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NOTE: Attachment 1 (Draft Permit), 3 (Final Permit) and 5 (City of Nashua Comments) are available as separate downloads.

April 13, 2015

VIA EAB eFILING SYSTEM

Ms. Eurika Durr
Clerk of the Board
U.S. Environmental Protection Agency
Environmental Appeals Board
1200 Pennsylvania Avenue, N.W.
Mail Code 1103M
Washington, DC 20460-0001

Re: City of Nashua-Wastewater Treatment Facility
Petition for Review of NPDES Permit No. NH0100170

Dear Ms. Durr:

Attached please find for filing, the City of Nashua's Petition for Review of NPDES Permit No. NH0100170 issued to the Nashua Wastewater Treatment Facility. The Environmental Protection Agency, Region 1, issued this permit on March 10, 2015. It was received by certified mail on March 12, 2015, therefore, the appeal deadline, pursuant to 40 C.F.R. § 124.20(c), is April 13, 2015.

The petition has been prepared in compliance with the formatting and length requirements contained in the Environmental Appeals Board's Practice Manual.

Thank you for your assistance with this filing.

Very truly yours,

Sherry Young

Sherilyn Burnett Young

cc: Samir Bukhari, Assistant Regional Counsel, Environmental Protection Agency, Region I
Lisa Fauteux, Director of Public Works, City of Nashua

BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C.

In re:	)	
City of Nashua, Division of Public Works	)	NPDES Appeal No. 15-_____
NPDES Permit No. NH0100170	)	

PETITION FOR REVIEW OF CITY OF NASHUA WASTEWATER TREATMENT FACILITY NPDES PERMIT ISSUED BY REGION 1

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April 13, 2015

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I. INTRODUCTION

Pursuant to 40 C.F.R §124.19(a), the City of Nashua, New Hampshire (the "City" or "Nashua"), through its undersigned representatives, respectfully submits this Petition for Review ("Petition") of the National Pollutant Discharge Elimination System ("NPDES") Permit No. NH0100170 (the "Permit,") dated March 10, 2015, issued by the Environmental Protection Agency ("EPA"), Region 1 ("Region"). See, Attachment 3, 2015 Permit.

As more fully noted in the Issues Presented and Argument sections below, certain conditions and effluent limits set forth in the Permit are based on one or more findings of fact or conclusions of law which are clearly erroneous, involve an abuse of discretion, or implicate important policy considerations. The Permit imposes new conditions and limits that are overly burdensome, not required by law, exceed the Region's authority, or are based on clearly erroneous findings of fact or conclusions of law, or both. Additionally, several of the Region's responses in the record fail to meaningfully acknowledge or address significant comments and concerns raised by the Petitioner, as required by 40 C.F.R. § 124.17(a)(2). *In re San Jacinto River Authority,* 14 E.A.D. 688, 92 (EAB 2010); and *In re Wash. Aqueduct Water Supply Sys.,* 11 E.A.D. 565, 585-86 (EAB 2004). The Region also failed to provide the Petitioner with fair notice of its new compliance obligations in certain material respects. *D.C. Water and Sewer Auth.* at *112-114, citing *In re Indeck-Elwood, LLC*, PSD Appeal No. 03-04, slip op. at 28-29 (EAB, Sept. 27, 2006); *In re Amoco Oil Co.*, 4 E.A.D. 954, 981 (EAB 1993); *In re GSX Servs. of S.C., Inc.*, 4 E.A.D. 451, 467 (EAB 1992). Thus, the City of Nashua is compelled to contest the Permit and its various conditions and limits and respectfully requests the Environmental Appeals Board ("EAB") to grant review of this petition.

II. THRESHOLD PROCEDURAL REQUIREMENTS

Petitioner satisfies the threshold requirements for filing a petition for review under 40 C.F.R. part 124, to wit:

A. Petitioner has standing to petition for review because it submitted comments on the draft permit transmitted to the Petitioner. *See* 40 C.F.R. § 124.19(a). See Attachment 5, November 18, 2013 letter from City of Nashua to Mr. Ken Moraff of Region 1.

B. The issues raised by the Petitioner in its petition were all raised during the public comment period as noted in citations below. Therefore, they were preserved for review. The City of Manchester also submitted comments on the draft permit. See Attachment 6. November 14, 2013 letter from City of Manchester to Mr. Ken Moraff of Region 1. Also, certain other arguments are included below that could not have been reasonably ascertained at the time the Petitioner submitted comments on the Draft Permit because the issues were first raised by the Region in the Response to Comments (Attachment 4), or because additional information supporting the City's position has been developed since then.

C. The Petition is timely filed. 40 C.F.R. § 124.19(a) and 20. The notice of the issuance of the Final Permit (Permit) is dated March 10, 2015. The Petitioner received actual notice of the Permit on March 12, 2015. The thirtieth day after the day following receipt of the notice, April 12, 2015, falls on a weekend and thus this Petition is filed on the first working day after the 30-day deadline, April 13, 2015. The Petition for Review complies with the Board's Practice Manual.

III. FACTUAL AND STATUTORY BACKGROUND

The Petitioner operates a wastewater treatment facility in Nashua, New Hampshire known as the Nashua Wastewater Treatment Facility (NWTF), which is subject to regulation

under the Clean Water Act. The NWTF provides full secondary treatment to an average design flow of 16 million gallons per day (MGD) and a peak flow of 32 MGD, although its average daily flow is 11 MGD. The facility also receives 375,000 gallons of septage each year.

The NWTF discharges treated effluent to the Merrimack River through Outfall-001. During wet weather events, the NWTF provides treatment for up to 50 MGD. With the addition of other facilities described below, the NWTF can treat up to 110 MGD.

Nashua has nine CSOs. Four of the CSOs discharge to the Nashua River (CSOs 006-009) and five of the CSOs discharge to the Merrimack River (CSOs 002-005 and 014). In 1999, the City was under an administrative order from the Region to separate its sewer and stormwater by 2019. The City of Nashua estimated separating the remaining combined sewer-stormwater mains would cost $250 million. In lieu of a complete separation program, the Region approved Nashua's pursuit of a wet weather pollution control program. Pursuant to that program, between 1999 and 2006, the City of Nashua spent approximately $24.1 million and separated 8.97 miles of sewers. Approximately 75% of its sewers are now separated from the stormwater collection system. In a 2005 Consent Decree with the Region, amended in 2009, the City of Nashua committed to constructing a number of wet weather flow projects to reduce and eliminate overflows and divert stormwater to either storage or treatment. The EPA-approved projects completed to date total $69.2 million and include:

1. $32.38 million high-rate Wet Weather Flow Treatment Facility;
2. $19.78 million Screening and Disinfection Facility;
3. $5.76 million 40,000 gallon Storage Facility at CSO-004 and pipe lining; and
4. $5.08 million for Sewer Separation.

The high-rate WWFTF is designed to eliminate untreated overflows from CSO-003 and CSO-004 and bring wet weather discharges from these CSOs into compliance with the requirements of state and federal water quality standards. The WWFTF is located adjacent to the

NWTF. It is capable of handling up to 60 MGD of wet weather flows (stormwater and wastewater). It is this facility that increases NWTF's capacity to 110 MGD. Pursuant to the High Flow Management Plan, when flow rates exceed 50 MGD, NWTF staff lower the main influent gate at the NWTF, diverting flows to the WWFTF. The WWFTF treatment uses the Actiflo system of treatment. The effluent from the WWFTF is blended with the secondary effluent at the chlorine contact chamber at the NWTF. The flow then discharges at Outfall-001.

The Screening and Disinfection Facility (SDF) is located approximately 1.25 miles from the NWTF. The SDF is designed to eliminate untreated overflows from CSO-005 and CSO-006 (now combined and referred to as CSO-014). The SDF meets the Nine Minimum Controls (NMC) guidance and was designed in accordance with the City's Consent Order requirements for the treatment of E.coli bacteria. It is capable of screening and disinfecting 91 MGD of peak combined sewage flow and has an internal storage capacity of one million gallons. During a storm event, combined sewage enters the facility where it is screened from floatables material entering the facility. Sodium Hypochlorite is then added to the influent flow for disinfection purposes. Up to 1 million gallons of combined sewage flow can be accumulated (stored) within the facility before an overflow discharge will occur to the Merrimack River via the facility's outfall pipe CSO-014. Should the facility exceed its storage capacity of 1 million gallons and overflow to the Merrimack River, the flow is first treated with Sodium Bisulfite to remove the chlorine residual prior to treated overflows entering the River. Following a wet weather event, the remaining storage contents of the SDF (up to 1 million gallons) is returned to the NWTF for treatment. Because of the high stored volume of the SDF, the dilute flow can adversely affect the NWTF's 85% removal requirement of TSS and BOD for longer than 24 hours after a wet weather event.

The City has a Long Term Control Plan (LTCP), High Flow Management Plan, Post Construction Monitoring Plan, Long-Term Preventative Maintenance Program, to manage stormwater, minimize adverse impacts of stormwater flows on the NWTF, and eliminate overflows. Over the next six years, the City of Nashua intends to spend up to another $30 million on additional capital improvements: separate additional sewers and stormwater collection systems, upgrade aging aeration blowers, tanks, grit systems, clarifiers, and dewatering equipment. In addition to facility and system improvements, the City also invests in green infrastructure projects such as: rain gardens, stormwater treatment units, drainage swales, and the use of porous pavement. It also has enacted stormwater ordinances to reduce stormwater entering the collection system.

The City's current sewer rate is $27.77 per quarter for .0625-inch service plus $9.26 per month. The rate increased by 10% in 2011 and 10% in 2013, and is expected to increase by 10 percent in 2015, 10% in 2016, 10% in 2017, 5% in 2018, and 5% in 2019.

The City's last NPDES permit was issued May 31, 2000, expired on May 31, 2005, and was administratively continued by the Region during its review of the City's Permit renewal application. On July 23, 2013, the Region publicly noticed the Draft Permit (Attachment 1) and solicited public comments from July 23, 2013 through November 18, 2013. The City of Nashua filed comments dated November 18, 2013 (Attachment 5). The City of Manchester filed comments dated November 14, 2013 (Attachment 6). The Region responded to all comments on March 10, 2015 (Attachment 4) and issued the Permit (Attachment 3). The Region also included a copy of the State of New Hampshire Department of Environmental Services' (NHDES) Section 401 Water Quality Certification which had been issued to the Region on January 22,

2015 for the draft permit. The NHDES has not yet adopted the final Permit pursuant to NH RSA 485-A:13.

IV. ARGUMENT

A. Standard of Review

Pursuant to 40 C.F.R. §124.19(a), the Board should grant review of the Region's decision on an NPDES Permit when the Petitioner establishes that the permit conditions in question are: 1) based on a clearly erroneous finding of fact or conclusion of law, or 2) involves an exercise of discretion on important policy considerations that the Board determines warrants review.

To the extent that the permit conditions in question are water quality-based requirements, the Region must satisfy the requirement that the discharge from the NWTF "will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard." 40 C.F.R. §124.44(d)(i).

B. The Region's 7Q10 Derivation and Dilution Factor Calculations are Clearly Erroneous and Involve an Arbitrary Exercise of Discretion on Important Policy Considerations

Please see, Derivation of 7Q10, Comment B.1 (pages 3-4 of 80)

1. Derivation of the 7Q10

EPA's approach to calculating the 7Q10 flow for the Merrimack River at the NWTF's Outfall 001 is contrary to the methodology recommended in EPA's Guidance Document entitled "Technical Guidance Manual for Performing Wasteload Allocations, Book VI: Design Conditions[1]," (EPA 7Q10 Guidance). As applied in this case, the result is neither reliable nor accurate. The more appropriate method of calculating flow is that as recommended in the EPA 7Q10 Guidance Document, which recommends using the Log-Pearson Type III methodology for determining hydrologically-based low flows, a method that is widely used and supported by

[1] *See* Technical Guidance Manual for Performing Wasteload Allocations, Book VI: Design Conditions – Chapter 1: Stream Design Flow for Steady-State Modeling EPA440/4/86-014 1986, page 2-2.

USGS[2]. Simply put, the Log-Pearson Type III methodology uses the flow as recorded in nearby stream gages, factors in the watershed flow at the gaging area, and then applies that flow calculation to the ungaged area of the river [in this case, at Outfall 001] and adjusts flow based on the comparative ratio of watershed flow at the Outfall 001 area. EPA (or NHDES) used a hybrid approach that partially relied upon the Log-Pearson Type III methodology where gaged flow data was available, and then unnecessarily and erroneously merged its calculations with the Dingman methodology. *See* **Response to Comments, Response B.1 at Page 4 of 8:**

> "As described in the Fact Sheet, in areas where gaging data *was* available, the 7Q10 flows at the USGS gaging station sites were calculated using Log-Pearson Type III statistics, not the S.L. Dingman Method. In areas where gaging station data *was not* available (and no data exist), the S.L. Dingman Method was used to calculate the 7Q10 in the Merrimack River, as there was no data to which statistics like the Pearson Fit Method could be applied..."

The Dingman equation[3] is used only for ungaged portions of a watershed, and does *not* combine gaged and ungaged flow data, adding and subtracting flows, to calculate low flow in streams. The USGS published a 2003 study[4] on regression equations to estimate low flow frequency statistics in New Hampshire. This study is based in part on the study conducted by Dingman. Both studies caution on using these equations on areas where watershed parameters are outside the ranges of those used to develop the equations and also cautioned that the areas studied were unregulated streams.

Furthermore, the EPA/NHDES combined methodology relied heavily on the stream gage flow value at the Merrimack River gaging station in Lowell, MA, which is the next gaging

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[2] USGS, "Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams," *Water-Resources Investigations Report* 02-4298, Pembroke, New Hampshire, (2003)
[3] S. Lawrence Dingman and Stephen Lawlor, "Estimating Low-Flow Quantiles from Drainage-Basin Characteristics in New Hampshire and Vermont", *Water Resources Bulletin*, American Water Resources Association, Vol 31, No. 2, April 1995.
[4] USGS, "Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams," *Water-Resources Investigations Report* , 02-4298, Pembroke, New Hampshire, 2003

station downstream from the NWTF. However, the results of the flow measurements at the Lowell gaging station are considerably affected by the impoundment dam located just upstream of the gaging station at Lowell. Low-flow statistics from a gage that is located within an impounded area of the stream can bias the calculation of upstream flows, since the gage data reflects dam discharge as opposed to the natural flow of the stream.

The EPA/NHDES' unconventional use of the combination of Log-Pearson Type III and S.L. Dingman approaches, together with the heavy reliance on the biased Lowell gaging station flow value, results in an inappropriate and inaccurate calculation of the 7Q10 at Outfall 001.

Nashua does not disagree that the facility design flow should be used in mass balance calculations. However, for the purpose of determining upstream 7Q10, it is more appropriate to use upstream gaging data in the Log Pearson Type III statistical analysis and then use the ratio of the area of the gaged watershed to the area of the watershed at Nashua. Additionally, the flow through the downstream gage is regulated by the Pawtucket Falls Dam. By using the Log Pearson Type III approach, there is no need to adjust the 7Q10 for the WWTF discharge since all of the analysis is based on gaged flow upstream from the WWTF.

The 7Q10 value for Merrimack below Manchester was used to determine the 7Q10 for Merrimack at Nashua using a watershed-specific correction for the drainage area ratio. The estimated drainage area at Nashua is 3999 sq-mi and the estimated drainage area at Manchester is 3092 sq-mi. The 2003 USGS study also states that the use of a drainage area ratio approach is the best approach when the ungaged site is on the same stream as a stream-gaging station. The relationship suggested by the USGS is:

$$Nashua_{7Q10} = Manchester_{7Q10} * (A_{Nashua}/A_{Manchester})^{n} \quad \text{[Equation 1]}$$

Where Ax is the drainage area and n is an exponent particular to the watershed in question, in this case, the Merrimack River. The exponent n was derived using flow records from the two gaged stations on the Merrimack River, Lowell and Manchester[5]. In order to eliminate any concern regarding effect of the WWTF on the downstream gage, only data through 1973 was used in equation 2 to derive the exponent. This is prior to the WWTF treating all of the Nashua flow being brought online in 1974.

$$Lowell_{7Q10} = Manchester_{7Q10} * (A_{Lowell}/A_{Manchester})^{n} \text{ [Equation 2]}$$

This yields a value of n=0.90325 which is used in equation 1 with the 7Q10 below Manchester to determine the 7Q10 at Nashua (as shown in Table 1). The analysis used to derive the 7Q10 is shown in Attachment 7.

Table 1

Location	Calendar Year (cfs)
Merrimack River near Goff's Falls below Manchester 01094000 (1942-2012)	650
Merrimack River upstream of Nashua WWTF	820

Based on the fact that the EPA/NHDES methodology used for calculating the 7Q10 flow resulted in an unreliable and erroneous figure, the more appropriate figure for the upstream critical low flow of **820 cfs** should be used in the dilution factor determination and *all* mass-balanced based effluent limit determinations applicable to the Nashua Permit.

2. **Dilution Factor for Water Quality-Based Effluent Limitations (WQBELs)**
Please refer to Comments B.1 (pages 3-4 of 80), B.4 (pages 6-10 of 80), B.5 (pages 10-15 of 80), B.23 (page 29 of 80), and C.2 (pages 35-39 of 80)

[5] Nashua recognizes that using the gage data at Lowell to derive the watershed exponent introduces some bias. However, mathematically, the effect of the bias is limited.

In the Fact Sheet that accompanied the Draft Permit, EPA uses two different formulas to calculate dilution factors in Attachment B and Attachment I. (*See* Attachment 2). The dilution factor calculation method set forth in Attachment I more clearly follows the NPDES Permit Writers' Manual[6] and should be used for Permit calculations. Accordingly, Nashua used that method for both Attachment B and Attachment I calculations. The resulting calculations using the corrected upstream 7Q10 of 820 CFS, set forth in Attachment 7, are shown below:

Dilution Factor = {((820 cfs x 0.646)+16 mgd) / 16 mgd} x 0.9 = 30.70 [compared with 28.5 as shown in Attachment B to EPA's Fact Sheet]
Dilution Factor = {(820 cfs +141 cfs) / 141 cfs} x 0.9 = 6.13 [compared with 5.747 as shown in Attachment I to EPA's Fact Sheet]

Nashua's revised dilution factor calculations have an impact on a number of limits that were developed during the 2015 NPDES permitting process. Corrections to WQBELs are required in order to appropriately apply the 7Q10/dilution factor throughout the Permit. These will be discussed in detail in the following sections of this Petition that address specific parameters, including: Acute and Chronic TRC Limits at Outfalls 001 and 014, Total Phosphorus, Total Recoverable Copper, and Total Recoverable Lead.

C. **EPA's imposition of a Total Phosphorus (TP) seasonal effluent limit of 0.80 mg/l is clearly erroneous and an abuse of discretion**
Please refer to Comment B.4 (pages 6-10 of 80) and Comments C.1-7 (pages 34 to 43)

The City of Nashua challenges EPA's imposition of a total phosphorus effluent discharge limit of 0.80 mg/l on a seasonal basis from April 1 through October 31, including EPA's calculations of stream flow conditions under which the total phosphorus levels are measured, its calculation of an effluent limitation based on three data points – one of which is almost 8 years

[6] National Pollutant Discharge Elimination System (NPDES) Permit Writers' Manual, pages 6-23 through 6-29, EPA-833-K-10-001, September 2010.

old and no longer reflective of the upstream phosphorus levels in the Merrimack River, and related arguments.

1. The Phosphorus sampling results used by EPA in the calculation to determine the Total Phosphorus (TP) effluent limit were arbitrary and contrary to NHDES and EPA policy

In its Draft Permit, EPA used only two upstream phosphorus samples taken on 10/5/2007 (110 µg/l) and 7/27/2010 (36 µg/l) to calculate the phosphorus levels in the Merrimack River upstream from Outfall 001, and to derive a phosphorus effluent limit of 0.60 mg/l for Nashua. *See* Fact Sheet pp. 22-24, Attachment 2. In its Response to Comments, EPA recalculated its phosphorus effluent limit to 0.80 mg/l by including a third sampling result taken upstream on 9/21/2010 (67 µg/l). *See* Response to Comments pp. 36-39. The addition of one data sampling point to the equation resulted in a significant change in the effluent limitation. If one were to recalculate the same equation used by EPA with only the two most recent 2010 sampling data points of 36 µg/l and 67 µg/l, the phosphorus effluent limit would higher still.

Nashua would argue that if two data points are sufficient for EPA to use in calculating the phosphorus effluent limit, then the 2010 sampling points should be used as being more representative of current conditions, and not the 2007 data point that is 8 years old as of the date of the Permit. The NHDES 2010 CALM uses data within a five-year time period to ensure that impairment listings are based on data reflecting current conditions in the waterbody. Indeed, EPA itself has argued that using the "most currently available data... is logical and rational" in light of the need to assure compliance with water quality standards[7].

[7] *See* Order of Environmental Appeals Board, *In re: Town of Concord (MA) Department of Public Works*, NPDES Appeal No. 13-08 at 14.

There is actually more recent upstream phosphorus sampling results as shown in the table below that should also be considered in any calculation of the phosphorous limit given it is the most recent data available.

Total Phosphorus, ug/l		
Station #	Location	date
		5/17/2012
M070	u/s nashua wwtf	30.00
M170	u/s nashua wwtf	2
M270	u/s nashua wwtf	24
M370	u/s nashua wwtf	2

As set forth in Attachment 8, using the three current sampling data results (two from 2010 and one from 2012), and applying the corrected 7Q10 flow as discussed in Section B, above, **the revised phosphorus limit for Nashua is 2.2 mg/l.**

2. It is Arbitrary and Capricious and a Violation of Equal Protection for the Region to Set a Phosphorus Limit as a Numeric Limit When other Municipalities have received a Load-Based Limit

The phosphorus limits for other municipalities on the Merrimack River were set as load-based limits in recent years:

a. City of Concord, NPDES Permit No. NH0100901, Sept. 2, 2011 = 199 lb/day.

b. Town of Merrimack, NPDES Permit No. NH0100161, Mar. 20, 2014 = 164.8 lb/day.

c. City of Manchester, NPDES Permit No. NH0100447, Feb. 11, 2015 = 236 lb/day.

"As a general matter, an agency cannot treat similarly situated entities differently unless it 'support[s] th[e] disparate treatment with a reasoned explanation and substantial evidence in the record.'" *Lilliputian Sys. v. Pipeline & Hazardous Materials Safety Admin.*, 741 F.3d 1309, 1313 (D.C. Cir. 2014) (quoting *Burlington N. & Santa Fe Ry. Co. v. Surface Transp. Bd.*, 403 F.3d 771, 777, 365 U.S. App. D.C. 287 (D.C. Cir. 2005) (alterations in original)). *See* also *Plyler v. Doe*, 457 U.S. 202, 216 (1982) (equal protection clause requires "all persons similarly

circumstanced shall be treated alike."). EPA has not offered any "reasoned explanation" for why Nashua would be treated differently from the other enumerated communities, and therefore, the Nashua phosphorus permit limit should be set as a lb/day limit, in this case - 277 lb/day, monthly average.

3. Any Phosphorus Limit Set by EPA Should be Subject to a Schedule of Compliance

The Nashua WWTF is not designed for phosphorus removal and has only limited phosphorus data. A significant amount of phosphorus data collected through the critical period is necessary to determine what level of TP reduction is routinely achieved by the WWTF. Following data collection, an assessment of the plant's potential capacity to remove phosphorus must be conducted along with process modeling to determine what operational/capital upgrades are needed to achieve required reduction. Once those upgrades have been identified, the plant improvements must be designed and constructed. The time period necessary for the implementation of any phosphorus removal capability will extend well beyond the effective date of this permit.

4. EPA's failure to account for the existing phosphorus load reductions from upstream communities in determining NWTF's "reasonable potential" to cause or contribute to an instream excursion is Clearly Erroneous and Contrary to Law
Please Refer to Response to Comments C:1-7 (pages 34-43 of 80)

40 CFR 122.44(d)(1)(ii) 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, ...

As the City of Manchester noted in its comments (Attachment 6, pp 2-4) the communities of Concord, Manchester and Merrimack, New Hampshire have all received permits with

stringent phosphorus limits. Each have, or are in the process of, significantly reducing the phosphorus effluent levels, which has and will continue to have a beneficial impact on the overall phosphorus levels upstream of the NWTF.

In its Response to Comments C.4-7 (pp. 40-43), EPA acknowledged the phosphorus load reductions of Merrimack and Manchester, yet ultimately failed to consider the actual impacts to the Merrimack River from these limitations, contrary to the clear mandate to do so set forth in 40 CFR 122.44(d)(1)(ii). For example, as discussed in Section C. 1, above, EPA is using a 2007 phosphorus sampling data point (110µg/l) as support for concluding that NWTF's effluent discharge has a reasonable potential to cause impairment in the Merrimack River. This 2007 sampling data point does not represent current conditions in the Merrimack and should not be considered in any "reasonable potential" analysis. In addition, EPA also failed to take into consideration the changes in the New Hampshire MS4 permits for these same communities that will result in considerable non-point source loading of phosphorus to the Merrimack River.

At the very least, EPA's failure to consider the improved phosphorus loads upstream in the River and their impact on water quality argues for a compliance schedule that allows Nashua the opportunity to take additional phosphorus samples to determine current conditions.

5. EPA's application of the Gold Book standard as a water quality criteria for phosphorus is Clearly Erroneous and Contrary to Law (Please refer to Fact Sheet (pages 19-26 of 36)

New Hampshire does not have a numeric criteria for phosphorus, and instead uses a narrative criterion requiring that phosphorus contained in an effluent shall not impair a water body's designated uses.[8] In the absence of numeric criteria for phosphorus, EPA applied USEPA's Quality Criteria for Water 1986 (Gold Book). The Gold Book recommends a 0.10

[8] (Env-Wq 1703.14(b) provides that "Class B waters shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring.")

mg/L criterion for phosphorus for any stream not discharging directly into lakes or impoundments.

The Gold Book discusses the need to regulate phosphorus for eutrophication in some situations but specifically states that "a total phosphorus criterion to control nuisance aquatic growths is not presented." Therefore, EPA's position that the Gold Book created nutrient criteria that should be presumed applicable in this instance, in accordance with 40 CFR 122.44(d), is plainly in error. While the Gold Book suggests TP criteria of 0.10 mg/l may be appropriate for some streams, the Gold Book observes also that "there may be waterways wherein higher concentrations or loadings of total phosphorus do not produce eutrophy [...]". Such conditions are influenced by natural confounding factors such as "naturally occurring phenomena [which] may limit the development of plant nuisances", "natural silts or colors which reduce the penetration of sunlight needed for plant photosynthesis", "morphometric features of steep banks, great depth, and substantial flows [which] contribute to a history of no plant problems", and "nutrient[s] other than phosphorus [...] limiting plant growth". The Gold Book specifically indicates the need to consider such site-specific factors, not that such factors or lack of response be ignored in setting nutrient limitations for phosphorus. The phosphorus discussion ends with a reiteration that "no national criterion is presented for phosphate phosphorus for the control of eutrophication."

