PUBLIC WORKS DEPARTMENT

CITY OF PORTSMOUTH
680 Peverly Hill Road
Portsmouth N.H. 03801
(603) 427-1530 FAX (603) 427-1539

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VIA EMAIL Cobb.Michael@epa.gov

Michael Cobb
U.S. EPA, Region 1
5 Post Office Square, Suite -100(06-1)
Boston, MA 02109-3912

Subject: Comments on NH NPDES GP NHG58A000
City of Portsmouth, New Hampshire

Dear Mr. Cobb:

The City of Portsmouth New Hampshire ("Portsmouth" or "City") submits these comments on the Draft National Pollutant Discharge Elimination System (NPDES) Great Bay Total Nitrogen General Permit for Wastewater Treatment Facilities in New Hampshire, NPDES General Permit NHG58A000, ("Draft Permit") issued by the United States Environmental Protection Agency ("EPA"). Portsmouth appreciates the innovative structure of the Draft Permit and the opportunities it presents. By submitting these comments Portsmouth hopes to inform the final version of the permit for the benefit of not only Portsmouth but also other permittees. Portsmouth is committed to undertaking necessary improvements to protect the health of the Great Bay Estuary, but is concerned about the allocation of the responsibility within some elements the structure of the Draft Permit.

Sections of the Draft Permit upon which Portsmouth has commented, are bolded below. The comments include both a section identifying the issue(s) of concern with the Draft Permit language or structure, and, where appropriate, proposed recommendations for improvement. The New Hampshire Department of Environmental Services is referred to throughout as "NHDES." Additional abbreviations used in this comment include:

BOD – Five day biochemical oxygen demand
C – Celsius
CDOM – Colored dissolved organic matter
CLF – Conservation Law Foundation
Kg/ha-yr – kilogram per hectare per year
NCP – Nitrogen Control Plan
NOP – Nitrogen Optimization Plan
NPDES – National Pollutant Discharge Elimination System

NPS – Non-point source
PS- Point source
SAB – Science Advisory Board
TN – Total Nitrogen
TSS – Total suspended solids
WWTF – Wastewater treatment facility

It was not in Portsmouth's interest to request an extension of time to the comment period. Consequently, Portsmouth has, like other communities, prepared these comments in the midst of the state of emergency and stay at home order issued by the governor of New Hampshire. To the extent there are errors or inconsistencies, or items for further investigation or input, Portsmouth welcomes any request for clarification or dialogue.

EXECUTIVE SUMMARY

Portsmouth's comments are focused not merely on trying to mitigate technical challenges of the Draft Permit but also to address the inherent inequities of regulating only 12 communities to solve a watershed wide issue.

Portsmouth has identified the following specific issues of concern with the Draft Permit:

- The use of 2012 - 2016 flow data to calculate WWTF effluent TN limits;
- The use of annual average effluent TN limits;
- Delegation of responsibility and costs of ambient water quality monitoring; and
- The uncertainty surrounding the value of investing in non-point source and stormwater point source reductions.

Portsmouth has provided recommendations relating to using design flows for load basis; omitting unnecessary monitoring for ammonia; adding flexibility to required sampling; and adjusting the calculation of rolling and monthly average loads.

Other significant issues of concern relate to the NOP given that most WWTFs will have to upgrade and will need to operate at maximum performance to achieve the proposed TN limits; the concept and design of the ambient monitoring program and the lack of clarity relating to justification necessary to secure individual NPDES permits. The optional stormwater pathway in Appendix II presents significant challenges in meeting the intended goals given that some sources of the NPS and stormwater point source nitrogen cannot be affected by Portsmouth. Portsmouth further provides details in the comments and in the exhibits to these comments. As noted above, Portsmouth has provided recommendations which address these areas of concern.

Although Portsmouth has concerns with certain elements of the Draft Permit, Portsmouth looks forward to working within this innovative structure.

General Permit NHG58A000:

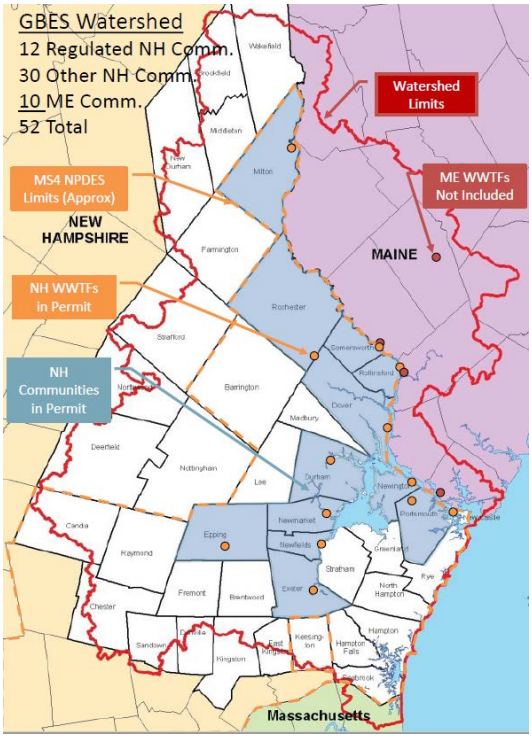
Comments specific to the General Permit are further supported by Exhibit A Proposed Adjusted Loads and Concentration Calculations and Exhibit B Letter from AECOM to City of Portsmouth Regarding Comments on the Draft Great Bay Total Nitrogen General Permit.

Part 1, Item 1.1 – Regarding Subject Discharges

Comment: One of the more significant concerns relative to the proposed structure of the Draft Permit is that it disproportionally burdens those communities with wastewater treatment facilities. The permit focuses on discharges from WWTFs clearly covered by the Clean Water Act and the NPDES permitting program, yet it establishes an aggregate load target that requires watershed wide participation to achieve. The nitrogen reduction requirements should apply, in some form or another, and not necessarily through this General Permit, to all towns and municipalities in Maine and New Hampshire that have discharges into the Great Bay Estuary. As a long term strategy, all watershed stakeholders must eventually be incorporated into the nitrogen reduction strategy.

Below for reference is a watershed map showing the scope of the regulated watershed. Of the 52 communities impacting the watershed, only 12 communities are regulated under this permit.

Figure A Great Bay Estuary Watershed Map



Part 2, Item 2.1, Table 2 – Calculation of Limits Based on 2012-2016 Flow Data

Comment: The Draft Permit falls short in its attempt to implement an adaptive management structure that allows municipalities the flexibility to maximize recent investments in wastewater treatment facilities and to leverage non-point source and stormwater activities that have the ability to reduce nitrogen as well as other pollutants entering the Estuary. One of the key areas that needs to be revisited if the goal is to be achieved is Table 2 and the underlying decision to set WWTF effluent TN limits based on 2012-2016 flow data.

To provide context, requiring WWTFs in the northeast to meet annual average effluent TN limits results in facilities that are larger than needed to achieve TN reductions during the warmer,

aquatic plant-growing season. By forcing compliance with an annual average limit, the defining design parameter becomes wastewater temperature in the coldest months of the year. The biological reaction rates for microorganisms that accomplish nitrogen removal drop exponentially with temperature below 20 degrees C; therefore when sizing WWTF tanks, processes, and systems for nitrogen removal for low wastewater temperatures in the winter months (e.g. 10 degrees C) the tanks get significantly larger. The unintended consequence of this is not only additional cost for tanks and systems that are only needed in cold weather, but it can also lead to operational difficulties in the other time periods of the year.

Given that a number of WWTFs in the region have been upgraded utilizing the capacity of existing tanks in order to maximize TN treatment, it is Portsmouth's observation that at least several of the WWTFs are likely unable to meet a TN annual average even when operating well below their design flow capacity. This will require, even under the approach of the Draft Permit, those facilities to upgrade in the near term.

Portsmouth will need to achieve even lower effluent TN loads from the City's WWTFs to offset the stormwater TN reduction (identified in Appendix II) that cannot be significantly reduced using stormwater controls (BMPs, structural/non-structural, etc.). Again, this will require Portsmouth's WWTFs to treat to even lower load limits than shown in Table 2 of the Draft Permit. This is complicated (for all permittees) by the annual average TN limit (compared to seasonal) and the fact that the TN loads were established using WWTF flow data from 2012 to 2016 (see Fact Sheet Table 3 – 2012-2016 WWTF Nitrogen Load to the Great Bay Estuary). These conditions may result in the need for a comprehensive WWTF upgrade or a self-induced moratorium on flow increases to the WWTF in the later years as flows to the WWTFs increase to the design capacity. This can be demonstrated by calculating the equivalent TN effluent concentration required to meet the proposed load limit for the WWTFs at their design flow using the load allocations in Table 2 in the Draft Permit. See Table A prepared by Portsmouth below.

Table A WWTF Concentrations at Design Flow

City/Town	Table 2 DRAFT Permit: TN Load (lbs/day)	Design Flow (mgd)	Calculated Equivalent Annual Average Concentration (mg/L)
Rochester	198	5.03	4.7
Portsmouth	269	6.13	5.3
Dover	164	4.7	4.2
Exeter	108	3	4.3
Durham	60	2.5	2.9
Somersworth	96	2.4	4.8
Pease ITP	87	1.2	8.7
Newmarket	35	0.85	4.9
Epping	37	0.5	8.9
Newington	16	0.29	6.6
Rollinsford	12	0.15	9.6
Newfields	16	0.117	16.4
Milton	11	0.1	13.2

For a typical WWTF in the northeast designed based on a seasonal TN permit limit at limit of technology for TN of 3 mg/L April through October and achieving 10 mg/L in the off season, the annual average TN would be expected to be around 5.5 to 6 mg/L. Evident from Table A above is that many of these facilities' equivalent effluent TN concentrations at design flows are well below 6 mg/L. Therefore, as the flows increase from the 2012-2016 basis used in the Draft Permit, the facilities will need to be upgraded in many cases to meet the nitrogen mass limits in the permit.

It is also clear from Table A above that the Draft Permit effluent TN loads are more stringent than a 3 mg/L TN (limit of technology) rolling seasonal average concentration for the majority of WWTFs since many of these facilities' equivalent effluent TN concentrations at design flows are well below 6 mg/L. If adaptive management was truly intended, the limits would not have been set so low in the first permit 5 year term. This approach results in no opportunity to achieve lower limits in future permit terms, if determined to be scientifically necessary.

Portsmouth points out that within Region 1, most WWTF effluent TN limits that have been imposed are on a seasonal average basis or rolling seasonal average basis. This is the approach used in the permits with total nitrogen limits for the Massachusetts WWTFs discharging to the Taunton River Basin and Buzzards Bay, the Rhode Island WWTFs discharging to Mount Hope Bay, the Blackstone River, and the Pawtuxet River, as well as the Newmarket and Exeter NH permits that have been issued. Using an annual average approach burdens the 12 communities (13 WWTFs) with additional treatment costs during the colder months of the year; a burden which is at odds with the established view that TN discharges are of most concern during the eelgrass growing season.

Recommendation: The City of Portsmouth recommends that the loads be proportionally

readjusted based on the target concentrations used to develop the loads (either 8 mg/L for the 7 WWTFs larger than 2 MGD, and "hold the load" for the 10 other WWTFs) at design flows. Portsmouth acknowledges that this will increase the permitted WWTF point source TN load and require additional overall reductions in non-point source and stormwater point source TN loads to achieve the 100 kg/ha-yr target established in the Draft Permit. See calculation in Exhibit A. This will, however, require fewer municipalities, including Portsmouth, to conduct upgrades in the first half of the Draft Permit 5 year term, and allow for the full use of the design capacity of the WWTFs. It will self-correct as a result of the structure of this permit; either by the municipality electing to conduct upgrades to reduce TN discharge at the WWTF (to meet TN loads as flows increase or to offset the required NPS and stormwater TN reduction) or through the EPA re-opening the permit and reducing the loads at the WWTFs (refer to last paragraph of Appendix II). Additional self-correcting measures are also suggested in these comments. Lastly this will prevent the EPA from issuing individual permit TN limits for the WWTFs that are overly restrictive but cannot be changed due to anti-backsliding and anti-degradation provisions of the Clean Water Act. This is demonstrated in Table B below and in the larger spreadsheet attached as Exhibit A:

Table B Proposed Adjusted Loads

City/Town	Table 2 DRAFT Permit: TN Load (lbs/day)	Table 3 Fact Sheet: 2012-2016 Flow (MGD)	Calculated Equivalent Concentration (mg/L)	Design Flow (MGD)	Adjusted Load Based on Design Flow (lbs/day)
Rochester	198	2.97	8.0	5.03	335.3
Portsmouth	269	4.03	8.0	6.13	409.2
Dover	164	2.46	8.0	4.70	313.3
Exeter	108	1.61	8.0	3.00	201.2
Durham	60	0.9	8.0	2.50	166.7
Somersworth	96	1.44	8.0	2.40	160.0
Pease ITP	87	0.64	16.3	1.20	163.1
Newmarket	35	0.52	8.1	0.85	57.2
Epping	37	0.25	17.7	0.50	74.0
Newington	16	0.11	17.4	0.29	42.2
Rollinsford	12	0.08	18.0	0.15	22.5
Newfields	16	0.09	21.3	0.12	20.8
Milton	11	0.07	18.8	0.10	15.7
Total NH (lbs/d)	1109.0				1981.3

To be consistent with the overall purpose of this Draft Permit, this WWTF revised TN load could be coupled with a rolling seasonal average concentration limit (based on concentrations in the third column of Table B above) April 1 to October 31, to prevent facilities from discharging excessive nitrogen when flow rates are less than their design flows. The two City of Portsmouth WWTFs would be bubbled as footnoted in Table 2 of the Draft Permit for load and concentration and a seasonal rolling average concentration would be a weighted average concentration based on the design flows and concentrations of each facility, or 9.4 mg/L effluent TN.

The City of Portsmouth further points out the following potential opportunities for readjustment.

