per 100 ml of *Escherichia coli* bacteria in accordance with the New Hampshire Surface Water Quality Regulations (See Env-Wq 1703.06(c)).

(v) The permittee shall review its entire NMC program and revise it as necessary. An annual report shall be provided by January 15th of each year which describes any subsequent revisions made to the NMC program and shall also include monitoring results from CSO discharges, and the status of CSO abatement projects.

D. Additional CSO Control Measures

The draft permit requires an annual certification no later than January 15th of each year that states that all discharges from combined sewer outfalls were recorded, and other appropriate records and reports maintained for the previous calendar year.

VI. Antidegradation

This draft permit is being reissued with limitations that are at least as stringent as those in the 2008 permit and there is no change in outfall locations. However, two additional existing CSO outfalls which were discovered since the issuance of the 2008 permit (Ray Brook and Dunbar Street) have been added to the draft permit.

VII. Monitoring and Reporting

The effluent monitoring requirements have been established to yield data representative of the discharge under authority of Section 308 (a) of the CWA in accordance with 40 CFR §§122.41 (j), 122.44 (l), and 122.48.

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

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

NetDMR is a national web-based tool for regulated Clean Water Act permittees to submit discharge monitoring reports (DMRs) electronically via a secure Internet application to U.S. EPA through the Environmental Information Exchange Network. NetDMR allows participants to discontinue mailing in hard copy forms under 40 CFR § 122.41 and § 403.12. NetDMR is

accessed from the following url: http://www.epa.gov/netdmr. Further information about NetDMR, including contacts for EPA Region 1, is provided on this website.

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

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

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

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

VIII. State Certification Requirements

EPA may not issue a permit unless the State agency with jurisdiction over the receiving water(s) either certifies that the effluent limitations and/or conditions contained in the permit are stringent enough to assure and, among other things, that the discharge will not cause the receiving water to violate NH water quality standards or waives its right to certify as set forth in 40 C.F.R. §124.53.

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

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

124.53 and 124.55.

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

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

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

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period to:

Mr. Michael Cobb, Environmental Engineer
U.S. Environmental Protection Agency
Office of Ecosystem Protection
5 Post Office Square
Suite 100, Mail Code: OEP06-1
Boston, Massachusetts 02109-3912

Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA-Region 1 and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit, the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA-Region 1's Boston office.

Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice.

X. EPA – Region 1 Contact

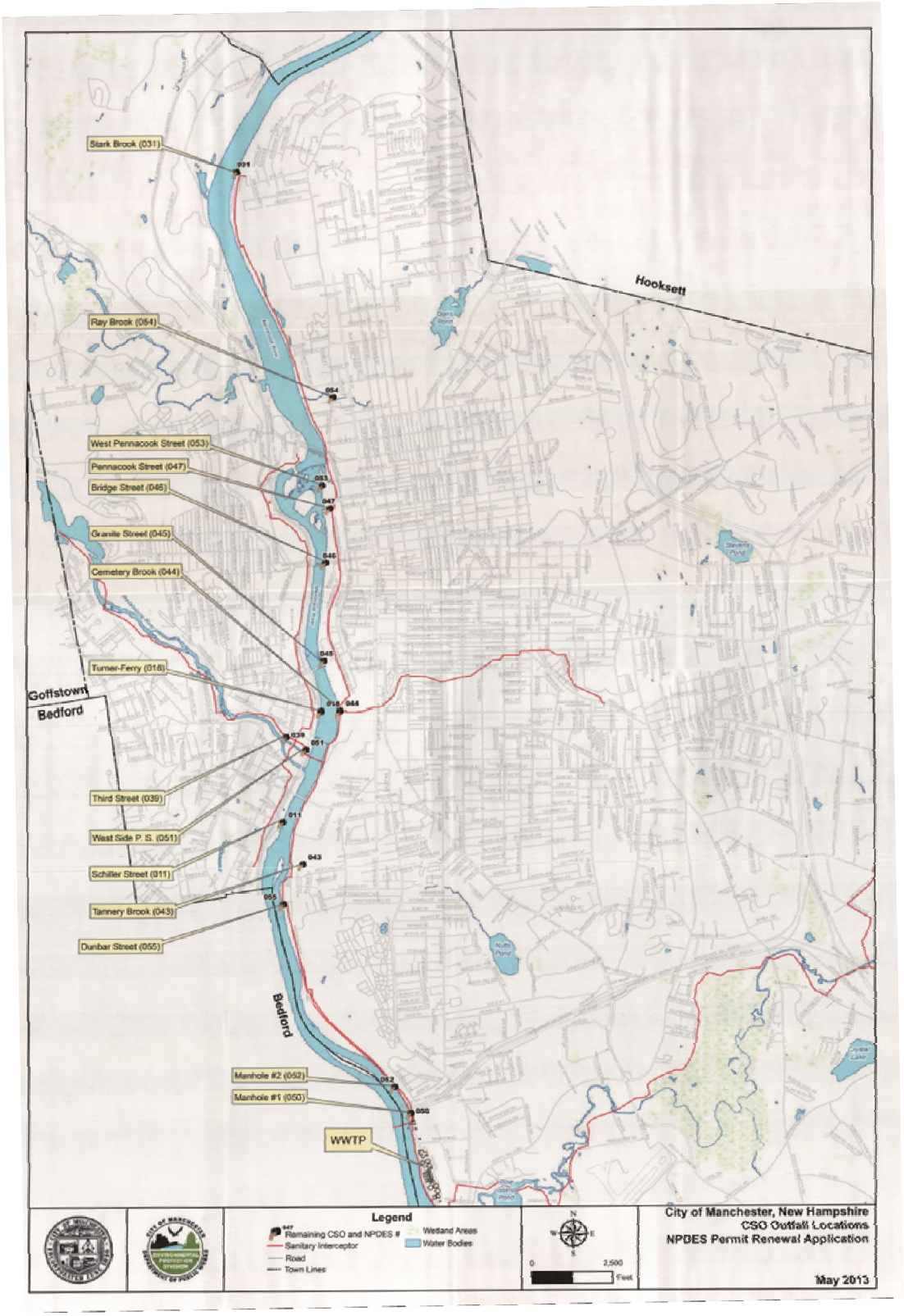
Additional information concerning the draft permit may be obtained between the hours of 9:00 A.M. and 5:00 P.M. (8:00 A.M. and 4:00 P.M. for the state), Monday through Friday, excluding holidays from:

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

9/11/2014

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

ATTACHMENT A – MANCHESTER WWTF & CSO LOCATIONS



Map provided in May 2013 NPDES Permit Application

ATTACHMENT B – DMR SUMMARY

001	BOD	BOD	BOD	BOD	BOD	BOD	Flow	Flow	pH	pH
Monitoring Period End Date	25 mg/L	7090 lb/d	40 mg/L	11350 lb/d	45 mg/L	12770 lb/d	MGD	MGD	6.5 SU	8 SU
	MO AVG	MO AVG	WKLY AVG	WKLY AVG	DAILY MX	DAILY MX	MO AVG	DAILY MX	MINIMUM	MAXIMUM
01/31/2009	5.49	912.	7.9	1229.	10.4	1553.	20.3	28.	6.82	7.32
02/28/2009	10.73	1939.	11.29	2312.	15.7	3262.	20.7	30.	6.85	7.28
03/31/2009	7.25	1909.	8.65	2361.	11.6	3343.	32.3	44.2	6.64	7.03
04/30/2009	6.5	1570.	7.16	1742.	9.52	2749.	29.4	42.3	6.54	7.1
05/31/2009	6.6	1212.	8.31	1601.	11.6	2071.	22.4	35.9	6.86	7.48
06/30/2009	4.86	987.	6.3	1160.	11.3	3671.	26.2	52.9	6.84	7.43
07/31/2009	4.01	956.	4.7	1200.	6.91	1861.	30.	45.8	6.74	7.42
08/31/2009	4.3	826.	5.44	1212.	10.5	3003.	22.	48.5	6.73	7.07
09/30/2009	5.35	707.	5.2	744.	9.56	1536.	15.6	22.	6.8	7.28
10/31/2009	5.81	807.	9.48	1492.	13.1	2688.	16.4	34.	6.86	7.48
11/30/2009	4.24	790.	4.9	1003.	7.18	1901.	20.5	36.9	7.01	7.5
12/31/2009	7.1	1356.	10.22	1940.	15.	3601.	22.3	46.1	6.87	7.32
01/31/2010	4.95	966.	5.67	1394.	9.42	2595.	21.7	44.1	6.9	7.4
02/28/2010	5.67	1181.	7.76	2134.	12.7	4498.	24.1	58.	6.86	10.48
03/31/2010	3.61	1242.	5.43	1489.	8.11	2479.	41.6	60.7	6.85	7.7
04/30/2010	5.09	1479.	6.2	1977.	10.1	3422.	33.5	59.9	6.67	7.47
05/31/2010	6.43	1054.	7.27	1165.	10.3	2535.	19.5	30.1	6.63	7.2
06/30/2010	6.95	910.	7.41	1139.	10.7	1863.	15.5	24.	6.87	7.19
07/31/2010	5.89	600.	8.69	831.	9.28	1178.	12.	17.8	7.01	7.24
08/31/2010	6.18	715.	8.66	1209.	8.92	1620.	13.	27.8	6.89	7.51
09/30/2010	5.41	561.	6.02	595.	7.04	959.	12.1	17.3	6.99	7.7
10/31/2010	6.42	846.	7.92	1198.	9.74	3310.	15.2	40.8	7.04	7.47
11/30/2010	8.86	1420.	9.68	1647.	13.8	2671.	16.5	25.8	6.92	7.48
12/31/2010	8.63	1337.	10.12	1754.	13.4	2781.	17.4	30.9	6.93	7.41
01/31/2011	8.25	1036.	10.6	1332.	12.2	1609.	14.9	17.7	7.02	7.43
02/28/2011	8.45	1155.	9.28	1271.	13.6	2653.	16.3	26.4	6.9	7.43
03/31/2011	7.77	2402.	10.3	4354.	14.4	6652.	38.1	56.3	6.68	7.6