USEPA did not set specific stream eutrophication TP criteria in the Gold Book. The Gold Book only advises that the rationale contained within the phosphate phosphorus section "should be considered" in setting a TP criterion. Developing a TP criterion would require site-specific studies and data. The Region has undertaken no such site-specific studies in this

instance to demonstrate that NWTF's phosphorus discharges are the cause of cultural eutrification in the Merrimack River[9].

D. The Region's Calculations for Copper and Lead are Clearly Erroneous and Involve an Abuse of Discretion on Important Policy Considerations

Please refer to Comment B.5 (pages 10-15 of 80)

On pages 15 to 18 of the Fact Sheet to Draft Permit (Attachment 2), the EPA calculated the reasonable potential for metals to cause or contribute to an exceedance of water quality standards. Nashua applied the same approach as used by EPA for the "reasonable potential" calculations for copper and lead, with revised input to reflect the 7Q10 of 820 cfs (discussed in Section B, above) and more recent effluent data as shown in Attachment 9. The results (see Table 1, below), demonstrate that there is no reasonable potential for the discharge of lead to violate the instream standard. The monthly average lead limit should be removed from the Permit. In addition, the limit for copper should be revised to a monthly average limit of 2.57 mg/l.

The New Hampshire water quality criteria[10] for copper are expressed as a function of the water effect ratio (WER). Footnote d to Table 1703.1 states that the values displayed in Table 1703.1 correspond to a WER of 1.0 and that the site-specific WER for copper can be determined using the procedures outlined in "Streamlined Water-Effect Ratio procedure for Discharges of Copper" (EPA-822-R-01-005). Nashua is aware that application of a site-specific WER in other cases have demonstrated that the instream copper criteria is often much higher than the criteria given in Table 1703.1. As a result, reasonable potential analyses using the site-specific criteria often demonstrate that a higher limit, or no limit at all, is necessary for copper. Accordingly, Nashua requests a Compliance Schedule to allow time to implement a Water Effect Ratio study

[9] NH regulations also requires a demonstration of the impacts of the phosphorus discharge on the potential use impairment in the River. No such specific analyses was presented in this case.

[10] New Hampshire Code of Administrative Rules, Chapter Env-Wq 1700 Surface Water Quality Regulations

for copper in accordance with the above referenced guidance to determine what the actual instream criteria for copper are and subsequently, if any copper effluent limit is appropriate for the NWTF. Nashua requests that the current copper limit be held in abeyance until such time it takes to conduct the study. At that time, Nashua will conduct a reasonable potential analysis (RPA) and request that the Permit be revised in accordance with the RPA.

[See Table 1 on following page]

Table 1: Mass Balance Equations for Determining Reasonable Potential and Effluent Limitations

Metal	Qd	Cd	Qs	Cs	Qr	Cr	Criteria*0.9		Reasonable Potential	Limit (µg/L)	
	cfs	µg/L	cfs	µg/L	cfs	µg/L	Acute	Chronic	Y/N	Acute	Chronic
Aluminum		52.51		90		N/A	N/A	N/A	N/A	N/A	N/A
Cadmium		0.9		0		0.026	0.851	0.746	No	N/A	N/A
Chromium III		3.156		0		0.092	N/A	N/A	N/A	N/A	N/A
Copper		32.42		2		2.891	3.41	2.57	Yes (chronic)	N/A	21.39
Lead		2.59		0		0.076	12.58	0.49	No	N/A	N/A
Nickel		8.76		0		0.257	N/A	N/A	N/A	N/A	N/A
Zinc	24.75	125.54	820	6.35	844.75	9.842	33.31	33.31	No	N/A	N/A

Metal	Parameter				CF Acute	CF Chronic	Dissolved Criteria		Total Recoverable Criteria	
	m_a	b_a	m_c	b_c			Acute CMC (µg/L)	Chronic CCC (µg/L)	Acute CMC (µg/L)	Chronic CCC (µg/L)
Aluminum	---	---	---	---	---	---	---	---	750	87
Cadmium	1.128	-3.6867	0.7852	-2.715	1.002	0.967	0.95	0.80	0.95	0.83
Chromium III	0.819	3.7256	0.819	0.6848	0.316	0.86	183.07	23.81	579.32	27.69
Copper	0.9422	-1.7	0.8545	-1.702	0.96	0.96	3.64	2.74	3.79	2.85
Lead	1.273	-1.46	1.273	-4.705	0.993	0.993	13.88	0.54	13.98	0.54
Nickel	0.846	2.255	0.846	0.0584	0.998	0.997	144.92	16.10	145.21	16.14
Zinc	0.8473	0.884	0.8473	0.884	0.978	0.986	36.20	36.50	37.02	37.02

Merrimack River Hardness (mg/L) 25

E. **The Region's Calculations for Total Residual Chlorine Effluent Limitation is Clearly Erroneous and should be revised**
Please refer to Comment B.23 (page 29 of 80)[11]

On page 15 of the Fact Sheet (Attachment 2), the EPA calculated the Total Residual Chlorine effluent limits based on a dilution factor of 28.5. As discussed in Section B, above, that dilution factor is erroneous and should be revised to reflect the updated 7Q10 and resulting dilution factor as shown by the calculations below:

Total Residual Chlorine Effluent Limitations at Outfall 001

Acute TRC Limit = 19 µg/l x 30.70 = 583 µg/l (0.58 mg/l)
Chronic TRC Limit (Outfall 001) = 11 µg/l x 30.70 = 337 µg/l (0.34 mg/l)

Total Residual Chlorine (Screening and Disinfection Facility -SDF)

Nashua previously requested that the total residual chlorine limits for the SDF be determined using the 30Q10 to better reflect conditions when the facility would actually be discharging. However, as EPA pointed out, New Hampshire's Water Quality Standards require the use of 7Q10 for WQBELs. The TRC limits should be revised to reflect the updated 7Q10 and resulting dilution factor set forth in Section B, above, as shown by the calculations below:

Acute TRC Limit = 19 µg/l x 6.13 = 116 µg/l (0.12 mg/l)
Chronic TRC Limit (Outfall 001) = 11 µg/l x 6.13 = 67 µg/l (0.07 mg/l)

F. **The Requirements for Effluent Limitations Monitoring for BOD, TSS and pH Prior to the Effluent from the NWTF Combining with the Effluent from the WWFTF are Unlawful**
Please refer to Comment B.10, Response to Comments (p. 17 of 80).

In its comments, the City of Nashua requested the Region remove Footnote #3 in Part I.A.1 which sets effluent limitations and monitoring requirements for the treatment facility. See Permit at page 4 of 28. Footnote #3 requires the City to collect samples for BOD_5, TSS, and pH

[11] Nashua raises the Total Residual Chlorine calculation for Outfall 001 because, based on the revised dilution factor as determined in Section B, the EPA calculation in the Fact Sheet is erroneous and must be modified.

at a point within the internal secondary treatment processes. Permit at 4 of 28. There is no outfall at this point; rather, it is prior to blending with other effluent and well before Outfall 001. The Region has specified limits and monitoring frequency for samples collected at this internal location. If samples violate the limitations or if samples are not taken according to Part I.A.1 of the Permit, the Region will seek to enforce against the City of Nashua. It is long-standing that the Region does not have authority to impose such internal limitations and monitoring. See, *Am. Iron & Steel Inst. V. EPA,* 115 F.3d 979, 996 (D.C. Cir. 1997); *Iowa League of Cities v. EPA,* 711 F.3d 844, 877 (8th Cir. 2013).

Similar to the facts of *Iowa League,* the Region is applying effluent limitations to a facility's internal secondary treatment processes, rather than at the end of the pipe. *Id.* at 877. Footnote 3 states the sample "shall be taken at a location prior to the flow combining with the effluent from the [WWFTF]". Permit at 4 of 28. Pursuant to 33 U.S.C. § 1311(b)(1)(B), the Clean Water Act authorizes the EPA to set "effluent limitations based on secondary treatment." *Id.* Effluent limitations are restricted to regulations governing "discharges from point sources into navigable waters." *Id.*; 33 U.S.C. § 1362(11). The object of the limitations is the "discharges of pollutants from a point source." 33 U.S.C. § 112(a). "[D]ischarge of pollutant" means the "addition of any pollutant to navigable waters." 33 U.S.C. § 1362(12). Like *Iowa League of Cities,* the Region is attempting to apply effluent limitations to the discharge of flows from one internal treatment unit (NWTF sedimentation facility or chlorination facility) to another (blending with flow from Nashua's WWFTF). *Iowa* at 877. The Court concluded:

> "[w]e cannot reasonably conclude that [the Region] has the statutory authority to do so. *Iowa,* citing *Am. Iron & Steel Inst. V. EPA,* 115 F.3d 979, 996 (D.C. Cir. 1997) ('The statute is clear: The EPA may regulate the pollutant levels in a waste stream that is discharged directly into the navigable waters of the United State through a 'point source'; it is not authorized to regulate the pollutant levels in a facility's internal waste stream.')" *Iowa* at 877-878.

For these reasons, the Board should find that the Region's inclusion of effluent limitations and monitoring requirements on the NWTF's internal treatment processes is based on the Region's clearly erroneous conclusion of law or fact, or both.

G. The Regions' Imposition of Monthly Monitoring and Reporting for BOD_5 and TSS and Associated Footnotes in Internal Treatment Process Flows at the WWFTF and SDF are Clearly Erroneous and Arbitrary and Capricious

Please refer to Comments B.22, B.24, B.25, B.27, and B.28 (pages 27-31 of 80)

This section is a slightly different application of the *Iowa League of Cities* than in Section F. A brief background is important. In Comment B.22, the Region conceded that it erred in the Draft Permit in including a TSS effluent limitation of 30 mg/l. The Region removed the numeric effluent limitations in the Final Permit (presumably in light of *Iowa League*) but argued it had authority to require internal process monitoring, on a monthly basis, and reporting under Section 308 and 402 and denied the City's request to withdraw the monitoring from the Permit. See Response to Comment B.22. As explained below, the Region is mistaken in fact and law. The requirement to report monthly sampling results for BOD_5 and TSS at the WWFTF and SDF are also arbitrary and capricious.

In arguing it has authority to impose monitoring and reporting, the Region is imposing monitoring and reporting requirements as if the WWFTF is a bypass. See Response B.24, page 30 of 80. The Region is including flow monitoring "to better understand whether the WWFTF and bypass are operating" consistent with the LTCP. First, this argument is erroneous as a matter of fact. The LTCP only requires monitoring of E. coli, not BOD_5 or TSS. See LTCP at pages7-1 Water Quality Parameters. Second, the WWFTF is not a bypass and as such, the bypass rule is wholly inappropriate in this case. *Iowa League*, *supra,* at 858, 875-876. The City uses an ACTIFLO system, similar to the facts in *Iowa League*, to treat peak wet weather flows.

The WWFTF was required in the City's 2005 Consent Decree with the Region. Flows from the WWFTF are blended with effluent from the secondary treatment process at the chlorination facility before discharge at Outfall 001. Neither the WWFTF, nor the subsequent blending, is a bypass. Accordingly, the Region's reliance on bypass to support its imposition of monitoring requirements is erroneous as a matter of fact and law.

The Region's reliance on Section 308 is also inapposite. Section 308 is not ambiguous and warranting agency interpretation. Section 308 does not provide authority to identify what to monitor in the effluent. In simple terms, it merely addresses the 'how', 'when', 'where'; not the 'what'. The 'what' is addressed in the other sections that "carry out objective[s] of this chapter." 33 U.S.C. § 1318(a).

The Region's reliance on Section 402 still does not provide it with authority to set effluent limitations and monitoring requirements at points within the internal secondary treatment processes. Footnotes #1, #2, #3, #6, and #7 of Permit Part 1.B.5.a. of the Permit require the City to collect samples at the WWFTF for BOD_5 and TSS at a point within the internal secondary treatment processes (prior to the chlorine contact chamber). See Permit at 13-14 of 28. Footnotes #1, #2, #3, #4, #8, #9, and #10 of Permit Part 1.B.5.b. set effluent limitations and monitoring requirements for the SDF at points within the internal treatment process. See Permit at 15-17 of 28. The Region does not have authority to set these requirements for the WWFTF and SDF and the City objects to the inclusion of BOD, TSS, and associated footnotes in the Permit.

Section 402 authorizes the Region to "issue a permit for the discharge of any pollutant." 33 U.S.C. § 1342(a). "Effluent limitations" are defined as "any restriction established by a State or the [EPA] on quantities, rates, and concentrations of chemical, physical, biological, and other

constituents which are discharged from point sources into navigable waters." 33 U.S.C. § 1362(11) (emphasis added). "[A]ny restriction" encompasses both numerical and non-numerical effluent limitations. *Iowa League*, *supra*, at 866. Thus, effluent limitations contained in an NPDES permit, numeric or otherwise, pertain to discharges from point sources into navigable waters. The Region argues in its Response B.22 that "the [non-numeric] monitoring requirements in Part I.B.5.a. of the Draft Permit, which pertain to the WWFTF, are not effluent limitations." To argue that the effluent limitations are effluent limitations for Section 402 but not for Section 301 is a game of foolery that is, without question, clearly erroneous as a matter of law. Part I.B.5.a. of the City's Permit sets forth "Effluent Characteristic", "Effluent Limitation", and "Monitoring Requirement". BOD_5 and TSS are conventional pollutants traditionally monitored under the NPDES program and the Permit clearly sets forth BOD_5 and TSS under "Effluent Characteristic", "Effluent Limitation", and "Monitoring Requirement" on pages 13-16 of 28 for the WWFTF and SDF. This is not a situation of ambiguity where deference to an agency interpretation of the definition of effluent limitation is warranted. As discussed in Section E above, the Region only has authority to set effluent limitations on effluent discharges, that is, discharges from point sources to navigable waters. *Iowa League, supra,* at 877. Where the flow from the WWFTF and SDF do not discharge to a navigable water and are still part of the internal treatment processes of the NWTF, it is well-established that the Region does not have authority to set effluent limitations. *Am. Iron, supra* at 996; *Iowa League, supra* at 877.

Furthermore, the arbitrary and capricious nature of the Region's BOD_5 and TSS permit requirements is illustrated by the fact that the SDF, as approved by the Region under the 2005 and 2009 Consent Decree, is not designed for BOD_5 or TSS removal. Nor does the design of the WWFT or the SDF incorporate any ability to sample "influent and effluent concentrations" of

BOD_5 and TSS. The receiving waters are not impaired for dissolved oxygen or suspended solids and thus there is no water quality basis for the monitoring requirements.

Assuming arguendo that the Region had authority to impose effluent monitoring of the internal treatment process, the Region failed to provide the City with fair notice of the new compliance obligation in material respects such that it could have timely and cost-effectively factored monitoring into the design of the WWFTF and SDF. *D.C. Water and Sewer Auth.* at *112-114, citing *In re Indeck-Elwood, LLC*, PSD Appeal No. 03-04, slip op. at 28-29 (EAB, Sept. 27, 2006); *In re Amoco Oil Co.*, 4 E.A.D. 954, 981 (EAB 1993); *In re GSX Servs. of S.C., Inc.*, 4 E.A.D. 451, 467 (EAB 1992).

For the foregoing reasons, the Board should find that the Region's inclusion of effluent limitations and monitoring requirements on internal treatment processes associated with the WWFTF and SDF is based on the Region's clearly erroneous conclusion of law and fact.

H. <u>The Region's Definition of 'Event' for Sampling at the SDF is contrary to *AMm. Iron & Steel Inst.* and *Iowa League of Cities* and should be Modified as Proposed</u>
Please refer to Comments B.22, B.24, and B.25 at 27-31of 80.

The Region's monitoring frequency for the SDF in Part I.B.5.b. is triggered by an 'event', defined by the Region to be "anytime there is flow *into* the SDF". See footnote 3, Permit at 15-17 of 28. In order to be consistent with *Iowa League*, this definition needs to be revised to be "anytime there is flow *out of* the SDF". Otherwise, the Region runs afoul of imposing effluent limitations on internal treatment processes, which as discussed in Sections F and G, is beyond the Region's authority. The SDF is an un-manned, million-gallon storage facility that bleeds flows to the NWTF for full secondary treatment. Flows 'into' the SDF flow back to the NWTF. Thus, it is completely part of an internal treatment processes and beyond the Region's authority to impose effluent limitations. The only time there would be a flow subject to

the Region's authority is in the rare event that the SDF's million-gallon storage capacity is exceeded. Accordingly, it is arbitrary and capricious for the Region to not modify footnote 3 in Part I.B.1.5.b of the Permit and the Board should grant review.

I. <u>The Definition of Dry Weather is contrary to CSO policy and guidance and should be revised</u>
Please refer to Comments B.14 and 16, (pages 19-21 of 80)

In its Response to Comments B. 14 and 16, EPA changed the definition of dry weather:

> Dry weather is defined as any calendar day on which there is less than 0.1 inch of rainfall, no snow melt, **and 24 hours after a storm event** to allow the storm-flow flow to pass through the collection and treatment facilities.

Nashua maintains that this is still insufficient time to allow the flow to pass through the facilities, in the event of certain wet weather storms, particularly in light of the up to 1 million gallons of flow from the SDF to the NWTF after a significant storm event. The Permit condition should be revised to add the following language:

> Distinct rainfall events shall be defined as having at least a 10-hour window with no precipitation > 0.01" and storms exceeding the 2 year, 24-hour event shall be given an *additional* 24 hours to clear the system.

This Section I Discussion refers to the Permit conditions in Part I.A.4 and I.B.2.d

J. <u>Monitoring Requirements for TSS and BOD Should be Reduced</u>
Please refer to Comment B.3 (pages 5-6 of 80)

Consistent with the EPA's response to Comment B.3, the City hereby reserves its right to re-submit its request for a permit modification and request a reduction in the monitoring requirements for BOD_5 and TSS once additional data has been collected.

K. <u>Whole Effluent Toxicity Monitoring</u>
Please refer to Comment B.9 (pages 16-17 of 80)

The City hereby reserves the right to request a permit modification regarding monitoring requirements for ammonia, hardness, aluminum, cadmium, copper, lead, nickel, or zinc as part of EPA-approved WET testing once additional data has been collected.

L. Comment B.18 Part I.B.1.d. Additional Statement Unwarranted

The Long Term Monitoring Plan (LTMP) requirements are intended specifically to protect water quality. If the CSO discharge is in compliance with the LTMP and the Effluent Limitations, then the City is in compliance with water quality standards. The Region's additional statement: "The discharge shall not cause a violation of the water quality standards of the receiving stream" is not warranted and leaves the City and Region vulnerable to third-party lawsuits. The additional statement should be removed.

M. Collection System Operation and Maintenance Plan Deadline Needs Extension

Please refer to Comment B.30 and B.31 (pages 31-32 of 80)

In Part I.E.5, the Region imposed a requirement that the City develop a Collection System Operation and Maintenance Plan (O&M). The City has no such plan. Deadlines are set for 6 months for preliminary information and a final plan is due in 24 months, June 1, 2017. The City requests an extension to the plan completion deadline (24 months) in light of the fact that Nashua is currently soliciting proposals to select a new Enterprise Asset Management/Work Order System. It is upon this new platform that the required O&M Plan will be developed. The City requests an extension from 24 months to 36 months. The City will need the additional time to: 1) select, purchase, and install a new Asset Management System (12 months); 2) to properly migrate the current collection system data (6 to 12 months); 3) to learn how to properly use the new functionality of the software (6 months); 4) to plan, budget and properly staff the proposed program (6 months) in order to develop a reasonable, meaningful and realistic maintenance plan. Extending the deadline from 24 to 36 months will also better align with the requirement of Part I.E.4 (formerly Part I.D.4) that requires the submittal of a map of the sewer system within **30** months of the effective date of

the permit. This map is an integral part of the overall O&M plan and will be updated concurrent with the O&M plan.

N. Nine Minimum Controls Annual Reporting Requirements Need Modification

Please refer to Comment B.21 (page 25 of 80)

Part I.B.3 of the Permit sets forth Nine Minimum Controls annual reporting requirements. The City commented that some actions were unclear and the Region's response focused on whether the requirements were inconsistent with the CSO Control Policy. The City still believes certain of the requirements are unclear as follows. With respect to e(3), (4), (6) & (7) [sic-there is no e(5)]:

- Item e(3) seems to be misplaced in the annual reporting requirements. The analysis it requires seems more appropriate as an implementation measure for NMC #9 (Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls) since the event threshold profile may have changed due to the implementation of LTCP projects.

- Item e(4) seems to presume that Nashua has additional work to be done to implement the LTCP. The City's understanding is that all LTCP projects have been completed although it notes that they were not at the time the draft permit was issued. The City argues the following change should be made to clarify the requirement: replace the phrase, "reducing CSO discharge events" with "implementing the LTCP."

- Items e(6) & (7) also seem more appropriate as implementation measures for NMC #8 (Public Notification to ensure that the public receives adequate notification of CSO occurrences and CSO. With regard to item e(7), is EPA assuming that disinfected CSOs pose a health threat?

V. STAY OF CONTESTED AND NON-SEVERABLE CONDITIONS

In accordance with EPA regulations, the effect of the limits and conditions contested herein must be stayed, along with any uncontested conditions that are not severable from those contested. See, 40 C.F.R. §§124.16(a) and 124.60(b). In light of the fact that the Petitioner is contesting major provisions of the Permit, i.e., Parts I.A., I.B, I.C., I.D., and I.E., and given the encompassing and interdependent relationship of these provisions to all remaining non-contested

provisions, the proper effect is to extend the stay to the Permit in its entirety. In which case, and until such time as the Board reviews and resolves the contested provisions or remands the Permit to the Region for subsequent modification, the Petitioner should be directed to comply with the terms and conditions of the Facility's former NPDES permit, i.e., those terms/conditions issued prior to the March 10, 2015 Permit issuance.

VI. CONCLUSION AND RELIEF SOUGHT

For the foregoing reasons, the City of Nashua, New Hampshire respectfully seeks for review by the EAB the appeal terms and provisions of the final NPDES Permit. After such review, the City of Nashua requests:

A. the opportunity to present oral argument in this proceeding and a briefing schedule for this appeal to assist the EAB in resolving the issues in dispute;

B. a remand to EPA Region I with an order to issue an amended NPDES Permit that conforms to the EAB's findings on the terms and provisions appealed by Nashua; and

C. and such other relief that may be appropriate under these circumstances.

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STATEMENT OF COMPLIANCE WITH WORD LIMITATIONS

I hereby certify that this petition for review, including all relevant portions, contains less than 14,000 words.

Sherilyn Burnett Young

Dated: April13, 2015.

LIST OF ATTACHMENTS

Attachment 1	Draft NPDES Permit No. NH0100170 Dated: July 11, 2013
Attachment 2	Fact Sheet to NPDES Permit - Dated: July 11, 2013
Attachment 3	Final NPDES Permit No. NH0100170 Dated: March 6, 2015
Attachment 4	EPA Response to Comments Dated: March 6, 2015
Attachment 5	City of Nashua Comments to Draft NPDES Permit Dated: November 18, 2013
Attachment 6	City of Manchester Comments to Draft NPDES Permit Dated: November 14, 2013
Attachment 7	7Q10 Low Flow and Dilution Calculation
Attachment 8	Total Phosphorus Effluent
Attachment 9	Copper and Lead Effluent Limitations Calculation

CERTIFICATE OF SERVICE

I, Sherilyn Burnett Young, hereby certify that on this 13th day of April 2015, I served a copy of the foregoing Petition for Review, Statement of Compliance with Word Limitations on the parties identified below by U.S. first-class mail, postage pre-aid:

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Thomas Burack, Commissioner
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Concord, New Hampshire 03302-0095

Dated on the 13th day of April, 2015.

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City of Nashua

Draft Permit Requirement	Nashua Comment	Response	Basis for Appeal
Part I.A.1. Footnote #17 (shown as Footnote #4 in Draft Permit on page 6/28) The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand during dry weather. Dry weather is defined as any calendar day on which there is less than 0.1 inch of rainfall and no snow melt. The percent removal shall be calculated as a monthly average using the influent and effluent BOD5 and TSS values collected during dry weather days.	B.14 & 16 The language as currently stated in this footnote regarding 85 percent removal of TSS and BOD during dry weather is not protective of our facility due to the wet weather flow issues. EPA's definition of dry weather should not be used as a surrogate for dry weather flow conditions. CSO policy and guidance refer to dry weather flow as containing only non-precipitation flow. The NWTF requires at least 24 hours for the hydrograph from a storm event to leave the collection system and treatment facility. In addition, stored volumes from the Storage Facility and the Screening and Disinfection Facility will also impact influent flow totals. During this period, the facility meets all Effluent Limitation requirements; however, the influent flow is still dilute enough to violate the 85 percent removal requirements. As such, the following language changes are requested to this footnote: *The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand during dry weather. Dry weather is defined as any calendar day on which there is less than 0.1 inch of rainfall, no snow melt, and at least 24-hours after a storm event to allow the storm-flow hydrograph to pass through the collection and treatment facilities. The percent removal shall be calculated as a monthly average using the influent and effluent BOD5 and TSS values collected during dry weather days.*	B.14 & 16 The footnote referred to in the above comment actually pertains to the language contained in Part I.A.4., which requires the minimum 30-day average percent removal of BOD5 and TSS be no less than 85% during periods of dry weather[4]. Dry weather is defined in Part I.A.4. of the Draft Permit as "*any calendar day on which there is less than 0.1 inch of rainfall and no snow melt*". EPA has modified the definition of dry weather found in Part I.A.4. and I.B.2.d. of the Final Permit in response to the commenter's concern regarding the length of time it may take for increased flows resulting from wet weather events to pass through the collection system (and treatment facilities). To remove any ambiguity associated with the time for the storm-related flow (as recorded by a hydrograph) to pass through the collection system, the suggested language in the above comment of "*at least 24-hours*" was changed to "*24 hours*" in Part I.A.4. of the Final Permit, which has reads as follows (modified language is in bold): "*The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand during dry weather. Dry weather is defined as any calendar day on which there is less than 0.1 inch of rainfall, no snow melt (defined as a day in which the temperature is greater than 32° F), and* ***24 hours after a storm event to allow the storm-related flow to pass through the collection system and treatment facilities (as recorded by a hydrograph)****. The percent removal shall be calculated as a monthly average using the influent and effluent BOD5 and TSS values collected during dry weather days.*"	1. Nashua's original comment advised that at least 24 hours for the wet weather flow to make it through the system. 2. EPA's revised language assumes that all wet weather flow will pass through the system within 24 hours. 3. To address EPA's concern for ambiguity, Nashua has analyzed influent flow and precipitation data to provide a more definite time period for wet weather flows to pass through the system.