Adjustment for Location and Proportional Influence:

The Peirce Island WWTF and Pease WWTF are situated the closest to the ocean of all the WWTFs discharging to the Estuary. The discharge of the WWTFs is directly to the Piscataqua River which has been well documented to have a significantly higher flushing rate (lower retention time) than Great Bay proper. Given the location of the discharge and the hydrodynamics at the discharge point, these WWTFs have a lesser fraction of the WWTF effluent entering and staying in Great Bay proper, have a significantly higher dilution as a result of the hydrodynamics and a much longer travel distance from the discharge point to areas of the Estuary where nitrogen has been perceived to be of greatest concern. The EPA and NHDES could consider a geographic adjustment based on an accepted hydrodynamic model. This work could be done if the higher loads were initially provided (show in Table B above) and readjusted as part of the second cycle of the permit.

Adjustment for Wet Weather at WWTFs

In the Fact Sheet page 28, paragraph 3, the EPA describes the methodology to normalize nonpoint sources and stormwater loads for rainfall. Yet, there was no consideration given in the permit for normalizing the WWTF load for rainfall. The impact of rainfall is typically seen at WWTFs as a function of the condition of the wastewater collection system as infiltration and inflow (I/I). This is more pronounced for WWTFs that have a tributary wastewater collection system that is combined with directly connected stormwater features such as catch basins, roof and yard drains, and other fixtures.

The amount of I/I treated at a WWTF is specific to that facility and its collection system condition. When extraneous groundwater and stormwater enters the collection system it is seen as an increase in flow at the WWTF and a reduction of the influent nitrogen concentration due to dilution. Having a lower concentration of nitrogen in the influent does not necessarily result in a corresponding decrease in effluent concentration at the outfall of the WWTF due to the treatment functions inside the unit processes. Therefore, increased flow, even if due to extraneous stormwater and groundwater, typically results in a higher overall mass of nitrogen released. Portsmouth suggests, at a minimum, that the rainfall normalization ratio (45.2 in/yr÷40.9 in/yr = 1.11) be applied to the nitrogen load values provided in the permit. This is a critical adjustment for the Peirce Island WWTF, which is the only facility in the watershed with a truly combined wastewater collection system. Acknowledging this would allow the WWTFs to incorporate, into their nitrogen control plan or overall strategy, an infiltration and inflow reduction goal.

Part 2, Item 2.1, Table 2 – Regarding Measuring, Monitoring and Reporting Ammonia

Comment: Permit compliance is based on TN. Table 2 in the Draft Permit requires the permitted entity to measure, monitor and report the effluent concentration of a number of forms of nitrogen. Ammonia nitrogen is one parameter that must be monitored weekly and reported, but the determination of ammonia is not needed to calculate the total nitrogen in the effluent. It will add to the cost for compliance with the permit without providing meaningful additional data for determining effluent total nitrogen.

Recommendation: The requirement for reporting ammonia should be deleted.

Part 2, Table 2, Footnote 1 – Regarding Sampling, Location and Timing

Comment: Footnote 1 notes that a routine sampling program is to be developed in which samples are taken at the same location, at the same time, and on the same days of the week each month. The footnote 1 language offers Portsmouth no flexibility to address site specific conditions at each WWTF. In addition, the requirement to sample at the same time each week is unrealistic from an operational perspective and may not yield the best data for measuring overall performance given fluctuations in dosing, sudden changes in influent characteristics due to collection system changes or breaks and other temporary events.

Recommendation: The permit should allow sampling to be conducted weekly within the same 72 hour time frame each week (example between 7:00 am Tuesday and 7:00 am Friday each week).

Part 2, Table 2, Footnote 3 – Regarding Rolling Average

Comment: Footnote 3 notes "The limit is an annual load limit (in units of average pounds per day) and shall be reported as a rolling average. The value will be calculated as the arithmetic mean of the monthly average load (in lb/day) for the reporting month and the monthly average loads (in lb/day) of the previous eleven months." This approach results in a value that is an average of averages. This adds inaccuracy to the calculations, since averaging averages does not account for how many data points comprise each month average. Since the required WWTF sampling is one composite per week, some months will have five samples, some months will have four. A bad four sample month will be weighted the same as a good five sample month which is not representative of actual conditions.

Recommendation: The limit should be an annual load limit (in units of average pounds per day) and should be reported as a 52-week rolling average.

Part 2, Table 2, Footnote 4 – Regarding Monthly Average

Comment: Footnote 4 notes "The total nitrogen monthly average mass loading reported each month shall be calculated as follows: Total Nitrogen (lb/day) = average monthly total nitrogen concentration (mg/L) * average monthly flow (MGD) * 8.345". To arrive at the monthly average, the 4 or 5 monthly samples are averaged and the average flow over the entire month is used. This methodology is not representative of the actual conditions, as averaging the concentrations and flow could skew the result.

Recommendation: The mass loading should be calculated using the sample concentration and flow on the day the sample is collected, and the mass loading for the 4 or 5 sample days each month should be averaged to determine the TN monthly average. (There is precedent for this as this is the approach used in the Connecticut Nitrogen General Permit.)

Part 2, Item 2.2 – Regarding Nitrogen Optimization Plan

Comment 1: From Portsmouth's perspective, the role of the Nitrogen Optimization Plan within the permit structure would vary depending on the limits set under Table 2 in the Draft Permit.

If the limits set forth in Table 2 remain as currently presented in the Draft Permit, there is little role for a nitrogen optimization plan as the limits imposed on most of the wastewater treatment facilities will require them to be significantly upgraded and otherwise optimized for nitrogen removal in the near term to meet the permit requirements. For a community such as Portsmouth, the new Peirce Island WWTF will be under manufacturer performance obligations for another year relative to nitrogen removal capability and if an upgraded facility is constructed at Pease it too will likely be subject to certain warranties and contractual obligations as to performance. A further engineering effort to try to find additional nitrogen optimization opportunities would be a poor allocation of resources in most scenarios. In addition, it is generally understood that the operator's obligation is to make sure the effluent limits at the end of the pipe are achieved. How the operator achieves that is not within the realm of traditional EPA oversight.

If Table 2 is adjusted as Portsmouth has set forth in Table B above to take into account WWTF design flows, a Nitrogen Optimization Plan for the current facility is a more reasonable investment in resources provided that language in the current draft is adjusted for clarity and scope. Under Paragraph 1 in the Draft Permit, the NOP appears intended to identify nitrogen optimization that can be achieved using operational adjustments. Under Paragraph 2, however, the NOP notes the optimization should "…reduce the discharge of nitrogen to the extent practicable." This language is vague, undefined, and subjective and it is not clear from this requirement what is being asked of the permittee. It suggests that capital improvements may be required. In addition, it is not clear whether Portsmouth for example would be required to operate its Peirce Island WWTF to the fullest extent of its capabilities at all times (which means adding carbon, increasing costs and consuming additional energy).

Recommendation 1: If Table 2 is not adjusted, the Nitrogen Optimization Plan requirement should be deleted in its entirety. If Table 2 is adjusted, Paragraph 2 of the Draft Permit should be revised to indicate that the NOP requirement is for reasonable operational changes only, in the growing season, and does not require the permittee to undertake capital improvements.

Comment 2: Under Paragraph 3, the permittee is required to re-evaluate and notify the EPA as a result of changes "…in design, construction, operation, or maintenance of the facility, which have a significant effect on the potential for the discharge of nitrogen…". The term "significant" must be better defined for the benefit of the operators and managers of the WWTFs. The need to notify the EPA of any changes at the facility, especially related to operations and maintenance of the facility, could become burdensome and put presumed limitations on WWTF operations related to overall treatment plant optimization efforts.

Recommendation 2: Portsmouth recommends that in place of the word "significant," a clearly objective measure of performance be used instead.

Part 2, Item 2.3 – Regarding Adaptive Management Ambient Monitoring Program

Comment: Part 2.3 of the Draft Permit requires that permittees "shall all participate in the annual ambient monitoring program." The elements of the monitoring program are set out in detail in Part 2.3. As noted in the Draft Permit, each permittee is responsible for a percentage of the overall ambient monitoring cost equivalent to the percentage of the design flow of their wastewater treatment facility divided by the total design flow of all the WWTFs covered by the Draft Permit. The term "permittee" is not defined and as a result it is not clear whether

permittees listed in Table 1 who are excluded from coverage of the Draft Permit under Section 3.2 are responsible for ambient monitoring costs.

It is estimated that the ambient monitoring program, as set out in Part 2.3, would cost upwards of $1.5 million per year. The Draft Permit will be in effect 5 years from the effective date, but it is understood that the Draft Permit will be reissued for several 5-year terms as evidenced by Appendix II of the Draft Permit, which allows the option of developing and implementing long-term nitrogen control plans. These plans may extend well beyond 18 years utilizing adaptive management approaches, which in turn, must be guided by the ambient monitoring program.

There are legal, technical, and practical objections to the ambient monitoring program. The overarching objection is that, for the reasons provided below, the ambient monitoring program should not be part of the Draft Permit. First, the scale of this discharger-funded ambient monitoring program is without a known precedent. Second, it is antithetical to the Clean Water Act and to state water quality laws. Third, it is not fair or equitable to require the listed point source permittees to bear the entire cost of the ambient monitoring program. Finally, the allocation of fees among the permittees is not related to the impacts that each discharger has on water quality.

Aside from these fatal flaws, the design of the proposed annual ambient monitoring program may not be appropriate to achieve the goal of adaptive management. Critically important is that any monitoring program used for adaptive management, (1) be dynamic rather than static; (2) be of predictable and reasonable cost; (3) involve enough permittees and other watershed stakeholders to create an effective pool of funds; and (4) have clear goals. To ensure that there is enough permittee and other watershed stakeholder involvement and to ensure that there are requisite funds for such a long-term monitoring program, there would need to be an intermunicipal agreement amongst the permittees and other stakeholders. Intermunicipal agreements are covered by RSA Chapter 53-A, and require the approval of the New Hampshire Attorney General as well as approval by the governing body of each community. The development of an intermunicipal agreement to accomplish this task does not preclude a role for the Piscataqua Region Estuary Partnership (PREP). However, establishment of these agreements and developing sufficient funding to undertake the monitoring takes time which is not provided for in this permit.

Other specific legal, technical, and practical objections to the ambient monitoring program are set out below.

<u>The Proposed Ambient Monitoring Program is Without Known Regulatory Precedent</u>

The State of Connecticut recently reissued its General Permit for nitrogen discharges effective January 1, 2019. The General Permit authorizes the discharge of total nitrogen from 79 municipal WWTFs. The General Permit does not require any of the 79 municipal WWTFs to conduct ambient monitoring. The Long Island Sound monitoring program is conducted by the State of Connecticut in cooperation with the State of New York and other members of the Long Island Sound Study (LISS) group which includes EPA and other governmental and nongovernmental organizations. The LISS group conducts extensive ambient monitoring in Long Island Sound. This is a better, and more sustainable, approach than placing the burden of long-term ambient monitoring program on a group of relatively small municipal WWTFs.

Similarly, the State of Virginia has issued a nitrogen General Permit which authorizes the discharge of total nitrogen and total phosphorus from facilities in the Chesapeake Bay watershed in Virginia. The Virginia General Permit does not require any permitted facility to undertake ambient monitoring. Further, EPA and New Hampshire have developed several other general permits authorizing wastewater or stormwater discharges (e.g., N.H. Small MS4 General Permit and N.H. Multi-Sector General Permit). None of these other general permits require ambient monitoring. In summary, aside from ambient monitoring adjacent to outfalls for specific purposes, Portsmouth is not aware of any general or individual permits that require the type and extent of ambient monitoring required in the Draft Permit.

The Proposed Ambient Monitoring Program is Contrary to the Clean Water Act and State Water Quality Laws

It is clear, based on several Clean Water Act provisions, that the responsibility for ambient water quality monitoring is a state and/or federal obligation. Section 104 of the Clean Water Act established, early on, that water quality surveillance and investigation systems for the purpose of monitoring the quality of the navigable waters, groundwater and waters of the contiguous zones and oceans was to be conducted by states, their political subdivisions and other federal agencies. More specifically, Congress specified that the development of water quality standards and identification of areas that needed additional water quality controls was the responsibility of each state. Section 303(d) requires states to identify those waters that are not meeting water quality standards and to develop total maximum daily loads for pollutants causing water quality standard violations. It is the state's responsibility to submit, to the EPA, reports on the status of the state's water quality. These reports require the regular monitoring of the condition of waterbodies within the state's boundaries.

In addition to the Clean Water Act provisions listed above, EPA's own regulations consistently interpret the NPDES permitting scheme to require permittees to monitor only at the outfall and not in the ambient water. These regulations at 40 CFR Section 122 are all focused on determining what is coming out of the point source rather than the quality of the ambient water. The determination as to whether the quality of the ambient water is sufficient to meet water quality standards has always been left to the state (or EPA if the agency felt that the state was not properly adopting and applying water quality standards).

Obviously, EPA and the State can utilize and encourage other parties to voluntarily participate in water quality data collection. EPA has developed several guidance documents that make it clear that NPDES permit holders may be encouraged to voluntarily provide ambient water quality data. Should dischargers voluntarily provide data, the dischargers could be granted benefits for doing so. For example, permittees could enjoy reduced compliance, reporting and monitoring in their permits. *See, e.g., EPA's 1996 Interim Guidance for Performance-Based Reductions of NPDES Permit Monitoring Frequencies* and *EPA's 2007 Watershed-based National Pollutant Discharge Elimination System (NPDES) Permitting Technical Guidance.* In addition, the State of New Hampshire has developed guidance for submittal of surface water data information in order to assist the State in developing its water quality reports under Section 305(b) and its list of impaired waters under Section 303(d). However, encouraging other parties, including other nongovernmental agencies and dischargers, to assist in collecting ambient water quality data is not the same thing as **requiring** that permittees obtain data and submit reports in order to be eligible for a permit.