001	BOD	BOD	BOD	BOD	BOD	BOD	Flow	Flow	pH	pH
Monitoring Period End Date	25 mg/L	7090 lb/d	40 mg/L	11350 lb/d	45 mg/L	12770 lb/d	MGD	MGD	6.5 SU	8 SU
	MO AVG	MO AVG	WKLY AVG	WKLY AVG	DAILY MX	DAILY MX	MO AVG	DAILY MX	MINIMUM	MAXIMUM
04/30/2011	9.98	2459.	13.25	2842.	14.4	3531.	29.	48.2	6.8	7.4
05/31/2011	11.89	2537.	13.13	3406.	15.3	4252.	25.7	38.1	6.9	7.6
06/30/2011	8.34	1589.	10.82	2014.	16.8	2721.	23.5	45.2	6.9	7.3
07/31/2011	3.95	518.	5.85	749.	12.4	1608.	16.2	20.5	6.88	7.28
08/31/2011	2.98	420.	4.1	572.	5.58	917.	19.6	52.2	6.67	7.08
09/30/2011	3.97	801.	5.76	1044.	9.4	1831.	23.5	44.4	6.59	7.17
10/31/2011	3.61	900.	0.78	998.	6.9	1489.	30.6	52.7	6.6	7.81
11/30/2011	4.38	955.	5.79	1278.	11.3	2182.	26.1	41.7	6.77	7.13
12/31/2011	4.35	950.	5.86	1293.	7.06	2025.	26.5	50.5	6.55	7.46
01/31/2012	4.88	835.	4.72	779.	11.7	2293.	20.7	44.3	6.85	7.29
02/29/2012	5.71	859.	8.72	1625.	8.6	1399.	17.8	25.1	7.05	7.48
03/31/2012	4.61	785.	5.07	986.	8.1	1473.	19.9	27.1	6.9	7.34
04/30/2012	5.2	712.	5.71	723.	7.63	920.	18.2	45.3	6.9	7.3
05/31/2012	4.95	868.	5.86	999.	8.33	1347.	21.2	31.6	6.7	7.2
06/30/2012	4.93	948.	6.8	1877.	7.39	2166.	22.8	40.5	6.65	7.17
07/31/2012	4.58	570.	5.46	680.	8.48	1019.	14.6	21.5	6.54	7.2
08/31/2012	3.69	482.	4.17	677.	6.84	1039.	16.6	34.8	6.65	7.2
09/30/2012	6.91	962.	8.15	1145.	12.	2520.	15.4	29.7	6.53	7.51
10/31/2012	6.5	969.	7.01	929.	10.2	3299.	17.5	41.8	6.51	7.28
11/30/2012	5.86	893.	7.06	1567.	8.92	1486.	18.4	28.8	6.7	7.35
12/31/2012	6.09	963.	7.26	1383.	13.	2781.	17.9	32.4	6.8	7.31
01/31/2013	6.71	926.	6.76	982.	9.42	1482.	17.3	39.5	6.75	7.29
02/28/2013	7.51	1103.	8.75	1108.	9.08	2358.	17.4	33.6	6.72	7.28
03/31/2013	6.44	1323.	8.06	1461.	11.8	2179.	25.1	41.8	6.61	7.11
04/30/2013	5.82	1136.	6.29	1360.	10.62	2330.	24.	33.8	6.7	7.2
05/31/2013	6.41	1065.	8.22	1312.	10.05	1791.	20.06	39.18	6.7	7.2
06/30/2013	4.49	906.	5.71	1150.	8.9	1817.	24.95	45.65	6.8	7.2
07/31/2013	5.94	1172.	6.91	1349.	10.7	2355.	23.06	34.52	6.8	7.1
08/31/2013	5.89	864.	6.98	1156.	11.42	2252.	16.9	33.3	6.7	7.

001	BOD	BOD	BOD	BOD	BOD	BOD	Flow	Flow	pH	pH
Monitoring Period End Date	25 mg/L	7090 lb/d	40 mg/L	11350 lb/d	45 mg/L	12770 lb/d	MGD	MGD	6.5 SU	8 SU
	MO AVG	MO AVG	WKLY AVG	WKLY AVG	DAILY MX	DAILY MX	MO AVG	DAILY MX	MINIMUM	MAXIMUM
09/30/2013	5.7	855.	7.4	1000.	11.3	2581.	18.16	35.14	6.7	7.1
10/31/2013	6.59	751.	10.45	1075.	11.86	1199.	14.18	22.12	6.7	7.2
11/30/2013	7.57	852.	9.87	1281.	11.96	1739.	13.92	43.32	6.8	7.2
MIN	2.98	420.	0.78	572.	5.58	917.	12.	17.3	6.51	7.
MAX	11.89	2537.	13.25	4354.	16.8	6652.	41.6	60.7	7.05	10.48
AVE	6.1	1064.5	7.4	1394.7	10.6	2312.6	21.1	37.3	6.8	7.4
# of Samples	59	59	59	59	59	59	59	59	59	59
# of Violations	0	0	0	0	0	0	0	0	0	1

001A	TSS	TSS	TSS	TSS	TSS	TSS	TRC	TRC	E. coli	E. coli	Phosphorus	Aluminum
Monitoring Period End Date	30 mg/L	8510 lb/d	45 mg/L	12770 lb/d	50 mg/L	14190 lb/d	.133 mg/L	.23 mg/L	126 CFU/100mL	406 CFU/100mL	mg/L	ug/L
	MO AVG	MO AVG	WKLY AVG	WKLY AVG	DAILY MX	DAILY MX	MO AVG	DAILY MX	MO GEO	DAILY MX	MO AVG	MO AVG
01/31/2009	6.52	1076.	10.03	1557.	24.2	3.841	0.	0.	--	--	--	--
02/28/2009	11.84	2089.	16.74	3382.	23.6	4877.	0.	0.	10.29	72.2	2.05	610.
03/31/2009	14.07	3910.	20.2	6437.	43.6	12829.	0.	0.	13.84	290.9	1.	110.
04/30/2009	4.87	1196.	5.23	1418.	10.6	2984.	0.	0.	9.09	240.	0.775	50.
05/31/2009	7.75	1440.	13.83	2503.	34.4	5672.	0.	0.	4.94	120.1	2.35	55.
06/30/2009	6.21	1470.	7.17	1353.	35.4	12243.	0.	0.015	5.65	69.5	0.775	50.
07/31/2009	28.25	7842.	106.29	30278.	482.	142585.	0.	0.	4.98	629.	1.245	50.
08/31/2009	4.97	930.	7.14	1553.	13.8	4451.	0.	0.	4.45	62.	0.725	50.
09/30/2009	9.88	1326.	9.06	1071.	31.8	4667.	0.	0.	3.32	29.1	3.05	50.
10/31/2009	8.5	1184.	22.17	3169.	19.4	2981.	0.	0.	286.	73.8	2.4	160.
11/30/2009	7.56	1353.	9.57	1958.	14.4	4429.	0.	0.	3.53	72.3	3.3	55.
12/31/2009	8.04	1561.	8.77	1839.	16.2	5029.	0.	0.	6.68	344.1	1.75	50.
01/31/2010	6.77	1276.	8.71	2277.	14.6	5162.	0.	0.11	4.25	298.7	1.45	65.
02/28/2010	8.47	1888.	12.51	3849.	27.2	8858.	0.	0.	10.89	1553.	2.	65.
03/31/2010	5.98	2112.	6.83	2942.	10.8	5081.	0.	0.19	52.51	2419.6	0.855	105.
04/30/2010	7.03	2004.	10.06	3194.	15.6	4675.	0.	0.09	4.03	107.1	1.25	50.
05/31/2010	9.67	1542.	11.66	1698.	19.6	3080.	0.	0.18	3.75	1986.3	1.7	50.
06/30/2010	10.92	1447.	12.6	1986.	16.2	3245.	0.	0.08	4.41	1732.9	2.4	50.
07/31/2010	8.42	868.	11.37	1317.	23.8	3541.	0.	0.18	4.13	26.2	2.65	50.
08/31/2010	8.82	1030.	11.03	1551.	22.	5092.	0.	0.15	11.74	275.5	3.4	50.
09/30/2010	7.28	750.	7.72	853.	14.	1506.	0.	0.15	13.45	410.6	2.75	50.
10/31/2010	8.5	1123.	11.26	1731.	15.6	5302.	0.	0.22	10.37	115.3	1.95	50.
11/30/2010	15.55	2151.	16.98	2455.	24.8	4544.	0.	0.16	9.73	488.4	1.9	70.
12/31/2010	12.32	1768.	19.03	2548.	22.6	3069.	0.	0.16	8.67	23.5	2.05	85.
01/31/2011	10.91	1362.	15.8	1986.	23.	2883.	0.01	0.39	4.93	27.5	1.6	60.
02/28/2011	9.21	1258.	11.57	1597.	25.4	3343.	0.	0.2	5.66	38.4	2.	80.
03/31/2011	8.37	2621.	11.17	4615.	14.2	6476.	0.	0.2	27.45	2419.6	0.74	145.
04/30/2011	12.42	2791.	16.66	3717.	26.2	6477.	0.	0.19	6.08	60.5	1.45	120.