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PART I.B.2. NINE MINIMUM CONTROL IMPLEMENTATION LEVELS a. The permittee shall implement the nine minimum controls in accordance with the documentation provided to EPA and NHDES under Part I.B.1. of this permit, or as subsequently modified to enhance the effectiveness of the controls. This implementation must include the items listed below (Part I.B.2.) plus any other controls the permittee can feasibly implement as set forth in the documentation. b. Each CSO structure/regulator, and/or pumping station shall be routinely inspected at a minimum of once per month to insure that they are in good working condition and adjusted to minimize combined sewer discharges (NMCs #1, 2, and 4). The following inspection results shall be recorded: date and time of the inspection, the general condition of the facility, and whether the facility is operating satisfactorily. The following information shall be recorded if maintenance is necessary: a description of the necessary maintenance, the date the necessary maintenance was performed, and whether the observed problem was corrected. The permittee shall maintain records of all inspections for a minimum of three years. c. Discharges to the combined sewer system of septage, holding tank wastes or other material which may cause a visible oil sheen or containing a floatable material are prohibited during wet weather when CSO discharges may be active (NMCs #3, 6, and 7). d. Dry weather overflows (DWOs) are prohibited (NMC # 5). Dry weather is defined as any calendar day on which there is less than 0.1 inch of rain and no snow melt (defined as a day in which the temperature is greater than	**B.19** The Nashua NPDES permit contains provisions for Nine Minimum Controls (NMCs) for CSOs. A side-by-side comparison was performed with the year 2000 permit. The comparison indicated that Part I.B.2.a. to Part I.B.2.f. are similar to the previous permit with the exception of paragraph d., which addresses dry weather overflows and paragraph f., which includes the requirement for signs at CSO outfalls. Part I.B.2.g. and Part I.B.2.h. are new paragraphs to the 2013 Draft Permit addressing public notification and annual reporting, respectively. The bulk of these requirements were carried over from the previous permit. These requirements are not consistent with either the Combined Sewer Overflows Guidance for Nine Minimum Controls (EPA, May 1995, 832-B-95-003) or the Combined Sewer Overflows Guidance for Permit Writers (EPA, August 1995, 832-B-95-008). The permit requires that Nashua review and update, if needed, its program for implementing the NMCs and that the program incorporate the Nine Minimum Control Implementation Levels outlined in Part I.B.2. of the permit as a threshold for EPA approval. These requirements are very prescriptive and could hardly be considered minimal. Additionally, some of the requirements are not appropriate given the circumstances of Nashua's CSO discharges. Appendix A of the CSO permit writers' guide provides example permit conditions for Phase II CSO permits. In this guidance, EPA organizes the permit conditions by each NMC along with the documentation necessary to evaluate compliance. Part I.B.2. Nine Minimum Control compliance language should be revised for consistency with federal guidance. The Part	**B.19.** The commenter merely asserts that the permit is inconsistent with the *Combined Sewer Overflows Guidance for Nine Minimum Controls* (EPA, May 1995, 832-B-95-003) or the *Combined Sewer Overflows Guidance for Permit Writers* (EPA, August 1995, 832-B-95-008), which does not provide grounds to revise the Draft Permit provisions, and is mistaken in the belief that mini*mum* CSO controls must be mini*mal* and non-prescriptive. The requirements in Part I.B.2. of the Draft Permit contain elements of both a Phase I and Phase II NPDES permit, which, contrary to the above comment, are consistent with the 1994 CSO Control Policy as well as subsequent guidance developed for the implementation of this policy. While the expectation of the national CSO Control Policy is that the incorporation of CSO controls in NPDES permits will occur through a two-phased approach, it is oftentimes difficult to distinguish between Phase I and Phase II. The CSO Control Policy recognizes this and as such, is designed to accommodate variations in the design and implementation of CSO controls. As a result, NPDES permits issued to CSO communities often include requirements of both a Phase I and Phase II permits. The above comment does not provide an explanation as to why some of the requirements in Part I.B.2. of the Draft Permit are not appropriate given the "circumstances of Nashua's CSO discharges". The permit conditions outlined in Appendix A of the *CSO Guidance for Permit Writers* (USEPA September 1995 [EPA 832-B-95-008]) and referenced extensively in the above comment, are, as the title implies, "Compilation of Example CSO Permit Conditions," and are not intended to be applied to each and every CSO permit without first giving due consideration to the	Nashua's contention that these requirements are not consistent with applicable CSO policy and guidance stems from the specificity of the requirements where guidance suggests that permittees develop their own approach to implementing the requirements. Nashua's contention that the requirements are not appropriate given the circumstances of their CSO discharges pertains primarily to item h. (item g in final permit) and how it related to the long-term control plan. Had EPA adopted Nashua's suggested language for this part, their concern would have remedied. However, EPA did not and the specific concern remains. The offending language is found in (d) language requires that Nashua annually issue "a status update of measures taken during the previous calendar year to <u>reduce occurrences of CSO Discharges</u>." This seems to presume that Nashua has yet to complete its Long-Term Control Plan. That is not the case – in fact the plan is nearly fully implemented with the final level of control and reductions already established. Reporting in accordance with this language would give the public the erroneous impression that Nashua is not adequately controlling CSOs since no further reductions are required. Nashua's concern would be remedied by the following language, ""a status update of measures taken during the previous calendar year to <u>continue to implement the Long-Term Control Plan</u>."

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32° F). All dry weather sanitary and/or industrial discharges from CSOs must be reported to EPA and NHDES within 24 hours and a written report provided within five days of the overflow in accordance with the reporting requirements for plant bypass (Paragraph D.1.e. of Part II of this permit and 40 CFR § 122.41(l)(6)). e. The permittee shall quantify and record all discharges from combined sewer outfalls (NMC # 9). Quantification shall be through direct measurement. The following information shall be recorded for each combined sewer outfall for each discharge event: - Duration (hours) of discharge; - Volume (gallons) of discharge; and - Precipitation data collected by the City of Nashua's rain gages at daily (24-hour) intervals and one-hour intervals. Cumulative precipitation per discharge event shall be calculated. The permittee shall maintain all records of discharges for at least three years after the effective date of the permit. f. The permittee shall install and maintain identification signs for all combined sewer outfall structures (NMC #8). The signs must be located at or near the combined sewer outfall structures and be easily readable by the public. These signs shall be a minimum of 12 x 18 inches in size, with white lettering on both sides against a green background, and shall contain the following information: **CITY OF NASHUA** **WET WEATHER** **SEWAGE DISCHARGE** **OUTFALL (discharge serial number)** The permittee, to the extent practicable, shall add a universal symbol to its warning signs reflecting a CSO discharge, or place additional signs in languages other than English based on notification from the EPA and NHDES or on the permittee's own determination	I.B.2. language should be streamlined and appropriate for Nashua's system and CSO discharges as follows: a. The permittee shall implement the nine minimum controls in accordance with the documentation provided to EPA and NHDES under Part I.B.1. of this permit, or as subsequently modified to enhance the effectiveness of the controls. This implementation must include the item s listed below (Part I.B.2.) plus any other controls the permittee can feasibly implement as set forth in the documentation. b. Properly Operate and Maintain the Collection System i. Adequate management, staffing and funding. The permittee's Nine Minimum Control Plan shall document the resources allocated (manpower, funding, equipment and training) to system operation and maintenance. c. Inspection and Maintenance. The permittee shall inspect each CSO structure/regulator, and/or pumping station at a frequency necessary to ensure good working condition and compliance with the NMC. The permittee's Nine Minimum Control Plan shall document the inspection procedures to include: frequency of inspections, date/time, facility condition and any maintenance performed. The permittee shall maintain records of all inspections for a minimum of three years. d. Maximize Use of the Collection System for Storage. i. The permittee shall maintain all dams, diversion structures or regulator settings to minimize discharge from the CSO outfalls	specific details of each CSO community. Most, if not all, of the items included in the commenter's suggested language for Part I.B.2., or their substantive equivalent, are found in the Draft Permit. These requirements (Part I.B.2. of the Draft Permit), were developed in accordance with the national CSO Control Policy and were established following an evaluation of the measures taken by the City to control discharges from CSOs as well as the impacts of wet weather-related flows on the combined collection system. CSOs are a very serious environmental and public concern, and the requirements in the permit are designed to address them in an effective manner, which many times includes prescriptive conditions so that EPA and the public can be assured that specific steps will be taken to prevent their occurrence and/or mitigate their impacts as expeditiously as possible. The requirements in Part I.B.2. of the Draft Permit remain unchanged in the Final Permit.	

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that the primary language of a substantial percentage of the residents in the vicinity of a given outfall structure is not English. g. The permittee shall provide notification to the NHDES-WD orally within 24-hours of the discharge from a CSO. Written notification shall also be provided to NHDES-WD within 5 days of the discharge from a CSO. h. The permittee shall issue an annual notification to the public which shall include (a) general information on CSOs, (b) their locations in Merrimack River Watershed, (c) potential health risks posed by exposure to CSO discharges, and (d) a status update of measures taken during the previous calendar year to reduce occurrences of CSO discharges.	and shall keep them free from obstructions. ii. The permittee shall evaluate measures that retard inflows and provide upstream detention. iii. The permittee's Nine Minimum Control Plan shall document alternatives considered for maximizing storage and the actions taken to do so. e. Review and Modify Pretreatment Program i. The permittee shall evaluate the potential for non-domestic dischargers to impact CSO discharges and make necessary modifications to the pretreatment program. ii. The permittee's Nine Minimum Control Plan shall document evaluations and any modifications to the pretreatment program. f. Maximize Flow to the NWTF i. The permittee shall operate the NWTF at the maximum level during wet weather flow conditions. ii. The permittee's Nine Minimum Control Plan shall document the actions taken to maximize flow and describe any changes to further maximize flow. g. Prohibit Dry Weather CSOs. i. The permittee shall monitor the system for dry weather overflows (overflows that occur in the absence of wet weather flow conditions). Should a dry weather overflow occur, the permittee shall immediately begin corrective action. ii. The permittee's Nine Minimum Control Plan shall document and describe alternatives considered and actions taken to identify and correct dry weather overflows. The plan should also include procedures for notifying permitting authorities of dry weather overflows.		

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	h. Control Solid and Floatable Materials i. The permittee shall implement measures that could include baffles, trash racks, static screens, catch basin controls, nets, booms, etc. to control solids and floatable materials in CSOs. ii. The permittee's Nine Minimum Control Plan shall document the procedures or technologies considered, a description of the controls implemented and plans for any future controls. i. Implement a Pollution Prevention Program i. The permittee shall implement a pollution prevention program to reduce pollutants in CSO discharges. The program should include elements such as street cleaning, public education, product bans/use control and waste/refuse management. ii. The permittee's Nine Minimum Control Plan shall document the alternatives considered, the measures implemented and the expected benefit of the selected controls. j. Notify the public of CSOs. i. The permittee shall implement a public notification plan to include adequate signage at CSO outfall points and other methods of notice including the use of media, mailers and the internet. ii. The permittee's Nine Minimum Control Plan shall list and describe the measures planned for implementation, the location where signs are posted along with the information provided on the signs and the procedures for issuing notices. k. Monitor to Characterize CSO Impacts and the Efficacy of CSO Controls i. The permittee shall monitor CSO		

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	outfalls and determine any other information needed to properly characterize the system, CSO impacts and the effectiveness of control measures. ii. The permittee's Nine Minimum Control Plan shall include relevant information and data as well as any evaluation of that information in terms of CSO impacts and control efficacy.		
PART I.B.3. NINE MINIMUM CONTROLS ANNUAL REPORTING REQUIREMENT Annually, no later than **March 1st** of each year, the permittee shall submit a report to EPA and NHDES summarizing activities during the previous calendar year relating to compliance with the nine minimum controls. This report shall include, but not be limited to, the following: a. A certification which states that the once-per-month inspections required in Part I.B.2.b. of the permit were conducted, results recorded, and records maintained. b. A certification which states that all discharges from CSOs were recorded and records maintained for the previous calendar year. In addition, a summary of the previous year's discharge monitoring information required by Part I.B.2.e. of this draft permit, including activation frequencies and discharge volumes, for all of the authorized combined sewer overflow outfalls identified in **Attachment A** of this permit, shall be submitted as an attachment to this certification. c. Precipitation data for each day of the previous calendar year, including total rainfall (expressed in inches), peak rainfall intensity (highest fifteen minute sample multiplied by four to convert to inches per hour), and	**B.21.** The previous permit only required the submittal of a certification that CSO discharges were recorded and records maintained. The Draft Permit contains extensive annual report requirements. A few requirements are reasonable, such as records of activation frequencies and volumes of CSO discharged. Other reporting requirements are unclear, such as the requirement to report precipitation data for each day of the year as opposed to only days where a discharge actually occurred. Additionally, other parts of the permit require data collection at rainfall gages at one-hour intervals while the annual report requires 15-minute intervals in order to calculate peak rainfall intensity. The proposed monitoring requirements appear to attempt to characterize the operation of the collection system prior to the implementation of any controls with the expectation that CSO discharges from this system would not be consistent with the CSO Control Policy. However, the proposed monitoring requirements are not consistent with the CSO Control Policy. CSO discharges are managed through use of the WWFTF at the wastewater plant and the SDF, which are part of Nashua's Long Term Control Plan. New Hampshire rule Env-Wq 1703.03(c)	**B.21.** The commenter's suggestion that the reporting requirements in Part I.B. of the Draft Permit are inconsistent with the CSO Control Policy are unsubstantiated. As discussed in the Fact Sheet, since issuance of the 2000 permit, the City has implemented several of the CSO controls that were evaluated and selected in their Long Term Control Plan, including partial separation of the combined system, increasing the capacity for the off-line storage of combined flows, screening and disinfection, system optimization measures, and the operation of the Wet Weather Flow Treatment Facility. Based on the information that was available during the development of the Draft Permit, EPA was unable to determine whether wet weather flows are managed in a manner that is consistent with the Nine Minimum Controls (specifically, greater use of the collection system for storage (NMC #2) and return of the flow to the POTW for treatment (NMC #4)), the procedures established in the High Flow Management Plan[5] and the underlying assumptions set forth in the Long Term Control Plan[6]. The data and information collected and submitted in accordance with the monitoring requirements found in Part I.B. of the Draft Permit will allow for a characterization of the collection system and the Wet Weather Flow	Please note that under items under e are mis-numbered; they skip (5). Nashua accepts these requirements with the exception of e(3),(4),(6) and (7) Nashua notes that e(3) seems to be more of an implementation measure for NMC #9 since the event threshold profile may have changed with the implementation of the LTCP projects. Nashua's objection to e(4) mirrors the objection to Part I.B.2.d and requests that the phrase, "reducing CSO discharge events" be replaced with "implementing the LTCP." Items e(6) and (7) also seem more appropriate as implementation measures.

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average intensity (the total rainfall for the storm event divided by the duration of the storm, expressed in inches per hour), as required by Part I.B.2.e. of the permit. d. A summary of modifications to the NMC program which have been evaluated, and a description of those which will be implemented during the upcoming year. e. In the first annual report submitted in accordance with this permit, the permittee shall update the public notification plan describing the measures actively being taken to meet NMC #8 (see Part I.B.1.) and an evaluation of further measures to enhance the public notification program, including the following: (1) Outfall signs visible from both water and land. (2) Signs/notices at areas where people may be using CSO-impacted waters for recreation such as swimming, boating, fishing, and places where the public may gain access to the water (e.g. boat put-in areas). The notice would include information on the health risks posed by CSOs and sources for additional information on CSOs and water quality. (3) Analysis of precipitation data collected by the City of Nashua's rain gages located throughout the collection system and CSO discharge data to estimate the threshold rain events which normally cause overflows. This evaluation shall be conducted on data collected beginning the effective date of the permit.	requires that all CSOs meet an *E. coli* limit of 1,000 colonies per 100 mL at the end of the pipe. Additionally, the *New Hampshire Statewide Total Maximum Daily Load (TMDL) for Bacteria Impaired Waters*, September 2010 states, *"Although meeting ambient bacteria standards at the point of discharge for all sources is the goal of this TMDL, compliance will be based on ambient water quality and not water quality at the point of discharge (i.e., end of pipe). In addition, per Env-Wq 1703.06(c), for non-tidal CSO discharges in Class B waters, a bacteria criteria of 1,000 E. coli/100 mL shall be applied at the end of pipe."* It is clear that the disinfected CSO, WWFTF and SDF discharges will be in compliance with the TMDL and protective of instream uses, including downstream water supply. Any monitoring and reporting requirements should be established to verify compliance with the effluent limitations, the NMC, and the TMDL. The Part I.B.1. requirement for annual *E. coli* monitoring from CSOs #002-#009 for permit compliance serves this purpose. The annual Reporting requirements in Part I.B.3. should be revised in the Final Permit to only include: - Duration - Volume - Precipitation data (daily including the day prior to a discharge event) - *E. coli* concentration (when measured)	Treatment Facility to be made, which will assist in evaluating consistency with the NMC, and in turn, to assure compliance with the CSO-related requirements of permit. (CSO control policy, Part II.C.1., p. 18691). EPA disagrees with the commenter's assertion that Part I.B.1 fully stands in for the more extensive requirements of Part I.B.3. The *E. coli* data that is collected in accordance with Part I.B.I. of the Final Permit will be used to determine compliance with the water-quality based *E. coli* limit, whereas Part I.B.3. of the Draft Permit requires the submittal of an annual report, the elements of which are to include the CSO discharge and precipitation data that were collected in accordance with Part I.B.2. of the permit, which will be used to evaluate compliance with the technology-based limits (i.e., the Nine Minimum controls). As previously stated in this response, the CSO discharge and precipitation data will provide information that is necessary for understanding the operation of the collection system during wet weather and to evaluate compliance with the Nine Minimum Controls (specifically, NMC #2 (maximum use of the collection system for storage), #4 (maximization of flow to the POTW) and #9 (monitoring to effectively characterize CSO impacts and the efficacy of CSO controls)). The data will also provide localized information relative to the conditions that result in discharges from individual CSOs. EPA agrees with the commenter's contention that the precipitation data collection requirements in Parts I.B.3.c. of the Draft Permit are somewhat unclear. Therefore, the language in Part I.B.3.c. of the Final Permit has been changed to read as "*Precipitation data for each day of the previous calendar year, including total rainfall, peak intensity, and average intensity*".	

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I.B.4 & I.B.5 Wet Weather Flow Treatment Facility and Screening and Disinfection Facility In addition to the requirements described above, the Wet Weather Flow Treatment Facility (WWFTF) and screening and disinfection facility (SDF) are subject to additional monitoring requirements as enhanced minimum controls, as set forth in Table I.B.5.a. and Table I.B.5.b. Discharges from these facilities shall not cause or contribute to violations of the water quality standards in the receiving water.	**B.22.** The NWTF utilizes Actiflo units as treatment for flows exceeding the hydraulic capacity of the biological treatment facilities. The Draft Permit includes a number of monitoring requirements for this facility prior to blending with the effluent from the biological portion. These requirements in their entirety should be deleted to be consistent with the recent case law pertaining to blending. In a March 25, 2013 decision, the Eighth Circuit United States Court of Appeals found that *"effluent limitations apply at the end of the pipe"* and *"There is no indication that the secondary treatment regulations established situations in which it would be impractical to apply effluent limitations at the end of the pipe..."* The Eighth Circuit Court ruled *that "The* *EPA may regulate the pollutant levels in a waste stream that is discharged directly to the navigable waters of the United States through a "point source"; it is not authorized to regulate the pollution levels in a facility's internal waste stream. Therefore, insofar as the blending rule imposes secondary treatment regulations on flows within facilities, we vacate it as exceeding the EPA's statutory authority.* The Draft Permit also includes biochemical oxygen demand (BOD5) and total suspended solids (TSS) monitoring requirements for the Screening and Disinfection Facility (SDF). The facility was not designed for BOD5 and TSS removal; therefore, technology-based monitoring requirements are not appropriate. Additionally, the receiving stream is not impaired for dissolved oxygen or suspended solids, so there is no water quality basis for the monitoring requirements. Furthermore, the only controlling criteria in the City's Long Term Control Plan is monitoring and	**B.22.** As noted in Response B.10, Footnote # 3 to Part I.B.5.a. of the Draft Permit has been removed from the Final Permit and the monthly average effluent limitation of 30 mg/l for total suspended solids ("TSS") found in Part I.B.5.a of the Draft Permit has been changed to a monitor only requirement in the Final Permit. Sampling frequency remains at once per month. The commenter's assertion that EPA's inclusion of monitoring requirements for the WWFTF and SDF are inconsistent with the cited case law are without merit. The case, which was from the Eighth Circuit, is inapposite. First, the monitoring requirements in Part I.B.5.a. of the Draft Permit, which pertain to the WWFTF, are not effluent limitations, and are not being imposed pursuant to Section 301(b)(1)(B), but instead under Section 308, 402, and the implementing regulations at 40 C.F.R. Part 122, which confer broad authority on EPA to monitor and gather information from POTWs. These monitor-only requirements are necessary to ensure the collection of data that will allow for a determination to be made regarding whether the operation of the facilities are consistent with the objectives and assumptions underlying the LTCP[7]. In addition, this monitoring will provide information necessary for understanding the operation of the collection system during wet weather and will allow for determinations to be made with respect to the effectiveness of its operation consistent with the Nine Minimum Controls. With respect to the effluent limits and monitoring conditions in Part I.B.5.b. of the Draft Permit, which pertain to the SDF, the *Iowa League of Cities* decision is not applicable. The SDF is a stand-alone facility	WWFTF EPA's inclusion of internal monitoring requirements are in fact, contradictory to the findings of the 8th Circuit in the Iowa League of Cities decision. The court found that, "… effluent limitations are restricted to regulations governing 'discharges from point sources into navigable waters.'" and that, "The EPA would like to apply effluent limitations to the discharge of flows from one internal treatment unit to another. We cannot reasonably conclude that it has the statutory authority to do so." EPA has indicated that in interprets the 8th circuit decision to be binding in the 8th circuit only, suggested that it will consider blending related issues on a case by case basis and has deferred to a June 2014 forum on the public health impacts of blending. A summary of the forum has yet to be finalized. Region 1 also states that the requirements are necessary to determine if the WWFTF is operating in accordance with the LTCP. The only measure of the consistency with the LTCP, is the activations and the circumstances surrounding them. SDF EPA contends that the 8th circuit decision isn't direct applicable to the SDF since it is a stand alone facility. By federal definition the SDF is a POTW. So the decision, (or at least parts of it) is applicable – especially in regards to internal monitoring.

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	reporting for *E. coli*. EPA Region 1 should not be imposing effluent limitations other than total residual chlorine and *E. coli* on wet weather discharges per the Eighth Circuit Decision Iowa League of Cities versus EPA. The BOD5 and TSS monitoring requirements should be deleted from the permit.	that does not involve blending with other effluents from the POTW or the WWFTF. This facility has a dedicated outfall which discharges to the Merrimack River. As with the WWFTF, the effluent limitations and monitoring requirements for the SDF are necessary to allow for a determination to be made regarding whether the operation of the facilities are consistent with the objectives and assumptions underlying the LTCP and to provide information necessary for understanding the operation of the collection system during wet weather and will allow for determinations to be made with respect to the effectiveness of its operation consistent with the Nine Minimum Controls. The requirements in Part I.B.5.a. and b. of the Final Permit remain unchanged from the Draft Permit.	Again EPA R1 argues that the monitoring is necessary to determine compliance with the LTCP. Nashua must reiterate the fact that BOD and TSS monitoring is not a measure of the effectiveness of the SDF nor of its adherence to the LTCP since the facility is designed solely for the removal of floatables and pathogens.
Part I.A.1 Total Phosphorus (April 1st – October 1st), average monthly concentration effluent limitation of 0.8 mg/L, reporting requirement for maximum daily concentration, average monthly and maximum daily mass loading. Monitoring requirement of 2/week with a 24-hour composite sample type.	**B.4.** EPA Region 1 has circumvented New Hampshire's narrative nutrient criteria by basing an effluent phosphorus limit on ecoregion reference conditions. In the Nashua NPDES permit, a phosphorus limit was imposed because the recreational chlorophyll *a* standard of 15 µg/l has been exceeded in the Merrimack River. The phosphorus limit was established using a mass-balance wasteload allocation procedure using the 7Q10 as the basis. The use of the wasteload allocation procedure is inappropriate and should not be used to establish nutrient limits. The effects of nutrients are long-term and affected by many external factors. Numeric nutrient criteria should be established with a site-specific study to establish the correlation between nutrients and a biological response. It does not appear that biological data has been collected in conjunction with chlorophyll *a* data to evaluate a biological response in the Merrimack River.	**B.4.** EPA has addressed the specific comments in detail below, but as a preliminary matter, the EPA observes that most if not all of the legal/regulatory objections to the permit underlying the City's comments on the phosphorus limit have been squarely addressed in past decisions by the United States Environmental Appeals Board and by the United States Court of Appeals for the First Circuit. *See Upper Blackstone Water Pollution Abatement Dist. v. U.S. EPA*, 690 F.3d 9, 33 (1st Cir. 2012), *cert. denied*, 133 S. Ct. 2282 (2013) (upholding the Region's overall methodology for the imposing a phosphorus limit, including use of the Gold Book, among other information, to establish a site-specific total phosphorus limit applicable to that particular discharge); *In re Upper Blackstone Water Pollution Abatement Dist.*, NPDES Appeal Nos. 08-11 to 08-18 & 0906 (EAB May 28, 2010) (same); *see also, In re City of Attleboro*, NPDES Appeal No. 8-08 (EAB Sept. 15, 2009) (same). Most recently, the EAB	Nashua appeals that the average monthly TP concentration effluent limitation is applied without consideration of a reasonable compliance schedule to account for the time required to make necessary upgrades and changes to treatment methods at the Nashua WWTP to meet these new standards. A minimum fifteen year compliance schedule is required in order to ensure that the Nashua WWTP is capable of meeting the new effluent requirements for TP. In addition, New Hampshire is in the process of establishing numeric nutrient criteria which could result in a revised WQBEL for TP. The requested 15-year compliance schedule would also provide Nashua with the flexibility needed to meet any revised TP limit.