In short, the ambient monitoring program, as set out in the Draft Permit, is antithetical to the provisions of the Clean Water Act and to New Hampshire water quality laws.

It Is Arbitrary and Inequitable for Thirteen Point Source Dischargers to Bear the Entire Cost of the Ambient Monitoring Program

The mechanism for funding the ambient monitoring program makes no sense. The entire cost of the ambient monitoring program is to be borne by 13 municipal treatment facilities. Note, that four municipal treatment facilities in Maine are not included in the funding allocation. Any ambient monitoring program should be deferred until there is a mechanism for all of the communities in the Great Bay watershed to participate in and fund the ambient monitoring program. This is consistent with the findings of the Great Bay Nitrogen Non-Point Source Study (2014), where it was estimated that sixty-eight percent (68%) of the nitrogen that enters the Great Bay Estuary originated from sources other than municipal wastewater treatment facilities (Pg. 1, citing DES, 2010; PREP, 2013). Other sources included atmospheric deposition, fertilizers, septic systems and animal wastes.

No one disputes that these 2014 estimates generally represented nitrogen loads to the Great Bay Estuary. However, since 2014, the contribution of nitrogen from municipal WWTFs has declined significantly and now represents an even smaller percentage of the nitrogen load to the Estuary. EPA acknowledges this declining contribution from point sources on page 16 of the Fact Sheet citing the 2018 State of the Estuary Report. When nitrogen loads are dominated by diffuse sources, including sources from out of state, monitoring costs must be allocated to public agencies.

The Allocation of Cost for the Ambient Monitoring Program Does Not Make Sense

Given that the proposed nitrogen general permit is based on land area derived nitrogen loads, wouldn't it be more equitable to develop a fee apportionment schedule based on land area? There is a wide disparity in land area sizes between the municipalities and the resulting impact from point and nonpoint source runoff. Allocating cost on the basis of wastewater treatment plant point source loadings is not equitable. Nitrogen loads from wastewater treatment plants may have significantly different impacts on actual water quality. For example, dischargers into riverine portions of Great Bay may have less impact not only in the riverine portion but in the upper reaches of the Bay. EPA acknowledges this fact on page 13 of the Fact Sheet and states that free-flowing rivers "tend to flush out sediments and pollutants relatively quickly." It does not make sense to base the ambient monitoring program cost on wastewater plant loadings unless additional detailed analysis is conducted to support that allocation.

Recommendation:

The ambient monitoring program contained in Section 2.3 of the Draft Permit should be eliminated from the permit. If an ambient monitoring program of this scope and complexity is to be conducted it should be managed and funded by state and federal agencies as provided in the Clean Water Act, its implementing regulations and state water quality laws. This has been the past practice of both EPA and the NHDES and that past practice conforms with state and federal law. If municipalities are asked to voluntarily assist in the ambient monitoring program there should be a defined procedure and protocol which sets out the parameters for their involvement. For these reasons, the ambient monitoring program should be removed from the

Draft Permit.

Regardless of who conducts an ambient monitoring program, any such program should be deferred for at least two years to enable Great Bay water quality to readjust with the significant changes that have occurred in nitrogen loading as a result of efforts by municipal treatment facilities and MS4 permittees. This would allow time to ensure that public funding is available to undertake the monitoring program, to reevaluate the testing required and to understand how the data will be processed and interpreted. A delay of two years before initiating the ambient monitoring program will also allow municipalities to enter into the necessary agreements along with the organization of a science advisory panel for the specific purpose of reviewing, updating and modifying the monitoring program to best ensure that state water quality standards are being achieved and will enable municipalities to determine whether they can contribute funding for the ambient monitoring program. Given the economic hardships that municipalities will be facing as a result of the COVID-19 pandemic, it is appropriate to defer imposition of additional costs on Great Bay municipalities.

More importantly, deferring the ambient monitoring program for two or more years will allow the State to develop legislation which will help municipalities in the Great Bay watershed reduce nitrogen levels. For example, state legislation could further strengthen shoreland and wetland protection ordinances in Great Bay municipalities to minimize point and nonpoint source nitrogen runoff. The State should pass legislation restricting fertilizer use. The State could develop septic system regulations similar to Title V in Massachusetts which would require upgrading of septic systems adjacent to waterbodies upon sale of the property. All of these legislative initiatives would help reduce the large percentage of nitrogen loading which is not attributable to wastewater treatment facilities and much of which is currently unregulated.

Part 3, Item 3.2 – Regarding When an Individual NPDES Permit for Nitrogen Discharges May be Requested

Comment: This paragraph states that any request for an individual permit shall be provided "…with reasons supporting the request…". There is no further definition of what reasons would need to be described in this request and there is no reference in 40 C.F.R. Section 122.28(b)(3)(iii) supplying a justification for this type of request. This item is of particular importance to Portsmouth due to the burden of cost sharing that Portsmouth is obligated to pay under the Draft Permit, if, in spite of no legal authority to do so, EPA retains the mandatory Adaptive Management Ambient Monitoring Program described in 2.3. Although it is not clear from permit language, Portsmouth's share of the cost of that program would likely be proportionally higher each time a municipality was granted an exclusion from the Draft Permit.

In addition, Portsmouth points out that if a permittee elects to proceed under an individual permit, the development of a permit application typically takes longer than 90 days to accomplish. So, while the 90-day window for submitting an NOI after the effective date is reasonable, it is not reasonable to assume that a complete permit application can be developed and submitted in that time frame particularly if the municipality needs to obtain the assistance from an engineering firm selected by competitive means.

Recommendation: Provide a summary of the major categories of reasons that would need to be addressed as part of any request for an individual permit or additional narrative on this item. Consider inserting a longer time frame, such as 120 days, pursuant to which an individual

permit application could be submitted.

General Permit NHG58A000 Appendix II: Optional Non-Point Source and Stormwater Point Source Nitrogen Reduction Summary

Comments specific to the General Permit are further supported by Exhibit C Memo from VHB to City of Portsmouth Regarding Preliminary Assessment of NPS Controls Needed to Meet EPA's Draft GBTN GP.

Comment: Appendix II sets forth an optional pathway in which permittees could elect to participate to meet water quality goals without additional costly upgrades to the WWTFs. Under the terms of this section permittees would be required to develop a Nitrogen Control Plan (NCP) that would outline a phased approach of implementing various NPS and stormwater control measures to ultimately reduce their existing baseline nonpoint source and stormwater nitrogen load by 45% over a 23-year period. That implementation would be tracked and adjusted as needed over time to meet the target.

Portsmouth has extensively reviewed opportunities within the municipal boundaries to reduce overall nitrogen loads from non-point sources and stormwater point sources. The Portsmouth study concluded that the goals as set forth in the Draft Permit are highly unlikely to be achieved. In order to get close, Portsmouth would have to require significant regulation of private property, treat stormwater from nearly all of the directly connected impervious area in Portsmouth, and install advanced septic treatment technologies, structural and non-structural technology application as well as significantly expand Best Management Practices (BMPs). The initial calculations show that when factoring in the loads that cannot be effectively managed (atmospheric deposition, etc.) Portsmouth needs to reduce the manageable load by 53%, a value higher than the 45% listed in the Draft Permit. This will require Portsmouth to offset its loads using the WWTFs as part of its NCP. While this offsetting of the loads using Portsmouth's Peirce Island WWTF, and particularly its new Biological Aerated Filter (BAF) is manageable, Portsmouth is at risk of needing to impose a moratorium on development in the latter years of the NCP as flows to the WWTF increase toward the design capacity and/or implementing stringent controls on dischargers with high nitrogen. This is especially important when certain types of nitrogen from industrial dischargers cannot be removed in a municipal wastewater treatment facility. This is referred to in the wastewater industry as recalcitrant nitrogen and generally believed to be not bioavailable in the natural environment (i.e. Piscataqua River/Ocean).

Portsmouth's stormwater consultant, VHB, prepared an analysis for Portsmouth that explains the difficulty of achieving the target load reduction described in the Draft Permit. Despite EPA's claims that they believe much of the load reduction target could be achieved through nonstructural measures, the VHB analysis clearly shows that this is not the case given the known current performance curves which indicate that nonstructural measures would produce limited load reduction credits. The maximum load reduction credit associated with good housekeeping measures including street sweeping, catch basin cleaning, and leaf litter control was estimated to be 3,100 lbs N/yr but that assumes that 60% of the impervious connected area is Portsmouth owned.

EPA has also suggested communities could impose local fertilizer bans. As discussed elsewhere in this comment, eliminating the use of lawn fertilizer is highly unrealistic unless a

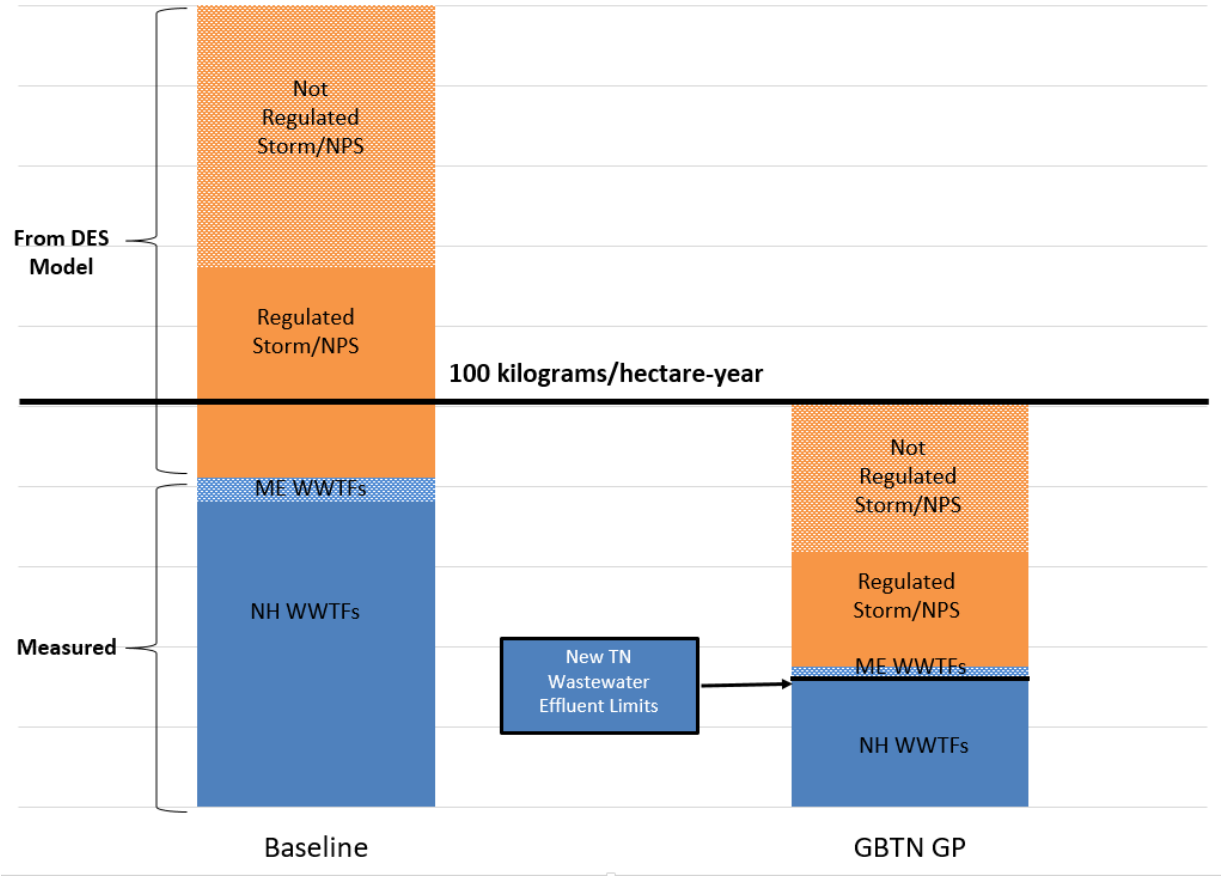
statewide or regional legislation limits fertilizer use. But even if Portsmouth could somehow eliminate the estimated nitrogen load associated with lawn fertilizer use (~16,200 lbs N/yr), Portsmouth would still need to come up with approximately 5,200 lbs N/yr of additional load reduction. In order to achieve this additional load reduction Portsmouth would still need to implement stormwater retrofits for most of the existing impervious area, including privately-owned land. Retrofits for privately owned land is problematic because while it can be done through land controls on development and redevelopment, it assumes that such private activity is taking place.

Other permittees have reached similar conclusions regarding the difficulties and costs achieving the applicable target load reductions. See City of Dover and City of Rochester comments.

Representatives of the Conservation Law Foundation (CLF) who attended the public hearing on this Draft Permit described a report being prepared by their expert Dr. Rob Roseen relative to stormwater and NPS measures that could be undertaken to achieve the target. Portsmouth requested that the report be shared when available so that the City could evaluate opportunities and data that it may have overlooked in evaluating the potential effect of the target set in the Draft Permit. CLF indicated that the report would not be available for third party review until submitted as part of the public comment. Portsmouth looks forward to reviewing the report and any additional information which might suggest a route to compliance.

Based on the information currently available to Portsmouth it seems apparent that the ultimate goal of achieving 100 kg/ha-yr loading stands little likelihood of being achieved without the participation of all municipalities in the watershed and huge investments on the part of permittees. This is most apparent when reviewing the non-point source and stormwater point source loads that are not regulated under this permit. The graph below demonstrates the currently proposed split of regulated and unregulated point and non-point source loads to the estuary. Nearly half of the non-point source and stormwater point source nitrogen loads are not regulated under the permit structure. Further within the regulated NPS and stormwater TN loads there are categories of loads that cannot be directly impacted by the municipality such as the atmospheric deposition TN load. It has been communicated by DES and EPA that the atmospheric deposition TN load trends are likely downward and that the appropriate credit will be given, but the permittees have no control over regulations or other factors affecting the atmospheric loads.