001A	TSS	TSS	TSS	TSS	TSS	TSS	TRC	TRC	E. coli	E. coli	Phosphorus	Aluminum
Monitoring Period End Date	30 mg/L	8510 lb/d	45 mg/L	12770 lb/d	50 mg/L	14190 lb/d	.133 mg/L	.23 mg/L	126 CFU/100mL	406 CFU/100mL	mg/L	ug/L
	MO AVG	MO AVG	WKLY AVG	WKLY AVG	DAILY MX	DAILY MX	MO AVG	DAILY MX	MO GEO	DAILY MX	MO AVG	MO AVG
05/31/2011	23.58	5067.	28.89	7486.	38.4	10021.	0.	0.18	17.29	248.1	0.855	405.
06/30/2011	18.41	3472.	22.94	4175.	28.2	4738.	0.091	0.19	12.07	81.3	0.98	75.
07/31/2011	5.71	797.	11.94	2353.	12.8	2030.	0.061	0.18	7.17	870.4	1.8	60.
08/31/2011	5.16	922.	5.71	1125.	9.	3049.	0.043	0.17	16.34	235.9	2.2	60.
09/30/2011	7.37	1443.	9.09	1708.	17.6	3090.	0.064	0.2	13.06	53.7	1.42	160.
10/31/2011	5.58	1443.	6.4	1911.	9.4	3935.	0.067	0.22	6.66	488.4	0.69	115.
11/30/2011	5.51	1209.	6.77	1366.	11.8	2325.	0.072	0.21	2.47	19.7	1.34	55.
12/31/2011	5.83	1265.	9.91	2006.	23.6	4478.	0.065	0.18	2.23	60.9	0.63	125.
01/31/2012	4.73	856.	5.91	1269.	9.6	2586.	0.097	0.27	2.36	140.3	0.58	50.
02/29/2012	4.33	643.	5.4	1008.	5.4	1004.	0.054	0.18	1.93	84.6	2.4	50.
03/31/2012	4.53	749.	5.4	847.	9.	1310.	0.058	0.2	2.13	49.4	1.65	50.
04/30/2012	4.74	783.	5.69	1372.	12.	4531.	0.057	0.2	2.05	22.6	2.6	50.
05/31/2012	7.8	1390.	8.14	1597.	16.6	2718.	0.046	0.12	2.67	45.9	2.1	140.
06/30/2012	6.86	1319.	10.63	1824.	14.6	3566.	0.072	0.17	3.07	55.1	1.35	55.
07/31/2012	5.49	672.	7.09	849.	11.	1383.	0.076	0.19	3.86	81.3	3.2	50.
08/31/2012	5.87	841.	6.	1075.	10.4	2265.	0.06	0.19	7.64	2419.6	3.75	50.
09/30/2012	16.53	2151.	24.86	3444.	41.4	6337.	0.075	0.17	6.71	68.3	2.85	60.
10/31/2012	8.3	1257.	14.43	1925.	20.8	3905.	0.057	0.19	5.83	128.4	2.	50.
11/30/2012	7.66	1185.	8.94	1766.	28.2	3375.	0.055	0.14	2.21	26.2	1.85	90.
12/31/2012	7.09	1091.	10.89	1554.	29.6	4106.	0.061	0.19	3.15	196.8	2.3	55.
01/31/2013	4.4	658.	5.03	729.	8.6	2110.	0.069	0.23	2.87	193.5	1.75	50.
02/28/2013	5.46	835.	6.14	1099.	10.	2801.	0.01	0.38	1.53	15.8	2.45	50.
03/31/2013	5.57	1148.	6.94	1439.	8.6	1850.	0.6	0.21	3.13	39.5	0.81	65.
04/30/2013	5.1	1021.	6.4	1352.	8.2	1706.	0.046	0.19	2.28	58.6	1.14	50.
05/31/2013	5.2	865.	6.2	1030.	7.6	1895.	0.049	0.17	2.32	64.	1.55	90.
06/30/2013	5.3	1153.	6.3	1393.	13.8	2724.	0.046	0.19	3.01	73.3	2.05	50.
07/31/2013	7.4	1447.	10.	1965.	19.6	3150.	0.038	0.09	9.71	143.9	1.15	75.
08/31/2013	6.3	918.	7.6	1393.	13.	3169.	0.04	0.11	20.83	866.4	2.55	55.
09/30/2013	6.2	926.	10.4	1358.	17.6	2701.	0.035	0.14	8.	30.7	2.55	50.

001A	TSS	TSS	TSS	TSS	TSS	TSS	TRC	TRC	E. coli	E. coli	Phosphorus	Aluminum
Monitoring Period End Date	30 mg/L	8510 lb/d	45 mg/L	12770 lb/d	50 mg/L	14190 lb/d	.133 mg/L	.23 mg/L	126 CFU/100mL	406 CFU/100mL	mg/L	ug/L
	MO AVG	MO AVG	WKLY AVG	WKLY AVG	DAILY MX	DAILY MX	MO AVG	DAILY MX	MO GEO	DAILY MX	MO AVG	MO AVG
10/31/2013	6.4	744.	8.9	1029.	15.8	1791.	0.039	0.16	10.23	435.2	2.8	50.
11/30/2013	5.5	700.	7.6	1327.	12.2	4119.	0.052	0.21	4.67	79.8	3.25	55.
MIN	4.33	643.	5.03	729.	5.4	3.841	0.	0.	1.53	15.8	0.58	50.
MAX	28.25	7842.	106.29	30278.	482.	142585.	0.6	0.39	286.	2419.6	3.75	610.
AVE	8.4	1531.2	12.3	2535.7	26.4	6336.5	0.	0.1	12.5	368.3	1.9	84.1
# of Samples	59	59	59	59	59	59	59	59	58	58	58	58
# of Violations	0	0	1	1	1	1	1	4	1	12	N/A	N/A

WET - Effluent	Al	Cd	Cu	Pb	Ni	Zn	Hardness	Ammonia-N
Monitoring Period End Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX
03/31/2009	0.1	0.	0.008	0.001	0.002	0.067	72.	8.2
06/30/2009	0.04	0.	0.008	0.0007	0.003	0.063	60.	13.
09/30/2009	0.04	0.	0.009	0.0006	0.	0.038	61.	5.
12/31/2009	0.07	0.	0.009	0.	0.	0.043	46.	7.1
03/31/2010	0.064	0.	0.017	0.0006	0.	0.028	64.	8.3
06/30/2010	0.053	0.	0.031	0.0005	0.	0.044	61.	15.
12/31/2010	0.091	0.	0.014	0.001	0.002	0.06	69.	13.
03/31/2011	0.098	0.	0.009	0.001	0.002	0.039	68.	5.6
06/30/2011	0.16	0.	0.014	0.001	0.	0.043	83.	13.
09/30/2011	0.039	0.	0.01	0.	0.002	0.031	69.	8.2
12/31/2011	0.061	0.	0.011	0.0007	0.	0.032	68.	5.8
03/31/2012	0.05	0.	0.014	0.0006	0.002	0.04	61.	13.
06/30/2012	0.037	0.	0.01	0.	0.	0.035	62.	15.
12/31/2012	0.042	0.	0.012	0.0007	0.002	0.053	64.	8.4
03/31/2013	0.046	0.	0.005	0.0007	0.	0.029	69.	9.
06/30/2013	0.044	0.	0.027	0.0006	0.	0.034	60.	11.
09/30/2013	0.052	0.	0.019	0.	0.	0.048	68.	4.5
MIN	0.037	0.	0.005	0.	0.	0.028	46.	4.5
MAX	0.16	0.	0.031	0.001	0.003	0.067	83.	15.
# of Samples	17	17	17	17	17	17	17	17