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	Irrespective of a site-specific numeric nutrient study, there does not appear to be any justification for the proposed phosphorus limit in the Nashua permit. We reviewed the *Upper Merrimack and Pemigewasset River Study Field Program 2009-2012 Monitoring Data Report*, U.S. Army Corps of Engineers dated December 2012. A review of this report indicates that the upstream and downstream data for chlorophyll *a* and total phosphorus appear to indicate that the NWTF discharge has no discernable impact on the receiving stream. For each sampling date, stream flow, along with upstream, downstream and NWTF effluent phosphorus concentrations were measured; however, a mass-balance relationship between effluent phosphorus concentration and instream phosphorus could not be inferred from the data. These findings suggest that "reasonable potential" does not exist for the Nashua discharge to cause or contribute to exceedances of the chlorophyll *a* recreation-based criterion. Furthermore, the data from the study also indicates that the Nashua discharge does not have reasonable potential to cause or contribute to violations of the narrative criteria for nutrients. The total phosphorus limit should be removed from the permit. A site-specific study and modeling effort will determine the nutrient input versus biological response relationship in the Merrimack River watershed. The study should take into account both the point and non-point source contribution.	comprehensively addressed the Region's approach to interpreting the State's narrative nutrient criterion to derive an effluent limitation in *In re Town of Newmarket Treatment Plant*, NPDES Appeal No. 12-05, 16 E.A.D. __ (EAB December 2, 2013). EPA encourages the City to consult these decisions in conjunction with reviewing the Region's responses below. EPA did not circumvent the narrative criteria for nutrients contained in the New Hampshire Water Quality Standards, but translated that existing criteria into a numeric effluent limitation based on the information (including site-specific data related to the effluent discharge and receiving waters) reasonably available during the permit development and reissuance process. As described in the Fact Sheet, EPA based the phosphorus limit in the Draft Permit on the Gold Book criterion, which was derived from an effects-based approach, rather than the ecoregional criterion, which was derived from a reference condition-based approach. See Fact Sheet at 19 20. EPA's overall approach to interpreting the State's narrative nutrient criterion to derive an effluent limitation is consistent with the requirements of 40 C.F.R. § 122.44(d) and has been addressed and upheld by the Environmental Appeals Board (EAB) (See Response to comment 8). The New Hampshire Water Quality Standards do not contain criteria for chlorophyll *a.* As described in the Fact Sheet, chlorophyll *a* is a response indicator whose quantity may be correlated with the amount of phytoplankton (suspended plant biomass) present within the system (USEPA 2000, Chapra 1997, Thomann & Mueller 1987). Therefore, elevated instream chlorophyll *a* concentrations are indicative of nutrient enrichment. As such, NHDES applies a chlorophyll *a* concentration of 15 µg/l as a threshold value when making	

Draft Permit Requirement	Nashua Comment	Response	Basis for Appeal
		determinations as to whether the primary contact designated use is supported in a fresh water body under CWA Section 303(d) (see *2012 NHDES Consolidated Assessment and Listing Methodology (CALM)* (NHDES 2012)). Sections 301 and 402 of the Act, and implementing regulations at 40 C.F.R. § 122.44(d), are the provisions that govern this permitting action, not Section 303(d) and associated non-binding listing guidance such as the CALM. Therefore, the chlorophyll *a* threshold value that is used in making use support determinations is not directly applicable to this permitting action and was not determinative in EPA's permitting decision. This value was, however, one piece of information EPA considered in arriving at its decision to impose a water quality-based effluent limitation for nutrients. It is worth noting that the chlorophyll *a* concentration of 15 µg/l used by NHDES is a threshold value for the protection of recreational uses, not for the protection of aquatic life uses, and that chlorophyll *a* values less than 15 µg/l are correlated with mesotrophic conditions in the literature (see Table 1 and Table 2). The regulatory requirement for the establishment of a water quality based effluent-limit is based upon a determination that the pollutant of concern is or may be discharged at a level that will "cause, has the reasonable potential to cause, or contributes to an excursion above a State water quality standard, including State narrative criteria for water quality" (*See* 40 C.F.R. § 122.44(d)(1)(i)). The absence of numeric nutrient criteria does not preclude EPA from establishing a water quality-based effluent limit in a NPDES permit. CWA § 301(b)(1)(C) and its implementing regulations at 40 C.F.R. § 122.44(d)(1), impose requirements on EPA to include in NPDES permits "any requirements…necessary to: (1) Achieve	

Draft Permit Requirement	Nashua Comment	Response	Basis for Appeal
		water quality standards established under section 303 of the CWA, including State narrative criteria for water quality." In the absence of site-specific numeric criteria for the Merrimack River, or the development and adoption of statewide numeric criteria, EPA is compelled to establish limits that ensure compliance with all existing applicable criteria, which, in this case, are the narrative criteria found at Env-Wq 1703.14 (also see Response C.8.). In New Hampshire, NPDES permit limits for discharges to rivers and streams are calculated such that applicable criteria are achieved under the "7Q10" flow conditions, or the "lowest average flow which occurs for 7 consecutive days on an annual basis with a recurrence interval of once in 10 years on average." *See* Env-Wq 1705.02(a) and (d). Also see Env-Wq 1702.44. EPA has simply written the permit in a manner that complies with applicable water quality standards as required by the CWA. Use of the 7Q10 flow is reasonable from a water quality perspective, as it ensures that water quality standards are met even in periods of critical low flow when the flow of the receiving water provides relatively little dilution to buffer impacts of pollutant loadings from the facility. Use of critical low flows is also consistent with the reasonably conservative approach the Region has adopted in nutrient permitting in general and that it has determined is necessary in this case in particular to break the ongoing cycle of eutrophication in the receiving waters. Please also see *In re City of Attleboro, MA Wastewater Treatment Plant*, NPDES Appeal No. 08-08, 14 E.A.D. __ (EAB, September 15, 2009) (discussing use of 7Q10 flow regimes in permit that vary from other TMDLs approved by the state and upholding the Region's determination to use 7Q10 as opposed to seasonal or annual average flows).	

Draft Permit Requirement	Nashua Comment	Response	Basis for Appeal
		Upon finding that reasonable potential exists for the discharge from the Nashua Wastewater Treatment Facility ("WWTF") to cause or contribute to violations of water quality standards, EPA was obligated to impose a phosphorus limit on the discharge in accordance with the requirements of 40 C.F.R. § 122.44(d)(1) , and calculated that limit in accordance with section 122.44(d)(1)(vi). A detailed explanation of the legal and technical basis for the establishment of the phosphorus limit of the Draft Permit may be found on pages 19-24 of the Fact Sheet, as well as in Responses C.2., C.7., C.8. and C.15. The intent of including the data presented in the *Upper Merrimack and Pemigewasset River Study Monitoring Data Report* (United States Corps of Engineers ("USACE") December 2012) was to highlight the fact that the receiving water is exhibiting signs associated with eutrophication, and not to demonstrate a direct causal relationship between the discharge of phosphorus from the Nashua Wastewater Treatment Facility (WWTF) and the receiving water. These data were pieces of EPA's larger analysis of determining the need for a phosphorus effluent limitation under applicable regulations. The *Upper Merrimack and Pemigewasset River Study Monitoring Data Report* does not replicate nor is it a substitute for the reasonable potential analysis performed by EPA in determining whether phosphorus is discharged at a level that will cause, or may cause or contribute to, violations of water quality standards. The City contends that: "*A review of this report indicates that the upstream and downstream data for chlorophyll a and total phosphorus appear to indicate that the NWTF discharge has no discernable impact on the receiving stream. For each sampling date, stream flow, along with upstream, downstream and NWTF*	

Draft Permit Requirement	Nashua Comment	Response	Basis for Appeal
		effluent phosphorus concentrations were measured; however, a mass-balance relationship between effluent phosphorus concentration and instream phosphorus could not be inferred from the data." EPA disagrees with the conclusory assertion that these data reveal "no discernable impact" of phosphorus on the receiving waters. While the *Upper Merrimack and Pemigewasset River Study Monitoring Data Report* does not in itself contain an analysis of the impact of the effluent discharged from the Nashua WWTF on the downstream receiving water, EPA applied the ambient and effluent phosphorus data presented in this report, as well as the receiving water 7Q10 flow and the design flow of the facility, to a mass balance equation, the result of which indicates that the discharge does in fact present reasonable potential to cause or contribute to excursions above the 0.1 mg/l total phosphorus target. Additionally, the receiving water data indicate chlorophyll *a* levels in excess of the threshold. Based on the analysis presented in the Fact Sheet, which includes but is not limited to the information presented in the *Upper Merrimack and Pemigewasset River Study Monitoring Data Report*), EPA has concluded that the phosphorus limit in the Final Permit is necessary to ensure compliance with water quality standards. Should additional information, including the results of a site-specific study and/or modeling effort, become available during the term of the Final Permit which changes EPA's conclusions with respect to the phosphorus limit, the permit may be modified in accordance with 40 C.F.R. § 122.62(a)(2).	
Part I.A.1 Total Recoverable Copper, average monthly concentration effluent limitation of 20.0 µg/L,	**B.5.** EPA Region 1 did not use the recommended method for the calculation of total	**B.5.** Contrary to the above comment, EPA's approach to developing the total recoverable	Nashua does not further challenge this permit requirement

Draft Permit Requirement	Nashua Comment	Response	Basis for Appeal
reporting requirement for maximum daily concentration. Monitoring requirement of 2/month with a 24-hour composite sample type. Total Recoverable Lead, average monthly concentration effluent limitation of 0.540 µg/L, reporting requirement for maximum daily concentration. Monitoring requirement of 2/month with a 24-hour composite sample type.	recoverable permit limits from a dissolved criterion as outlined in EPA's *The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (EPA 823-B-96007, 1996). In this document, the EPA Office of Water advised that dissolved metal concentrations should be used for the application of aquatic life criteria for metals. With very few exceptions, the total recoverable-based criterion for each metal must be multiplied by a conversion factor to obtain a dissolved criterion that should not be exceeded in the water column. The wasteload allocation must be translated into a total recoverable metals permit limit. As such, the hardness-dependent Criteria Continuous Concentration (CCC) and Criteria Maximum Concentration (CMC) should be calculated using the following equations: CCC = (exp{mc[ln(stream hardness)]+ bc}) x (CCF) CMC =(exp{ma[ln(stream hardness)]+ ba}) x (CCF) Where: mc,bc,ma,ba = hardness-dependent coefficients CCF = Chronic Conversion Factor ACF = Acute Conversion Factor The translator converts the value for dissolved metal at laboratory conditions to total recoverable metal at ambient conditions as follows: fd = Cdiss/Ctotal = $1/[1 + \{[Kpo] [ss^{(1+a)}] [10^{-6}]$ Where: ss = in-stream suspended solids concentration (mg/L) Kpo, a = partition coefficients (from guidance) The instream allowable concentrations (IAC) are then calculated as follows:	copper and lead limits in the Draft Permit, which is described in detail below, is consistent with the recommended methodology found in *The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007]). Although many inorganic components of domestic wastewater, including metals, are in the particulate form, differences in the chemical composition between effluent and receiving water affects the partitioning of metals between the particulate and dissolved fractions as the effluent mixes with the receiving water, often resulting in a transition from the particulate to dissolved form (*The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007])[2] . Therefore, quantifying only the dissolved fraction of metals in the effluent prior to discharge may not accurately reflect the biologically-available portion of metals in the receiving water. Therefore, effluent limits for metals are expressed as total recoverable metals in accordance with the requirements of 40 C.F.R. § 122.45(c). The total recoverable concentration of a metal is a measure of both the dissolved and particulate fraction. In order to establish total recoverable limits that will ensure attainment of dissolved aquatic life criteria, conversion factors have been developed to reflect the partitioning of metals as the effluent mixes with the receiving water, allowing for the translation between a dissolved criterion and a total recoverable limit (and vice-versa). These conversion factors are the fraction of the total recoverable metal in the effluent that will be in the dissolved form in the receiving water (*The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007]).	

Draft Permit Requirement	Nashua Comment	Response	Basis for Appeal
	Chronic IAC = CCC/fd Acute IAC = CMC/fd The calculated allowable effluent concentration is then: Cw ≤ (SA) [Cm(Qs+Qw) – QsCs]/Qw Where: SA = percent "Stream Allocation" Cm = resultant in-stream concentration after mixing Cw = concentration of pollutant in wastewater Cs = stream background concentration Qw = wastewater flow Qs = stream low flow The facility effluent data is then compared with the allowable effluent concentrations to determine if reasonable potential exists for the discharge to result in a water quality exceedance. Typically, if the 95th percentile value exceeds the allowable concentration, then reasonable potential exists and a limit is applied. A revised Reasonable Potential Analysis was performed for copper and lead using the recalculated 7Q10, stream background data from upstream monitoring, a hardness of 25 mg/l, and a suspended solids concentration of 10 mg/L. Table 1 provides a summary of the revised RPA for copper and lead. Reasonable potential does not exist for either copper or lead to exceed water quality criteria as a result of the NWTF discharge. Limits for copper and lead should be removed from the permit.	The New Hampshire Water Quality Standards contain water quality criteria for metals that are expressed in terms of dissolved metals. *See* Env-Wq 1703.21, Table 1703.1, Footnote i. Conversion factors for translating dissolved criteria into total recoverable limits are found in the New Hampshire Water Quality Standards at Env-Wq 1703.21, Table 1703.2 (also see *The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007]. In developing the Draft Permit, EPA applied these conversion factors to the metals criteria contained in the New Hampshire Water Quality Standards at Env-Wq 1703.21, Table 1, to translate between dissolved metals and total recoverable metals. The equations used to derive the dissolved metals criteria contained within the state water quality standards as well as the conversion factors used to convert dissolved metals to total recoverable metals, are shown below in Table 2. *See* Env-Wq 1703.21, Table 1703.1.	

1. 7Q10 Determination
2. Part I.A.1 Effluent Limitations and Monitoring Requirements
3. Part I.B.1 Combined System Overflows
4. Part I.B.2 Nine Minimum Control Implementation Levels
5. Part I.B.3 Nine Minimum Controls Annual Reporting Requirement
6. Part I.B.5.a and Part I.B.5.b Wet Weather Flow Treatment Facility and Screening and Disinfection Facility
7. Part I.D.4 Collection System Mapping
8. Part I.D.5 Collection System Operation and Maintenance Plan
9. Part I.H Monitoring and Reporting
10. Part I.I State Permit Conditions
11. Request for New Permit Condition Regarding Flow through Treatment Units

7Q10 Determination

Nashua Comment B.1

- EPA Region I calculated the 7Q10 in the Merrimack River to be 784.1 cubic feet per second (cfs) using USGS gage station data from:
  - the Merrimack River below Manchester (01092000),
  - the Souhegan River at Merrimack (01094000),
  - the Nashua River at East Pepperell (01096500),
  - the Concord River below R Meadow Branch (01099500)
  - and the Merrimack River at Lowell, MA (01100000).
- And the S.L. Dingman Method for the ungaged drainage area between Manchester and Nashua and between Lowell and Manchester
- And adjusting the upstream 7Q10 by subtracting the NWTF design flow
- Hazen and Sawyer used the log Pearson Fit Method to calculate a 7Q10 of 791 CFS using station statistics for USGS gages 01092000 and 01100000 & recommended using WWTP LTA to adjust u/s 7Q10.

EPA Response B.1

- Used S.L. Dingman Method in areas where gaging station data was not available (and no data exist), the
- EPA applies mass balance equations that assume critical (7Q10) flow conditions in the receiving water, both upstream and downstream from the discharge, and that assumes the POTW is operating at design flow.

Recommended Actions:

- **Double check EPA's calculations – my recollection is that they "double adjusted" for WWTP flow**
- **Check the sensitivity of the difference in 7Q10s (once WWTP adjustment matter is sorted)**

- **If 7Q10 difference isn't large enough to change limits – then don't pursue an appeal on this issue**

Part I.A.1 Effluent Limitations and Monitoring Requirements

Nashua Comment B.2

Language change for monitoring frequency

Requested that the measurement frequency for BOD_5 and TSS be changed to "*weekdays*" or to "*5 samples per calendar week.*"

EPA Response B.2.

- Previous permit also had "5/Week"
- The monitoring frequency of 5 days per week is broad enough to encompass the City's preferred sampling schedule (e.g., 5 samples per calendar week or weekdays)

Recommended Actions: None

Nashua Comment B.3

Reduction in Monitoring Requirements for TSS and BOD

- Requested reduced monitoring for BOD and TSS based on effluent data from March 31, 2007 through March 31, 2012
  - The long-term average BOD_5 was 46 percent of the permit limit with one violation in 2010 (> 2yrs old)
  - the BOD_5 monitoring frequency should be reduced from five samples per week to three samples per week.
  - The long-term average TSS was 31 percent of the permit limit with no
  - the TSS monitoring frequency should be reduced from five samples per week to two samples per week.

EPA Response B.3.

- The City's wastewater treatment facilities are affected by the intensity, duration and frequency of wet weather events.
- EPA lacks data at this time with respect to periods when the Wet Weather Flow Treatment Facility (WWFTF) is operated
- This is basis for EPA keeping the monitoring requirements as written in the Draft Permit.
- EPA has determined that the BOD_5 and TSS monitoring requirements are necessary
  - to generate data to fully and adequately characterize the effluent quality
  - assess treatment efficiencies under varying flow conditions, including when the WWFTF is operated
- EPA finds that reducing the monitoring frequency for BOD_5 and TSS is not appropriate at this time

- The City may re-submit its request a permit modification to a reduce the monitoring requirements for TSS and BOD5 in once additional data have been collected
- EPA will consider the merits of that renewed request based on the larger data set that will then exist in the record.

Recommended Actions:

- **Determine when the WWFTF went online to see how much data is available**
- **Compare that data to monitoring reduction requirements**
- **Appeal permit provisions:**
  - **If supported by data, request reductions**
  - **If not supported by available data, request a specific reopener since EPA R1 may not be very responsive to permit modification request**

Nashua Comment B.4

Numeric Nutrient Criteria and Total Phosphorus Limit

- EPA Region 1 circumvented New Hampshire's narrative nutrient criteria by basing an effluent phosphorus limit on ecoregion reference conditions.
- EPA imposed a WQBEL phosphorus limit for FAL protection because the recreational chlorophyll-*a* standard of 15 µg/L has been exceeded in the Merrimack River.
- EPA used a mass balance based on 7Q10 to calculate the phosphorus limit
- Numeric nutrient criteria should be established with a site-specific study to establish the correlation between nutrients and a biological response.
- It does not appear that biological data has been collected in conjunction with chlorophyll-*a* data to evaluate a biological response in the Merrimack River.
- A review of the upstream and downstream data for chlorophyll-*a* and total phosphorus in the *Upper Merrimack and Pemigewasset River Study Field Program 2009-2012 Monitoring Data Report*, U.S. Army Corps of Engineers dated December 2012, indicates that the NWTF discharge has no discernable impact on the receiving stream.
  - For each sampling date, stream flow, along with upstream, downstream and NWTF effluent phosphorus concentrations were measured; however, a mass-balance relationship between effluent phosphorus and instream phosphorus could not be inferred from the stream & facility flow, & u/s, d/s & effluent TP concentrations
  - This suggests that 'reasonable potential' does not exist for the Nashua discharge to cause or contribute to exceedences of the chlorophyll-*a* recreation-based criterion.
  - Nor does the data indicate that the Nashua discharge has reasonable potential to cause or contribute to violations of the narrative criteria for nutrients.
- The total phosphorus limit should be removed from the permit.
- A site-specific study and modeling effort taking into account both the point and non-point source contributions will determine the nutrient input versus biological response relationship in the Merrimack River watershed.

EPA Response B.4.

- EPA cites past decisions by the United States Environmental Appeals Board and by the United States Court of Appeals for the First Circuit. as upholding the Region's overall methodology for the imposing a phosphorus limit, including use of the Gold Book, among other information, to establish a site-specific total phosphorus limit applicable to the particular discharges in question
    - *See Upper Blackstone Water Pollution Abatement Dist. v. U.S. EPA*, 690 F.3d 9, 33 (1st Cir. 2012), *cert. denied*, 133 S. Ct. 2282 (2013)
    - Upper Blackstone Water Pollution Abatement Dist., NPDES Appeal Nos. 08-11 to 08-18 & 0906 (EAB May 28, 2010) (same);
    - City of Attleboro, NPDES Appeal No. 8-08 (EAB Sept. 15, 2009) (same).
    - The EAB comprehensively addressed the Region's approach to interpreting the State's narrative nutrient criterion to derive an effluent limitation in In re Town of Newmarket Treatment Plant, NPDES Appeal No. 12-05, 16 E.A.D. __ (EAB December 2, 2013).
- EPA encourages the City to consult these decisions in conjunction with reviewing the Region's responses below.
- EPA translated that existing criteria into a numeric effluent limitation based on reasonably available information
    - site-specific data related to the effluent discharge and receiving waters
    - the Gold Book criterion, which was derived from an effects-based approach, rather than the ecoregional criterion, which was derived from a reference condition-based approach. See Fact Sheet at 1920.
- EPA's overall approach to interpreting the State's narrative nutrient criterion to derive an effluent limitation is consistent with the requirements of 40 C.F.R. § 122.44(d) and has been addressed and upheld by the EAB (See Response to comment 8).
- The New Hampshire Water Quality Standards do not contain criteria for chlorophyll a.
    - chlorophyll a is a response indicator
    - elevated instream chlorophyll a concentrations are indicative of nutrient enrichment.
    - NHDES applies a chlorophyll a concentration of 15 µg/l as a threshold value when making determinations on primary contact designated use support (see 2012 NHDES Consolidated Assessment and Listing Methodology (CALM) (NHDES 2012))
- the chlorophyll a was not determinative in EPA's permitting decision but was one piece of information EPA considered in arriving at its decision to impose a WQBEL for TP.
- chlorophyll a values less than 15 µg/l are correlated with mesotrophic conditions in the literature (see Table 1 and Table 2).
- WQBELs required if pollutant of concern has the reasonable potential to cause, or contribute to an excursion above a State water quality standard, including State narrative criteria for water quality
    - The absence of numeric nutrient criteria does not preclude EPA from establishing a WQBEL.
    - EPA is compelled to establish limits that ensure compliance with all existing applicable criteria, which, in this case, are the narrative criteria found at Env-Wq 1703.14 (also see Response C.8.)
    - In New Hampshire, NPDES permit limits for discharges to rivers and streams are calculated such that applicable criteria are achieved under the "7Q10" flow conditions, See Env-Wq 1705.02(a) and (d). Also see Env-Wq 1702.44.
- Use of the 7Q10 flow is reasonable from a water quality perspective

- it ensures that water quality standards are met even in periods of critical low flow when the flow of the receiving water provides relatively little dilution to buffer impacts of pollutant loadings from the facility.
- Use of critical low flows is also consistent with the reasonably conservative approach the Region has adopted in nutrient permitting in general
- EPA RI has determined using the critical low flow in setting WQBELs for nutrients is necessary in this case in particular to break the ongoing cycle of eutrophication in the receiving waters.
- Refer to City of Attleboro, MA Wastewater Treatment Plant, NPDES Appeal No. 08-08, 14 E.A.D. __ (EAB, September 15, 2009) (on use of 7Q10 in permits that vary from other TMDLs and upholds the Region's use of 7Q10 as opposed to seasonal or annual average flows).

- EPA found that reasonable potential exists for the Nashua discharge to cause or contribute to violations of WQS &
  - was obligated to impose a phosphorus limit on the discharge &
  - calculated that limit in accordance with section 122.44(d)(1)(vi).
  - explanation of the legal and technical basis is found on pages 19-24 of the Fact Sheet, as well as in Responses C.2., C.7., C.8. and C.15.
- EPA contends that the data presented in the Upper Merrimack and Pemigewasset River Study Monitoring Data Report (United States Corps of Engineers ("USACE") December 2012):
  - highlights the fact that the receiving water is exhibiting signs associated with eutrophication,
  - was not meant to demonstrate a direct causal relationship between the discharge of phosphorus from the Nashua Wastewater Treatment Facility (WWTF) and the receiving water.
  - These data were pieces of EPA's larger analysis of determining the need for a phosphorus effluent limitation under applicable regulations.
  - The study does not replicate nor is it a substitute for EPA's RPA for phosphorus.
- EPA disagrees that these data reveal "no discernable impact" of phosphorus on the receiving waters.
- The Report does not in itself contain an analysis of the impact of the effluent discharged from the Nashua WWTF on the downstream receiving water
- EPA applied the following to a mass balance equation to show potential to exceed 0.1 mg/l TP:
  - the ambient and effluent phosphorus data presented in this report
  - as well as the receiving water 7Q10 flow and
  - the design flow of the facility
- Additionally, the receiving water data indicate chlorophyll a levels in excess of the threshold.
- EPA has concluded that the phosphorus limit in the Final Permit is necessary to ensure compliance with water quality standards.
- Should additional information, including the results of a site-specific study and/or modeling effort, become available during the term of the Final Permit which changes EPA's conclusions with respect to the phosphorus limit, the permit may be modified in accordance with 40 C.F.R. § 122.62(a)(2).

Table 1 Freshwater System Trophic Status Based on Mean Chlorophyll *a* Concentration[1]

Trophic Status	Wetzel (2001)	Ryding and Rast (1989)	Smith (1998)	Novotny and Olem (1994)
Eutrophic	> 10 µg/l	6.7-31 µg/l	----------	> 10 µg/l
Mesotrophic	2-15 µg/l	3-7.4 µg/l	3.5-9 µg/l	4-10 µg/l
Oligotrophic	0.3-3 µg/l	0.8-3.4 µg/l	----------	< 4 µg/l

1 Adapted from *Ambient Water Quality for Dissolved Oxygen, Water Clarity, and Chlorophyll a for Chesapeake Bay and its Tidal Tributaries* (USEPA 2003)

Table 2 Nutrient (µg/l) and algal biomass criteria limits recommended to prevent nuisance conditions and water quality degradation in streams based either on nutrient-chlorophyll *a* relationships or preventing risks to stream impairment as indicated[1]

PERIPHYTON Maximum in mg/m²						
TN	TP	DIN	SRP	Chlorophyll *a*	Impairment Risk	Source
				100-200	nuisance growth	Welch et al. 1988 1989
275-650	38-90			100-200	nuisance growth	Dodds et al 1997
1500	75			200	eutrophy	Dodds et al. 1998
300	20			150	nuisance growth	Clark Fork River Tri-State Council, MT
	20				*Cladophora* nuisance growth	Chetelat et al 1999
	10-20				*Cladophora* nuisance growth	Stevenson unpubl. data
		430	60		eutrophy	UK Environ. Agency 1988
		100[2]	10[2]	200	nuisance growth	Biggs 2000
		25	5	100	reduced invertebrate diversity	Nordin 1985
			15	100	nuisance growth	Quinn 1991
		1000	10[2]	~100	eutrophy	Sosiak pers. comm.
PLANKTON Mean in µg/L						
TN	TP	DIN	SRP	Chlorophyll *a*	Impairment Risk	Source
300[3]	42			8	eutrophy	Van Nieuwenhuyse and Jones 1996
	70			15	chlorophyll action level	OAR 2000
750[4]	35			8	eutrophy	OECD 1992 (for lakes)

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

[1]From *Nutrient Criteria Technical Guidance Manual* (USEPA July 2000, Ch. 7, p.101 [EPA-822-B-00-002]))

Recommended Actions:

- **Review cited cases**

- **Review published EPA guidance on setting numeric nutrient limits based on narrative criteria and EPA-approved permit limits**
- **Research compliance schedules for nutrient limits**
- **Review NH rule Env-Wq 1703.14, 1705.02 & 1702.44**
- **Research use of alternatives to 7Q10 in setting WQBELs**
- **Review fact sheet & responses C.2, 7, 8 & 15**
- **Review recently issued Manchester permit**
- **Appeal permit provision to include**
  - **Removal of limit, or**
  - **Delayed implementation of limit to allow for instream study/modeling and/or**
  - **Compliance schedule**

Nashua Comment B.5

Reasonable Potential Analysis for Metals

- EPA Region 1 did not use the recommended method for the calculation of total recoverable permit limits from a dissolved criterion as outlined in EPA's The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From A Dissolved Criterion (EPA 823-B-96-007, 1996) which advises:
  - that dissolved metal concentrations should be used for the application of aquatic life criteria for metals
  - the total recoverable-based criterion for each metal must be multiplied by a conversion factor to obtain a dissolved criterion
  - The wasteload allocation must be translated into a total recoverable metals permit limit
- the hardness dependent Criteria Continuous Concentration (CCC) and Criteria Maximum Concentration (CMC) should be calculated using the following equations:

$$CCC = (\exp \{ m_C [\ln (\text{stream hardness})] + b_C \}) \times (CCF)$$
$$CMC = (\exp \{ m_A [\ln (\text{stream hardness})] + b_A \}) \times (ACF)$$

Where: m_c, b_c, m_a, b_a = Hardness dependent coefficients
CCF = Chronic Conversion Factor
ACF = Acute Conversion Factor

- The translator converts the value for dissolved metal at laboratory conditions to total recoverable metal at ambient conditions as follows:

$$f_d = C_{diss} / C_{total} = 1 / [1 + \{ [K_{po}] [ss^{(1+a)}] [10^{-6}] \}]$$

Where: ss = in-stream suspended solids concentration [mg/L]
K_{po}, a = partition coefficients (from guidance)

- The instream allowable concentrations (IAC) are then calculated as follows:

$$\text{Chronic IAC} = CCC / f_d$$
$$\text{Acute IAC} = CMC / f_d$$

- The calculated allowable effluent concentration is then:

$$Cw \leq (S_A)\,[C_m\,(Q_s + Q_w) - Q_sC_s] / Q_w$$

Where: S_A = percent "Stream Allocation"
C_m = resulting in-stream concentration after mixing
C_w = concentration of pollutant in wastewater
C_s = stream background concentration
Q_w = wastewater flow
Q_s = stream low flow

Table 1: Summary of Revised Reasonable Potential Analysis for Copper and Lead

	Copper	Lead
Stream Background Concentration, ug/L	2.0	0.50
Fraction Dissolved (f_D)	0.35	0.18
Measured Effluent Concentration, 95th percentile	30.2	2.58
CHRONIC		
Fish and Aquatic Life Water Quality Criteria	2.74	0.54
Instream Allowable Concentration	7.9	2.9
Maximum Allowable Effluent Concentration	172	71
Reasonable Potential (is Maximum Allowable < Effluent Concentration)?	No	No
ACUTE		
Fish and Aquatic Life Water Quality Criteria	3.63	13.9
Instream Allowable Concentration	10.5	75.5
Maximum Allowable Effluent Concentration	246	2,173
Reasonable Potential (is Maximum Allowable < Effluent Concentration)?	No	No

- RPA (Table 1) for copper and lead using:
  - the recalculated 7Q10,
  - stream background data from upstream monitoring,
  - a hardness of 25 mg/L, and
  - a suspended solids concentration of 10 mg/L.
- Reasonable potential does not exist for either copper or lead to exceed water quality criteria as a result of the NWTF discharge. Limits for copper and lead should be removed from the permit.