Figure B Loads Regulated Under the Draft Permit



By forcing stormwater improvements to center around those structural and non-structural technologies that are optimized for nitrogen removal there is a loss in the greater benefit that may be achieved by lesser cost technologies that would help to eliminate suspended sediments, colored dissolved organic matter (CDOM), and other pollutants. As has been pointed out by Portsmouth and some of the other communities to EPA and NHDES over the years, excessive suspended solids and CDOM appear to be a significant contributor to Estuary health as is evident by historical high rain events. Permit compliance is at the forefront of municipal infrastructure planning and the emphasis on nitrogen removal is likely to be impactful in the design of stormwater and non-point source features. Portsmouth points out by way of example that in Long Creek, South Portland, ME where very specific well-designed structural and non-structural stormwater improvements were implemented over a five-year period, some nutrient reduction has been achieved, but Long Creek remains in noncompliance as a result of other compounding issues such as metals and chlorides.

In the earlier part of these comments, the City of Portsmouth has advocated for higher effluent TN loadings for the WWTFs in this permit. As a result of that request, and in order to achieve the targeted 100 kg/ha-yr watershed TN loading, Portsmouth calculated (See Exhibit A) that the 45% reduction in NPS and stormwater point source loads would need to increase to 74%. This may appear contradictory to the overall approach because a number of communities, including Portsmouth, believe it will be hard to even achieve a 45% reduction so suggesting more would be that much harder to achieve. The approach here, however, is to provide flexibility to the

community to electively choose how to manage the overall reductions in TN from both the point source WWTFs and the NPS and stormwater TN loads as a whole as part of the NCP. This acknowledges that in a number of cases, communities will likely have to use their WWTF as a means to achieve the NCP by taking credit for nitrogen removed at the WWTF. In some cases, this may require the community to upgrade their WWTF in order to remove enough nitrogen to accomplish their TN removal goals because not all TN removal can be achieved though NPS and stormwater PS. In this way, the loads originally established by the EPA for the WWTFs will eventually be achieved. In the near term, however, the higher loadings proposed by the City of Portsmouth will prevent communities from having to upgrade their WWTFs in the near term, avoid unintended consequences of triggering anti-backsliding provisions of the Clean Water Act, allow for state wide legislation to be put in place to help NPS and stormwater PS reduction, permit development of better science on stormwater TN treatment, and provide the communities the flexibility to select their own approach to meet the overall TN reductions.

The last paragraph of Appendix II is a reopener clause indicating that if the NPS and stormwater efforts are not satisfactory "…more stringent nitrogen effluent limits for the WWTFs…" will be necessary. Portsmouth believes it is critical to the success of this permit that the WWTF limits would only be reduced after all contributors to the watershed were appropriately engaged, through regulation or otherwise, in the effort to reduce nitrogen discharges to the estuary. Please refer back to Figure B demonstrating that the goal cannot be achieved without all municipalities in the watershed (in New Hampshire and Maine) taking part. It is an unfair burden for these twelve municipalities to have in addition to the WWTF TN limit reductions. This would result in additional capital costs and economic impact to a small fraction of the overall problem, further encourage sprawl by shifting growth to communities that are not regulated by the Draft Permit and essentially undermine the environmental goal for the Great Bay Estuary.

The EPA has many regulatory options at its disposal. For example, EPA could invoke its residual designation authority pursuant to 40 CFR 122.26 to regulate otherwise unregulated point source discharges of stormwater into Great Bay. These discharges could be regulated based on land area contributing to the stormwater flow or some other metric. This would help to reduce nitrogen inputs that are otherwise unregulated and require those municipalities to begin implementing controls that are within their authority. Without reducing these currently unregulated point source discharges of stormwater it is placing an undue and continuing burden on municipal wastewater treatment facilities who only contribute a small portion of the total load.

Portsmouth is not advocating for EPA to exercise its residual designation authority at this time. Portsmouth has long expressed its view that residual designation authority would wrest land use control from local communities, a proposition that is generally antithetical to traditional New Hampshire values. In addition, residual designation authority would likely strictly limit growth opportunities within the watershed as a whole. That being stated, given the target and what the permittees currently anticipate relative to the challenge of achieving the 100 kg/ha-yr target, it is not unreasonable to assume that such a step is in the mid-to-long term forecast. Portsmouth further points out that stakeholders have the authority under the Clean Water Act to trigger such residual designation authority under appropriate circumstances.

Recommendation: Hold, Measure and Evaluate

As EPA is well aware, there have been upgrades to multiple wastewater treatment facilities within the Great Bay Estuary in the last five years. Those upgrades have reduced the amount of nitrogen discharged into the system. In addition, the Portsmouth Peirce Island Wastewater Treatment Facility's new Biological Aerated Filter (BAF) system is in operation and nitrogen removal is occurring and is expected to improve as the temperatures warm and the system matures. The effect of these wastewater facilities' improvements throughout the Estuary should have an opportunity to be realized before significant effort is undertaken to sample, plan, and undertake additional non-point source and stormwater nitrogen control measures beyond what is already required by each of the permittee's MS4 obligations. This hold, measure, and evaluate approach is step one in a true adaptive management framework.

Under this hold, measure, and evaluate step, the best-management practices that are already underway in each MS4 regulated community will continue. Meanwhile, NHDES, EPA, and PREP can elect to continue their baseline water quality monitoring work, and the permittees could begin to recreate a voluntary collaborative structure with NHDES and EPA to establish a robust sampling and monitoring program and to evaluate the nitrogen load target and other estuary stressors as well as to engage other stakeholders in the Estuary both in New Hampshire and Maine. This hold, measure, and evaluate period will also provide time for the permittees to advocate for state legislative changes to improve water quality in the watershed.

Among the one legislative change that would likely benefit the watershed is greater oversight and regulation of septic systems. The NHDES could, at a minimum, be authorized to require the inspections of existing septic systems, at the time the property is sold. This would reduce the number of perceived functional systems that are either short circuiting to the groundwater or have otherwise failed unknowingly so that they are required to be replaced or reconstructed. A statewide ban on the use and sale of high nitrogen fertilizers would also be a potential vehicle for meaningful change. Local ordinances banning fertilizer are unlikely to be successful as residents would still be able to purchase lawn fertilizer from retailers in neighboring towns and states, and thus, the effectiveness of such of an ordinance would be limited. Moreover, a statewide ban would send a more significant and meaningful signal to users than a local ordinance.

During the second five year permit term, the commencement of NCP efforts by each permittee is more appropriately taken. Undertaking this effort at a later date after a hold, measure, and evaluate period brings the permit structure into better alignment with a true adaptive management effort. It will also allow for further review and development of nitrogen removal technologies and more thorough vetting and evolution of the performance curves of the technologies.

As part of the hold, measure, and evaluation process, the scope of work for the ambient water quality monitoring plan could be revisited and adjusted as necessary. As written, the scope of work is set for the duration of the permit. It is unlikely that EPA would reopen the five-year general permit to change or adjust the water quality monitoring plan. It is common in this type of analytical work that the scope and limits of the work get adjusted as data is obtained, conditions in the water body change over time, or data is needed to answer new or different scientific questions. Without the ability to change and modify the water quality monitoring program, opportunities are lost for efficiencies (e.g. no longer testing parameters that do not change) and

for adding parameters that might be important as a result of changed conditions determined through previous observation and measurement. Portsmouth refers to and incorporates Brown & Caldwell's Technical Memorandum: Great Bay Total Ambient Monitoring Program Comments and Recommendations which is attachment 20 to the City of Rochester Comments to support this statement.

The City of Portsmouth believes establishing a Science Advisory Board (SAB) would allow for adjustments to the ambient water quality plan and that this could be done during the term of an active or administratively extended permit if properly structured in the General Permit. The SAB would also provide the communities an opportunity to request consideration of other water quality and estuary health test parameters or reduction in the water quality parameters to be measured but only if such requests are based on scientific data and subject to close scientific scrutiny.

Portsmouth strongly recommends that one primary charge of an SAB be to identify a model(s) that could be calibrated to the collected water quality data and to hydrodynamic data. The calibrated model could be used to predict water quality under different future scenarios. This approach would help direct the communities' efforts to achieve the overall goals most efficiently.

There are likely many examples where a model could be used for this Draft Permit. One example is the Massachusetts Water Resource Authority Permit where collected water quality data is reviewed annually by the EPA and state agency and new studies and monitoring parameters are added. The permittee is able to request adjustments to the parameters and the required studies. Obviously, the permittee needs to justify those requests with scientific data, literature, etc. The permittees' requests are further subject to public comment. This back and forth is done under the consultancy of a SAB that conducts peer reviews, evaluates monitoring data and advises the agencies on the implications of data, and proposed modifications to the monitoring plan. The science advisory panel identifies warning levels, and the potential causes. Portsmouth believes this type of model, modified for the Great Bay Estuary and this Draft Permit, would be beneficial if the participation and the allocation of costs is distributed across all stakeholders.

The timeline for the NCP planning and implementation effort should be redrafted to reflect the Hold, Measure, and Evaluate period.

Recommendation: Additional Specific Items

If a mandatory water quality monitoring program is included in the permit, over objection, it should include an SAB as described above to adjust the monitoring plan and develop models to efficiently reach the management goal.

Include Additional Supporting Baseline Load Data.

Comment: Appendix II contains the Optional Non-Point Source and Stormwater Point Source Nitrogen Reduction Pathway and sets targets based on the original municipality specific baseline, which is defined based on the NHDES 2014 Great Bay Nitrogen Non-Point Source Study. The municipality specific baseline data is not included in the Draft Permit or Fact Sheet.

Recommendation: Please include the baseline NPS and stormwater TN load for each community normalized for rainfall and broken down into the major load categories (human waste, animal waste, atmospheric deposition, fertilizer) with the date that baseline was established. This data will be useful and further inform the specific numeric reduction that needs to be achieved as part of the NCP.

Clarify Credits for BMPs and other MS4 Nitrogen Removing efforts

Credit should be provided under the Draft Permit for nitrogen removal efforts conducted by the municipalities under the NPDES MS4 Permit.

Clarify Credits for Communities with Combined Sewer Overflows (CSO)

The methodology for addressing stormwater does not appear to account for CSO communities like Portsmouth and Exeter (the only 2 of the 12 affected NH communities). Please clarify how CSO nitrogen inputs are addressed in the permit and how compliance towards a Long Term Control Plan (i.e. sewer separation, illicit connection removal, etc.) is accounted for under the optional pathway.

Clarify That Credit Is Available for Work Performed Outside of Municipal Boundaries

A number of communities have already determined that achieving the proposed non-point source and stormwater point source nitrogen reductions will not be feasible within the confines of their communities without significant reductions in the uncontrolled loadings (e.g. atmospheric deposition, fertilizer, etc.). Outlining additional options to those municipalities would be beneficial for the municipalities. These options may include constructing projects in another community in the watershed, a program of nitrogen credits and trading and/or establishing a watershed wide bank where communities can buy-in to credits.

The general permit should describe and confirm that opportunities and options for stormwater management exist for work undertaken by a community outside its municipal boundaries.

Clarify Process for Updating TN Performance Curves

The optional pathway relies heavily on the TN removal performance curves in Appendix F, Attachment 2 to the NPDES MS4 Permit for NH. EPA, NHDES and UNH Stormwater Center personnel have stated on multiple occasions that the removal credits for NPS and stormwater TN reduction controls will change over time as additional research is conducted, new technologies are added, and as nonstructural and BMP type measures are better understood.

Portsmouth requests that EPA clarify the mechanism to include updated TN removal performance curves in this permit or the MS4 permit. Please define the process by which updated performance curves will be developed, validated, accepted and available for applying credits under the confines of the optional pathway for the GBTN GP.

Confirm New Hampshire Department of Transportation Coordination

Portsmouth's land area is made up of the following: 6% NHDOT roadway right-of-way, 7%

Portsmouth roadway right-of-way, 16% Portsmouth owned parcels and 71% private land area. These ratios are generally consistent with a number of other communities in the watershed.

Please confirm whether Portsmouth and other communities can take credit for NPS and stormwater PS improvements completed by the NHDOT. Also, please confirm that the NHDOT will be regulated as part of the Draft Permit so as to not be able to increase TN loads as part of projects under current rules.

Develop a Credit for the Extension of Public Sewer Service

One of the major pathways to achieve non-point source nitrogen reduction is by lowering the human category contribution through septic system conversion or septic system elimination by extending sewer systems. Conversion of conventional septic systems to nitrifying septic systems may be an option for some municipalities, but for Portsmouth, it is more attractive to extend the sewer system due to the housing density, proximity to water bodies and extent of the existing system. In addition, bringing all wastewater flows to a single point for treatment allows flexibility to adjust to evolving regulatory changes. The Draft Permit structure, however, with a set annual load does not encourage adding flow to the WWTFs. For instance, Portsmouth is able to extend its sewer system into Rye and Greenland under franchise agreements, but this would increase the flow to the WWTF which would not be desirable under this permit structure. Increasing the flow requires the treatment facility to achieve more nitrogen reduction each day of operation. The unintended consequence of this particular scenario is that sewer system extensions are unlikely to occur from Portsmouth and these extensions would be into areas that are immediately adjacent to the estuary (many w/in 200 meters). There should be an offset built into the permit structure that encourages sewer system extensions.

Evaluate the Opportunity to Develop a Credit for the Conservation of Land

Portsmouth recommends that consideration be given for the acquisition in fee or easement for land that is held in conservation.

Clarify Reopener Clause for Compliant Permittees

Please clarify that if a permittee is meeting its NCP targets and WWTF limits that the reopener clause will not be used by EPA to impose further limits and lower targets for the compliant permittee if/ when other permittees or watershed contributors fail to meet their limits, targets or goals.