WET - Effluent	LC50 48Hr Ceriodaphnia	LC50 48Hr Pimephales	NOEL 7d Ceriodaphnia	NOEL 7d Pimephales
Monitoring Period End Date	100 %	100 %	8.5 %	8.5 %
	DAILY MN	DAILY MN	DAILY MN	DAILY MN
03/31/2009	100.	100.	100.	100.
06/30/2009	100.	100.	50.	8.3
09/30/2009	100.	100.	100.	12.5
12/31/2009	100.	100.	100.	100.
03/31/2010	100.	100.	100.	100.
06/30/2010	100.	100.	6.25	100.
12/31/2010	100.	100.	100.	100.
03/31/2011	100.	100.	100.	100.
06/30/2011	100.	100.	100.	100.
09/30/2011	100.	100.	100.	100.
12/31/2011	100.	100.	100.	100.
03/31/2012	100.	100.	100.	100.
06/30/2012	100.	100.	100.	100.
12/31/2012	100.	100.	100.	100.
03/31/2013	100.	100.	100.	100.
06/30/2013	100.	100.	25.	100.
09/30/2013	100.	100.	50.	100.
MIN	100.	100.	6.25	8.3
MAX	100.	100.	100.	100.
# of Samples	17	17	17	17
# of Violations	0	0	1	1

WET - Ambient	Al	Cd	Cu	Pb	Ni	Zn	Hardness	Ammonia-N
Monitoring Period End Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX
03/31/2009	0.1	0.009	0.003	0.001	0.	0.01	13.	0.24
06/30/2009	0.2	0.006	0.	0.0007	0.	0.017	9.2	0.
09/30/2009	0.2	0.0017	0.005	0.0009	0.	0.01	11.	0.
12/31/2009	0.74	0.007	0.004	0.002	0.	0.01	11.	0.15
03/31/2010	0.15	0.012	0.01	0.0005	0.	0.007	11.	0.12
06/30/2010	0.13	0.024	0.011	0.	0.	0.01	11.	0.
12/31/2010	0.58	0.007	0.003	0.0009	0.	0.009	9.7	0.
03/31/2011	0.31	0.004	0.	0.0007	0.	0.005	14.	0.12
06/30/2011	0.36	0.003	0.	0.0008	0.	0.005	8.1	0.
09/30/2011	0.036	0.006	0.	0.	0.	0.005	16.	0.
12/31/2011	0.36	0.0007	0.005	0.0009	0.	0.006	8.8	0.
03/31/2012	0.068	0.016	0.006	0.	0.	0.007	14.	0.16
06/30/2012	0.12	0.008	0.005	0.	0.	0.007	9.3	0.
12/31/2012	0.21	0.004	0.01	0.0008	0.	0.009	10.	0.
03/31/2013	0.15	0.002	0.014	0.	0.	0.006	9.	0.
06/30/2013	0.13	0.004	0.	0.	0.	0.007	11.	0.
09/30/2013	0.088	0.004	0.13	0.007	0.	0.022	13.	0.
MEDIAN	0.15	0.006	0.005	0.0007	0.	0.007	11.	0.
# of Samples	17	17	17	17	17	17	17	17

CSOs	011A	018A	031A	039A	043A	044A
Monitoring Period End Date	E. coli 1000 CFU/100mL MXSINSAM	E. coli 1000 CFU/100mL MXSINSAM	E. coli 1000 CFU/100mL MXSINSAM	E. coli 1000 CFU/100mL MXSINSAM	E. coli 1000 CFU/100mL MXSINSAM	E. coli 1000 CFU/100mL MXSINSAM
12/31/2009	--	--	--	--	--	53000.
12/31/2010	--	--	--	--	--	397000.
12/31/2011	--	--	--	--	--	260000.
12/31/2012	--	--	--	--	--	440000.
MIN	--	--	--	--	--	53000.
MAX	--	--	--	--	--	440000.
# of Samples	0	0	0	0	0	4
# of Violations	0	0	0	0	0	4

CSOs	045A	046A	047A	050A	051A	052A	053A
Monitoring Period End Date	E. coli 1000 CFU/100mL MXSINSAM	E. coli 1000 CFU/100mL MXSINSAM	E. coli 1000 CFU/100mL MXSINSAM	E. coli 1000 CFU/100mL MXSINSAM	E. coli 1000 CFU/100mL MXSINSAM	E. coli 1000 CFU/100mL MXSINSAM	E. coli 1000 CFU/100mL MXSINSAM
12/31/2009	2200.	--	210000.	680000.	--	840000.	--
12/31/2010	3100.	8400.	381000.	2600.	--	309000.	--
12/31/2011	3700.	22000.	560000.	--	--	Analysis Not Conducted	--
12/31/2012	1250.	10000.	--	--	--	Analysis Not Conducted	--
MIN	1250.	8400.	210000.	2600.	--	309000.	--
MAX	3700.	22000.	560000.	680000.	--	840000.	--
# of Samples	4	3	3	2	0	2	0
# of Violations	4	3	3	2	0	4	0

SLUDGE	Ar	Cd	Cr	Pb	Ni
Monitoring Period End Date	8573 mg/kg	43416 mg/kg	1423398 mg/kg	262781 mg/kg	213643 mg/kg
	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX
01/31/2009	--	--	--	--	--
02/28/2009	5.5	6.8	33.	44.	16.
04/30/2009	7.1	4.2	34.	83.	23.
06/30/2009	8.5	4.2	34.	83.	23.
08/31/2009	8.7	2.5	26.	70.	12.
10/31/2009	4.5	1.6	21.	29.	12.
12/31/2009	6.6	1.8	19.	55.	16.
02/28/2010	--	--	--	--	--
04/30/2010	4.6	2.5	19.	40.	11.
06/30/2010	4.6	2.5	19.	40.	11.
08/31/2010	8.7	2.5	26.	70.	12.
10/31/2010	7.2	1.2	19.	52.	16.
12/31/2010	4.9	1.8	16.	36.	21.
02/28/2011	5.9	4.3	18.	31.	14.
04/30/2011	--	--	--	--	--
06/30/2011	4.6	1.2	22.	56.	13.
08/31/2011	7.	1.8	22.	54.	12.
10/31/2011	--	--	--	--	--
12/31/2011	9.1	2.	20.	59.	13.
02/29/2012	4.8	3.6	15.	32.	11.
04/30/2012	--	--	--	--	--
06/30/2012	6.5	1.5	25.	61.	14.
08/31/2012	--	--	--	--	--
10/31/2012	--	--	--	--	--
12/31/2012	4.	1.3	11.	25.	8.
02/28/2013	--	--	--	--	--
04/30/2013	4.6	3.8	17.	30.	17.
06/30/2013	4.6	1.5	15.	32.	10.
08/31/2013	7.7	2.2	24.	83.	18.
10/31/2013	--	--	--	--	--
MIN	4.	1.2	11.	25.	8.
MAX	9.1	6.8	34.	83.	23.
# of Samples	21	21	21	21	21
# of Violations	0	0	0	0	0

ATTACHMENT C – STATISTICAL APPROACH FOR METALS (N ≥ 10)

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.[3] 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.

Datasets including non-detect values

[3] A different statistical approach is applied where the monitoring data set includes less than 10 samples.

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_y*= 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
δ = r/k

For the 95th percentile, this takes the form of z_p* = z-score[(.95 – δ)/(1 - δ)]. 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)	z_p*
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

RESPONSE TO COMMENTS
REISSUANCE OF NPDES PERMIT NO. NH0100447
CITY OF MANCHESTER
MANCHESTER WASTEWATER TREATMENT FACILITY
MANCHESTER, NEW HAMPSHIRE

From September 19, 2014 through October 18, 2014, Region 1 of the U.S. Environmental Protection Agency (EPA or Region 1) and the New Hampshire Department of Environmental Services, Water Division (NHDES) solicited public comments on the draft National Pollutant Discharge Elimination System (NPDES) permit to be reissued to the City of Manchester, New Hampshire (the "Permittee").

Region 1 and NHDES received comments from the Permittee, the City of Manchester, submitted October 17, 2014 and from the Lower Merrimack River Local Advisory Committee (LMRLAC), submitted October 14, 2014. Additionally, the City of Manchester submitted supplemental comments on October 24, 2014 and supplemental data on November 12, 2014. Although these supplemental comments were submitted after the close of the public comment period, EPA has exercised its discretion to respond to them herein. Below are all of the comments received and EPA's responses to those comments.