EPA Response B.5.

- EPA's approach to developing the total recoverable copper and lead limits is consistent with the recommended methodology found in The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion (USEPA 1996 [EPA-823-B96-007]).
- Quantifying only the dissolved fraction of metals in the effluent prior to discharge may not accurately reflect the biologically-available portion of metals in the receiving water.
- Effluent limits for metals are expressed as total recoverable metals in accordance with the requirements of 40 C.F.R. § 122.45(c).
- The total recoverable concentration of a metal is a measure of both the dissolved and particulate fraction.
- To establish total recoverable limits use conversion factors that
  - reflect the partitioning of metals as the effluent mixes with the receiving water
  - allow for the translation between a dissolved criterion and a total recoverable limit (and vice-versa).
- These conversion factors are the fraction of the total recoverable metal in the effluent that will be in the dissolved form in the receiving water
- The New Hampshire water quality criteria for metal are expressed in terms of dissolved metals.
  - See Env-Wq 1703.21, Table 1703.1, Footnote i.
  - Conversion factors for translating dissolved criteria into total recoverable limits are found in the New Hampshire Water Quality Standards at Env-Wq 1703.21, Table 1703.2
  - EPA applied these conversion factors to the metals criteria contained in the New Hampshire Water Quality Standards at Env-Wq 1703.21, Table 1, to translate between dissolved metals and total recoverable metals.
- The equations used to derive the dissolved metals criteria contained within the state water quality standards as well as the conversion factors used to convert dissolved metals to total recoverable metals, are shown below in Table 2

Table 4 Water Quality Criteria for Metals

Metal	m_A*	b_A*	m_C**	b_C**	CF acute	CF chronic	Dissolved Criteria[1]		Total Recoverable Criteria	
							Acute Criteria (CMC) * (µg/L)	Chronic Criteria (CCC)** (µg/L)	Acute Criteria (CMC) (µg/L)	Chronic Criteria (CCC) (µg/L)
Cadmium	1.1280	-3.6867	0.7852	-2.7150	1.002	0.967	0.95	0.80	0.95	0.83
Chromium III	0.8190	3.7256	0.8190	0.6848	0.316	0.860	183.07	23.81	579.32	27.69
Copper	0.9422	-1.7000	0.8545	-1.7020	0.960	0.960	3.64	2.74	3.79	2.85
Lead	1.2730	-1.4600	1.2730	-4.7050	0.993	0.993	13.88	0.54	13.98	0.54
Nickel	0.8460	2.2550	0.8460	0.0584	0.998	0.997	144.92	16.10	145.21	16.14
Zinc	0.8473	0.8840	0.8473	0.8840	0.978	0.986	36.20	36.50	37.02	37.02
Aluminum	---	---	---	---	---	---	---	---	750	87

[1]Dissolved Criteria
Acute Criteria (CMC) = $\exp\{m_A * \ln(\text{hardness}) + b_A\} * CF_{Acute}$
Chronic Criteria (CCC) = $\exp\{m_C * \ln(\text{hardness}) + b_C\} * CF_{Chronic}$
[2]Total Recoverable Criteria
Acute Criteria (CMC) = Dissolved Acute Criteria/CF_{Acute}
Chronic Criteria (CCC) = Dissolved Chronic Criteria/$CF_{Chronic}$

Comment [QSA1]:
(USEPA 1996 [EPA-823-B96-007]) was used as the basis for the use of the criteria conversion factor (CF). National Guidance requires that permits limits for metals are to be expressed in terms of total recoverable metal and not dissolved metal. As such, conversion factors are used to develop total recoverable limits from dissolved criteria. The conversion factor reflects how the discharge of a particular metal partitions between the particulate and dissolved form after mixing with the receiving water. In the absence of site-specific data describing how a particular discharge partitions in the receiving water, a default assumption equivalent to the criteria conversion factor is used in accordance with guidance.

[2] *The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion*

- The derivation of these limits are shown in pages 15-18 of the Fact Sheet.

Recommended Actions:

- **EPA is still misinterpreting the guidance. If you check the #s in Table 2, it looks like they essentially cancel out the conversion factors to get back to total recoverable.**
- **Do a side-by-side comparison to point out the inconsistency that EPA denies that they have**
- **Double check our RPA using the maximum concentrations vs 95th %ile**
- **Review recently issued Manchester permit (understand that they got Pb & Cu removed)**
- **Pursue appeal of this provision**

Nashua Comment B.6

Sample Type for Total Residual Chlorine

- The monitoring sample type for total residual chlorine should be changed from a 24-hour composite to a grab sample.

EPA Response B.6.

- The Draft Permit requires total residual chlorine samples to be collected as grab samples, not 24-hour composite samples as the commenter suggests.

Recommended Actions: None

Nashua Comment B.7

Modification of pH Permit Limit

- On August 24, 2012, the City of Nashua requested a modification of the pH permit limit from 6.5 to 8.0 standard units to 6.0 to 8.0 standard units.
- The City completed the required pH adjustment demonstration project, the results of which support the reduction of the lower range of the pH limit from 6.5 to 6.0 standard units.
- The permit should be revised to reflect this change.

EPA Response B.7

- the listing of the aquatic life designated use for the segment of the Merrimack River in the vicinity of the discharge as impaired due to pH makes the provision allowing relaxation of the pH no longer applicable
- NHDES does not allow for modifications to the pH limit outside of the range specified in the Water Quality Standards when the water body is impaired for pH, which it is at this time. Therefore, the pH limit in the Final Permit remains unchanged from the draft.

Recommended Action:

- **Review effluent pH data**
- **Review applicable NH rules & most recent 303(d) list**
- **Should only appeal if this poses a significant compliance problem**

Nashua Comment B.8

Whole Effluent Toxicity Limit

- Based on the revised calculation for 7Q10 and the procedures outlined in EPA's Guidance Manual
  - the 95th percentile LC50 for ceriodaphnia dubia = 92.9 percent and
  - the 95th percentile LC50 for pimephales promelas = 63.9 percent
- 2000 permit was incorrect
- Antibacksliding does not apply in the case
- The LC50 should be 11.69 percent based on:
  - a dilution factor of 28.5 &
  - an instream allowable value of 0.3TUa.
- The NWTF has passed 22 consecutive WET tests.
  - WET monitoring should be changed from semi-annual monitoring to annual monitoring.

EPA Response B.8

- See Response B.1. regarding the calculation of the 7Q10 flow.
- Not sure why Nashua says 2000 permit was written incorrectly.
  - Further, the commenter does not explain where the specific values it references above came from, or how they were derived.
- EPA R1 establishes Acute WET limits at an LC50 of 100, (not dilution factor) in order to minimize the size of the mixing zone that will be subjected to acutely toxic levels of effluent.
- EPA and State mixing zone policies require
  - minimally sized mixing zones and
  - no acute toxicity within the mixing zone.
- LC50 of 100 does not equate to no acute toxicity (it equates to 50% of the test organisms being killed)
- minimizing the size of the mixing zone
  - minimizes the exposure period to acutely toxic levels of effluent
  - minimizes or eliminates lethal impacts.
- WET testing frequency in the 2000 permit = quarterly
- WET testing frequency in the Draft Permit = semi-annually
- Even given the facility's past performance, EPA does not believe that a once per year monitoring requirement is sufficient

Comment [QSA2]:
C. dubia) and 126 (for *P. promelas*).

The Region is unsure where the 92.9 and 63.9% values came from. Assuming they are referring to the TSD, the Region calculated the 95th percentile daily max estimate for WET test results from 2007-2012, which were the results evaluated during the development of the Draft Permit. The 95th percentile daily max estimates are 105.5 (for

Recommended Actions:

- **Double check fact sheet & basis**
- **Double check our calcs**
- **Unless significant compliance problems, don't pursue appeal**

Nashua Comment B.9

Whole Effluent Toxicity Monitoring

- Object to monitoring for ammonia, hardness, aluminum, cadmium, copper, lead, nickel, or zinc as part of EPA-approved WET testing.
- NWTF has not had any recent WET violations that would require additional monitoring data as part of a Toxicity Identification/Reduction Evaluation (TI/RE).

EPA Response B.9.

- The requirement is included in NPDES permits issued to all POTWs in New England that include WET testing requirements
- is also a component of the EPA Region I Freshwater Acute and Chronic WET testing protocols, due to the likelihood for these metals to be present in the effluent discharged from a POTW.
- EPA includes the monitoring due to the risk of toxicity associated with discharges from domestic and industrial sources
- the commenter does not identify any water quality-based rationale for removing them

Recommended Actions:

- **Review EPA Region I Freshwater and Chronic WET testing protocols (may need to request)**
- **Consider a placeholder appeal only (not sure it is worth going to the mat over)**

Nashua Comment B.10

Footnote #3

- Footnote #3 should be deleted from the permit. Part I.B.5 of the permit outlines the requirements for Effluent Limitations and Monitoring Requirements for the Wet Weather Flow Treatment (WWFTF) discharge. The permitted compliance point for the NWTF consists of the wet weather discharge, blended effluent, and secondary treated effluent. A separate monitoring requirement for the secondary treated effluent does not meet the intent of EPA's policy on wet weather discharges. The removal of this footnote is supported by the Eighth Circuit Decision Iowa League of Cities versus Environmental Protection Agency, filed March 25, 2013 (refer to Section 6 of this letter).

EPA Response B.10

- footnote # 3 to Part I.B.5.a. of the Draft Permit has been removed from the Final Permit, as has the monthly average effluent limitation for TSS that was included in Part I.B.5.a. of the Draft Permit

Recommended Action: None

Nashua Comment B.11

Footnote #12

- Footnote #12 should be deleted from the permit. Language for reopening the permit is contained in NPDES Part II.A.2, Standard Conditions. A reopener clause specific to the NWTF is not justified.

EPA Response B.11.

- Footnote #12 has been removed from the Final Permit since Part II.A.4. contains reopener provisions for the permit.

Recommended Actions: None

Nashua Comment B.12

Footnote #15 (shown as Footnote #2 in draft permit on page 5/28)

Footnote #15 should be removed from the permit. The Effluent Limitations and Monitoring Requirements are intended specifically to protect water quality. An extra statement that "The discharge shall not cause a violation of the water quality standards of the receiving stream" is not warranted.

EPA Response B.12.

- The language is included in all NPDES permits issued to POTWs in New Hampshire,
- EPA cannot reasonably be expected to anticipate all the water quality issues arising from the discharge.
- EPA sees merit in including a more general, narrative, preventative permit provision that restates the commands of Section 301 and the implementing regulations at 40 C.F.R. §§ 122.4 and .44
- allows EPA to address, as necessary, ongoing water quality impairments caused or contributed to by such circumstances as changes in effluent quality that might otherwise meet permit conditions or the discharge of pollutants not identified in the City's permit application

Recommended Actions: None

Nashua Comment B.13

Footnote #16 (shown as Footnote #3 in draft permit on page 5/28)

- This footnote should be revised to be consistent with the New Hampshire narrative criteria for foam, as follows:

The discharge shall not contain substances that would settle so as to form harmful deposits or float as foam, debris, scum or other visible substances. The discharge shall not contain substances that produce odor, color, taste or turbidity in the receiving waters which is not naturally occurring and would render it unsuitable for its designated uses.

EPA Response B.13.

- The language contained in Part I.A.3. of the Draft Permit is from the General Water Quality Criteria contained within the New Hampshire Water Quality Standards at Env-Wq 1703.03,

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.

Recommended Actions: None

Nashua Comment B.14

Part I.A.1 Footnote #17 (shown as Footnote #4 in draft permit on page 6/28)

- CSO policy and guidance refer to dry weather flow as containing only non-precipitation flow.
- The NWTF requires at least 24 hours for the hydrograph from a storm event to leave the collection system and treatment facility.
- In addition, stored volumes from the Storage Facility and the Screening and Disinfection Facility will also impact influent flow totals.
- the following language changes are requested to this footnote:

*The permittees treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand during dry weather. **Dry weather is defined as any calendar day on which there is less than 0.1 inch of rainfall, no snow melt, and at least 24-hours after a storm event to allow the storm-flow hydrograph to pass through the collection and treatment facilities.** The percent removal shall be calculated as a monthly average using the influent and effluent BOD5 and TSS values collected during dry weather days.*

EPA Response B.14.

- EPA has modified the definition of dry weather found in Part I.A.4. and I.B.2.d. of the Final Permit in response to the commenter's concern
- To remove any ambiguity associated with the time for the storm-related flow (as recorded by a hydrograph) to pass through the collection system the revised language reads as follows :

*The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and biochemical oxygen demand during dry weather. **Dry weather is defined as any calendar day on which there is less than 0.1 inch of rainfall, no snow melt (defined as a day in which the temperature is greater than 32 deg F), and 24 hours after a storm event to allow the storm-related flow to pass through the collection system and treatment facilities (as recorded by a hydrograph).** The percent removal shall be calculated as a monthly average using the influent and effluent BOD5 and TSS values collected during dry weather days.*

Recommended Actions:

- **Review flow/precipitation records to better define hydrograph & return flow from storage**
- **Pursue appeal to allow for circumstances where greater than 24 hours may be required to pass storm-related flows**

Nashua Comment B.15

Request for New Footnote to Part I.A.1

- The operation of our secondary treatment facility is outlined in our High Flow Management Plan dated September 30, 2010 and approved by EPA Region 1. We request the following language be added as a footnote to Part I.A.1:

The secondary treatment facility will be operated in accordance with the EPA-approved City of Nashua High Flow Management Plan.

EPA Response B.15.

- A special condition has been added to the Final Permit that requires the operation of the wastewater treatment facility and the wet weather flow treatment facility during periods of wet weather to be consistent with the City of Nashua's High Flow Management Plan (HFMP), dated 2010, or the most recently–approved version of the HFMP. See Part I.C. of the Final Permit.

Recommended Action: None

Nashua Comment B.16

Part I.B.1 Combined System Overflows

Definition of Dry Weather

- CSO policy and guidance refer to dry weather flow as containing only non-precipitation flow.
- The NWTF requires at least 24 hours for the hydrograph from a storm event to leave the collection system and treatment facility.
- In addition, stored volumes from the Storage Facility and the Screening and Disinfection Facility will also impact influent flow totals. For permit consistency, please refer to our comment in Section 2 of this letter regarding Footnote #17.

EPA Response B.16

- EPA disagrees that the City should be given the discretion to determine on its own accord whether the system flows contain precipitation-derived flow.
- EPA believes an objective benchmark should be utilized to prevent confusion and to set clear expectations.
- See Response B.14., EPA has made changes to the definition of dry weather in Part

I.A.4. and I.B.2.d. of the Final Permit to accommodate the City's concerns regarding the time it may take for flows resulting from wet weather events to pass through the collection system and treatment facilities.

Recommended Actions:

- **See recommendations under Comment B.14**

Nashua Comment B.17

Part I.B.1.c

- We request that the language for reviewing and updating the Nine Minimum Controls (NMC) be changed to read "within twelve months of effective date of permit."

EPA Response B.17

- The language contained in Part I.B.1.c. of the Final Permit has been changed to read as

"Within twelve months of the effective date of the permit, the permittee shall review and update (as necessary) its program for implementing the Nine Minimum Controls, and...

Recommended Actions: None

Nashua Comment B.18

Part I.B.1.d

- The Long Term Monitoring Plan requirements are intended specifically to protect water quality.
- compliance with LTMP and the Effluent Limitations = compliance with water quality standards.
- An extra statement that "The discharge shall not cause a violation of the water quality standards of the receiving stream" is not warranted and leaves the City and EPA vulnerable to third party lawsuits.

EPA Response B.18

- The requirement that "The discharge shall not cause a violation of the water quality standards of the receiving stream" is consistent with the national CSO Control Policy
- This requirement is expressed in the form of a narrative limitation & is consistent with the Policy
- See also Response B.12.

Recommended Actions: None

Part I.B.2 Nine Minimum Control Implementation Levels

Nashua Comment B.19

- Part I.B.2.a. to Part I.B.2.f are similar to the previous permit except for
  - paragraph d, which addresses dry weather overflows
  - paragraph f, which includes the requirement for signs at CSO outfalls.
  - Part I.B.2.g (new) addresses public notification
  - Part I.B.2.h (new) addresses annual reporting
- not consistent with
  - the Combined Sewer Overflows Guidance for Nine Minimum Controls (EPA, May 1995, 832-B-95-003) or
  - the Combined Sewer Overflows Guidance for Permit Writers (EPA, August 1995, 832-B-95-008).
- The permit requires that Nashua review and update, if needed, its program for implementing the NMCs and that the program incorporate the Nine Minimum Control Implementation Levels outlined in Part I.B.2.of the permit as a threshold for EPA approval.
- These requirements are very prescriptive and could hardly be considered minimal
- some of the requirements are not appropriate given the circumstances of Nashua's CSO discharges.
- EPA guidance:
  - organizes the permit conditions by each NMC element &
  - suggests measures for implementation of each NMC &
  - documentation necessary to evaluate compliance.
- Part I.B.2 Nine Minimum Control compliance language should be revised for consistency with federal guidance. The Part I.B.2 language should be streamlined and appropriate for Nashua's system and CSO discharges, as follows:

a. *The permittee shall implement the nine minimum controls in accordance with the documentation provided to EPA and NHDES under Part I.B.1.of this permit, or as subsequently modified to enhance the effectiveness of the controls. This implementation must include the items listed below (Part I.B.2.) plus any other controls the permittee can feasibly implement as set forth in the documentation.*

b. *Properly Operate and Maintain the Collection System.*
   i. *Adequate management, staffing and funding. The permittee's Nine Minimum Control Plan shall document in the resources allocated (manpower, funding, equipment and training) to system operations and maintenance.*

c. *Inspection and maintenance. The permittee shall inspect each CSO structure/regulator, and/or pumping station at a frequency necessary to ensure good working condition and compliance with the NMC. The permittee's Nine Minimum Control Plan shall document the inspection procedures to include: frequency of inspections, date/time, facility condition and any maintenance performed. The permittee shall maintain records of all inspections for a minimum of three years.*

d. *Maximize Use of the Collection System for Storage.*
   i. *The permittee shall maintain all dams, diversion structures or regulator settings to minimize discharge from the CSO outfalls and shall keep them free from obstructions.*
   ii. *The permittee shall evaluate measures that retard inflows and provide upstream detention.*
   iii. *The permittee's Nine Minimum Control Plan shall document alternatives considered for maximizing storage and the actions taken to do so.*

e. *Review and Modify Pretreatment Program.*
   i. *The permittee shall evaluate the potential for non-domestic dischargers to impact CSO discharges and make necessary modifications to the pretreatment program.*
   ii. *The permittee's Nine Minimum Control Plan shall document evaluations and any modifications to the pretreatment program.*

f. *Maximize Flow to the NWTF.*
   i. *The permittee shall operate the NWTF at the maximum level during wet weather flow conditions.*
   ii. *The permittee's Nine Minimum Control Plan shall document the actions taken to maximize flow and describe any changes to further maximize flow.*

g. *Prohibit Dry Weather CSOs.*
   i. *The permittee shall monitor the system for dry weather overflows (overflows that occur in the absence of wet weather flow conditions). Should a dry weather overflow occur, the permittee shall immediately begin corrective action.*
   ii. *The permittee's Nine Minimum Control Plan shall document and describe alternatives considered and actions taken to identify and correct dry weather overflows. The plan should also include procedures for notifying permitting authorities of dry weather overflows.*

h. *Control Solid and Floatable Materials.*
   i. *The permittee shall implement measures that could include baffles, trash racks, static screens, catch basin controls, nets, booms, etc. to control solids and floatable materials in CSOs.*
   ii. *The permittee's Nine Minimum Control Plan shall document the procedures or technologies considered, a description of the controls implemented and plans for any future controls.*

i. *Implement a Pollution Prevention Program.*
   i. *The permittee shall implement a pollution prevention program to reduce pollutants in CSO discharges. The program should include elements such as street cleaning, public education, product bans/use control and waste/refuse management.*
   ii. *The permittee's Nine Minimum Control Plan shall document the alternatives considered, the measures implemented and the expected benefit of the selected controls.*

j. *Notify the Public of CSOs.*
   i. *The permittee shall implement a public notification plan to include adequate signage at CSO outfall points and other methods of notice including the use of media, mailers and the internet.*
   ii. *The permittee's Nine Minimum Control Plan shall list and describe the measures planned for implementation, the location where signs are posted along with the information provided on the signs and the procedures for issuing notices.*

k. *Monitor to Characterize CSO Impacts and the Efficacy of CSO Controls.*
   i. *The permittee shall monitor CSO outfalls and determine any other information needed to properly characterize the system, CSO impacts and the effectiveness of control measures.*
   ii. *The permittee's Nine Minimum Control Plan shall include relevant information and data as well as any evaluation of that information in terms of CSO impacts and control efficacy.*

EPA Response B.19

- The commenter doesn't specify how the permit is inconsistent with the Combined Sewer Overflows Guidance for Nine Minimum Controls (EPA, May 1995, 832-B-95-003) or the Combined Sewer Overflows Guidance for Permit Writers (EPA, August 1995, 832-B-95-008),
- minimum CSO controls need not be minimal and non-prescriptive.

- the Draft Permit contain elements of both a Phase I and Phase II NPDES permit, consistent with the 1994 CSO Control Policy
- While the expectation of the national CSO Control Policy is that the incorporation of CSO controls in NPDES permits will occur through a two-phased approach, it is oftentimes difficult to distinguish between Phase I and Phase II.
- The CSO Control Policy recognizes this and as such, is designed to accommodate variations in the design and implementation of CSO controls. As a result, NPDES permits issued to CSO communities often include requirements of both a Phase I and Phase II permits.
- Need an explanation as to why some of the requirements in Part I.B.2. of the Draft Permit are not appropriate given the "circumstances of Nashua's CSO discharges".
- The permit conditions outlined in Appendix A of the CSO Guidance for Permit Writers are example CSO Permit Conditions & not intended to be applied to each and every CSO permit without first giving due consideration to the specific details of each CSO community.
- Most, if not all, of the suggested items or their substantive equivalent, are found in the Draft Permit. These requirements (Part I.B.2. of the Draft Permit), were developed in accordance with the national CSO Control Policy
- The requirements established following an evaluation of the measures taken by the City to control discharges from CSOs as well as the impacts of wet weather-related flows on the combined collection system.

Recommended Actions:

- **Items a-f: Unless Nashua finds the draft permit provisions untenable then I would not recommend appealing these provisions since we would be arguing between different interpretations of guidance**
- **If Nashua does choose to pursue appeal of these provisions we would need to review:**
    - **Most recent 9 minimum control plan**
    - **LTCP and implementation schedule**
    - **EPA's evaluation of Nashua's measures to control discharges**
    - **Other EPA Region 1 permits (if they all have identical provisions then that kind of deflates EPA's argument that these are specific to Nashua)**
- **Item g: Nashua should appeal this provision to refer to "measures taken...to implement the LTCP" instead of measures taken...**

Nashua Comment B.20

Part I.B.2.g

- The City requests the language for oral CSO discharge notification to NHDES-WD be changed from "within 24 hours" to "the next business day."

EPA Response B.20

- The requirements in Part I.B.2.g. of the Draft Permit, requiring the City to provide both oral (i.e., within 24-hours") and written (within 5 days) notification to NHDES of a CSO discharge have been removed from the Final Permit, as discharges from CSOs during wet weather events are authorized under the permit.