<u>General Permit NHG58A000 Fact Sheet:</u>

EPA and NHDES have posited that the overall nitrogen load to the Great Bay should be no more than 100 kg/ha-year in order to restore eelgrass beds within the Estuary. This determination is preceded by over 10 years of dispute between regulators and the Great Bay Municipal Coalition, which included Portsmouth, regarding the role of Nitrogen in the system, the cause of eelgrass and other losses in the Estuary, and the means to achieve recovery, or at least resiliency, in the face of stressors such as climate change. Portsmouth remains concerned that EPA and NHDES have failed to invest in the scientific effort needed to best regulate pollutants in the Estuary and disagrees, based on the evidence to date, that 100 kg/ha-year is the appropriate target. Portsmouth expressly reserves its right to rely on any and

all arguments and data set forth in the comments submitted by Dover and Rochester.

That stated, Portsmouth anticipates deferring to the agency's decision on the appropriate target if it appears in the best interest of Portsmouth to do so.

Request for Compliance Schedule

If the effluent load limits for Table 2 are not adjusted in the final permit, the Pease WWTF will very likely be unable to meet the annual average effluent total nitrogen limit at the potential future projected flow of 1.77 mgd without an upgrade and Portsmouth will require a compliance schedule for that facility. EPA should explicitly provide for such compliance schedule in the general permit as provided in ENV-Wq 1701.03.

Reservation of Rights

There are several documents noted in these comments that were not available prior to the comment deadline or are in the process of being completed. The City of Portsmouth reserves its rights to supplement its comments based on documents that were not available.

The City of Portsmouth appreciates the thought EPA and NHDES have put into providing this innovative total nitrogen general permit and reiterate Portsmouth's commitment to the health of the Great Bay Estuary.

Sincerely,

Suzanne Woodland
Deputy City Attorney

Terry Desmarais, P.E.
City Engineer

ec: Karen Conard, City Manager
Peter Rice, Director of Public Works

Exhibit A Proposed Adjusted Loads and Concentration Calculations

Table A1: Proposed Loadings

City/Town	Table 2 DRAFT Permit: TN Load (lbs/day)	Table 3 Fact Sheet: 2012-2016 Flow (MGD)	Calculated Equivalent Concentration (mg/L)	Design Flow (MGD)	Adjusted Load Based on Design Flow (lbs/day)	Table 4 Fact Sheet: Delivery Factor (%)	Proposed Actual Load to GBE (lbs/day)
Rochester	198	2.97	8.0	5.03	335.3	75.56	253.4
Portsmouth	269	4.03	8.0	6.13	409.2	100	409.2
Dover	164	2.46	8.0	4.70	313.3	100	313.3
Exeter	108	1.61	8.0	3.00	201.2	100	201.2
Durham	60	0.9	8.0	2.50	166.7	100	166.7
Somersworth	96	1.44	8.0	2.40	160.0	100	160.0
Pease ITP	87	0.64	16.3	1.20	163.1	94.94	154.9
Newmarket	35	0.52	8.1	0.85	57.2	100.00	57.2
Epping	37	0.25	17.7	0.50	74.0	58.20	43.1
Newington	16	0.11	17.4	0.29	42.2	100.00	42.2
Rollinsford	12	0.08	18.0	0.15	22.5	98.96	22.3
Newfields	16	0.09	21.3	0.12	20.8	100.00	20.8
Milton	11	0.07	18.8	0.10	15.7	65.70	10.3
Total NH (lbs/d)	1109.0				1981.3		1854.5
Total NH (kg/ha-yr)	33.8				60.3		56.5
Communities below this line are not regulated in this permit but are needed to calculate total estuary load							
Kittery	60	0.9	8.0	2.5	166.7	100.00	166.7
Berwick	29	0.21	16.6	1.1	151.9	94.55	143.6
North Berwick	47	0.31	18.2	1	151.6	51.56	78.2
South Berwick	14	0.28	6.0	0.567	28.4	100.00	28.4
Total ME	150.0				498.5		416.8
Total ME (kg/ha-yr)	4.6				15.2		12.7
Total (lbs/d)	1259.0				2479.8		2271.3
Total (kg/ha-yr)	38.3				75.5		69.1

Table 1a Notes:

1. Calculated concentration varies marginally from those shown in Fact Sheet Table 3 due to rounding

Table A2: Proposed Reductions in Estuary Wide TN Load by Source

	Fact Sheet p 28: Baseline Loads 2012-2016[1]	Draft GBTN GP Loads (kg/ha-yr)[2]	Draft GBTN GP Reduction (%)	Proposed Loads (kg/ha-yr)	Proposed Reduction (%)
Total Estuary	199.71	100	50%	100	50%
WWTF	82.71	35.4	57%	**69.1**	**16%**
NPS and Storm	117.00	64.6	45%	**30.9**	**74%**

Table 1b Notes:

1. Fact sheet p. 26, first paragraph, referrences the total load to the estuary as 189.3 kg/ha-yr with NPS and PS stormwater contirbuting 106.6 kg/ha-yr. The NPS and PS storm is later normalized to inches rainfall (p 28, para 3) at a ratio of 45.2/40.9=1.1051 to 117 kg/ha-yr. The total of 199.71 shown above is not found in the Fact Sheet.
2. WWTF loads after applying delivery factor - represents load delivered to estuary not at the end of pipe.

Exhibit A Proposed Adjusted Loads and Concentration Calculations

Table B1: Annual Average Concerntration Equivalent for Seasonal TN 3 mg/L

Month[1]	Typical Effluent TN Concentration (mg/L)
J	10
F	10
M	5.5
A	3.5
M	3.5
J	3
J	3
A	2.5
S	2.5
O	3
N	10
D	10
Ave	**5.5**

Table B1 Notes:

1. Growing season in yellow

Table B2: Facilities At Or Below 5.5 mg/L (Eqivelant Seasonal TN 3 Mg/L) With Desing Q and DRAFT GBTN GP TN Load

City/Town	Table 2 DRAFT Permit: TN Load (lbs/day)	Design Flow (mgd)	Calculated Equivalent Annual Average Concentration (mg/L)[3]
Rochester	198	5.03	4.7
Portsmouth[1]	269	6.13	5.3
Dover	164	4.7	4.2
Exeter	108	3	4.3
Durham	60	2.5	2.9
Somersworth	96	2.4	4.8
Pease ITP[1]	87	1.2	8.7
Newmarket	35	0.85	4.9
Epping	37	0.5	8.9
Newington	16	0.29	6.6
Rollinsford	12	0.15	9.6
Newfields	16	0.117	16.4
Milton	11	0.1	13.2
Portsmouth/Pease[1]	356	7.33	5.8
Portsmouth/Pease @ 1.77 MGD[2]	356	7.9	5.4

Table B2 Notes:

1. Portsmouth and Pease are bubbled for a total of 356 lbs/d. Calc shown at bottom of table
2. Pease NPDES request for increase in capacity from 1.2 MGD to 1.77 MGD in process
3. Green highlight indicates that with DRAFT GBTN load and at design flows, the concentration that needs to be achieved on annual basis is equal to or less than a typical seasonal TN 3 mg/L permit

AECOM
250 Apollo Drive
Chelmsford, MA 01824
www.aecom.com

978.905.2100 tel
978.905.2101 fax

Exhibit B Letter from AECOM to City of Portsmouth Regarding Comments on the Draft Great Bay Total Nitrogen General Permit

J-60323328

February 25, 2020

Mr. Terry Desmarais, P.E.
City Engineer
Department of Public Works
680 Peverly Hill Road
Portsmouth, NH 03801

Subject: Review of Draft NPDES Great Bay Total Nitrogen General Permit for Wastewater Treatment Facilities in New Hampshire

Dear Mr. Desmarais:

In response to your request, we have reviewed the Draft NPDES Great Bay Total Nitrogen General Permit for Wastewater Treatment Facilities in New Hampshire and associated documents that were issued by the EPA on January 7, 2020 and provide the following background, comments and questions for your consideration.

Existing Portsmouth NPDES Permits Nitrogen Limits Overview

EPA has been discussing imposing effluent total nitrogen limits for wastewater treatment facilities (WWTFs) discharging to Great Bay for a number of years. Typically, total nitrogen limits have been added to each WWTF's NPDES permit, as was done in 2012 with Exeter and Newmarket where each WWTF received an effluent monthly average total nitrogen limit of 3.0 mg/l, required from April 1 – October 31.

EPA issued the current NPDES permit for the Peirce Island WWTF in 2007, and it expired in 2012, but it has been administratively continued as no new permit has been issued. As recently as July 2012, EPA had notified the City that a monthly average total nitrogen limit of 8 mg/l should be expected in the next NPDES permit that was being drafted. No draft individual permit has been issued for the Peirce Island WWTF to date.

Current nitrogen limits for the Peirce Island WWTF are contained in the second Consent Decree Modification that was executed by the City and EPA in the Fall of 2016. The Second Modification requires, for a five-year period beginning June 1, 2020, that "a seasonal average total nitrogen effluent concentration level no greater than 8 mg/l from May 1st through October 31st of each year, and a monthly average total nitrogen effluent concentration level no greater than 8 mg/l from June 1st through October 31st of each year" be achieved.

The Pease WWTF NPDES permit was issued in 2000, and it expired in 2005 but it has been administratively continued as no new permit has been issued. There are no effluent total nitrogen limits in the current permit for the Pease WWTF.

2020 DRAFT General Permit Overview

The Draft NPDES Great Bay Total Nitrogen General Permit for Wastewater Treatment Facilities in New Hampshire that was issued on January 7, 2020 imposes effluent limits for the 13 WWTFs in NH discharging to the Great Bay Estuary but does not include the 4 Maine WWTFs that discharge to the bay. The limits are mass based, with an annual load limit in pounds per day that is based on a 12-month rolling average reported monthly. Portsmouth is unique among the 13 WWTFs in that it is the only community covered by the draft General Permit with 2 WWTFs. The draft permit does appear to offer the City some additional flexibility in that compliance with the permit limits for Portsmouth is based on the sum of the discharges from both WWTFs compared to the total load allocation for both WWTFs of 356 pounds per day of total nitrogen. This combined limit for both WWTFs would provide an opportunity to consider the ability of the Peirce Island WWTF to potentially achieve a higher level of nitrogen removal than at the Pease WWTF and offset the required level of nitrogen reduction at the Pease WWTF, since the Peirce Island WWTF has the greater ability to remove nitrogen. This is more significant when the difference in size of the two WWTFs is considered.

The draft permit however has several other aspects that are significant. For each WWTF, within 12 months of permit issuance, a Nitrogen Optimization Plan (NOP) is to be prepared and implemented to optimize the nitrogen removal capability of each WWTF. The NOP requires reducing the discharge of nitrogen to the extent practicable. The City would be required to certify annually that both WWTFs are in compliance with the NOP and update the NOP if any changes are made to each facility affecting nitrogen removal.

The draft permit also requires the permittees covered by the permit to participate in a significant ambient receiving water and benthic monitoring program that includes Head of Tide monitoring at 8 locations twice monthly to characterize nitrogen loads to the Great Bay estuary; monthly water quality sampling and monitoring during 9 months of the year at 17 stations in the estuary; annual Sediment Profile Imaging and benthic sampling at 100 stations in the salt water portion of tributaries and the estuary; and aerial mapping of eelgrass and biological data collection in 22 Assessment Zones in tributaries and the estuary. An annual report on the monitoring program results is also required. The cost for this monitoring program is to be shared among the 12 communities included in the permit, with the cost for each community proportional to the design flow of the affected WWTFs as a percentage of the total design flow of all WWTFs covered by the permit. The design flow for all 13 WWTFs is not presented in the draft permit or in the associated Fact Sheet but using the 2012-2016 average daily flows for all affected WWTFs that are included in the draft permit Fact Sheet, Portsmouth's two WWTFs represent 4.94 mgd out of the total 15.17 mgd, or approximately 33 percent. Using the WWTF design flow data that was provided to the City previously by EPA, Portsmouth's two WWTFs represent approximately 27 percent of the total. Regardless of the final percentage, the City would have the largest share of the monitoring program cost out of all the affected communities.

Lastly, and probably most significantly, the draft permit includes an appendix with an Optional Non-Point Source and Stormwater Point Source Nitrogen Reduction Pathway. This is being offered by EPA in response to feedback from the Great Bay municipalities which "expressed a preference to invest in non-point source and stormwater point source nitrogen reductions before significant additional WWTF upgrades" according to the permit. If the City elects to follow this optional

approach, then a stormwater pollution database program called Pollution Tracking and Accounting Program (PTAPP) developed and maintained by the UNH Stormwater Center will be used to track changes implemented in the City that affect stormwater management and the nitrogen mass loading to the bay. Changes can be reductions realized by implementation of improved stormwater management of existing systems to reduce nitrogen mass loading, or changes could be additional stormwater that results from additional development over time which could increase the nitrogen mass loading from stormwater.

By electing to follow this optional pathway, the City would also agree to developing and implementing a Nitrogen Non-Point Source and Stormwater Point Source Control Plan in phases: a 1 year near term plan, a 3-year plan, an 8-year plan, a 13-year plan, and an 18-year plan. Each phase has a detailed list of required information for each plan and an assigned required level of non-point source control that is tied to the NHDES 2014 *Great Bay Nitrogen Non-Point Source Study* and the estimated non-point source total nitrogen mass loading presented. In that report, the City's total nitrogen baseline mass loading from stormwater and non-point sources was listed as 55,899 pounds per year, or approximately 153 pounds per day. As described in the Fact Sheet, the nitrogen baseline mass loading was then normalized to the average annual rainfall from 1988 - 2017. The required reduction in nitrogen loading in the draft permit is expressed in percent reduction of the normalized baseline nitrogen mass loading, with a 45 percent reduction required to be achieved 18 years after permit issuance. Although not stated in the draft permit, based on data previously provided to the City by EPA, the 45 percent reduction appears to translate to a requirement to remove 58 pounds per day of nitrogen from stormwater and non-point sources.