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

I. COMMENTS FROM THE CITY OF MANCHESTER

Comment 1:

"The City of Manchester's draft NPDES permit has established new copper and lead limits based on our Whole Effluent Toxicity (WET) testing. Manchester's WET testing samples are not performed in accordance with EPA's *Method 1669 Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels*. To verify that the proposed data is accurate, the City has initiated a copper and lead water quality study of the Merrimack River upstream and downstream of our POTW utilizing clean sampling techniques as outlined in EPA Method 1669.

The first round of four day low flow sampling was conducted at the end of August. Two more four day sampling rounds were completed in September and the fourth and final round of sampling is being completed this week. The sampling program includes analysis for total recoverable copper and lead, acid soluble copper and lead, total dissolved solids, pH and temperature. We also obtained USGS gage data for each sampling day to compare against 7Q10 parameters. Our data indicates that the river is not impaired for copper and lead. We have attached our preliminary study data to this letter. We will receive our final sampling data in early November and at that time will submit a full copy of our water quality study to EPA. Based on the initial results of this water quality study, the City respectfully requests a re-evaluation of the copper and lead permit limits proposed in our draft NPDES permit."

Attached to the comment above was the following letter and data submittal:

"Attached is the spreadsheet outlining clean sampling that was performed in the Merrimack River between August 18th and the 21st 2014 (four consecutive days), September 9th and September 5th (four consecutive days), and September 23rd and the 25th 2014 (four consecutive days). Another round of sampling was performed this week, but the analytical data will not be available until November.

Included is the Draft Quality Assurance Plan which is conformance with Method 1669. This will be updated at the end of the study to elaborate on changes made in the field due to sampling contamination and the issues with the first round of samples where the acid soluble results were consistently higher than the total recoverable results.

Also included is the clean sampling reports from the sampling that was taken and performed by ESI laboratories (same lab that does the WET testing analytical work in which the fact sheet data for copper and lead were taken).

Manchester is aware that the data that was used from the WET testing was taken under very poor sampling conditions. These samples were taken off a railroad bridge with a stainless steel bucket where there were no railings. The bucket was dropped about 80 feet to the Merrimack River and in many instances, the rope used to pull up the bucket rubbed against the railroad timbers, bridge structural beams and railroad tracks knocking minute particles off into the bucket as it was coming up.

The clean sampling tests were performed away from any metal structures, over 100 yards from bridges (as outlined in 1669) and both upstream and downstream from the WWTP's outfall. In the spreadsheet there are two green columns for both total recoverable Lead (Pb) and for total recoverable Copper (Cu). The average and median lead was non-detect (below the minimum detection limit). Copper had an average of less than 1 part per billion (ppb) in all samples. The median was 0.8 ppb. The average upstream concentration was 0.92 ppb and the average downstream concentration was 0.9 ppb. These concentrations are about 1/3 of the allowable WQ limit of 2.9 ppb for chronic conditions.

As can be seen from the flow conditions the river was very near 7Q10 conditions (655 cfs) during the 9/23 through 9/26 sample collection.

The clean sampling techniques and resultant data demonstrate that there are no WQ concerns with these metals either upstream or downstream from Manchester's WWTP outfall and the permit limit for test of both lead and copper is not warranted during this permit cycle."

Note that EPA did not deem it necessary to reproduce the Draft Quality Assurance Plan referenced above in this Response to Comments. However, EPA did review the plan and found it to be appropriate for this sampling effort. Hence, the data submitted by the commenter will be used in EPA's response and is presented below. Note that in the table below, the data for the final sampling event (10/14/2014 - 10/17/2014) was submitted to EPA on November 12, 2014 (after the close of the public comment period) but is included in this analysis.

						Pb Limit	**0.54**	**Cu Limit**	**2.9**		**Al ASA**	**106**
River Gaging Flows - Al, Cu, Pb - Clean Sampling Runs							All of the metals samples are stated in parts/billion ppb or ug/l					
	Date Time	River cfs	Gage ht	Flow MGD	pH	Temp C^0	Pb (Tot R)	Pb (AS)	Cu (Tot R)	Cu (AS)	Al (Tot R)	Al (AS)
MERLStadium Ramp	08/18/2014 12:45 EDT	5,020[P]	5.18[P]	3,244.5	6.8	20.6	0	0.6	0.9	2.2	180	140
MERLAAA	08/18/2014 13:15 EDT	5,050[P]	5.19[P]	3,263.9	6.8	22.8	0	0	0.8	1	200	140
MERLStadium Ramp	08/19/2014 13:15 EDT	3,980[P]	4.77[P]	2,572.3	6.6	23	0	0	0.8	1.4	150	120
MERLAAA	08/19/2014 13:45 EDT	3,980[P]	4.77[P]	2,572.3	6.6	22.1	0	0	0.8	0.7	140	120
MERLStadium Ramp	08/20/2014 12:15 EDT	3,710[P]	4.65[P]	2,403.7	6.6	23	0	0	0.8	1.1	110	98
MERLAAA	08/20/2014 12:45 EDT	3,710[P]	4.65[P]	2,403.7	6.6	22.1	0	0	0.7	0.9	120	100
MERLStadium Ramp	08/21/2014 12:00 EDT	3,220[P]	4.42[P]	2,081.1	6.6	21.2	0	0	0.7	1.1	110	91
MERLAAA	08/21/2014 12:45 EDT	3,220[P]	4.42[P]	2,081.1	6.8	21.4	0	0	0.7	1.1	100	93
MERLStadium Ramp	09/02/2014 12:30 EDT	2,090[P]	3.77[P]	1,350.8	7	24.8	0	0	2.8	1.5	46	41
MERLAAA	09/02/2014 13:00 EDT	2,020[P]	3.72[P]	1,305.6	7	24.8	0	0	1.8	0.8	43	39
MERLStadium Ramp	09/03/2014 12:45 EDT	2,450[P]	4.00[P]	1,583.5	7.5	24.7	0	0	1.1	1.1	43	37
MERLAAA	09/03/2014 13:30 EDT	2,350[P]	3.94[P]	2,081.1	7.2	24.7	0	0	1.6	1.1	43	38
MERLStadium Ramp	09/04/2014 12:00 EDT	2,310[P]	3.91[P]	1,493.0	7.1	25.3	0	0	2.3	1.1	37	35
MERLAAA	09/04/2014 12:45 EDT	2,290[P]	3.90[P]	1,480.1	7.1	24.9	0	0	2.1	0.9	39	36
MERLStadium Ramp	09/05/2014 12:00 EDT	2,590[P]	4.08[P]	1,674.0	7.5	25.5	0	0	1.9	0.7	41	32
MERLAAA	09/05/2014 12:45 EDT	2,570[P]	4.07[P]	1,661.0	7.2	24.7	0	0	1.1	0.6	38	32
MERLStadium Ramp	09/23/2014 12:45 EDT	1,630[P]	3.43[P]	1,053.5	7.3	19.3	0	0	0	0.09	29	26
MERLAAA	09/23/2014 13:15 EDT	1,580[P]	3.39[P]	1,021.2	7.1	18.8	0	0	0.5	1	30	26

MERLStadium Ramp	09/24/2014 12:15 EDT	1,480[P]	3.31[P]	956.5	7.5	18.5	0	0	0.06	0.05	25	22
MERLAAA	09/24/2014 12:45 EDT	1,320[P]	3.16[P]	853.1	7.1	19	0	0	0.06	0.06	28	25
MERLStadium Ramp	09/25/2014 12:30 EDT	1,470[P]	3.30[P]	950.1	7.4	18	0	0	0	3.4	27	25
MERLAAA	09/25/2014 13:00 EDT	1,380[P]	3.22[P]	891.9	7.1	18.1	0	0	0.06	0.07	31	24
MERLStadium Ramp	09/26/2014 12:00 EDT	1,140[P]	2.99[P]	736.8	7.3	19.1	0	0	0.06	0.09	26	23
MERLAAA	09/26/2014 12:45 EDT	1,140[P]	2.99[P]	736.8	7	19.3	0	0	0.6	0.6	28	27
MERLStadium Ramp	10/06/2014 09:00 EDT	1,210[P]	3.06[P]	2,336.3	7	16.4	0	0	0.5	0.6	20	20
MERLStadium Ramp	10/14/2014 12:15 EDT	1,510[P]	3.33[P]	2,336.3	7.2	17.3	0	0.5	0.6	0	28	23
MERLAAA	10/14/2014 13:00 EDT	1,590[P]	3.40[P]	2,460.1	6.9	18.6	0	0	0.6	0	45	28
MERLStadium Ramp	10/15/2014 12:15 EDT	1,140[P]	2.99[P]	1,763.8	7.1	18.6	0	0	1.4	0	20	23
MERLAAA	10/15/2014 13:00 EDT	1,000[P]	2.84[P]	1,547.2	7	19.5	0	0	0	0	15	28
MERLStadium Ramp	10/16/2014 12:15 EDT	2,870[P]	4.24[P]	4,440.6	7.3	17.9	2.8	2.7	2.7	0	130	57
MERLAAA	10/16/2014 12:45 EDT	2,750[P]	4.17[P]	4,254.9	6.9	18.6	0.6	0.07	1.3	0	140	60
MERLStadium Ramp	10/17/2014 11:15 EDT	8,220[P]	6.15[P]	12,718.2	7.1	17.8	0	0.6	0.7	0	69	46
MERLAAA	10/17/2014 12:15 EDT	8,420[P]	6.20[P]	13,027.7	7	18.8	0	0	0.7	0	82	49
Averages					7.04	20.88	0.10303	0.14	0.93	0.70	67.06	52.24
Median							0	0	0.7	0.7	43	36
Averages Upstream							0.16	0.26	1.02	0.85	64.18	50.82
Averages Downstream							0.01	0.00	0.84	0.55	70.13	54.06