Recommended Actions: None

Part I.B.3 Nine Minimum Controls Annual Reporting Requirement

Nashua Comment B.21

- The draft permit contains extensive annual report requirements.
- The Fact Sheet does not provide a basis for these requirements.
- Nashua agrees with reporting:
  - records of activation frequencies and
  - volumes of CSO discharged.
- Nashua is unclear about:
  - The requirement to report precipitation data for each day of the year as opposed to only days where a discharge actually occurred.
  - data collection intervals at rainfall gages (one-hour intervals or 15-minute intervals) in order to calculate peak rainfall intensity.
- the proposed monitoring requirements mimic those meant to characterize the operation of the collection system prior to the implementation of any controls
- EPA seems to expect that CSO discharges from this system would not be consistent with the CSO Control Policy.
- the proposed monitoring requirements are not consistent with CSO Control Policy.
  - CSO discharges are managed through use of the WWFTF at the wastewater plant and the SDF, which are part of Nashua's Long Term Control Plan.
- New Hampshire rule Env-Wq 1703.06(c) requires that all CSOs meet an E. coli limit of 1,000 colonies per 100 mL at the end of pipe.
- Additionally, the New Hampshire Statewide Total Maximum Daily Load (TMDL) for Bacteria Impaired Waters, September 2010 states, "Although meeting ambient bacteria standards at the point of discharge for all sources is the goal of this TMDL, compliance will be based on ambient water quality and not water quality at the point of discharge (i.e., end of pipe). In addition, per Env-Wq 1703.06(c), for non-tidal CSO discharges in Class B waters, a bacteria criteria of 1,000 E. coli / 100 mL shall be applied at the end of pipe."
- It is clear that the disinfected CSO, WWFTF, and SDF discharges will be in compliance with the TMDL and protective of instream uses, including downstream water supply.
- Any monitoring and reporting requirements should be established to verify compliance with the effluent limitations, the NMC, and the TMDL.
- The Part I.B.1 requirement for annual E. coli monitoring from CSOs #002 – #009 for permit compliance serves this purpose. The annual reporting requirements in Part I.B.3 should be revised in the final permit to only include:
  - Duration
  - Volume
  - Precipitation data (daily including the day prior to a discharge event)
  - E. coli concentration (when measured)

EPA Response B.21

- The commenter's suggestion that the reporting requirements in Part I.B. of the Draft Permit are inconsistent with the CSO Control Policy are unsubstantiated.
- the City has implemented several of the CSO controls selected in their Long Term Control Plan, including
  - partial separation of the combined system,
  - increasing the capacity for the off-line storage of combined flows,
  - screening and disinfection,
  - system optimization measures, and
  - the operation of the Wet Weather Flow Treatment Facility.
- Based on information available during the development of the Draft Permit, EPA was unable to determine whether wet weather flows are managed in a manner that is consistent with the Nine Minimum Controls
  - greater use of the collection system for storage (NMC #2) and
  - return of the flow to the POTW for treatment (NMC #4),
  - the procedures established in the High Flow Management Plan[5] and
  - the underlying assumptions set forth in the Long Term Control Plan[6].
- The data and information collected and submitted in accordance with the monitoring requirements found in Part I.B. of the Draft Permit will allow for
  - characterization of the collection system and the Wet Weather Flow Treatment Facility to be made,
  - evaluating consistency with the NMC, and
  - assure compliance with the CSO-related requirements of permit.
- EPA disagrees with the commenter's assertion that Part I.B.1 fully stands in for the more extensive requirements of Part I.B.3.
- The E. coli data that is collected in accordance with Part I.B.I. of the Final Permit will be used to determine compliance with the water-quality based E. coli limit,
- Part I.B.3. of the Draft Permit requires the submittal of an annual report to evaluate compliance with the technology-based limits (i.e., the Nine Minimum controls).
- CSO discharge and precipitation data will provide information that is necessary
  - for understanding the operation of the collection system during wet weather and
  - to evaluate compliance with NMC #2 (maximum use of the collection system for storage,
  - to evaluate compliance with NMC #4 (maximization of flow to the POTW) and
  - to evaluate compliance with NMC #9 (monitoring to effectively characterize CSO impacts and the efficacy of CSO controls)
- EPA agrees with the commenter's contention that the precipitation data collection requirements in Parts I.B.3.c. of the Draft Permit are somewhat unclear. Therefore, the language in Part
- I.B.3.c. of the Final Permit has been changed to read as "Precipitation data for each day of the previous calendar year, including total rainfall, peak intensity, and average intensity".

Recommended Action:

- **No action with regard to items a-d & e(1)&(2)**
- **However, I recommend further action on e(3), (4), (6) & (7) [note they mis-numbered and there isn't an e(5)]**
  - **Item e(3) seems to be misplaced in the annual reporting requirements. The analysis it requires seems more appropriate as an implementation measure for NMC #9 (Monitoring to**

Comment [QSA3]:
The City of Nashua submitted documentation of its plan for implementing the Nine Minimum Controls, titled "High Flow Management Plan for the Nashua Wastewater Treatment Plant", in November 1999. This document has since undergone several revisions, with the most recent revision occurring in April 2010 to include procedures for handling wet weather-related flows at the POTW and Wet Weather Flow Treatment Facility.

Comment [QSA4]:
[6] The City's Long Term Control Plan (LTCP) was submitted in 2003 (and amended in 2004). Specifically, the Long Term Control Plan predicts that the operation of the WWFTF will result in no untreated overflows in the largest storm in the typical year, or in the 5-year "actual" design storm

effectively characterize CSO impacts and the efficacy of CSO controls) since the event threshold profile may have changed due to the implementation of LTCP projects.

- Item e(4) seems to presume that Nashua has additional work to be done to implement the LTCP. My understanding is that all LTCP projects have been completed (but were not at the time the draft permit was issued). Nashua should appeal this provision to replace the phrase, "reducing CSO discharge events" with "implementing the LTCP."
- Items e(6) & (7) also seem more appropriate as implementation measures for NMC #8 (Public Notification to ensure that the public receives adequate notification of CSO occurrences and CSO With regard to item e(7), is EPA assuming that disinfected CSOs pose a health threat?

Wet Weather Flow Treatment Facility and Screening and Disinfection Facility

Nashua Comment B.22

- The NWTF utilizes Actiflo units as treatment for flows exceeding the hydraulic capacity of the biological treatment facilities. The draft permit includes a number of monitoring requirements for this facility prior to blending with the effluent from the biological portion.
- These requirements in their entirety should be deleted to be consistent with the recent case law pertaining to blending.
    - In a March 25, 2013 decision, the Eighth Circuit United States Court of Appeals found that "effluent limitations apply at the end of the pipe" and
    - "There is no indication that the secondary treatment regulations established situations in which it would be impractical to apply effluent limitations at the end of the pipe..."
    - The Eighth Circuit Court ruled that "The EPA may regulate the pollutant levels in a waste stream that is discharged directly into the navigable waters of the United States through a 'point source'; it is not authorized to regulate the pollutant levels in a facility's internal waste stream.
    - Therefore, insofar as the blending rule imposes secondary treatment regulations on flows within facilities, we vacate it as exceeding the EPA's statutory authority."
- The draft permit also includes biochemical oxygen demand (BOD5) and total suspended solids (TSS) monitoring requirements for the Screening and Disinfection Facility (SDF).
    - The facility was not designed for BOD5 and TSS removal; therefore, technology-based monitoring requirements are not appropriate.
    - Additionally, the receiving stream is not impaired for dissolved oxygen or suspended solids, so there is no water quality basis for the monitoring requirements.
    - Furthermore, the only controlling criteria in the City's Long Term Control Plan is monitoring and reporting for E. coli. EPA
    - Region 1 should not be imposing effluent limitations other than total residual chlorine and E. coli on wet weather discharges per the Eighth Circuit Decision Iowa League of Cities versus EPA.
- The BOD5 and TSS monitoring requirements should be deleted from the permit.

EPA Response B.22

- As noted in Response B.10, Footnote # 3 to Part I.B.5.a. of the Draft Permit has been removed from the Final Permit and the monthly average effluent limitation of 30 mg/l for total suspended solids ("TSS") found in Part I.B.5.a of the Draft Permit has been changed to a monitor only requirement in the Final Permit. Sampling frequency remains at once per month.
- The commenter's assertion that EPA's inclusion of monitoring requirements for the WWFTF and SDF are inconsistent with the cited case law are without merit.
- The case, which was from the Eighth Circuit, is inapposite.
    - First, the monitoring requirements in Part I.B.5.a. of the Draft Permit, which pertain to the WWFTF, are not effluent limitations, and are not being imposed pursuant to Section 301(b)(1)(B), but instead under Section 308, 402, and the implementing regulations at 40 C.F.R. Part 122, which confer broad authority on EPA to monitor and gather information from POTWs.
    - These monitor-only requirements are necessary to ensure the collection of data that will allow for a determination to be made regarding whether the operation of the facilities are consistent with the objectives and assumptions underlying the LTCP[7].
    - In addition, this monitoring will provide information necessary for understanding the operation of the collection system during wet weather and will allow for determinations to be made with respect to the effectiveness of its operation consistent with the Nine Minimum Controls.
- With respect to the effluent limits and monitoring conditions in Part I.B.5.b. of the Draft Permit, which pertain to the SDF, the *Iowa League of Cities* decision is not applicable.
    - The SDF is a stand-alone facility that does not involve blending with other effluents from the POTW or the WWFTF.
    - This facility has a dedicated outfall which discharges to the Merrimack River. As with the WWFTF, the effluent limitations and monitoring requirements for the SDF are necessary to allow for a determination to be made regarding whether the operation of the facilities are consistent with the objectives and assumptions underlying the LTCP and to provide information necessary for understanding the operation of the collection system during wet weather and will allow for determinations to be made with respect to the effectiveness of its operation consistent with the Nine Minimum Controls.

Comment [QSA5]:
[7] The specific levels of CSO control for each outfall are described in the Long Term Control Plan (LTCP) submitted by the City in 2003, as amended in 2004. The LTCP predicts that the operation of the WWFTF will result in no untreated overflows in the largest storm in the typical year, or in the 5-year "actual" design storm and that the operation of the SDF will result in no untreated CSOs in response to the largest storm in the typical year or the 2year or 5-year "actual" storms.

Recommended Action:

- **Nashua should appeal these provisions based on:**
    - **EPA's position is that they are following the 8th circuit decision on a case-by-case basis outside of the 8th circuit, meaning that the decision will be made either by the EAB or by the federal court**
    - **EPA's contention that these monitoring requirements are necessary to determine if the WWFTF & SDF operate consistent with the LTCP**
    - **The WWFTF flow goes to the chlorine contact basin for disinfection. The flow schematic does not show a path for flow from the facility to bypass disinfection – so there is no way for the facility to result in untreated discharge**
    - **Monitoring the flow discharged from the SDF along with the TRC and E. coli concentrations will provide EPA with the data necessary to determine if the facility is operating in accordance with the LTCP. BOD and TSS removal were not design parameters for this facility.**

- **Double check Iowa League of Cities decision regarding applicability to SDF. [I believe that it applies to any internal monitoring...]**
- **Review recent EPA guidance and any recent litigation related to Iowa League of Cities decision**
- **Review referenced portions of CWA and 40 CFR § 122 and in particular, the regulatory basis for establishing an "internal outfall." (see response to Comment 22)**

Nashua Comment B.23

Total Residual Chlorine

- EPA Region 1 used the Merrimack River 7Q10 for calculating the Water Quality Based Effluent Limit (WQBELs) for the CSO discharges. The CSOs will only discharge during wet weather.
- EPA's NPDES Permit Writers' Manual indicates that for most pollutants and criteria, the critical flow in rivers and streams is a measure of the low flow of that river or stream; however, the critical condition could be different under a different discharge situation (i.e., a high flow event where a CSO from wet weather are a significant issue).
- It is more appropriate to use the 30Q10 flow for reasonable potential during wet weather events. The RPA for total residual chlorine should be revised to reflect the correct dilution.

EPA Response B.23

- Although CSO discharges typically occur as a result of wet weather-related flows, water quality-based effluent limitations must be established using applicable water quality standards.
- New Hampshire's Water Quality Standards (RSA 485-A:8 VI, Env-Wq 1705.02), require the use of 7Q10 flows for the establishment of water quality based effluent limitations. EPA has explained the water quality-based rationale for employing the 7Q10 flow elsewhere in the RTC. The total residual chlorine limits in Part I.B.5. of the Final Permit, which were based upon the 7Q10 flow of the receiving water, remain unchanged from the Draft Permit.

Recommended Action: None

- **NH's WQ rules do require use of 7Q10 for WQBELs for FAL. The best course of action on this would be to petition for changes to these rules during the triennial review of standards.**

Nashua Comment B.24

Part I.B.5.a Footnotes #1, #2, #3, #4, #7, and #8

- The Effluent Limitations Table in Part I.B.5.a should not contain reporting requirements for
  - flow discharged from the WWFTF to the chlorine contact tank or
  - flow drained back to the NWTF.
- These flows are internal process flows and are not flows discharged to the Merrimack River. Per the Eighth Circuit Decision Iowa League of Cities versus EPA, the Court ruled that the EPA may not impose

arbitrary monitoring requirements on internal treatment processes and only end of pipe may be considered.

- As such, Part I.B.5.a Footnotes #1, #2, #3, #4, #7, and #8 should be removed from the permit.
- Additionally, Footnote #9 requiring the City to monitor and report rainfall precipitation should be removed from the permit. Rainfall monitoring is already required as part of the City's Long Term Control Plan.

EPA Response B.24

See Response B.22.

- EPA classified the outfall from the Wet Weather Flow Treatment Facility ("WWFTF") as an "internal outfall," since the effluent from the WWFTF is discharged to the chlorine contact chamber, where it is combined with secondary effluent prior to discharge to the receiving water.
- EPA included the flow monitoring requirements to better understand whether the WWFTF and bypass are operating in a manner that is consistent with the assumptions in the LTCP.
- While EPA acknowledges that the discharge from the WWFTF is not to the receiving water, but rather to the chlorine contact chamber where the effluent is combined with secondary and primary effluents prior to discharge to the receiving water through Outfall No. 001, the flow monitoring requirements contained in Part I.B.5.a. of the permit will ensure that the operation of the WWFTF is consistent with the underlying assumptions contained in the City's Long Term Control Plan (LTCP) that was submitted by the City in 2003, as amended in 2004. Specifically, the LTCP predicts that the operation of the WWFTF will result in no untreated overflows in the largest storm in the typical year, or in the 5-year "actual" design storm. The flow monitoring requirements in Part I.B.5.a. of the Final Permit remain unchanged from the Draft Permit.
- With the exception of footnote # 3 to Part I.B.5.a. of the Draft Permit, which has been removed from the Final Permit for the reasons discussed in Response B.10., the requirements in Part I.B.5.a. of the Draft Permit remain in the Final Permit.
- Footnote #9 to Part I.B.5.a. of the Draft Permit, has been modified in the Final Permit to clarify that precipitation data that is collected in accordance with the LTCP may be submitted to satisfy the requirement in Part I.B.5.a. provided that intensity (inches/hour) and duration (total hours/event) are provided.

Recommended Action: see recommended actions for B.22

Nashua Comment B.25

Part I.B.5.b Footnotes #1, #2, #3, #4, #5, #9, #10, and #11

- The Effluent Limitations Table in Part I.B.5.b should not contain reporting requirements for flow discharged into the SDF, discharged from the SDF, or flow drained back to the collection system per the Eighth Circuit Decision Iowa League of Cities versus EPA. As such, Part I.B.5.b Footnotes #1, #2, #3, #4, #5, #9, #10, and #11 should be removed from the permit.

EPA Response B.25

- The effluent from the SDF is discharged to the Merrimack River. Given that the SDF is a standalone facility with its own outfall to the Merrimack River and the effluent is not blended, the premise of the comment is incorrect. See Response B.22.

Recommended Action: see recommended action under B.22

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Nashua Comment B.26

Part I.B.5.b Footnote #12

- The requirement to monitor and report rainfall precipitation should be removed from the permit, as rainfall monitoring is already required as part of the City's Long Term Control Plan.

EPA Response B.26

- The precipitation data that is collected in accordance the LTCP may be used to satisfy the requirement in Part I.B.5.b. of the Final Permit, which remains unchanged from the Draft Permit. See Response B.24.

Recommended Action: None

Nashua Comment B.27

Request for New Footnote in Part I.B.5.a

- The operation of our WWFTF facility is outlined in our High Flow Management Plan dated September 30, 2010 and approved by EPA Region 1. We request the following language be added as a footnote to Part I.B.5.a:

The Wet Weather Flow Treatment Facility will be operated in accordance with the EPA-approved City of Nashua High Flow Management Plan.

EPA Response B.27

- The following language has been added as a Special Condition (Part I.C.) in the Final Permit: "Operation of the Wet Weather Flow Treatment Facility shall be in accordance with the most current EPA-approved High Flow Management Plan."

Recommended Action: None

Nashua Comment B.28

Request for New Footnote in Part I.B.5.b

The operation of our SDF is outlined in our High Flow Management Plan dated September 30, 2010 and approved by EPA Region 1. We request the following language be added as a footnote to Part I.B.5.b:

The Screening and Disinfection Facility will be operated in accordance with the EPA-approved City of Nashua High Flow Management Plan.

EPA Response B.28

The operation of the SDF is not described in the HFMP.

Recommended Action: None

Part I.D.4 Collection System Mapping

Nashua Comment B.29

- Collection system mapping is a requirement of the Long Term Control Plan, and should not be included as part of this NPDES permit. Part 1.D.4 should be removed from the permit.

EPA Response B.29

- The requirements in Part I.D.4. of the Draft Permit are being included in all NPDES permits issued to New Hampshire POTWs, and remain in the Final Permit.
- EPA does not perceive any drawback from making the requirement enforceable through the NPDES permit, and the permittee does not identify any.
- A statement has been added to Part I.D.4. clarifying that any mapping of the collection system that has been performed in accordance with the LTCP may be used to fulfill the requirements in Part I.D.4. of the Final Permit.

Recommended Action: None

Part I.D.5 Collection System Operation and Maintenance Plan

Nashua Comment B.30

Part I.D.5.a

- We request that the schedule for the Collection System Operation and Maintenance Plan be changed from 6 months to 30 months of the effective date of the permit.

EPA Response B.30

- The permittee has up to 24 months from the effective date of the permit to submit the full Collection System Operation and Maintenance Plan.
- Within the first 6 months of the effective date of the permit, the permittee is required to submit:
    - (1) description of the collection system management goals, staffing, information management, and legal authorities;
    - (2) A description of the overall condition of the collection system including a list of recent studies and construction activities; and

    - (3) A schedule for the development and implementation of the full Collection System O & M Plan including the elements in Part I.E.5.b.1. through b.7.
- The comments do not provide any reasons or explanation of the need to extend the schedule for the initial submittal of the collection system operation and maintenance plan from 6 to 30 months, therefore Part I.D.5. of the Final Permit remains unchanged from the Draft Permit.
- If the City wishes to submit a request to extend the deadline along with a justification of the request, EPA will consider an extension of the schedule through a permit modification.

Recommended Action:

- **Nashua should appeal this provision to ensure additional time to complete the plan**
- **The appeal should include an alternative schedule with an explanation for the additional time required.**
- **Go over requirements and develop a reasonable timeframe for each**

Nashua Comment B.31

Part I.D.5.b

- We request that the schedule for the Collection System Operation and Maintenance Plan submittal to EPA and NHDES be changed from 24 months to 36 months of the effective date of the permit.

EPA Response B.31

- The permittee has up to 24 months from the effective date of the permit to submit the full Collection System Operation and Maintenance Plan. Within the first 6 months of the effective date of the permit, the permittee is required to submit: (1) description of the collection system management goals, staffing, information management, and legal authorities; (2) A description of the overall condition of the collection system including a list of recent studies and construction activities; and (3) A schedule for the development and implementation of the full Collection System O & M Plan including the elements in Part I.E.5.b.1. through b.7.
- The comments do not provide any reasons or explanation of the need to extend the schedule for the initial submittal of the collection system operation and maintenance plan from 6 to 30 months, therefore Part I.D.5. of the Final Permit remains unchanged from the Draft Permit. If the City wishes to submit a request to extend the deadline along with a justification of the request, EPA will consider an extension of the schedule through a permit modification.

Recommended Action: see recommended action for B.30

Part I.H Monitoring and Reporting

Nashua Comment B.32

Part I.H.1.a

- We request that the schedule for submitting Discharge Monitoring Reports (DMRs) electronically using NetDMR be changed from one year to two years of the effective date of the permit.

EPA Response B.32

- Many permittees have not had any difficulty complying with the NetDMR electronic reporting requirements within one year.
- The City has not provided any justification as to why they would not be able to comply with the NetDMR reporting requirements within one year of the effective date of the permit, therefore, the date on which DMRs are to be submitted electronically using NetDMR has been maintained in the Final Permit.
- If the City believes that they cannot use NetDMR due to technical or administrative infeasibilities, or for other logistical reasons, and can demonstrate a reasonable basis that precludes the use of NetDMR, they may submit a request to opt out of the NetDMR reporting requirements (i.e., an "opt-out" request) following the procedure in Part I.I. of the Final Permit.

Recommended Action:

- **Nashua should appeal this provision thus allowing time during the appeal to work on NetDMR.**
- **Identify the steps needed to implement NetDMR & put together a proposed implementation schedule**

Part I.I State Permit Conditions

Nashua Comment B.33

State Permit Condition #5 states that the final effluent pH must be maintained in the range of 6.5 to 8.0 standard units. Please refer to our comment in Section 2 regarding the pH adjustment demonstration project. We request that this note be revised to reflect the new pH effluent limit range of 6.0 to 8.0 standard units.

EPA Response B.33

Please see Response B.7. regarding the pH limit in the Final Permit.

Recommended Action: None, unless Nashua is concerned about compliance with a 6.5-8.0 range. If an issue then:

- **Review listing methodology and data supporting pH impairment**
- **Contact NHDEP regarding pH policy**

ATTACHMENT 6

CITY OF MANCHESTER COMMENTS
Draft NPDES Permit
No. NH0100170

Dated: November 14, 2013

Kevin A. Sheppard, P.E.
Public Works Director

Timothy J. Clougherty
Deputy Public Works Director

Frederick J. McNeill, P.E.
Chief Engineer

CITY OF MANCHESTER
Highway Department
Environmental Protection Division

November 14, 2013

Ms Meridity Timony
U.S. EPA Region 1 (New England)
5 Post Office Square
Suite 100 (Mail Code OEP06-01)
Boston, MA 02109-3912

#13-19-PS

RE: Comments to Nashua's Draft NPDES Permit NH0100170

Dear Ms Timony:

The City of Manchester is providing the following comments to the Nashua's Draft Permit (NH0100170). Manchester's comments will demonstrate that;

1. The EPA & NHDES have an extensive "sound-science" document at their disposal, yet deferred to "Reasonable Potential" in setting a phosphorus limit;
2. The NHDES calculated a "Reasonable Potential" loading for phosphorus that will never be attained due to process changes that ensure phosphorus loading reductions at Merrimack and Manchester's WWTPs along with a proposed MS4 Permit that will reduce upstream TP loading significantly;
3. Nashua is a bigger plant than permitted upstream discharges yet Concord was given 90 lbs/month average discharge at 16 mgd design flow. Merrimack was given 168 lbs average monthly discharge and they are a 5 mgd designed facility. Concord was given 204 lbs average monthly discharge and they are designed at 10.1 mgd. There is no continuity in how permits are currently being proposed by the EPA;
4. The NHDES did not follow their "2010 Section 305(b) and 303(d) Consolidated Assessment and Listing Methodology (CALM) in the "Reasonable Potential" calculation;
5. The most recent extensive Merrimack and Pemigewasset River Study demonstrates that there is no oxygen impairment within the entire length of the Merrimack River. This study indicates that there is no adverse impact from the present phosphorus loadings and subsequent chlorophyll-a growth as measured and evidenced within the Merrimack River Study.

6. The Copper and Lead limits are within the contamination concentration assumptions as outlined with the CALM (Table 3-32) and therefore do not exhibit potential or 'Reasonable Potential" to exceed the WQ criteria.
7. The EPA and NHDES are requiring an unfunded mandate to achieve nutrient and metals removals where scientific study has shown that none are currently required

The Nashua Draft Permit indicates on pg. 10 of 28, item H. that annual notification shall be noticed to the public. Manchester would like to see the method listed to which this must be accomplished as, "The permittee shall issue an annual notification to the public, *via the largest daily circulated newspaper,* which shall include…"

TOTAL PHOSPHORUS LIMIT

The permit pg 3 of 28 lists a monthly average for total phosphorus of 0.06 mg/l between April 1st and October 1st. There are a number of factors that play into this determination of which will be discussed in sequence. Attachment B of the draft permit outlines how the 7Q10 is calculated with a resulting 7Q10 downstream flow of 784.1 cfs. The upstream 7Q10 is 759.4 cfs.

Table 4, on pg. 22 of 36, outlines two upstream sampling dates. The dates listed on table 4 are 10/5/2007 and 7/27/2010. The 10/5/2007 sample date has two short comings. It falls outside the proposed permit compliance dates of April 1st through October 1st. Second it is beyond the five-year data age requirement as outlined in the EPA approved NHDES CALM of five years (10/5/2012 five-year period end date and Nashua's draft permit was prepared in 2013). There is another sample available for 9/21/2010 which should have been calculated in Table 4 and the October 2007 data point should be removed from this subset. By following the criteria in the NHDES CALM and including the data point from 9/21/2010, with a Chlor-a of 2.0 ug/l and a TP of 67 ug/l. Table 4 should read as follows:

Station	Date	Chlor-a ug/l	TP ug/l
02M-MER	7/27/2010	20.85	36
MO70*	9/21/2010	2	67
MIN		2	67
MAX		20.85	67
AVG		11.425	51.5
Median		11.425	51.5

A Map is included in Attachment 1 that demonstrates that M070 is synonymous with 02M-MER and the mentioned 03-MER of the 10/5/207 sample.

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

The Nashua draft permit requires an average monthly total phosphorus limit of 80 pounds (16 mgd design flow and 0.6 mg/l monthly average discharge of TP). *The actual median in-stream phosphorus concentration is 51.5 ug/l. By adding the effluent concentration (after dilution) to the new background concentration, there is*

potential to be at 130 ug/l (corrected calculation, Pg 23 of 36 of the Fact Sheet). *NHDES states, "This indicates that reasonable potential exists for the discharge of phosphorus from the Nashua WWTP to cause or contribute violations of the WQ standards in the downstream receiving water).*" As attested within these comments, there is currently no impairment within the Merrimack River caused by TP. There is also an omission by the EPA in not reviewing the current and future nutrient reductions from the "Reasonable Potential" calculations as permits and process changes are happening just upstream of the Nashua WWTP.

The City of Nashua's permit indicated that they had a reasonable potential of discharging 340.3 lbs of TP to the Merrimack River on a peak design day (16 mgd at 2.55 mg/l TP). The Town of Merrimack is now using the Block and Hong process for removal of TP. They have been consistently able to reduce their loads over this summer's operating range by >50% and that is without any chemical addition. In the Merrimack Permit the EPA stated that the reasonable potential for the Merrimack Discharge was 594 lbs TP (5 mgd at 14 mg/l TP) or an in stream concentration of 0.212 mg/l. The Merrimack WWTP has experimented with biological nutrient removal over the summer period of 2013. The average discharge is 6 mg/l with a flow of 1.8 mgd. This is an actual discharge of 90 lbs of TP. This is the expected future maximum as there s little to no growth foreseen within the community over the next couple of years. Their draft permit allowed a daily average of 168 lbs. of discharge per day as a permit limit. The monthly mass loading calculates to an average daily phosphorus discharge of 4 mg/l at 5 mgd. Nashua's draft permit is for $1/6^{th}$ of the TP discharge that was allocated within Merrimack's discharge permit a few months prior. A question is why is there such a disparity between the TP allocation between two municipalities that are within 10 miles of each other along the same stretch of river? The City of Concord was permitted for 2.42 mg/l of TP discharge at and design flow of 10.1 mgd. That is a loading of 203.8 lbs of TP that is > 2 times the allowable mass loading given to Nashua.

The Town of Merrimack has proven that there can be a 500 lb reduction under their "Reasonable Potential" maximum TP load calculation as outlined in their draft permit. This proves that the "Reasonable Potential" condition is extremely conservative, has no basis in scientific fact, and can never transpire within Nashua's permit period.