The intent of the inclusion of the optional approach appears to be that it may be less costly to address non-point and stormwater sources of nitrogen than to upgrade (and operate) the WWTFs to remove additional nitrogen from the wastewater carried in the treated effluent. EPA notes that if a municipality follows the optional approach and nitrogen reductions do not allow the current water quality standards to be achieved in the specified timeframes, then further, more stringent, nitrogen reductions will be required.

The draft permit also states that a municipality can request to be excluded from the coverage of this general permit by applying for an individual permit which would include limits on total nitrogen. The draft permit does not indicate what the criteria for exclusion is, and only notes that exclusion shall be granted if the reasons cited are adequate to support the request. It is not clear what nitrogen limits would be imposed by EPA if such a request were submitted and granted.

The optional Non-Point Source and Stormwater Point Source Nitrogen Reduction Pathway presented in Appendix II does not appear to really be optional. Attached is the handout from the February 19, 2020 Public Hearing held by EPA and NHDES on the draft permit. As the chart in the lower left corner of the first page of the handout shows, the target total nitrogen load reduction for the General Permit is comprised of the WWTF loads and the non-point source and stormwater loads. Reductions in both sources of nitrogen are required to meet the 100 kg/ha-yr areal loading target level. If the City was to forgo taking any action on the "optional" non-point source and stormwater loads, it is clear from the chart in the handout that the WWTFs would then need to further reduce effluent total nitrogen to offset the shortfall. The draft permit and fact sheet do not clearly state if the "optional" Non-Point Source and Stormwater Point Source Nitrogen Reduction Pathway is not followed, that the WWTFs

will be required to reduce additional total nitrogen to offset the shortfall, only noting on page 31 of the Fact Sheet that if the "activities described above are not carried out and water quality standards are not achieved, EPA may reopen the General Permit….and incorporate any more stringent nitrogen effluent limits for the WWTFs necessary to ensure compliance with water quality standards". EPA should clarify that if the City did not follow the "optional" Non-Point Source and Stormwater Point Source Nitrogen Reduction Pathway, whether the WWTF allowable level of total nitrogen would be further reduced to offset the shortfall. This would allow the City to make an informed decision on the right strategy for the City on compliance with the General Permit.

The approach for the optional Non-Point Source and Stormwater Point Source Nitrogen Reduction Pathway presented in Appendix II to the Draft Permit relies heavily on the PTAPP database developed and supported by UNH. PTAPP is a tracking and accounting model for pollutant load reductions achieved through various non-point source (NPS) control projects. On page 11 of the 2014 NHDES Great Bay Nitrogen Non-Point Source Study, it is noted that the PTAPP model was validated as follows:

> "The model output was validated using measurements of nitrogen loads from the eight major tributaries to the Great Bay Estuary. PREP (2012) used the most recent monthly data (2009-2011) on nitrogen concentrations at the head-of-tide to calculate the total nitrogen load from nonpoint sources in each of the eight major watersheds. These three years had yearly rainfall between 53.1-64.8 inches per year. The NLM was run for these same watersheds. The model predictions were then compared to the measured loads to determine the accuracy of the model."

However, the model validation comparisons are not presented in the report, providing no definition of the accuracy of the model. Typically, in reports such as this, the model validation data and correlation with measured data are presented to allow the user to understand the accuracy of model. On page 14, it is again noted that the model input data "chosen values were validated by comparisons to other studies to ensure accuracy". No information on the validation comparison is presented.

The lack of validations documentation is of importance here as according to the Draft permit, this PTAPP model is to be used to determine the City's level of compliance with the non-point source and stormwater load reductions, which will dictate future capital expenditures. NHDES and UNH should provide clear model validation data showing the model correlates highly with measured data to gain confidence in the model. As it is presented, if the City follows the Optional Pathway, the City has significant financial commitments decided by a model with undocumented accuracy.

Comments and Questions on Specific Items in the Draft Permit

1. On page 4 in footnote 1 it is noted that a routine sampling program is to be developed in which samples are taken at the same location, at the same time, and on the same days of the week each month. This language is different than the language in the City's existing NPDES permit which notes that sampling for BOD and TSS is to be conducted twice weekly. The note 1 language offers the City no flexibility to address site specific conditions at each WWTF, and the

requirement to sample at the same time each week is likely unrealistic. Can the same language for sampling in the existing NPDES permit be used rather than the language in draft permit?

2. In Table 2 on page 4 of the draft permit, it is noted that the City must monitor and report the effluent concentration of a number of forms of nitrogen. Ammonia nitrogen is one parameter that must be monitored weekly and reported, but the determination of ammonia is not needed to determine the total nitrogen in the effluent. Why is monitoring and reporting of effluent ammonia being required for permit compliance? It will add to the cost for compliance with the permit without providing meaningful additional data.

3. On page 5, in footnote 3 to Table 2 it is noted "The limit is an annual load limit (in units of average pounds per day) and shall be reported as a rolling average. The value will be calculated as the arithmetic mean of the monthly average load (in lb/day) for the reporting month and the monthly average loads (in lb/day) of the previous eleven months." This approach results in a value that is an average of averages. This adds inaccuracy to the calculations, since averaging averages does not account for how many data points comprise each month average. Since the required WWTF sampling is one composite per week, some months will have five samples, some months will have four. A bad four sample month will be weighted the same as a good five sample month which is not representative of actual conditions. We suggest the basis for the Total Nitrogen mass limit should just be a 52-week rolling average.

4. On page 5, in footnote 4 to Table 2 it is noted "The total nitrogen monthly average mass loading reported each month shall be calculated as follows: Total Nitrogen (lb/day) = average monthly total nitrogen concentration (mg/L) * average monthly flow (MGD) * 8.345". To arrive at the monthly average, the 4 or 5 monthly samples are averaged and the average flow over the entire month is used. This methodology is not representative of the actual conditions, as averaging the concentrations and flow could skew the result. The mass loading should be calculated using the sample concentration and flow on the day the sample is collected, and the mass loading for the 4 or 5 sample days each month should then be averaged to determine the total nitrogen monthly average. There is precedent for this as this is the approach used in the Connecticut Nitrogen General Permit.

5. On page 5, it is noted that the permit basis is an annual 12-month rolling average. If the concern in the bay is impacts to eelgrass, why is an annual limit being imposed, and not a seasonal limit during the growing season? This would avoid burdening the 13 communities with additional treatment costs during the colder months of the year. This is the approach used in the permits with total nitrogen limits for the Massachusetts WWTFs discharging to the Taunton River Basin and Buzzards Bay, the Rhode Island WWTFs discharging to Mount Hope Bay, the Blackstone River, and the Pawtuxet River, and the Newmarket and Exeter NH permits that have been issued.

6. On Page 5, under Item 2 of the required Nitrogen Optimization Plan (NOP), the NOP is required to "reduce the discharge of nitrogen to the extent practicable". This is vague, undefined, and subjective. It is not clear from this requirement what is being asked of the permittee. In other permits in EPA Region 1, the requirement for the NOP is worded as follows (italics added):

> Within one year of the effective date of the permit, the permittee shall complete an evaluation of alternative methods of *operating* the existing wastewater treatment facility to optimize the removal of nitrogen and submit a report to EPA documenting this evaluation and presenting a description of recommended *operational* changes. The methods to be evaluated include, but are not limited to, *operational* changes designed to enhance nitrification (seasonal and year-round), incorporation of anoxic zones, septage receiving policies and procedures, and side stream management.

This wording makes it clear that the intent is to implement operational changes to the existing WWTF to optimize nitrogen removal, and not to require capital improvements to optimize nitrogen removal. Why is this wording not used as it has been used in numerous other Region 1 Permits?

For the Peirce Island WWTF, the requirement to "reduce the discharge of nitrogen to the extent practicable" may be interpreted to mean that since the secondary treatment process can increase the level of nitrogen removal from the 8 mg/l level called for in the Second Consent Decree Modification to 3 mg/l, achieving the 3 mg/l level is now required. The NOP language could be interpreted to require achieving the 3 mg/l level on an annual basis since the process has this capability. The Consent Decree also addresses this, noting that if a more stringent limit than the 8 mg/l seasonal limit is imposed through a subsequent NPDES permit, that the lower limit must be achieved. While this would remove the flexibility the City currently has to decide to lower the effluent total nitrogen at the Peirce Island WWTF, the City would receive "credit" for the nitrogen removed towards the total mass limit on total nitrogen for both WWTFs.

5. On page 6, paragraph 2.3 has the title of Adaptive Management Ambient Monitoring Program. On page 28 of the Fact Sheet, it is noted that "NHDES highlights the importance of restoring the Great Bay estuary through an adaptive management approach designed to address both point sources and non-point sources of nitrogen". However, the Adaptive Management approach in the draft permit only applies to the non-point sources and stormwater points sources of nitrogen and not to the WWTF effluent limits. The permit effluent limits on total nitrogen for each of the 13 WWTFs take effect (as noted on page 2 of the draft permit) on the first day of the calendar month immediately following 60 days after signature of the final permit, and are not deferred or phased in to allow time for data collection and evaluation to tailor the WWTF effluent limits to the conditions monitored in Great Bay. It appears that the "adaptive management" terms discussed in the permit and Fact Sheet are misleading since the WWTF limits would take effect immediately, putting the City in a position of potentially being in violation of the effluent nitrogen limits for the Pease WWTF as it was not designed to provide nitrogen removal.

6. On page 6, under paragraph 2.3, the requirement for each community to participate in the Adaptive Management Ambient Monitoring Program is discussed. The requirements of the sampling and monitoring program are outlined and represent a significant financial undertaking, which will be incurred annually perpetually going forward. This type of monitoring and data collection program has traditionally been conducted by state and federal regulatory agencies, funded by those agencies, and often supported by academia such as UNH. It appears that this permit is transferring the obligation for those costly monitoring programs to the 12 communities affected by the permit. What prompted this change in responsibility for funding monitoring programs?

While the technical requirements of what is be monitored and how and when are defined in this section of the draft permit, it lacks definition on a number of important elements of the monitoring program such as:

- What entity is responsible for coordinating and implementing the program?
- Who funds the costs for coordinating and implementing the program?
- What happens if one or more communities do not fund their share of the program cost, who funds the shortfall?

The last portion of Paragraph 2.3 requires each community to certify annually that they have participated in the ambient monitoring program and submitted the required data to EPA and NHDES. No indication is provided on what entity is coordinating this program, and what the ramifications are of not participating in the ambient monitoring program.

Section 2.3 notes that each community will pay a percentage of the ambient monitoring program cost based on the percentage of the total WWTF flow their WWTF design flow represents. The design flows for the 13 WWTFs covered by the draft permit are not presented but should be to allow a community to understand what it's commitment would be.

6. Appendix II contains the Optional Non-Point Source and Stormwater Point Source Nitrogen Reduction Pathway. It sets targets based on the original municipality specific baseline, which is defined based on the NHDES 2014 *Great Bay Nitrogen Non-Point Source Study.* The municipality specific baseline data however are not included in the permit or Fact Sheet, and rather than require the City to hunt for this information and make the needed calculations, this data should be included in this draft permit so the baseline is clearly defined.

Specific Comments and Questions on Fact Sheet

1. The Fact Sheet allows 60 days for the public comment period on the draft permit, with a public hearing scheduled for February 19, 2020. Comments are currently due to EPA by March 9, 2020. Given the complexities in this permit, and some of the missing information, 60 days appears to be insufficient to allow the City time to evaluate the proposed draft permit. Requesting an extension of the comment period and postponement of the public hearing should be considered.

2. The Fact Sheet and the Draft Permit note that this is a "watershed" permit. However, 4 of the 13 WWTFs located within the Great Bay Watershed (Kittery, Berwick, North Berwick, and South Berwick) are not required to participate in this "watershed" General Permit. The footnote to Table 4 on page 27 of the Fact Sheet notes that "EPA expects the Maine Department of Environmental Management (sic) to regulate nitrogen from these facilities". There does not appear to be any requirement for these facilities to control effluent total nitrogen, and no details of the requirements or schedule for when these facilities will reduce their effluent total nitrogen is discussed. Referring to this draft permit as a "watershed" permit is misleading as it does not address all nitrogen point sources to Great Bay. Why are these facilities not included? EPA and the Maine DEP should be coordinating efforts to include these facilities – the cited reason

presented in Footnote 1 to Table 4 that "Because EPA is not the permitting authority in the State of Maine, these facilities are not subject to this General Permit" appears to be an administrative excuse for not addressing all nitrogen inputs to Great Bay. If nitrogen loading is the cause of the alleged water quality impacts on eelgrass and not meeting water quality standards, then EPA should require the 4 Maine WWTFs to participate in the General Permit. They will benefit from the ambient monitoring program and should be required to fund their share. The need for control of nitrogen from all sources tributary to the bay is reinforced by EPA's own statement on page 19 of the Fact Sheet, where it is stated that "Given the tidal nature of the estuary, all significant sources of nitrogen throughout the watershed…are clearly contributing to this excessive load". EPA should explain why all sources are not addressed now.

3. On page 28 of the Fact Sheet , it is noted that 18 municipalities within Great Bay are subject to the recently issued MS4 stormwater General Permit (it is not clear if this is both NH and Maine), and that EPA expects " in the next reissuance of the MS4 General Permit will contain updated nitrogen control requirements for all communities covered under the MS4 General Permit based on data gather through the Adaptive Management Ambient Monitoring program". If the current total nitrogen levels in Great Bay are so high that (as noted on page 17 of the Fact Sheet) the water are "approaching or have reached their assimilative capacity for nitrogen and are suffering from the adverse effects of excessive nutrients", then why are the other 9 communities covered by the MS4 General permit not covered by this Draft Permit, as well as the other upstream communities with stormwater discharges to the Great Bay watershed in both Maine and New Hampshire not covered by the MS4 General Permit, not being required to implement the same 45 percent reduction in stormwater and non-point source discharges of nitrogen now?