*Note: Station MERLStadium Ramp is upstream of Manchester's discharge and Station MERLAAA is downstream of Manchester's discharge

EPA's Response 1:

EPA appreciates the effort and initiative taken by the City of Manchester to collect supplemental ambient data for both copper and lead. The data submitted herein is valuable in determining whether the facility has the reasonable potential to cause or contribute to water quality violations in the Merrimack River. EPA agrees with the commenter that the ambient WET test samples may have been contaminated due to improper collection procedures and should not be used in this analysis. The permittee is required to correct any deficiencies in its WET testing procedures to ensure future ambient data is collected in accordance with WET protocol (Attachments A and B of final permit) and may be used in future permitting decisions. However, in this analysis EPA has reevaluated the reasonable potential calculations for copper and lead with the total recoverable data collected using clean sampling techniques. Note that only the upstream data (with station name "MERLStadium Ramp") was used in determining the background ambient concentration. The data with station name "MERLAAA" was not used in this analysis because it was taken downstream of the discharge. All of the data used in this reevaluation is presented below.

Clean Sampling Runs		**Pb**	**Cu**
		ug/l	**ug/l**
MERLStadium Ramp	08/18/2014 12:45 EDT	0	0.9
MERLStadium Ramp	08/19/2014 13:15 EDT	0	0.8
MERLStadium Ramp	08/20/2014 12:15 EDT	0	0.8
MERLStadium Ramp	08/21/2014 12:00 EDT	0	0.7
MERLStadium Ramp	09/02/2014 12:30 EDT	0	2.8
MERLStadium Ramp	09/03/2014 12:45 EDT	0	1.1
MERLStadium Ramp	09/04/2014 12:00 EDT	0	2.3
MERLStadium Ramp	09/05/2014 12:00 EDT	0	1.9
MERLStadium Ramp	09/23/2014 12:45 EDT	0	0
MERLStadium Ramp	09/24/2014 12:15 EDT	0	0.06
MERLStadium Ramp	09/25/2014 12:30 EDT	0	0
MERLStadium Ramp	09/26/2014 12:00 EDT	0	0.06
MERLStadium Ramp	10/06/2014 09:00 EDT	0	0.5
MERLStadium Ramp	10/14/2014 12:15 EDT	0	0.6
MERLStadium Ramp	10/15/2014 12:15 EDT	0	1.4
MERLStadium Ramp	10/16/2014 12:15 EDT	2.8	2.7
MERLStadium Ramp	10/17/2014 11:15 EDT	0	0.7
Median		**0**	**0.8**

Using the updated median of all the ambient data for copper and lead, the reasonable potential calculations done in the Fact Sheet were reanalyzed below. The following mass balance is used to project in-stream metal concentrations downstream from the discharge.

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

rewritten as:

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

where:

Q_d = design flow of facility (34 mgd)
C_d = effluent metals concentration (95th percentile, see Att. C of Fact Sheet for procedure)
Q_S = upstream 7Q10 flow (412.6 mgd)
C_S = median upstream metals concentration
Q_r = downstream 7Q10 flow ($Q_s + Q_d$ = 446.6 mgd)
C_r = resulting downstream metals concentration

Reasonable potential is then determined by comparing the resulting downstream metals concentration (for both acute and chronic conditions) with the criteria for each metal multiplied by the factor 0.9 to reserve 10% assimilative capacity (Env-Wq 1705.01). 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 metals concentration (C_d) using the criterion times 0.9 as the downstream metals concentration (C_r). See the table below for the results of this analysis with respect to copper and lead.

Metal	**Qd**	**Cd** (95th Percentile)	**Qs**	**Cs** (Med.)	**Qr = Qs + Qd**	**Cr = (QdCd+QsCs)/Qr**	**Criteria * 0.9**		**Reasonable Potential**	**Limit = (Qr*Criteria*0.9 -Qs*Cs)/Qd**	
	mgd	**ug/l**	**mgd**	**ug/l**	**cfs**	**ug/l**	**Acute (ug/l)**	**Chronic (ug/l)**	**Cr > Criteria**	**Acute (ug/l)**	**Chronic (ug/l)**
Copper	34	26	412.6	0.8	446.6	2.69	3.41	2.6	Chronic	N/A	24
Lead		1.0		0		0.08	12.6	0.5	No	N/A	N/A

As indicated in the table above, based on the 95th percentile of the effluent concentrations and median upstream concentrations there is not reasonable potential (for either acute or chronic conditions) that the discharge of lead will cause or contribute to an exceedance of the applicable water quality criteria. However, there is reasonable potential for copper (chronic only) to cause or contribute to an exceedance. Hence, the final permit does not contain any limits for lead but does contain an **average monthly limit for copper of 24 ug/l**.

II. COMMENTS FROM LMRLAC

Comment 1:

"The sampling frequency for CSO events of "1/yr" shown in para 1b is strikingly lenient. It would seem much more reasonable to require sampling during **every** CSO event at **every** CSO location and the timely public reporting of the results, including trends, including trends in CSO event frequency."

EPA's Response 1:

The monitoring frequency described in this comment is for *E. coli* only. In addition to this monitoring requirement, there is a requirement to quantify every discharge event from every CSO either through direct measurement or an estimation technique. This requirement is described in section I.G.3.a of the permit and must include the date of discharge, duration of discharge, and volume of discharge as well as precipitation data for each CSO discharge event. These records must be submitted to EPA in an annual CSO report by January 15th of each year. EPA believes this level of monitoring and reporting is sufficient to establish and track trends in CSO event frequency.

Comment 2:

"The draft permit is largely silent on making the results of the monitoring and mapping activity readily available to the public. We recommend that the draft permit be amended to require the timely posting of all monitoring and mapping results on a publically accessible website."

EPA's Response 2:

EPA recognizes the value in notifying downstream municipalities of CSO discharge events in a timely manner. Hence, EPA has included a requirement (Section I.I.9) in the draft permit for the permittee to notify the only downstream water community within 20 miles of the discharge (Pennichuck Water Treatment Plant) of any emergency condition, plant upset, bypass, CSO discharge or other system failure which has the potential to violate permit limits and affect harvesting of shellfish or the quality of water to be withdrawn for drinking water purposes. This notification requirement includes an immediate contact via telephone, as well as a written notification within 10 days.

Additionally, the final permit requires that the permittee keep all collection system maps up-to-date and available for review by federal, state, and local agencies as well as the public (See Part I.C.4). EPA promotes transparency and encourages the Manchester WWTF to post both monitoring and mapping results on a publically accessible website, to the extent practicable. It should be noted that the monitoring results which Manchester submits to EPA may be accessed by the public via the online tool *Enforcement and Compliance History Online* (ECHO), found at echo.epa.gov.

Comment 3:

"It would be helpful if the permit itself, or the material associated with it, were to explicitly address the relationship of this permit and Phase 2 of the CSO abatement program that the DES website (http://des.nh.gov/organization/commissioner/pip/factsheets/wwt/documents/web-9.pdf) reported was under federal and state review as of 2012. If this permit is in fact the implementation of Phase 2, it would be helpful to see a display of the old and new CSO targets and how they compare to the targets being established for the CSO discharges from the City of Nashua's new waste water storage system."

EPA's Response 3:

The draft permit and final permit reissuance are not intended to be an implementation of Phase 2 of the CSO abatement program (Long-Term Control Plan). As mentioned in the comment and on page 34 of the Fact Sheet, the permittee has submitted a proposed Phase 2 Long-Term Control Plan which is currently under federal and state review. EPA and NHDES will be working with the City of Manchester to implement this plan in the near future, but at this time CSO removal target dates have not been established for comparison as requested in the comment above. Once the Long-Term Control Plan is approved by EPA, the CSO removal target dates will become effective at that time.

III. SUPPLEMENTAL COMMENTS FROM THE CITY OF MANCHESTER

Comment 1:

NPDES Permit, Page 2 of 24, Effluent Limitations and Monitoring Requirements Table, Rows "CBOD5" and "TSS", Columns "Average Weekly" and "Maximum Daily"

The City respectfully requests to delete mass loading discharge limits, leaving only concentration limits.