Manchester is in the process of installing a Modified Johannasburg Process for biological phosphorus removal. Manchester currently discharges 477 lbs of TP to the Merrimack on an average day (22 mgd at 2.6 mg/l TP). Bio-Win modeling has demonstrated that Manchester will consistently achieve a 1 mg/l or less TP effluent discharge with bio-P removal. That would mean a reduction to 183 lbs of TP to the Merrimack River on an average day (294 lb reduction from current loading levels). This reduction taken with the 500 lbs actualized reduction from "Reasonable Potential" expectation from Merrimack's discharge is almost 800 lbs of TP removed from the future "Reasonable Potential" load into the Merrimack River daily.

An 800 lb "Reasonable Potential" actualized reduction with a 7Q10 flow rate of 789 cfs (509 mgd) downstream of Nashua provides for 0.188 mg/l removal of TP from the Merrimack River. This is greater than the 0.139 calculated "Reasonable Potential" limit outlined in the Nashua draft permit. It would leave an in stream loading of 0.024 mg/l form the "Reasonable Potential" discharge from the Town of Merrimack's draft permit (212 ug/l maximum facility discharge at 5 mgd with a concentration of 14 mg/l).

This does not include the reductions that will be achieved by the pending MS4 permits that will require TP reductions from all communities south of Concord. The EPA is only looking at the potential additions to the Merrimack River, but has not factored in the real reductions that have transpired since the 2010 sampling and will transpire over this permit period. It is impossible to reach any of the in stream "Reasonable Potential" conditions as outlined in the Nashua or Merrimack draft permits.

As the Army Corps study has demonstrated that the Merrimack River has no current impacts from nutrient or algae impacts, it is safe to say that with the above mentioned pending TP removals, the Merrimack River quality will only get better (Note that the Phase II study indicates the Merrimack River is currently in compliance with WQ criteria as outlined in the NHDES CALM). There is no reasonable potential for the Merrimack River to be any more impacted from TP loads than what was measured in the Phase II Merrimack River Study (prior to the installations of the Block and Hong process at Merrimack and the pending nutrient upgrade at Manchester). This is reason enough to include at a maximum a monitor only provision in the Nashua permit for TP with no concentration or mass based nutrient limit for phosphorus.

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

The EPA has not demonstrated that TP is causing a WQ violation and has not factored in reductions in their "Reasonable Potential" argument.

LOW DISSOLVED OXYGEN INDICATES NUTRIENT AND CHLOROPHYLL-A PROBLEMS

The draft Nashua permit pg 20 of 36 states at the start of paragraph 3, *"While **phosphorus is a causal indicator of eutrophication, chlorophyll-a and dissolved oxygen are response indicators** whose quantities may be correlated with… **elevated concentrations of chlorophyll-a, excessive algal and macrophyte growth, and low levels of dissolved oxygen are all effects of nutrient enrichment**."* As there were no oxygen violations, as noted in the below discovery, or instances of excessive algal and macrophyte growth, there is no evidence that phosphorus levels are causing any degradation.

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

years versus five years for other water body types." (CALM – Section 3.1.11 Data Age).

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

The extensive MPR-Study is not only the most current data available, but in this rare instance includes an entire population of data for the largest river in the state, rare by any scientific standard as pointed out by both the EPA and NHDES. The CALM states, *"The number of samples needed to make a use support decision plays a large role in an assessments defensibility and believability…. The more data there is the more confident one can be that the data represents actual conditions. In statistical terms the entire collection of all measurements is called the population. Since it is impossible to sample the entire population, it is necessary to try to describe the population based on a subset of the measurement. By doing so, some error is always introduced"* (CALM Section 3.1.17). In this instance the entire population was not only sampled once, but twice during lower flow critical conditions.

One sampling event happened on July 27, 2010 when the flow was at 2.5 times the 7Q10. The measured upstream phosphorus was 36 ug/l. Upstream flow was at 2.5 X the 7Q10 equaling 1,225 mgd that would give an upstream TP loading of 368 lbs. The other was on September 21, 2010 when the flow was at 1.5 times the 7Q10 at 67 ug/l giving an upstream TP concentration of 411 lbs. The newly calculated in stream median is 51.5 ug/l. This at the 7Q10 would give an instream load of 218 lbs at 7Q10 flows. This is 60% or less o f the calculated "Reasonable Potential" loading when measured on these days with no adverse impact to the WQ of the Merrimack River. When you look at the reductions outlined above that are currently happening along the Merrimack River with Merrimack's nutrient treatment and the nutrient treatment proposed at the Manchester WWTP within two years, there will be no greater loading to the Merrimack River than what was measured during the summer 2010 sampling events. There is no potential for Nashua to grow to 16 mgd daily and no potential for the river concentration below Nashua to reach 130 ug/l for TP as Merrimack has significantly reduced its TP discharge and Manchester will be doing this as well in two years. The 0.6 mg/l limit is unnecessary when viewing the above actual conditions and result in an expensive unnecessary unfunded upgrade for Nashua.

Appendix C of the MPR-Study has 140 pages of data tables. Within these data tables is the most extensive sampling that has ever occurred on the entire Merrimack River within the boundaries of New Hampshire. Contained within these pages are 945 actual field sample events for dissolved oxygen (DO). In review of all the 945 DO data sets the lowest observed DO reading during the two critical events occurred at station M042 on July 27th. The DO was 5.5 mg/l with a saturation of 69%. A follow up DO was taken with a subsequent DO reading of 6.4 mg/l and a saturation of 77.8% **(Attachment 2)**. It appears for whatever reason, the initial reading was compromised and should not be considered as the DO increased by 0.9 mg/l and the saturation by 8.8%.

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

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

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

Should oxygen saturation be assessed separately from the DO mg/l levels only two samples fall within the criteria as cited in the population samples. The CALM has a 10% rule for impairment, "*For water quality assessments, there are basically two types of error Type I, the water body is assessed as impaired when it is really fully supporting and Type II, the water body is assessed as fully supporting when it is really impaired…. DES employed the 'binomial approach; in previous reporting cycles. The binomial approach, however, was criticized by some as being too lenient because the number of exceedances needed for a water body to be considered impaired increased with the total sample size, and at least 3 exceedances were needed for total sample sizes of 10 or less. The concern was that some water bodies were not being listed which were actually impaired. In response to these concerns DES decided to abandon the binomial approach starting with the 2006 cycle and adopt the slightly more stringent ten percent rule (i.e. 10% rule) for determining use support*" (CALM – Section 3.1.17 Minimum Number of Samples -10 Percent Rule). No field samples demonstrated a DO of less than 5 mg/l and only a couple of saturation levels fell below the 75%. Note: In 2006 NHDES dropped the assessment methodology from the binominal approach 30% to determine impairment to the 10% rule. This is a 66% reduction that is significantly more restrictive than the binominal approach.

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

As referenced within the CALM and verified via sound-science through the MRP-Study, there is no DO impairment on in the Merrimack River. The NHDES is taking the unscientific approach by station that "Reasonable Potential" in the Nashua Draft Permit for TP discharge will cause future violations of the dissolved

oxygen standard and excessive algal/macrophyte growth. Based on the two critical low-flow period sampling events, that comprise the most current data, it was demonstrated that there is no dissolved oxygen impairment within the Merrimack River and no excessive algal/macrophyte growth. This reasoning assures a Type I error for dissolved oxygen and phosphorus as outlined in the CALM.

COPPER

Attachment H of Nashua's draft permit has a determination for reasonable potential for Copper. The Merrimack River is only listed as impaired for the metal Aluminum as outlined in paragraph 3 on page 11 of 36. There is no 303(d) impairment for Copper. Attachment D (pg. xv) of the draft permit lists WET testing upstream from Nashua's outfall. The maximum concentration is 11 ug/l, the average is 2 ug/l and the median is 2 ug/l. None of these samples were taken via clean sampling techniques. Table 3-32 of the NHDES CALM lists WQ criteria for non-clean sampling as 15.7 ug/l for freshwater chronic. As the average/median upstream concentration is 2 ug/l as sampled by non-clean methods, there is no WQ impairment evidenced in the Merrimack River for Copper when sampled using non-clean sampling techniques.

When you take the non-clean sampling concentration for Copper (15.6 ug/l), as outlined in Table 3-32 of the CALM and multiply that by the dilution factor of 28.5 you get a Copper discharge concentration of 447 ug/l for typical non-clean sampling conditions and not the 20 ug/l that is listed in the draft permit

Also note in attachment H at the bottom of page xxii, that the draft permit makes reference to chronic aluminum criterion (87 ug/l) and does not correctly reference the Copper criterion as outlined in the NHDES CALM.

LEAD

Attachment H of Nashua's draft permit has a determination for reasonable potential for Lead. The Merrimack River is only listed as impaired for the metal Aluminum as outlined in paragraph 3 on page 11 of 36. There is no 303(d) impairment for Lead. Table 2 on pg 18 of 35 indicates a median upstream concentration of 0.5 ug/l. Footnote 5 states (Establishing a limit equal to the criterion would be appropriate because the median upstream concentration exceeds 90% of this value (.54 X.9 + 0.486 ug/l) of the draft permit lists WET testing upstream from Nashua's outfall. Table 3-32 of the NHDES CALM lists WQ criteria for non-clean sampling as 4.8 ug/l for freshwater chronic. As the upstream median is 0.5 ug/l (12.5% of allowed in-stream lead for non-sampling techniques) there is no WQ impairment for Lead as measured upstream and it is unfounded to set a lead limit in the Nashua permit as stated in footnote 5.

When you take the non-clean sampling concentration for lead (4.8 ug/l), as outlined in Table 3-32 of the CALM and multiply that by the dilution factor of 28.5 you get a leadr discharge concentration of 137 ug/l and not the 0.54 ug/l that is listed in the draft permit. It may be appropriate for the EPA to nudge permittees toward the practice of clean sampling techniques as the EPA has moved permitted toward electronic DMR reporting, otherwise Table 3-32 of the CALM should be the guidance for metals concentration when developing metals limitations.

Also note that when the DMRs are submitted the EPA does not allow a < or ND factor in the sheet. It has been requested that the detection limit be submitted to allow the program to accept the data. There is no indication in

the draft permit if some of the data supplied was less than the detection limit or of the ND designation where a detection limit was used. The need to have a number in all spaces on the DMR skews the average and median concentrations toward higher calculations.

UNFUNDED MANDATE

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

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

The NHDES is establishing new limits for phosphorus, copper and lead at the Nashua WWTP and within the Merrimack River where clearly, the "sound-science" data of the MPR-Study indicates there is no impairment in the Merrimack River. Without the establishment of TMDLs the appearance of regulatory overreach is prominent when viewing the differing TP loads for Concord, Merrimack and Nashua. The "Reasonable Potential" loadings as expressed in the permit narrative were at times exceeded during the extensive consensus/population MPR-Study with no impairment results. This contradicts the NHDES' "Reasonable Potential" argument as evident through the massive amount of data gathered in the Phase II MPR-Study. The MPR-Study demonstrates that a phosphorus limit is not needed for the Merrimack WWTP and that the Merrimack River is in compliance with WQ standards.

The Army Corps of Engineers along with the NHDES and several municipal stakeholders has begun Phase III of the MRP-Study that will specifically measure metals by clean-sampling techniques. The data gathered from this third round of extensive sampling will determine whether or not there is metals contamination in the Merrimack River from Manchester through Amesbury Massachusetts. It is premature at this time to insist there is contamination within the Merrimack by viewing data that was not sampled via clean-sampling techniques. The sampled data is below the limits criteria for non-clean sampling concentration as outlined in the CALM, Table 3-32 and insistence in placing these concentrations in Nashua's permit is an unfunded mandate.

The NHDES "Reasonable Potential" argument is mandating Nashua to upgrade their facility to meet phosphorus removal capabilities far below those mass limits given to upstream WWTPs that will cost the City millions of dollars for design, construction, equipment and ongoing operations and maintenance costs. It is clear that the average monthly concentration limit of 0.6 mg/l limit included in the draft permit based on "reasonable potential"', but clearly contradicted by the scientific findings of the MPR-Study, is an unfunded mandate that will cost the rate payers of Nashua unneeded expenses to achieve a reduction of a pollutant that does not currently, nor will it during the next permit cycle, cause a water quality violation.

The NHDES must revisit the mass loading allocations give to Concord and proposed for Merrimack and assure that Nashua and other future permittees like Manchester, Derry and Hudson are all receiving equal riparian rights and would be assured with an established TMDL.

STATUTORY AND REGULATORY AUTHORITY

Phosphorus

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

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

Env-WS 1703.14.

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

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

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

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

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

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

explained below, we have several significant objections with the assumptions and determinations made by the Region in developing this limit.

1. Misapplication of 40 CFR § 122.44(d)

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

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

> An integral part of the TMDL process is the analysis of cause-effect relationships via a mathematical model of loading input and resulting water quality response.[2]

On its face, 122.44(d) itself indicates that more restrictive limits only apply if the discharge "causes" a water quality criteria excursion[3] as discussed in the *Upper Blackstone* decision. The *Upper Blackstone* decisions repeatedly refer to the fact that nutrients were demonstrated to be "causing" extensive "cultural eutrophication" as the basis for imposing more restrictive limitations.[4]

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

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

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

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

[4] ***Upper Blackstone Water Pollution Abatement Dist. v. EPA*, 690 F.3d 9 (1st Cir. 2012)**

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

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

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

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

Under EPA's approach used in the City of Nashua's NPDES permit, "cultural eutrophication" (the condition intended to be regulated under the adopted narrative criteria) is equated with a numeric value to conclude more restrictive limits are "necessary" *even if the water body is not exhibiting signs of cultural eutrophication.* However, the NPDES regulation was intended to implement the adopted standard as closely as possible with the state's intent – not to substitute a new numeric value in place of it. See, *Am Iron and Steele v. EPA.*

The structure of the rule and "relevant" preamble discussion[5] confirms this is how the rule is to apply. Under Section 122.44(d)(1)(ii) the permit writer first determines if "a discharge... causes or contributes to an instream excursion". In the case of a narrative standard one looks to see if the characteristics that are intended to be prevented are evidenced in the waters (i.e., cultural eutrophication causing some type of system imbalance). If it is determined that an excursion is occurring (or likely to occur) then and only then "the permitting authority must establish effluent limits using one or more of the following methods..." The structure of the rule is clear; the methods for picking a protective instream level are only used to set the effluent limits, not to decide that the

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

waters are in violation of the narrative standard. The 1989 preamble discussion further supported that the methods used to derive the effluent limit was not the same method used to determine if an excursion existed:

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

As is clear from these quotes, Section (vi) is used to set the permit limits *after the excursion (violation) is identified*, not to declare the waters in exceedance (violation) of a state's narrative standard. Any other approach would turn the structure of the Act on its head.[6] EPA is not implementing the adopted narrative standard; EPA is replacing it with a new numeric standard as if it was the adopted narrative standard. That plainly violates the Alaska Rule and 40 CFR 131.21.

EPA is simply jumping over that process by claiming that exceeding a non-specific nutrient concentration constitutes a narrative criteria violation, regardless of whether or not nutrients are actually causing excessive plant growth or DO violations. Thus, it is apparent, that EPA's latest position is a major reinterpretation of 40 CFR 122.44(d), without rulemaking and contrary to the structure of the Act. It is thus, therefore, patently illegal and may not be applied in this instance. *U.S. Telecom. Ass'n v. FCC*, 400 F.3d 29 at 35 ('a substantive change in the regulation,' requires notice and comment) (quoting *Shalala v. Guernsey Mem'l Hosp.*, 514 U.S. 87, 100 (1995

2. Waters Not Listed as Nutrient Impaired

Under section 303(d) of the Clean Water Act, New Hampshire is given primary authority for identifying which of its waterbodies are not meeting the governing water quality standards and for what reasons. EPA has limited authority (inapplicable in this instance) to intrude into this State responsibility. With regard to Merrimack River, New Hampshire has never identified the waterbody as nutrient impaired on the State's 303(d) list.[7] Moreover, Region 1 specifically approved New Hampshire's decision not list the waterbody as nutrient impaired, indicating that the current instream conditions and loadings are acceptable. If EPA wishes to amend a State's 303(d) listing decision, there is a specific process for doing so. Until such steps are taken, however, EPA has no authority to presume nutrients are impairing the Merrimack River or assert that a narrative criteria violation related to nutrients exists in this waterbody.

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

[7] As mentioned in the draft permit, stretches of the Merrimack River are identified as impaired by aluminum, dissolved oxygen, pH, and *Escherichia coli*. Unlike numerous other waterbodies in New Hampshire, chlorophyll-a (surrogate for plant growth) is not the basis of impairment.

3. State Narrative Criteria Misapplied

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

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

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

The key evidentiary component of the narrative nutrient criterion is that a violation is only found when it is demonstrated that phosphorus *is causing* an impairment (*e.g.*, "in such concentrations that would impair"; "human-induced addition of ... nutrients ... which results in"). This requires a "cause and effect" demonstration to find a violation of the narrative criteria. In issuing the draft permit, EPA relied on the Gold Book phosphorus criterion as an appropriate "narrative translator" and applied the Gold Book phosphorus criterion as though it represented a toxic substance by applying the criterion at the 7Q10 stream flow. However, the Gold Book notes that phosphorus concentrations critical to noxious plant growth vary and nuisance growth may result from a particular concentration of phosphate in one geographical area but not in another. Thus, even the Gold Book, upon which EPA relied upon to identify a potential criterion, cautioned that adverse effects cannot be assumed but must be confirmed.

To claim a nutrient limitation is necessary to eliminate use impairments and protect ecological resources under the state's narrative standard, EPA must first demonstrate that the nutrient at issue (phosphorus) caused the impairment, otherwise defined as "cultural eutrophication" (excessive algal growth causing impairment such as DO violations – Env-Wq 1702.15) under state law. Moreover, any "narrative translator" must be based on a system-specific defined "cause and effect" relationship showing the nutrients have caused such "cultural eutrophication."

The permit action is premised on the *assumption* that the waters are nutrient impaired, that the Gold Book phosphorus criterion is an appropriate numeric translator, and that a simple mass balance under design conditions is sufficient to demonstrate reasonable potential. However, there is no indication that "cultural eutrophication" has occurred as a result of the discharge, and the 303(d) list does not identify the waters as impaired by nutrients.

- **Deposition Testimony Confirmed Cause and Effect Demonstration Required for Narrative**

Criteria Violation

The DES has identified the Great Bay Estuary as nutrient impaired based on a scientifically deficient draft criteria document specific to the estuary, and EPA has applied the draft criteria in setting NPDES limits for several municipal dischargers to the estuary. This action was challenged and several DES staff were deposed and gave testimony on application of the state's narrative nutrient criteria. Mr. Paul Currier of DES confirmed that any claim of narrative criteria violations requires a documented *causal relationship* between nutrients and excessive plant growth adversely impacting designated uses (*See* Currier Dep. at 18, 19, 134)[8].

The Gold Book phosphorus criterion cannot be a proper translator of the existing narrative criteria without a causal demonstration that phosphorus is causing cultural eutrophication. Moreover, both Mr. Currier and Mr. Trowbridge noted that merely exceeding values contained in the draft 2009 Criteria (and, in this case, the Gold Book criterion) does not provide a demonstration that a narrative violation exists. (Currier Dep. at 80; Trowbridge Dep. at 332-333)

Based on these sworn acknowledgements on how state law is intended to operate, it was improper for EPA to presume that the exceeding the Gold Book levels will or has caused impairment anywhere in the Merrimack River. It was equally improper for EPA to presume that attaining compliance with the numeric values contained in the Gold Book, was necessary to avoid violating the state's narrative criteria. Finally, it was also improper to presume that the Gold Book criterion accurately reflected the level of scientific demonstration required by the existing narrative standard to designate waters as nutrient impaired. Such speculation is not a basis for narrative criteria implementation and does not constitute "weight of evidence" that phosphorus has triggered narrative criteria violations as assumed in EPA's proposed permitting action. Consequently, the necessary evidence to support use of the Gold Book criterion as a "narrative translator" has not been provided and the use of the Gold Book criterion is this permit action is arbitrary and capricious.

4. No Evidence of Excessive Algal Growth

The conceptual model relating nutrients to aquatic life impairment requires that nutrient loads stimulate aquatic plant growth which, in turn, causes an adverse effect (e.g., dissolved oxygen criteria violations, impaired macroinvertebrate communities). That is, "cultural eutrophication" is a prerequisite to narrative criteria implementation. This model is well known and documented in EPA's Gold Book (1986), the Technical Guidance Manual for Developing Total Maximum Daily Loads (EPA, 1995)[9], the Protocol for Developing Nutrient TMDLs (EPA, 1999)[10], and EPA's guidance on Using Stressor-response Relationships to Derive Numeric Nutrient Criteria (2010)[11].

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[8] Full copies of the Currier, Short and Trowbridge Depositions, plus exhibits have been provided to EPA by the Coalition's counsel. Due to the voluminous nature of those documents they are not being resubmitted with these comments.

[9] USEPA. September 1995. Technical Guidance Manual for Developing Total Maximum Daily Loads. Book II: Streams and Rivers. Part 1: Biochemical Oxygen Demand/Dissolved Oxygen and Nutrients/Eutrophication. EPA 823-B-95-007.

[10] USEPA. November 1999. Protocol for Developing Nutrient TMDLs. First Edition. EPA 841-B-99-007

[11] USEPA. November 2010. Using Stressor-response Relationships to Derive Numeric Nutrient Criteria. EPA-820-S-10-001.

> [I]f the maximum possible chlorophyll a level that could be achieved is extremely low, it will usually be safe to conclude that nutrients do not pose a problem in relation to water column algae.
>
> In most natural systems, especially flowing streams, the actual chlorophyll a levels that occur will be substantially less than the maximum potential under a combination of ideal conditions. Collection of chlorophyll a data could be used to verify the estimated chlorophyll a levels and to determine whether a problem exists.
>
> (Technical Guidance Manual at 4-8)

If the designated use impairment identified for the Merrimack River (chlorophyll-a, primary contact recreation as outlined on pg 11 of 36 of the draft permit) is due to phosphorus, there must be a showing that algal levels in the river are elevated and these elevated algal levels cause or contribute to the low dissolved oxygen. However, there are no data reported in the Fact Sheet that address algal concentrations in the river that contributed to low dissolved oxygen. Without any data to support a key component of the conceptual model, EPA's presumption that phosphorus is causing a violation of the state's narrative criteria is arbitrary and capricious.

5. Gold Book Not Applicable as Criteria without Site-Specific Data Confirmation

As described above, EPA simply assumed that the Gold Book's 0.1 mg/L preliminary recommendation for phosphorus was the applicable instream target for the Merrimack River without using any site-specific data to confirm (1) the existence of a nutrient impairment or (2) whether such a criterion is necessary to protect the applicable uses. In so doing, EPA has effectively adopted a numeric criterion for all similar-situated waters in the state (i.e., free-flowing without a direct link to a lake or reservoir). Moreover, in this case, EPA has effectively concluded that 0.1 mg/l TP limit should be applied to all flowing waters without considering any of the relevant physical factors or whether the nutrient level is actually causing any use impairment. Such EPA action is both procedurally and substantively improper. First, States have primary authority to amend existing water quality standards and all amendments (state or federal) must be subjected to a public notice and comment process. For other states where EPA has determined that a numeric criterion was the applicable translator for a state's narrative standard, EPA has undergone notice and comment rulemaking. This is required by 40 C.F.R. §§ 131.21 and 22. EPA's recent nutrient criteria adoption action in Florida was an example of such agency decision-making. Second, the Gold Book does not recommend that a 0.1 mg/L TP nutrient level be established for streams. Rather, the Gold Book expressly qualifies its recommendation for nutrients because of the dynamic interplay nutrients have with individual ecosystems and the range of potentially appropriate nutrient levels given varied site-specific conditions.[12] Thus, the Region has also failed to properly apply the recommended approach specified in the "Gold Book."

[12] Quality Criteria of Water (Gold Book) EPA 440/5-86-001 (May 1, 1986) (Recognizing that instream phosphorus levels "do not directly impact streams and rivers" and that "a number of specific exceptions can occur to reduce the threat of phosphorus"). Furthermore, EPA's document entitled "National Recommended Water Quality Criteria – Correction" (USEPA April 1999) specifies that no numeric recommendation has been proposed for phosphorus – only a "narrative statement" applies. This narrative statement requires consideration of site-specific information on whether or not the nutrient level is actually causing excessive plant growth and impairment of uses.

6. Reference Waters

The Fact Sheet discusses several guidance documents which contain recommended total phosphorus criteria based on an evaluation of the concentration of phosphorus expected in reference waters. Although the Fact Sheet notes that EPA did not choose to apply a reference-based phosphorus criterion, we note that such application is inconsistent with New Hampshire's narrative criterion, which requires a demonstration that phosphorus is causing excessive plant growth and/or dissolved oxygen impairment. Moreover, the application of reference-based nutrient criteria to implement the state's narrative criterion was rejected by the court in the State of Florida (February 2012).

The circumstances in Florida are identical to the circumstances in New Hampshire. Both narrative criteria limit nutrient concentrations to prevent designated use impairments. The court found that reference-based criteria are premised on preventing any change in nutrient concentrations that increase above the "reference" concentration. However, the narrative criteria limit increases in nutrient concentrations above the concentration that causes harm. Consequently, before the reference-based criteria can be applied, EPA must first demonstrate that these criteria are set at a threshold above which use impairment is caused by phosphorus.

7. 7Q10 Flow Inappropriate for Nutrient Regulation

The phosphorus limit proposed in the City of Nashua permit was based and developed upon the calculated 7Q10 flow. However, nutrients are not toxics and their impacts are manifested over a growing season as discussed in EPA's Protocol for Developing Nutrient TMDLs (1999) (at 4-3).

> TMDL developers should be aware that nutrient problems tend to be seasonally expressed and in many cases might result from the accumulation of year-round loadings.

Criteria based on the prevention of toxic effects utilize low flow conditions in the development of water quality-based effluent limits to ensure that adverse effects, which are expressed over a short exposure period, do not occur. However, impairments associated with nutrients are not expressed in the same way. Rather, nutrient concentrations must stimulate plant growth which then causes use impairment. This conceptual model has a longer averaging period and does not require application under extreme low flow conditions as discussed in EPA's NPDES Permit Writers' Manual (September 2010).

> [T]he recommended nutrient criteria represent conditions of surface waters that have minimal impacts caused by human activities rather than values derived from laboratory toxicity testing.
>
> [S]tates may adopt seasonal or annual averaging periods for nutrient criteria instead of the 1-hour, 24-hour, or 4-day average durations typical of aquatic life criteria for toxic pollutants.
>
> (NPDES Permit Writers' Manual at 6-6)

Thus, it is well-settled that nutrient concerns for streams and rivers, to the extent they exist at all, are only a concern during the growing season (e.g. April – September). During this period, snow melt and wet weather result in stream flows typically far greater than 7Q10. As a result, the proposed limit was developed using a

non-representative flow and is, consequently, unnecessarily stringent.