4. On page 23 of the Fact Sheet, EPA notes that the adaptive management approach is iterative. On page 3 of Appendix II to the Draft Permit, it is stated that "In the event the activities described above are not carried out and water quality standards are not achieved, EPA may reopen the General Permit within the timeframe of the permit (5 years) or reissue the General Permit beyond the timeframe of the permit (5 years) and incorporate more stringent nitrogen effluent limits for the WWTFs necessary to assure compliance with water quality standards". This implies that further reductions in effluent total nitrogen to the bay beyond what is stated in the draft permit will likely be required in the future. There are several other references throughout the Fact Sheet that make it clear these initial nitrogen limits are expected to get more stringent over time and may be reduced even during the life of the draft permit requirements. How can the City plan for future nitrogen control efforts if the target is likely to continue to move?

   Much of the focus for the need for nitrogen control has been tied to the state of eelgrass in Great Bay, and page 24 notes that eelgrass monitoring is part of the ambient monitoring program. The discussion notes that an assumption is made the nitrogen loads do not increase because of other changes in land use, weather, atmospheric deposition or other reasons. Climate change has the strong potential to change rainfall patterns and temperatures, both of which could affect nitrogen loads. How are these climate change related affects accounted for so that the communities are not penalized for these effects?

5. In Table 3 on page 25, the average flows and total nitrogen concentrations for 2012 to 2016 are presented and used as the basis for the nitrogen load allocations. These years were fairly dry

years. These data may underestimate the historical levels of nitrogen discharged for the 2 Portsmouth WWTFs. Why was a period that is more representative of typical or average conditions not used for this analysis? Furthermore, since a number of the affected communities, including Portsmouth, have recently completed WWTF upgrade projects that were sized to accommodate planned growth, why are the nitrogen load allocations not based on the WWTF design flows rather than limited historical data?

6. On page 26, the methodology for adjusting the 2009-2011 non-point source and stormwater data to the 2012-2016 period by applying a ratio based on annual rainfall to the loading rate. This approach is a very rough approximation at best, and given the magnitude of financial expenditures being considered to address nitrogen, this methodology does not seem sufficiently accurate and should be revised.

7. On page 28, it is noted that EPA is soliciting comments on the need for a compliance schedule for any WWTFs that may need to implement more significant process improvements and/or upgrades to comply with the annual average effluent total nitrogen limit. The Pease WWTF will very likely be unable to meet the annual average effluent total nitrogen limit at the potential future projected flow of 1.77 mgd without an upgrade, and we recommend it be identified as such to EPA.

8. The methodology for addressing stormwater does not appear to account for CSO communities like Portsmouth and Exeter (the only 2 of the 12 affected NH communities). How are CSO nitrogen inputs addressed in the permit? If the City continues to implement the targeted sewer separation program, how does the City receive credit for these improvements?

9. Since most of the land in the City is privately owned, and City property accounts for only a small fraction of the City's total land area, controlling nitrogen in the stormwater generated on private property will likely involve conducting work on private property. The City does not have a right to conduct work on private property, so it is unclear how the City could commit to making a reduction in nitrogen from stormwater generated on property it does not own. EPA should clarify their intent on this requirement.

We would be pleased to meet with you to discuss the comments at your convenience. If we can provide any further information on this matter, please feel free to contact us.

Very truly yours,

Jon R. Pearson
Vice President
AECOM

Encl.

JRP/jrp

Draft Great Bay Total Nitrogen General Permit

What is a General Permit?

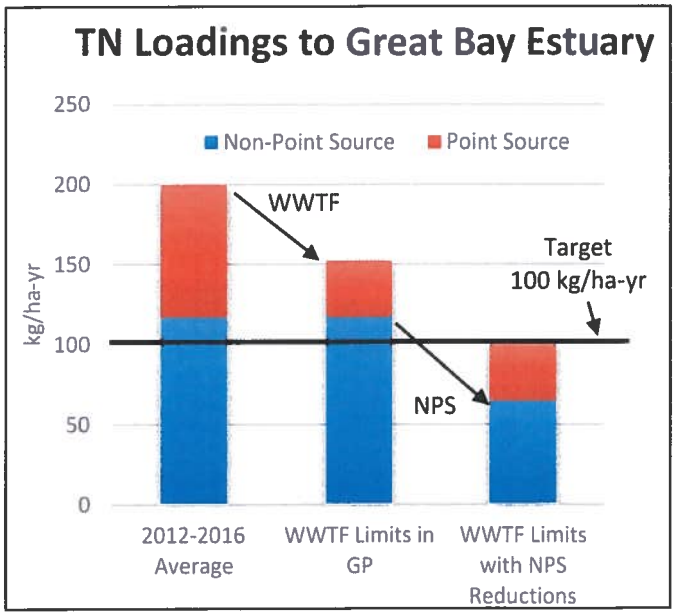
A National Pollutant Discharge Elimination System (NPDES) individual permit is written to reflect site-specific conditions of a single discharger and is unique to that discharger whereas a NPDES general permit is written to cover multiple dischargers with similar operations and types of discharges.

What is the purpose of the Public Notice Period?

The public notice period is a time for the public to review and comment on the Draft Permit. After the public notice period ends on March 9, 2020, EPA will consider the comments, and if warranted, revise the permit based on those comments before issuing the final permit. Along with the Final Permit, EPA will issue written responses to comments received during the public notice period. Information about the Draft Permit and how to submit comments is provided at: https://www.epa.gov/npdes-permits/draft-great-bay-total-nitrogen-general-permit.

Why is this permit only for Total Nitrogen?

Given the scope of the impact of excess nutrient enrichment throughout the Great Bay estuary, this permit is designed to establish equitable total nitrogen limits for all New Hampshire publicly-owned treatment works (POTWs) in the Great Bay watershed to protect and restore the entire estuary more efficiently and expeditiously than the issuances of multiple individual permits. Each POTW will maintain coverage under an individual permit for the discharge of all other pollutants.



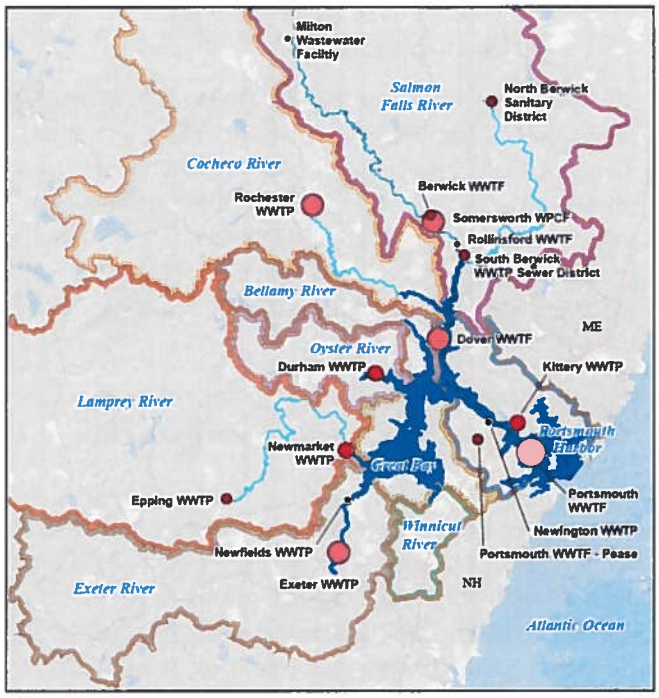


Figure 1 – Location of POTWs discharging to the Great Bay watershed. Circles indicate the relative average daily discharge from POTWs between 2012-2016.

What is "Adaptive Management" and how does it work?

In recent years, some of the Great Bay communities have expressed a preference for their permits to be based on an adaptive management approach. Adaptive management is an approach to natural resource management that emphasizes learning and adapting plans over time, allowing policymakers to take action to address problems despite the uncertainty inherent in our understanding of complex ecological systems. The process is iterative and allows course corrections as knowledge of the system increases. In support of this approach, the Draft Permit proposes the following:

- a target (100 kilograms per hectare per year, or kg/ha-yr) for total nitrogen loading, based on a range of total nitrogen loadings drawn from the scientific literature that are demonstrated to impact similar estuaries (100 kg/ha-yr is at the high end of that range—in other words, the highest loading that might support a healthy estuary)
- effluent limits and optimization requirements to reduce total nitrogen loads from all POTWs

- incentives that consider optional reductions in total nitrogen loading from other sources (e.g., stormwater runoff)
- an ambient monitoring program to track progress and build knowledge

As total nitrogen loads are reduced in the coming years, the EPA and New Hampshire Department of Environmental Services (NHDES) will evaluate the ambient monitoring data to track the response throughout the estuary. This information, along with other scientific information that may be available in the future, will inform future regulatory decisions with the goal of restoring water quality in the Great Bay estuary.

What is the *Optional Non-Point Source and Stormwater Point Source Nitrogen Reduction Pathway?*

In recent years, the State of New Hampshire and some of the Great Bay communities have expressed a preference to invest in non-point source and stormwater load reductions before significant additional investments in POTW upgrades. The Draft Permit was designed in large part to accommodate this preference and sets forth an optional pathway to achieve non-POTW load reductions at the scale necessary to meet the overall total nitrogen target. Participation in this pathway is not a requirement of the general permit but is strongly encouraged and comes with the incentive that meaningful progress on this pathway by a municipality may forestall more stringent effluent limits that may otherwise be necessary in the future.

What about total nitrogen reductions from the rest of the watershed?

The Great Bay watershed has 52 municipalities, 16 of which have POTWs that discharge to a surface water (12 in New Hampshire and four in Maine) and the other 36 do not. The Draft Permit covers the 12 municipalities in NH that have POTWs, including one municipality, Portsmouth that has two POTWs. EPA is not the permitting authority in the state of Maine, so the Maine Department of Environmental Management (MEDEP) will regulate nitrogen discharges from those four facilities. Additionally, EPA anticipates that the next reissuance of the Municipal Separate Storm Sewer System (MS4) general permit will contain updated nitrogen control requirements for all communities covered under the MS4. The MS4 general permit covers many additional communities that are not included in the Draft Great Bay Total Nitrogen General Permit. These permitting actions will allow the nitrogen reductions to be spread throughout the watershed.

What is the Adaptive Management Ambient Monitoring Program?

The Draft Permit proposes that all 12 permittees will contribute equitably (based on percentage of total design flow) to the overall cost of annual monitoring throughout the estuary. EPA and NHDES anticipate that the permittees will contract with a single entity to perform the monitoring each year. The program consists of the following.

- Head of tide monitoring
  - 2 monitoring events per month
- Estuarine monitoring
  - 16 datasondes
  - 1 monitoring event per month
- Eelgrass monitoring
  - aerial mapping
  - ground-truthing
- Sediment monitoring
  - sediment profile imaging
  - benthic grab samples

Key Contacts:

Michael Cobb
U.S. EPA Environmental Engineer
617-918-1369
Cobb.Michael@epa.gov

Dan Arsenault
U.S. EPA Environmental Engineer
617-918-1562
Arsenault.Dan@epa.gov

Stergios Spanos
NHDES Supervisor NPDES Permits & Compliance
603-271-6637
Stergios.Spanos@des.nh.gov

Hayley Franz
NHDES NPDES Permits
603-271-0671
Hayley.Franz@des.nh.gov

General Info:
Toll-free customer service
1-888-EPA-7341

Learn More at:
https://www.epa.gov/npdes-permits/draft-great-bay-total-nitrogen-general-permit

Exhibit C - Memo from VHB to City of Portsmouth Regarding Preliminary Assessment of NPS Controls Needed to Meet EPA's Draft GBTN GP

To: Brian Goetz, Deputy Director DPW,
Terry Desmarais, PE City Engineer

Date: May 7, 2020

Project #: 52542.02

From: Bill Arcieri

Re: Preliminary Assessment of NPS Controls Needed to meet EPA's Proposed GBTN General Permit

The memo provides a summary as well as an assessment of the potential impacts of the proposed permit requirements contained in the Environmental Protection Agency's (EPA's) Draft Great Bay Total Nitrogen General Permit (GBTN GP) released on January 7, 2020. The DRAFT GBTN GP establishes average daily total nitrogen load limits for wastewater treatment facilities in twelve municipalities located in the Great Bay watershed in New Hampshire. The Draft GBTN GP also establishes an optional pathway that municipalities can consider in order to achieve additional nitrogen load reductions through nonpoint source (NPS) and stormwater treatment controls for purposes of possibly avoiding even lower daily N load limits at the wastewater treatment facilities (WWTF) future permits. EPA believes the additional load reductions included in this proposed Draft GBTN GP are needed to meet state water quality standards. Under the optional pathway, municipalities would be required to develop a Nitrogen Control Plan (NCP) that would outline a phased approach of implementing various NPS and stormwater control measures to ultimately reduce their existing baseline nonpoint source and stormwater nitrogen load by 45% over a 23-year period.

EPA suggests the maximum nitrogen (N) load to the Great Bay should be no more than 100 kilograms per hectare per year (kg/ha/year) based on the aerial size of the estuary in order to restore eelgrass beds within the Bay. Various technical experts and local officials have raised concerns as to whether the research used by EPA to set this maximum load is applicable to the Great Bay given the physical differences (e.g., flushing rate, size, water depth, etc.) between the Great Bay and the estuaries included the research. Although this is a critical issue with respect to underlying premise of this Draft Permit, we are not addressing this issue in this memo but instead focus on assessing what the potential ramifications may be for Portsmouth if it were to select the "optional" pathway of the Draft GBTN GP, particularly with respect to the various nonpoint source and stormwater control measures that may be needed to meet the proposed N load reductions included in this Draft Permit. In the future, these proposed load reductions and NPS/stormwater control requirements may no longer be optional given that EPA states on pages 28-29 of the fact sheet, that these NPS/stormwater control requirements could be rolled into the next MS4 permit scheduled for renewal in 2022.