The weekly and daily mass loading limits for BOD and TSS in the permit could potentially cause a disincentive for the WWTP to maximize primary and secondary flow beyond the regulatory design flow amount, since it increases the chance for permit violations. Previously, the WWTP had to meet permit limits in the secondary effluent, and not the blended effluent that includes bypass flows. However, with the blended effluent requirement, the WWTF could violate BOD and TSS daily and weekly mass loading limits during wet-weather, high-flow periods, even with very low effluent concentrations.

We understand that other regional combined sewer WWTPs have been able to remove daily and weekly BOD and TSS mass limits from their permit for this reason. By increasing the overall flow treated at the facility, the City will be able to reduce the quantity of untreated CSO discharge from the collection system into the river. This is also consistent with the provisions for an exception to the 85% removal requirement for CBOD and TSS during wet weather events, because achieving such removal rates during wet weather is very difficult because of dilute influent concentrations. The discussion in the Fact Sheets on page 9 of 52 implies, but does not explicitly state, that during wet weather events, only concentration limits (and not mass limits) be met during wet weather. Therefore, the City respectfully request to delete mass loading discharge limits, leaving only concentration limits

EPA's Response 1:

As discussed on page 9 of the Fact Sheet, concentration-based limits are applicable during all wet-weather events even during a bypass at the POTW in accordance with other permit requirements (i.e., flow greater than 34 mgd). In such instances, the 85% removal requirement for CBOD5 and TSS is not applicable based on 40 CFR § 133.103(a). However, there is no

corresponding exception in the regulations (or in the draft permit) to the mass-based limits during wet weather. Hence, these limits will remain in effect during both dry and wet weather in the final permit.

EPA notes that the implementation of the Nine Minimum Controls (NMC) in the draft permit includes a requirement to maximize flow to the POTW for treatment (see Section I.G.1.a.(1)(d) in the draft permit). This requirement precludes purposely reducing flow to the POTW in order to limit mass loadings of CBOD and TSS in the POTW effluent. However, EPA expects that current and future collection system work to separate storm water and to reduce I/I in accordance with the City's Long-Term Control Plan will significantly reduce peak flow to the treatment plant as well as CBOD and TSS mass loadings.

EPA also notes that the City has been able to consistently meet these mass-based limits in the past, even when monthly average flows were well above their 34 mgd design flow (as shown in Attachment B of Fact Sheet). For example, even in March of 2010 (the period of maximum monthly average flow [41.6 mgd] during the draft permit review period [Jan 2009 – Nov 2013]) all of the CBOD and TSS mass loadings were well below the corresponding mass-based limits. In fact, during the entire review period there was not a single violation of the CBOD mass-based limits and only one month with TSS violations (July 2009).

Comment 2:

NPDES Permit, Page 2 of 24, Effluent Limitations and Monitoring Requirements Table, Row "Total Phosphorus", Column "Average Monthly"

Phosphorus is changed from the current twice-monthly monitor in our current permit to a limit of 0.9 mg/l. Our review of the sampling data indicates there were no phosphorus levels in the Merrimack river that approached the 0.1 mg/l narrative limit as outlined in the EPA Gold Book and as outlined in the State's cultural eutrophication language in Env-Wq 1702.1 which is defined as, "*...the human-induced addition of wastes containing nutrients which results in excessive plant growth and/or decrease in dissolved oxygen*."

The data cited from the Merrimack River Study sampling on July 27, 2010 does show an increase of plant growth in the form of chlorophyll-a, but does not demonstrate a corresponding decrease in dissolved oxygen. The study data for that day indicates there were no corresponding dissolved oxygen levels below 5.0 mg/l or saturation levels below 75%. Therefore, because decreased dissolved oxygen with the excessive plant growth, or just conditions of decreased oxygen were not met, Env-Wq 1702.15 was not violated. On page 13 of 52, paragraph four, the permit cites the median upstream samples as 20.26 and 28.45 ug/l for phosphorus. The projected "Reasonable Potential" calculation is 310 ug/l, another indicator is not impaired.

The City recommends that similar to aluminum, and as with our ongoing lead and copper, that we initiate a clean sampling phosphorus program to ensure our decision making is based on sound science. The City is currently constructing a $22.4 million aeration upgrade that is designed for phosphorus removal. This upgrade will be completed at the end of 2015. This significant investment demonstrates that the City is moving forward with EPA and NHDES to address nutrient concerns and protect Merrimack River water quality. We want to ensure that our continued investments are based on sound science to maximize our investment in the City's

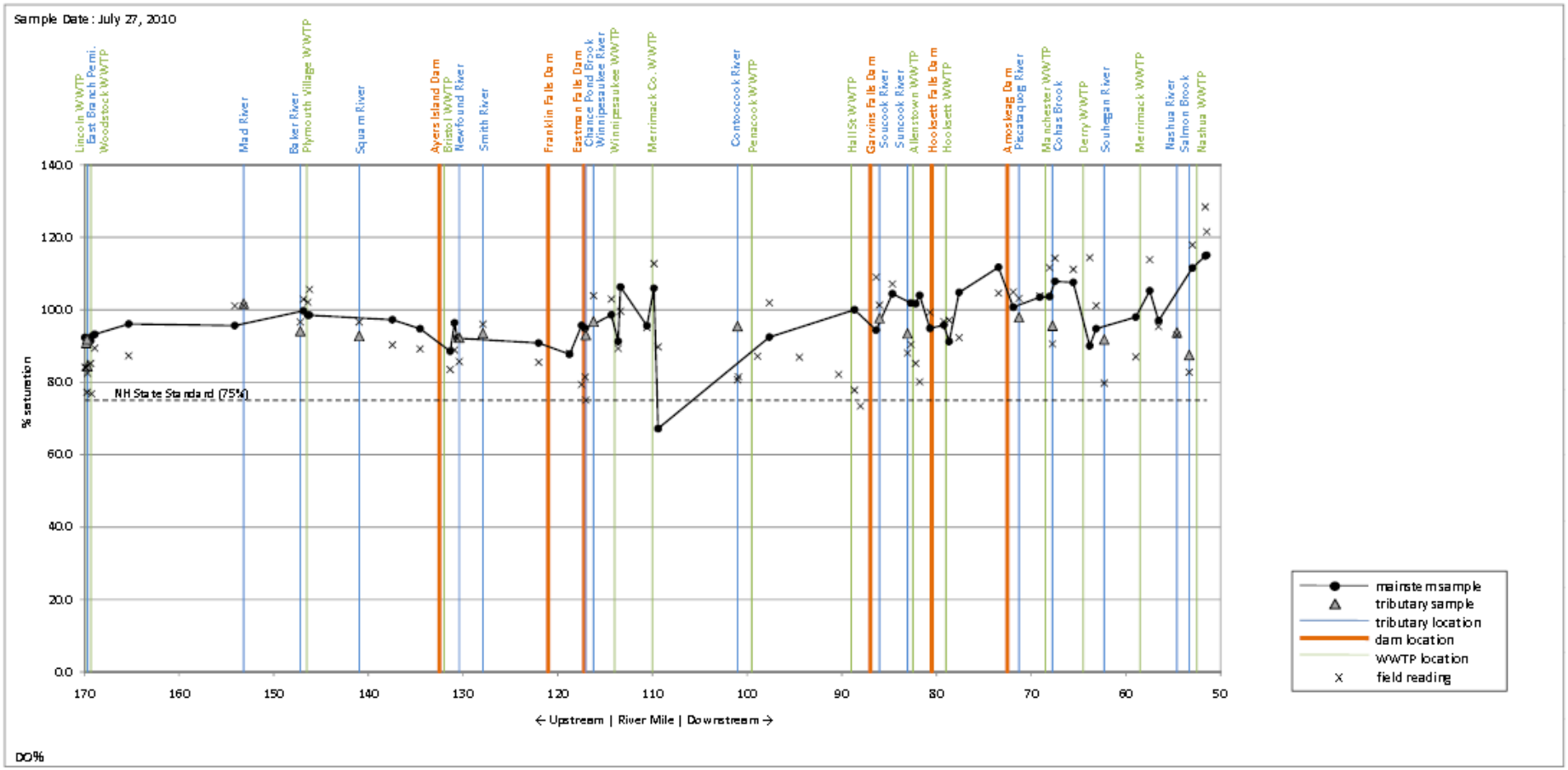
environmental infrastructure. Therefore, working with NHDES, we request a one-year phosphorus sampling program.