***

Based on the information contained in these comments, it is respectfully requested that the Region withdraw the phosphorus, copper and lead limits from the draft permit. Under New Hampshire law, a narrative criteria violation requires some demonstration that a water body is being impaired by nutrients. The MPR-Study conducted on the Merrimack River by the USACOE demonstrated that this impairment does not exist. To impose a phosphorus limit, the Region must demonstrate that nutrients are, in fact, causing impairments in the Merrimack River and develop an instream phosphorus target based on the site-specific data used in that determination. Moreover, it is inappropriate to presume that a 0.1 mg/L TP level is required to protect all flowing waters from nutrient impacts. It is also scientifically inappropriate to base the proposed limit on the rarely occurring 7Q10 flow that does not control the degree of plant growth occurring in the river. Given the assumptions in the Region's approach to interpreting the state's narrative standard and setting phosphorus limits, the draft provision of 0.06 mg/l should be withdrawn.

Respectfully submitted,

Ricardo Cantu
Superintendent, Manchester WWTP

Cc: Fred McNeill, P.E.
Harry T. Stewart, P.E., NHDES
Mario Leclerc, City of Nashua

ATTACHMENT 7

7Q10 Low Flow and Dilution Calculation

7-day min annual series

Hydrologic Year	Min-7-day Annual Series	Log	Calendar Year	Min-7-day Annual Series	Log
4/1/1923	1261.4	3.10			
4/1/1924	1456.7	3.16	12/31/1924	1456.71	3.16
4/1/1925	1230.3	3.09	12/31/1925	1230.29	3.09
4/1/1926	12142.9	4.08	12/31/1926	1334.86	3.13
4/2/1927	2215.7	3.35	12/31/1927	2215.71	3.35
4/1/1928	2900.0	3.46	12/31/1928	2900.00	3.46
4/1/1929	1241.0	3.09	12/31/1929	1241.00	3.09
4/1/1930	18171.4	4.26	12/31/1930	989.29	3.00
4/2/1931	1336.4	3.13	12/31/1931	1336.43	3.13
4/1/1932	1344.0	3.13	12/31/1932	1344.00	3.13
4/1/1933	1575.0	3.20	12/31/1933	1575.00	3.20
4/1/1934	14942.9	4.17	12/31/1934	1106.00	3.04
4/2/1935	1622.3	3.21	12/31/1935	1622.29	3.21
4/1/1936	1538.0	3.19	12/31/1936	1538.00	3.19
4/1/1937	1586.1	3.20	12/31/1937	1586.14	3.20
4/1/1938	13528.6	4.13	12/31/1938	3030.00	3.48
4/2/1939	1423.4	3.15	12/31/1939	1423.43	3.15
4/1/1940	1516.6	3.18	12/31/1940	1516.57	3.18
4/1/1941	1012.3	3.01	12/31/1941	1012.29	3.01
4/1/1942	18000.0	4.26	12/31/1942	1527.57	3.18
4/2/1943	1614.7	3.21	12/31/1943	1614.71	3.21
4/1/1944	1468.0	3.17	12/31/1944	1468.00	3.17
4/1/1945	2129.7	3.33	12/31/1945	2129.71	3.33
4/1/1946	14957.1	4.17	12/31/1946	2081.00	3.32
4/2/1947	1086.9	3.04	12/31/1947	1086.86	3.04
4/1/1948	1036.9	3.02	12/31/1948	1036.86	3.02
4/1/1949	1225.9	3.09	12/31/1949	1225.86	3.09
4/1/1950	18628.6	4.27	12/31/1950	1088.86	3.04
4/2/1951	3247.1	3.51	12/31/1951	3247.14	3.51
4/1/1952	1416.3	3.15	12/31/1952	1416.29	3.15
4/1/1953	1094.7	3.04	12/31/1953	1094.71	3.04
4/1/1954	10688.6	4.03	12/31/1954	2041.43	3.31
4/2/1955	1335.7	3.13	12/31/1955	1335.71	3.13
4/1/1956	1450.9	3.16	12/31/1956	1450.86	3.16
4/1/1957	729.4	2.86	12/31/1957	729.43	2.86
4/1/1958	13442.9	4.13	12/31/1958	1435.29	3.16
4/2/1959	1279.6	3.11	12/31/1959	1279.57	3.11
4/1/1960	1431.4	3.16	12/31/1960	1431.43	3.16
4/1/1961	1425.3	3.15	12/31/1961	1425.29	3.15
4/1/1962	25657.1	4.41	12/31/1962	1438.86	3.16
4/2/1963	991.1	3.00	12/31/1963	991.14	3.00
4/1/1964	686.3	2.84	12/31/1964	686.29	2.84
4/1/1965	723.0	2.86	12/31/1965	723.00	2.86
4/1/1966	8815.7	3.95	12/31/1966	951.29	2.98
4/2/1967	1443.7	3.16	12/31/1967	1443.71	3.16
4/1/1968	1289.6	3.11	12/31/1968	1289.57	3.11
4/1/1969	1509.1	3.18	12/31/1969	1509.14	3.18
4/1/1970	10471.4	4.02	12/31/1970	1194.29	3.08
4/2/1971	1160.9	3.06	12/31/1971	1160.86	3.06
4/1/1972	1600.9	3.20	12/31/1972	1600.86	3.20
4/1/1973	1805.7	3.26	12/31/1973	1805.71	3.26

Log Pearson Parameters	Hydrologic Year	Calendar Year	
average:	3.38	3.12	
standard deviation:	0.4872024	0.14065638	
skew coefficient:	1.0172895	0.24707881	
years in series	49	49	
Skew	Return Period KT Values		
Probability	0.1	0.1	
Recurrence	10	10	
0	-1.12762	-1.28155	0
0.1	-1.10776	-1.27057	0.1
1.017289521	-1.1240999	-1.2539266	0.247079
Merrimack at Lowell (cfs)			
7Q10	678	880	

Min 7-day Series	Percentile
703.9086	1.00
818.1714	5.00
990.7714	10.00
1046.857	15.00
1092.371	20.00
1160.857	25.00
1227.629	30.00
1271.857	35.00
1335.029	40.00
1340.971	45.00
1423.429	50.00
1432.971	55.00
1442.743	60.00
1458.971	65.00
1513.6	70.00
1538	75.00
1592.029	80.00
1620.771	85.00
2090.743	90.00
2626.286	95.00
3247.143	100.00

Derivation of Merrimack River 7Q10 at Nashua, New Hampshire

7-day min annual series

Hydrologic Year	Min-7-day Annual Series	Log		Calendar Year	Min-7-day Annual Series	Log
4/1/1937	1870.00	3.27	12/31/1937	1141.57	3.06
4/1/1938	1141.57	3.06	12/31/1938	1725.71	3.24
4/1/1939	1725.71	3.24	12/31/1939	963.14	2.98
4/1/1940	963.14	2.98	12/31/1940	1069.43	3.03
4/1/1941	1323.14	3.12	12/31/1941	857.43	2.93
4/1/1942	857.43	2.93	12/31/1942	1166.86	3.07
4/1/1943	1166.86	3.07	12/31/1943	1248.43	3.10
4/1/1944	1248.43	3.10	12/31/1944	1238.57	3.09
4/1/1945	1238.57	3.09	12/31/1945	1695.71	3.23
4/1/1946	1695.71	3.23	12/31/1946	1621.43	3.21
4/1/1947	1621.43	3.21	12/31/1947	797.43	2.90
4/1/1948	797.43	2.90	12/31/1948	924.71	2.97
4/1/1949	924.71	2.97	12/31/1949	870.86	2.94
4/1/1950	870.86	2.94	12/31/1950	817.14	2.91
4/1/1951	817.14	2.91	12/31/1951	2180.00	3.34
4/1/1952	2180.00	3.34	12/31/1952	912.57	2.96
4/1/1953	912.57	2.96	12/31/1953	720.29	2.86
4/1/1954	720.29	2.86	12/31/1954	1280.71	3.11
4/1/1955	1280.71	3.11	12/31/1955	962.43	2.98
4/1/1956	962.43	2.98	12/31/1956	1016.29	3.01
4/1/1957	1016.29	3.01	12/31/1957	594.29	2.77
4/1/1958	594.29	2.77	12/31/1958	917.86	2.96
4/1/1959	917.86	2.96	12/31/1959	1010.29	3.00
4/1/1960	1010.29	3.00	12/31/1960	1067.57	3.03
4/1/1961	1067.57	3.03	12/31/1961	876.43	2.94
4/1/1962	876.43	2.94	12/31/1962	948.71	2.98
4/1/1963	948.71	2.98	12/31/1963	695.43	2.84
4/1/1964	695.43	2.84	12/31/1964	394.43	2.60
4/1/1965	394.43	2.60	12/31/1965	664.71	2.82
4/1/1966	664.71	2.82	12/31/1966	827.14	2.92
4/1/1967	827.14	2.92	12/31/1967	1061.43	3.03
4/1/1968	1061.43	3.03	12/31/1968	1037.14	3.02
4/1/1969	1037.14	3.02	12/31/1969	1169.71	3.07
4/1/1970	1169.71	3.07	12/31/1970	850.00	2.93
4/1/1971	850.00	2.93	12/31/1971	742.86	2.87
4/1/1972	742.86	2.87	12/31/1972	1158.57	3.06
4/1/1973	1158.57	3.06	12/31/1973	1294.43	3.11
4/1/1974	1294.43	3.11	12/31/1974	861.57	2.94
4/1/1975	861.57	2.94	12/31/1975	1024.71	3.01
4/1/1976	1024.71	3.01	12/31/1976	1338.00	3.13
4/1/1977	1338.00	3.13	12/31/1977	969.43	2.99
4/1/1978	969.43	2.99	12/31/1978	742.86	2.87
4/1/1979	742.86	2.87	12/31/1979	1163.71	3.07
4/1/1980	1101.14	3.04	12/31/1980	655.29	2.82
4/1/1981	655.29	2.82	12/31/1981	1334.14	3.13
4/1/1982	1467.14	3.17	12/31/1982	1030.57	3.01
4/1/1983	1030.57	3.01	12/31/1983	819.71	2.91
4/1/1984	819.71	2.91	12/31/1984	836.14	2.92
4/1/1985	836.14	2.92	12/31/1985	777.43	2.89
4/1/1986	777.43	2.89	12/31/1986	1545.71	3.19
4/1/1987	1545.71	3.19	12/31/1987	1045.71	3.02
4/1/1988	1045.71	3.02	12/31/1988	911.00	2.96
4/1/1989	911.00	2.96	12/31/1989	1025.43	3.01
4/1/1990	1025.43	3.01	12/31/1990	1046.29	3.02
4/1/1991	1046.29	3.02	12/31/1991	436.00	2.64
4/1/1992	436.00	2.64	12/31/1992	1360.00	3.13
4/1/1993	1360.00	3.13	12/31/1993	657.86	2.82
4/1/1994	657.86	2.82	12/31/1994	1025.43	3.01
4/1/1995	1025.43	3.01	12/31/1995	559.43	2.75
4/1/1996	559.43	2.75	12/31/1996	931.43	2.97
4/1/1997	931.43	2.97	12/31/1997	1088.86	3.04
4/1/1998	1088.86	3.04	12/31/1998	1026.71	3.01
4/1/1999	1026.71	3.01	12/31/1999	748.00	2.87
4/1/2000	748.00	2.87	12/31/2000	1290.00	3.11
4/1/2001	1290.00	3.11	12/31/2001	694.43	2.84
4/1/2002	694.43	2.84	12/31/2002	605.43	2.78
4/1/2003	605.43	2.78	12/31/2003	1049.86	3.02

Log Pearson Parameters	Hydrologic Year	Calendar Year	
average:	2.99	2.99	
standard deviation:	0.13	0.13	
skew coefficient:	-0.26	-0.30	
years in series	71	71	
Skew	Return Period KT Values		
Probability	0.1	0.1	
Recurrence	10	10	
	-0.2	-1.30105	-1.30105	-0.2
	-0.3	-1.30936	-1.30936	-0.3
	-0.26	-1.305622	-1.3094394	-0.30

Merrimack below Manchester

	(cfs)	
7Q10	652	650

Correction for Drainage Area:

$(DA_{Nashua}/DA_{Manchester})^{\theta}$ 1.2615

	DA (sq-mi)	
At Nashua	3999	
At Merrimack	3092	820

Merrimack at Nashua	(cfs)	
7Q10	822	820

$$Lowell_{7Q10} = Manchester_{7Q10} * (A_{Lowell}/A_{Manchester})^{\theta}$$

DA_{Lowell}	4421 sq-mi
$DA_{Manchester}$	3092 sq-mi
$7Q10_{Lowell,\ pre\text{-}WWTF}$	880 cfs
$7Q10_{Manchester,pre\text{-}WWTF}$	637 cfs
watershed exponent, n	0.90325

Min 7-day Series	Percentile
422.2814	1.00
598.1857	5.00
662.6571	10.00
721.4143	15.00
759.7714	20.00
819.0714	25.00
840.7429	30.00
873.3643	35.00
912.2571	40.00
934.0214	45.00
989.8571	50.00
1025.321	55.00
1031.886	60.00
1048.25	65.00
1086.729	70.00
1161.357	75.00
1263.857	80.00
1335.821	85.00
1450.143	90.00
1594.929	95.00
2180	100.00

4/1/2004	1049.86	3.02	12/31/2004	1385.14	3.14
4/1/2005	1385.14	3.14	12/31/2005	1227.14	3.09
4/1/2006	1227.14	3.09	12/31/2006	1442.86	3.16
4/1/2007	1442.86	3.16	12/31/2007	891.00	2.95
4/1/2008	891.00	2.95	12/31/2008	1627.14	3.21
4/1/2009	1627.14	3.21	12/31/2009	1485.71	3.17
4/1/2010	1485.71	3.17	12/31/2010	839.71	2.92
4/1/2011	839.71	2.92	12/31/2011	1141.43	3.06
4/1/2012	1141.43	3.06	12/31/2012	1080.86	3.03
4/1/2013	1080.86	3.03	12/31/2013	#N/A	#N/A

7-day min annual series

Hydrologic Year Min-7-day Annual Series		Log	Calendar Year Min-7-day Annual Series		Log
4/1/1937	1870.00	3.27	12/31/1937	1141.57	3.06
4/1/1938	1141.57	3.06	12/31/1938	1725.71	3.24
4/1/1939	1725.71	3.24	12/31/1939	963.14	2.98
4/1/1940	963.14	2.98	12/31/1940	1069.43	3.03
4/1/1941	1323.14	3.12	12/31/1941	857.43	2.93
4/1/1942	857.43	2.93	12/31/1942	1166.86	3.07
4/1/1943	1166.86	3.07	12/31/1943	1248.43	3.10
4/1/1944	1248.43	3.10	12/31/1944	1238.57	3.09
4/1/1945	1238.57	3.09	12/31/1945	1695.71	3.23
4/1/1946	1695.71	3.23	12/31/1946	1621.43	3.21
4/1/1947	1621.43	3.21	12/31/1947	797.43	2.90
4/1/1948	797.43	2.90	12/31/1948	924.71	2.97
4/1/1949	924.71	2.97	12/31/1949	870.86	2.94
4/1/1950	870.86	2.94	12/31/1950	817.14	2.91
4/1/1951	817.14	2.91	12/31/1951	2180.00	3.34
4/1/1952	2180.00	3.34	12/31/1952	912.57	2.96
4/1/1953	912.57	2.96	12/31/1953	720.29	2.86
4/1/1954	720.29	2.86	12/31/1954	1280.71	3.11
4/1/1955	1280.71	3.11	12/31/1955	962.43	2.98
4/1/1956	962.43	2.98	12/31/1956	1016.29	3.01
4/1/1957	1016.29	3.01	12/31/1957	594.29	2.77
4/1/1958	594.29	2.77	12/31/1958	917.86	2.96
4/1/1959	917.86	2.96	12/31/1959	1010.29	3.00
4/1/1960	1010.29	3.00	12/31/1960	1067.57	3.03
4/1/1961	1067.57	3.03	12/31/1961	876.43	2.94
4/1/1962	876.43	2.94	12/31/1962	948.71	2.98
4/1/1963	948.71	2.98	12/31/1963	695.43	2.84
4/1/1964	695.43	2.84	12/31/1964	394.43	2.60
4/1/1965	394.43	2.60	12/31/1965	664.71	2.82
4/1/1966	664.71	2.82	12/31/1966	827.14	2.92
4/1/1967	827.14	2.92	12/31/1967	1061.43	3.03
4/1/1968	1061.43	3.03	12/31/1968	1037.14	3.02
4/1/1969	1037.14	3.02	12/31/1969	1169.71	3.07
4/1/1970	1169.71	3.07	12/31/1970	850.00	2.93
4/1/1971	850.00	2.93	12/31/1971	742.86	2.87
4/1/1972	742.86	2.87	12/31/1972	1158.57	3.06
4/1/1973	1158.57	3.06	12/31/1973	1294.43	3.11

Log Pearson Paramet	Hydrologic Year	Calendar Year	
average:	2.98	2.99	
standard deviation:	0.14	0.14	
skew coefficient:	0.00	-0.10	
years in series	32	32	
Skew	Return Period KT Values		
Probability	0.1	0.1	
Recurrence	10	10	
-0.2	-1.30105	-1.30105	-0.2
-0.3	-1.30936	-1.30936	-0.3
0.00	-1.2846	-1.292819	-0.10

Merrimack below Manchester

(cfs)

7Q10	641	637

Min 7-day Series	Percentile
450.3886	1.00
622.4571	5.00
689.2857	10.00
724.8	15.00
775.6	20.00
817.1429	25.00
836.2857	30.00
866.6857	35.00
883.6571	40.00
915.7429	45.00
924.7143	50.00
954.2	55.00
1000.714	60.00
1020.457	65.00
1051.714	70.00
1067.571	75.00
1163.029	80.00
1224.8	85.00
1348.857	90.00
1666	95.00
2180	100.00

ATTACHMENT 8

Total Phosphorus Effluent

ATTACHMENT 8

Nashua WWTP Permit, Total Phosphorus Limit Calculation			
Parameter	Value	Units	Notes or Formula
Upstream 7Q10, Qs	820	cfs	= Qs from Log Pearson Type III analysis using Merrimack River at Manchester gage data
Upstream 7Q10, Qs	529.7	mgd	
Lowest Monthly WWTP Discharge, Qd	8.1	mgd	Nashua information from DMR flows 2007 to 2012
Design Flow Discharge, Qdmax	16	mgd	NPDES Permit
Downstream Flow, Qr	545.7	mgd	=Qs + Qd (use design flow for Qd in accordance with NPDES Permit Writers' Manual)
Downstream Flow, Qr	844.8	cfs	=Qr [mgd]/ 0.646
Upstream River Concentration, Cs	0.027	mg/L	median concentration based on 2010-2012 data
Downstream Concentration, Cr	0.100	mg/L	EPA Gold Book Target
Mass Based Phosphorous Limit, Md	291	lb/day	= (QrCr(0.90)-QsCs)*8.345 (This includes a provision to maintain 10% of assimilative capacity)
Corresponding Concentration at Qd, Cd	4.3	mg/L	= Md / (8.345 * Qd)
Corresponding Concentration at Qdmax, Cdmax	2.2	mg/L	= Md / (8.345 * Qdmax)

Total Phosphorus Background Concentration, ug/l					
Station #	Location	Assessment Unit	sampling date - TP ug/l		
			7/27/2010	9/21/2010	5/17/2012
M070	u/s nashua	NHRIV700061206-24	36.00	67.00	30.00
M170	u/s nashua	NHRIV700061206-24			2
M270	u/s nashua	NHRIV700061206-24			24
M370	u/s nashua	NHRIV700061206-24			2
Min	2.00				
Max	67.00				
Ave	26.83				
Med	27.00				

ATTACHMENT 9

Copper and Lead Effluent Limitations Calculation

ATTACHMENT 9

Table 2: Metals Data for the Merrimack River – Upstream of Nashua (2007 – 2014)								
Date	Al	Cd	Cr	Cu	Pb	Ni	Zn	Hardness
	Daily Max	Daily Max	Daily Max	Daily Max	Daily Max	Daily Max	Daily Max	Daily Max
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
3/30/2007	0.095	0	0	0.002	0	0	0.02	20
6/30/2007								
9/30/2007	0	0	0	0	0	0	0.016	18
12/31/2007	0.14	0	0	0	0	0	0.0067	13.3
3/31/2008	0.038	NA	NA	0	0	0	0.02	14
6/30/2008	0.051	NA	NA	0	0	0	0.052	17
9/30/2008	0.15	0	0	0	0.001	0	0.011	14
12/31/2008	0.07	0	NA	0.002	0	0	0.019	17
3/31/2009	0.14	0	NA	0.003	0.0007	0	0.015	13
6/30/2009	0.11	0	0	0.002	0.0006	0	0.017	14
9/30/2009	0.06	0	0	0.003	0	0	0.009	15
12/31/2009	0.075	0	0	0.006	0.0008	0	0.005	14
3/31/2010	0	0	0	0.006	0.0005	0	0.009	15
6/30/2010	0.082	0	0	0.011	0.0007	0	0.006	15
9/30/2010	0.043	0	0	0.003	0.0005	0	0.004	18
12/31/2010	0.49	0	0	0.004	0.001	0	0.008	8.8
3/31/2011	0.082	0	0	0	0	0	0.005	17
6/30/2011	0.4	0	0	0	0.0008	0	0.004	8.3
9/30/2011	0							
12/31/2011	0.085	0	0	0	0	0	0.004	13
3/31/2012	0.08	0	0	0	0.0005	0	0.004	14
5/1/2012	0.13	0	0	0.005	0	0	0.004	11
8/1/2012	0.09	0	0	0	0	0	0.005	17
11/14/2012	0.09	0	0	0.005	0	0	0.004	14
3/5/2013	0.15	0.0005	0.002	0.013	0.0007	0.002	0.008	17
4/17/2013	0.14	0	0	0.015	0.0007	0	0.005	9.5
9/4/2013	0.13	0	0	0.002	0.0008	0	0.012	14
11/6/2013	0.05	0	0	0	0	0	0.003	14
3/9/2014	0.06	0	0	0	0	0	0.006	17
6/1/2014	0.1	0	0	0.003	0	0	0.006	14
8/25/2014	0.09	0	0	0	0	0	0.007	15
10/28/2014	0.2	0	0	0	0	0	0.005	11
Min	0	0	0	0	0	0	0.003	8.3
Max	0.49	0.0005	0.002	0.015	0.001	0.002	0.052	20
Avg	0.11035	1.79E-05	7.69E-05	0.00283	0.00031	6.67E-05	0.0100	14.40

Table 2: Metals Data for the Merrimack River – Upstream of Nashua (2007 – 2014)								
Date	Al	Cd	Cr	Cu	Pb	Ni	Zn	Hardness
	Daily Max	Daily Max	Daily Max	Daily Max	Daily Max	Daily Max	Daily Max	Daily Max
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Median	0.09	0	0	0.002	0	0	0.00635	14

Table 3: Nashua WWTF Effluent Metals Data (2007 – 2014)							
Date	Al	Cd	Cr	Cu	Pb	Ni	Zn
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
3/31/2007	0.06	0.001	0.003	0.027	0	0.006	0.18
4/30/2007				0.02			
5/31/2007				0.02			
6/30/2007	0.02	0.001	0.002	0.017	0.005	0.003	0.063
7/31/2007				0.01			
8/31/2007				0.01			
9/30/2007	0	0	0	0.007	0	0.008	0.068
10/31/2007				0.02			
11/30/2007				0.02			
12/31/2007	0.026	0	0	0.015	0	0.007	0.087
1/31/2008				0.01			
2/29/2008				0.01			
3/31/2008	0	0	0	0.021	0	0.005	0.086
4/30/2008				0.01			
5/31/2008				0.01			
6/30/2008	0	0	0	0.017	0.0008 2	0.003	0.096
7/31/2008				0.03			
8/31/2008				0.01			
9/30/2008	0.03	0	0	0.012	0.001	0.005	0.048
10/31/2008				0.01			
11/30/2008				0.02			
12/31/2008	0.02	0	0.003	0.011	0	0	0
1/31/2009				0.006			
2/28/2009				0.013			
3/31/2009	0	0	0	0.011	0.001	0.002	0.063
4/30/2009				0.01			
5/31/2009				0.01			
6/30/2009	0.02	0	0	0.009	0.002	0.004	0.066
7/31/2009				0.01			
8/31/2009				0.01			
9/30/2009	0	0	0.003	0.01	0.001	0.006	0.051
10/31/2009				0.019			
11/30/2009				0.01			
12/31/2009	0.031	0	0	0.019	0.0012	0.004	0.052
1/31/2010				0.013			
2/28/2010				0.007			
3/31/2010	0	0	0	0.013	0.001	0.005	0.053

Table 3: Nashua WWTF Effluent Metals Data (2007 – 2014)							
Date	Al	Cd	Cr	Cu	Pb	Ni	Zn
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
4/30/2010				0.02			
5/31/2010				0.029			
6/30/2010	0.047	0	0	0.029	0.002	0.007	0.079
7/31/2010				0.03			
8/31/2010				0.02			
9/30/2010	0.038	0	0.003	0.019	0.001	0.009	0.084
10/31/2010				0.03			
11/30/2010				0.02			
12/31/2010	0.04	0	0	0.024	0.001	0.006	0.096
1/31/2011				0.02			
2/28/2011				0.03			
3/31/2011	0.047	0	0.002	0.019	0.002	0.006	0.12
4/30/2011				0.02			
5/31/2011				0.02			
6/30/2011	0.029	0	0	0.01	0.001	0.004	0.06
7/31/2011				0.02			
8/31/2011				0.025			
9/30/2011	0.038	0.0005	0.002	0.025	0.001	0.005	0.072
10/31/2011				0.02			
11/30/2011				0.011			
12/31/2011	0.032	0	0	0.011	0.0006	0.004	0.057
1/31/2012				0.02			
2/29/2012				0.02			
3/31/2012	0.021	0	0	0.018	0.0009	0.004	0.087
5/1/2012	0.05	0	0	0.017	0.001	0.004	0.061
8/1/2012	0.03	0	0	0.019	0	0.007	0.05
11/14/2012	0	0	0	0.021	0.0006	0.006	0.055
3/5/2013	0.04	0.0005	0.002	0.034	0.0005	0.006	0.095
4/17/2013	0.08	0	0	0.027	0.015	0.007	0.059
9/4/2013	0.03	0	0	0.034	0.0006	0.004	0.08
11/6/2013	0.03	0	0	0.014	0.0006	0.005	0.057
3/9/2014	0	0	0	0.059	0.001	0.004	0.19
6/1/2014	0	0	0	0.014	0	0.004	0.099
8/25/2014	0.03	0	0	0.007	0	0.018	0.04
10/28/2014	0.00	0.00	0.00	0.006	0	0.005	0.031
Min	0	0	0	0.006	0	0	0
Max	0.08	0.001	0.003	0.059	0.015	0.018	0.19
Avg	0.0246	9.38E-	0.00062	0.0176	0.0013	0.0054	0.0745

Table 3: Nashua WWTF Effluent Metals Data (2007 – 2014)							
Date	Al	Cd	Cr	Cu	Pb	Ni	Zn
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	56	05	5	25	07	06	31
Median	0.0295	0	0	0.0185	0.0009 5	0.005	0.0645
95th Percentile (µg/L)	52.14	0.878	3.026	34.11	2.54	8.77	125.7