EPA's Response 2:

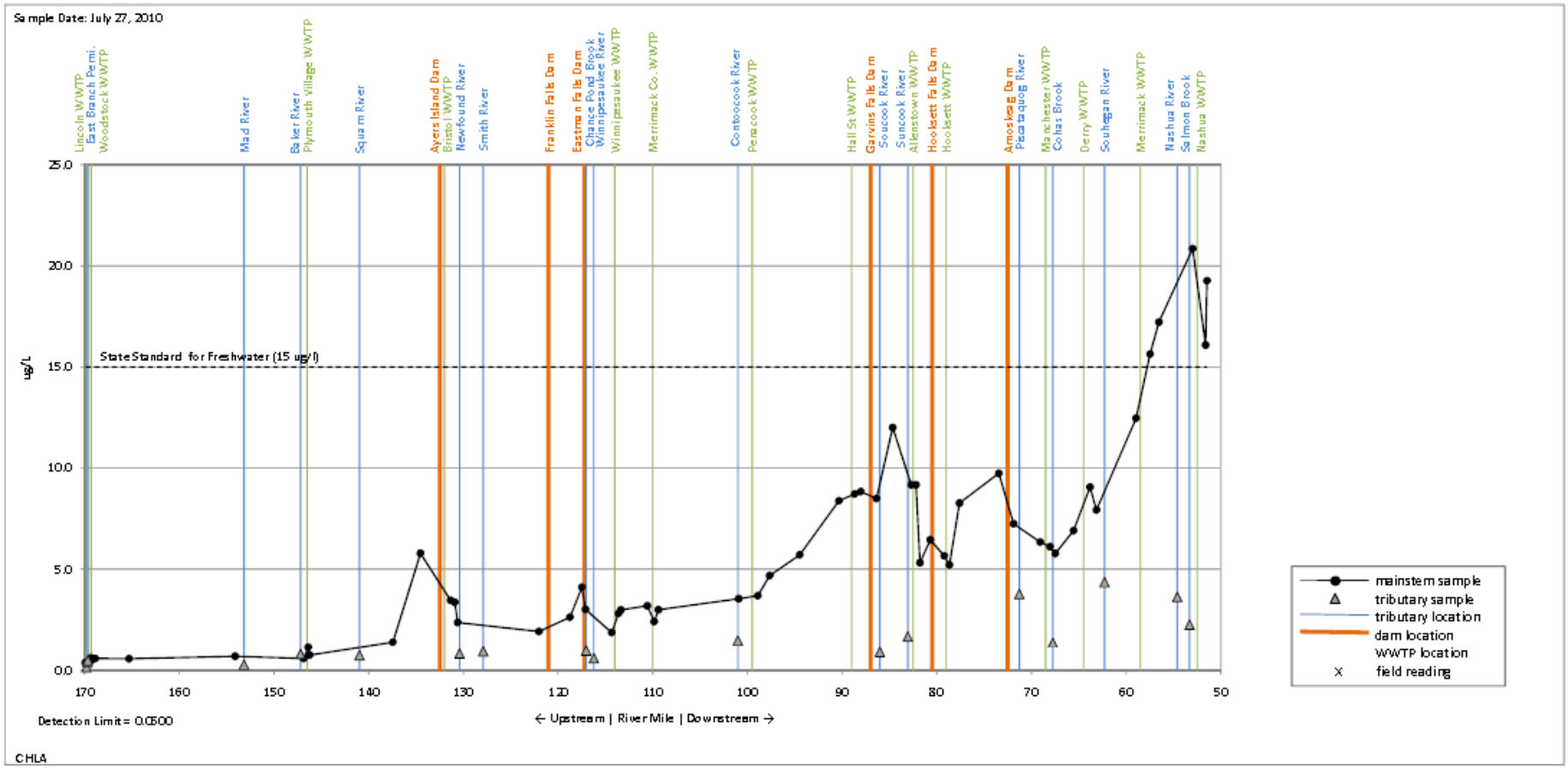
As referred to in the comment above, the New Hampshire Surface Water Quality Regulations (NHSWQR) state in Env-Wq 1702.15 that cultural eutrophication is defined as "*…the human-induced addition of wastes containing nutrients to surface waters which results in excessive plant growth and/or a decrease in dissolved oxygen.*" Contrary to the commenter's interpretation, this definition does not require both excessive plant growth *and* decreased dissolved oxygen in order for cultural eutrophication to be considered present. Rather, EPA's interpretation of the NHSWQR is that excessive plant growth (chlorophyll-a) *or* a decrease in dissolved oxygen are sufficient indicators of eutrophication in supporting the reasonable potential analysis for phosphorus. Having said that, in addition to the clear evidence of excessive plant growth downstream of Manchester's discharge, EPA does also have concern regarding dissolved oxygen levels in the receiving water. In fact, page 14 of the Fact Sheet mentions that DO saturation is impaired in the segment of the Merrimack River receiving Manchester's discharge (segment NHRIV700060803-14-02 in the State of New Hampshire's 2012 *Final List of Threatened or Impaired Waters That Require a TMDL*). However, it should be noted that the phosphorus limit is based on reasonable potential to cause or contribute to a water quality violation, not the presence of an instream violation. In this case, the evidence of instream eutrophication is simply used to support the finding that there is reasonable potential for such an exceedance.

EPA also notes that in many cases low DO may not be the best indicator of eutrophication. Depending on the time of day and water depth during sampling, a better indicator may be DO supersaturation and increased levels of chlorophyll-a. Based upon the diurnal cycle of algae these indicators represent evidence of algal growth (typically occurring during the day near the water surface), whereas low DO saturation represents evidence of cellular respiration and algal decay (typically occurring during the night near the river bottom). In this case, although there was only a single measurement below the 75% DO saturation criterion on July 27, 2010, a review of the data report from the July 2010 sampling event does indicate significant DO supersaturation (>100%, as high as 115.1%) just downstream of the Manchester discharge as well as DO supersaturation (>100%, as high as 131.3%) and increased levels of chlorophyll-a (>15 ug/l, as high as 20.85 ug/l) farther downstream in the vicinities of the Merrimack WWTF and the Nashua WWTF. The figures below from the *Upper Merrimack and Pemigewasset River Study Monitoring Data Report* (December 2012) illustrate the levels of DO saturation and chlorophyll-a along the Merrimack River on July 27, 2010. Both DO saturation and chlorophyll-a levels increase appreciably downstream of the Manchester WWTF discharge (located at approximately river mile 68), which further suggests eutrophic effects are present and the current discharge of phosphorus from the Manchester WWTF has the reasonable potential to cause or contribute to these effects. Hence, the permit contains a monthly average total phosphorus limit of 236 lb/d, applicable from April 1 through October 31.

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



Mainstem, Tributary, and WWTP Effluent Samples
Chlorophyll-a



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

Finally, the City requested that a clean sampling program be initiated for phosphorus similar to what was done for aluminum in the previous permit reissuance. EPA and NHDES welcome the collection of additional clean samples and would be happy to work with the City of Manchester to review any such data in the future and reevaluate the need for a phosphorus limit at that time. However, at this time, EPA recognizes that the ambient data used in the reasonable potential analysis was collected using appropriate sampling techniques. Additionally, it should be noted that even if the upstream phosphorus data were assumed to be zero, the effluent phosphorus alone would have resulted in a downstream phosphorus concentration of 0.32 mg/l (95^{th} percentile of effluent divided by dilution factor = 3.74 mg/l / 11.82), far above the Gold Book value of 0.1 mg/l. Hence, EPA places great confidence in the present reasonable potential determination and need for a phosphorus permit limit. EPA is pleased that the City is moving forward with an upgrade to the POTW designed for phosphorus removal and would be happy to work with the City in the implementation of that upgrade to ensure it adequately protects the designated uses of the Merrimack River based upon sound science.

Comment 3:

NPDES Permit, Page 13 of 24, Section 5-c

Manchester respectfully requests to keep the sludge testing schedule as currently permitted at three-times per year.

The current permit requires three samples per year as did the previous permits. Manchester has never come close to the maximum allowable sludge concentrations are typically 99% less than the allowable concentrations confirming that the sludge is relatively metals free before incineration.

EPA's Response 3:

EPA agrees that based on the consistent historical compliance of the sludge testing there is no reason to increase the monitoring frequency in this permit reissuance. Hence, section I.F.5.c of the final permit has been adjusted to three times per year.

Comment 4:

NPDES Permit, Page 9 of 24, Section E-1-b

The City respectfully requests 180 days for the evaluation of the local limits.

The new $22.4 million aeration upgrade will go on line at the end of 2015. It will take some time to develop accurate phosphorus uptake data to determine our local limits.

EPA's Response 4:

Based on the imminent upgrade to the WWTF, EPA agrees that an increase to 180 days for the evaluation of the local limits is appropriate. Hence, section I.E.1.b of the permit has been updated accordingly.

Comment 5:

NPDES Permit, Page 23 of 24, Section J-4

The City respectfully requests a listing be included in the NPDES permit of all systems located 20 miles downstream with contact information as presented in Section I-9 of the draft permit.

EPA's Response 5:

EPA believes that the only drinking water system currently drawing water from the receiving water within 20 miles of the point of Manchester's discharge is the Pennichuck Water Treatment Plant. The relevant notification requirements and contact information for this facility can be found in Section I.I.9 of the final permit.