EPA estimates the current average total annual N load to the Bay is approximately 189.3 kg/ha/yr. based on PREP's water quality monitoring data and discharge monitoring reports submitted by various WWTFs during the 2012-2016 period. EPA estimates that if the 7 largest WWTFs (incl. Peirce Island WWTF) were to achieve an average annual nitrogen concentration of 8 mg/L. then the total annual WWTF N load would be reduced to approximately 35 kg/ha/yr. based on average annual flow volumes recorded during the 2012-2016 period. Given these assumptions, approximately 65 kg/ha/yr. of the assumed theoretical maximum N load would be left for NPS and stormwater contributions. After normalizing for average annual rainfall, EPA estimates that the current watershed N load from NPS/stormwater sources is 117 kg/ha/yr. and to get to 65 kg/ha/yr., the "regulated" communities would need to reduce their baseline load by 45% through the NPS/stormwater control pathway.

The following provides a preliminary assessment of the types and extent of control measures that the City's would likely be needed in order to meet EPA's proposed 45% load reduction target for nonpoint sources. For purpose of this memo, the City's baseline NPS nitrogen load is based on the Great Bay

Nonpoint Nitrogen Source Study (GBNNPSS) completed by the New Hampshire Department of Environmental Services' (NHDES) in 2014. This Study estimated that the City's average annual baseline NPS load is approximately 48,073 lbs. N/year after normalizing for average annual rainfall and accounts for various land use and activities as outlined below. VHB recommends that the estimates of developed land and impervious areas used to develop the GBNNPSS load estimates be updated before the City moves forward with any more detailed planning efforts or assessments.

Estimated NPS Nitrogen Loads

Table 1.0 presents the estimated average annual baseline N loads by land use and/or land use activity within City boundaries based on the GBNNPSS results. Nitrogen originates from four major sources including atmospheric deposition, fertilizers, animal waste (based on estimated numbers of livestock, dogs and cats) and human waste (septic systems). Atmospheric deposition contributes 39% of the estimated total load and represents the largest N source followed by chemical fertilizer and animal waste at 34% and 18%, respectively.

Table 1.0 Estimated Delivered NPS Loads by Land Use/Activity in Portsmouth based on GBNNPSS

Land use /Activity	Original N Source	Area	Average Annual Load[1] (lbs./yr.)	% of Baseline Load	Potential Control Measure
Unmanageable or Non-Development Related Activities					
Natural Vegetation	atmosphere	4,826	3,830		
Water Surfaces	atmosphere	1,540	2,917		
	Subtotal	**6,366**	**6,747**	**14%**	
Agriculture	atmosphere	134	109		
	chem fertilizer	134	202		Fertilizer Ban/ Education
	animal waste	horses	356		
	Subtotal	**134**	**666**	**1%**	
Manageable or Development Related Land Use Activities					
Lawns	atmosphere	1,400	1,230		
	chem fertilizer	1,400	15,453		Education/ Outreach
	Pet waste	1,400	1,045		
	Subtotal	**1,400**	**17,727**	**37%**	
Managed Turf	atmosphere	118	50		
	chem fertilizer	118	781		
	Subtotal	**118**	**830**	**2%**	
Impervious Area					
Directly Connected (DCIA)	atmosphere	2,252	7,623		
	Pet waste[2]	na	5,355		
	DCIA Subtotal	**2,252**	**12,978**	**27%**	SW treatment
Disconnected (DIA)	atmosphere	1,256	2,860		
	Pet waste[2]	na	2,024		
	DIA Subtotal	**1,256**	**4,884**	**10%**	
Septic Systems		No. of SS			
Within 200m water body	human waste	84	**1,380**		Sewer ext.
Outside 200m buffer	human waste	398	**2,799**		Adv. treatment
	Pet waste	na	**60**		
Subtotal		**482 systems**	**4,239**	**9%**	
	Total	**11,526 ac**	**48,073**	**100%**	
Total N by Source	**Atmosphere**	--	**18,618**	39%	
	Chem. Fertilizer	--	**16,436**	34%	
	Animal waste	--	**8,840**	18%	
	Human waste	--	**4,179**	9%	
		Total	**48,073**	**100%**	

Notes: [1]Average annual load represents the delivered load estimated by GBNNPSS adjusted or normalized to average annual rainfall consistent with EPA Fact sheet. [2]The GBNNPS estimated approximately 6,500 dogs and 7,300 cats within the City in 2012

.Potential N Control Measures and Implications

To meet EPA's proposed 45% load reduction target for NPS and stormwater contributions, the City would need to reduce the average annual baseline NPS load of 48,073 lbs. N/yr. to 21,484 lbs. N/yr. If we exclude the 15% of the baseline load attributed to atmospheric deposition on natural vegetated areas and from agricultural areas, the manageable portion of the baseline load is approximately 40,660 lbs. N/yr. and the actual percent reduction needed from manageable sources would be 53%.

Achieving this proposed load reduction would require extensive participation and willingness by private landowners and residents to adopt various measures for all manageable sources or activities including lawn fertilizer use, stormwater treatment of nearly all of the directly connected impervious area (DCIA) within the City as well as advanced treatment for septic systems. The following provides a general analysis of the type of measures that could be used, their likely effectiveness and the potential load reductions that may result based on various assumptions and existing data expressed in the literature.

Lawn Fertilizer

According to state statute RSA 431, municipalities are preempted from regulating the sale of fertilizers but could potentially regulate the "use" of fertilizer. Regulating the use of fertilizer at the municipal level would be challenging politically and logistically. Politically, residents are likely to find a fertilizer ban to be unreasonable and arbitrary given that residents in surrounding towns in the same watershed would not be subject to the same restrictions. Logistically, if the City did adopt such a ban, it would be extremely difficult to enforce effectively since homeowners would still be able to purchase fertilizer and apply it discreetly during off-hours such as at night, early morning hours or weekend. The only way to effectively implement a fertilizer ban is at the state or regional level.

Fertilizer usage can be reduced voluntarily through intensive education campaigns. The Chesapeake Bay Network estimated that education programs targeting residents and commercial applicators could reduce lawn fertilizer usage by as much as 5 to 17% depending on the intensity and type of education program.[1] The most effective programs involved the use of social science professionals to facilitate focus groups to modify resident behavior through effective messaging and monitor change through public opinion surveys. Using a similar approach, the City might reduce lawn fertilizer usage by as much as 17% or approximately 2,600 lbs. N/yr. which is approximately 12% of the target load reduction.

Non-Structural Good Housekeeping Measures

The City's ongoing good housekeeping measures including catch basin cleaning, street-sweeping and leaf litter pickup provide limited N load removal. Based on removal credit information contained in Appendix F, Attachment 2 of the MS4 permit. the estimated N load credits associated with catch basin cleaning (2x year), monthly street sweeping with a regenerative air sweeper and an annual leaf litter control program are as high as 6%, 8% and 5%, respectively. Using a combined N removal credit of 19%, these measures would reduce the baseline N load by as much as 5,151 lbs. N/yr., assuming all 3,508 acres of the estimated directly connected and disconnected impervious area were treated. Only a portion of the total estimated impervious area is City-owned property. If we assume 60% of the total impervious area is under City jurisdiction this would result in a potential load reduction of approximately 3,100 lbs. N /yr., which is approximately 14% of the target load reduction.

Based on the assumptions discussed above, the combined estimated N load reduction for nonstructural measures and a lawn fertilizer education program would be approximately 5,700 lbs. N/yr., which would achieve 26% of the load reduction target. The City would still need to achieve another 15,700 lbs. N/yr. of load reduction to get to the proposed 45% reduction target of 21,484 lbs. N/yr.

[1]Schueler, T and C. Lane. 2013. Recommendations of the Expert Panel to Define Removal Rates for Urban Nutrient Management. CBP Approved Report

Stormwater Structural Treatment Measures

The GBNNPS study estimated that nitrogen accumulating on directly connected impervious area (DCIA) consisting of approximately 2,250 acres accounts for approximately 12,978 lbs. N/yr. of the City's total baseline load. It is difficult to estimate how much of the DCIA could be practically and feasibly treated using stormwater BMP retrofits given the potential physical constraints and limited space that is likely to be encountered, especially in the densely developed commercial and downtown areas The DCIA that consists of City roadways will have limited right-of way space to implement stormwater treatment BMPs. The City does not have the legal authority to require commercial property owners to retrofit their properties with stormwater BMPs except through site plan approval for redevelopment projects. And even with stringent redevelopment standards, requiring or expecting 100% of the existing DCIA to be treated is technologically infeasible and economically impractical.

For purposes of this analysis, if we optimistically assumed that 80% of the total DCIA could be treated with stormwater BMPs that have an average TN removal efficiency of 50%, (consistent with EPA's MS4 permit), this would result in an overall load reduction of approximately 5,200 lbs. N/yr., which is about 24% of EPA's proposed load reduction target. Realistically, retrofitting 80% of the existing DCIA with adequately sized BMPs is unlikely given the limited space and potential site constraints in the highly urbanized downtown area, which is a large portion of the DCIA area. Nonetheless, even if we assume this level of stormwater BMP retrofitting could be achieved along with the nonstructural measures, described above, this would potentially result in an estimated total load reduction of approximately 10,900 lbs. N./yr. or approximately 51% of the reduction target. The City would still need to achieve another 10,584 lbs. N/yr. of load reduction to get to EPA's proposed load reduction target of 21,484 lbs. N/yr.

There may be opportunities to reduce some of the nitrogen load contributed from pet waste through increased education and outreach efforts, particularly that estimated to be linked to the disconnected impervious areas (DIA). The pet waste associated with the DCIA would be treated as part of the structural BMPs discussed above. DIA generally refers to paved and roofed areas that drain to vegetated areas and are not directly connected to an engineered storm drain system. Even with a highly effective education program, the maximum amount of nitrogen reduction resulting from an enhanced pet waste management program is likely to be no more than 2,000 lbs. N/yr., based on the GBNNPSS estimates.

Septic Systems

The only other potentially manageable source of nitrogen is associated with septic systems. The GBNNPS study estimated that there were just under 500 septic systems in the City that contribute a total average annual N load of approximately 4,200 lbs. N/yr. Even if the City could somehow eliminate this entire estimated nitrogen load through sewer extensions or onsite advanced treatment systems, the City would still not be able to meet the 45% overall nitrogen load reduction target. Realistically, even if the City could connect all the septic systems to the wastewater treatment system and/or could retrofit systems with advanced onsite treatment, this would not eliminate 100% of the nitrogen load from septic systems. Connecting systems through sewer extensions would result in some additional nitrogen output from the wastewater facility and onsite advanced treatment systems promoting denitrification are not 100% effective. Thus, only a portion of the septic system load could likely be reduced or eliminated. The potential costs to connect the septic systems or to retrofit with advanced treatment would be substantial.

Summary of Findings

The results of the analysis indicate that achieving the proposed 45% nitrogen load reduction target would be extremely challenging, if not impossible. Even with overly optimistic assumptions of the potential treatment benefits for various control measures, the City, at best, might be able to reduce the estimated

average annual N load by approximately 12,000 to 16,000 lbs. N/yr. or approximately 55 to 75% of the proposed reduction target. These estimates assume that most of the existing directly connected impervious area would be treated by stormwater BMPs and to get to the higher load reduction estimate, much of the estimated septic system load would have to be eliminated though sewer extensions or advanced onsite treatment. Achieving these load reductions would require substantial capital investment and added operations and maintenance costs and possibly multiple decades to implement. For the stormwater retrofits alone, the potential order of magnitude cost to install BMP retrofits in approximately 1,800 acres of DCIA could total $54 million or more assuming an average BMP installation cost of $30,000 per acre. This does not include land acquisition costs, design and permitting costs or annual O&M costs to maintain the BMPs

Private landowners and developers could bear some of the future stormwater BMP costs through future redevelopment projects that adopt enhanced stormwater treatment per City Site Plan Regulations. The City is currently in the process of updating its regulations to include and perhaps go beyond the standards included in the current MS4 Permit. The City is considering a lower disturbance threshold that will capture more redevelopment projects than would otherwise be captured if the 40,000 square feet disturbance threshold included in the MS4 Permit was used. The recent proposed changes to the MS4 Permit released by EPA defer to Section D of the 2012 SWA Model Regulations, which require redevelopment projects to treat 30% of the existing impervious area and 50% of any new impervious area.

Even with full adoption of the post-construction stormwater regulations that are in included in the MS4 Permit, it will take several decades to retrofit much of the existing impervious area in Portsmouth. Much of the developable area in the City is already developed, such that most new development activity is in the form of redevelopment. Even we assumed that 100 acres of developed area is typically redeveloped each year (this is believed to be a high estimate) and all this area was impervious, this would result in approximately 30 acres existing impervious area being treated with stormwater retrofits each year. At this rate, it would take approximately 60 years to achieve the underlying assumption used in this analysis of treating 1,800 acres (80%) of the estimated existing directly connected impervious area. The amount of redevelopment each year greatly depends on economic conditions, and in some years, there may be very little activity. Unfortunately, given that only a subset of communities within the Great Bay watershed would be subject to this proposed Permit and to the current MS4 Permit, any proactive steps that the City may take to treat impervious area could be offset by development activity in neighboring towns that are not subject to the same permit or have not adopted similar requirements.

EPA has stated they believe much of the load reduction target can be achieved through nonstructural measures, however, this results of analysis show that the load reduction credits associated with good housekeeping measures including street sweeping, catch basin cleaning and leaf litter control are only estimated to be 3,100 lbs. N/yr. and that assumes that 60% of the IC area is City owned, which is a high estimate. EPA personnel have also stated that the N removal credits included in the MS4 permit for nonstructural and good housekeeping measures are likely to increase in the future based on additional research. This would certainly be helpful, but again based on the results of this analysis, the anticipated credit increases for the non-structural measures would need to double, if not, triple or quadruple, in order for there to be any meaningful change in future treatment scenarios where the City could rely more on nonstructural measures and less on the costly structural measures to achieve EPA's target N load reduction.

In closing, it is important to note that the data and assumptions used in the GBNNPS to develop the N loads and the data and assumptions used in this memo to estimate the potential treatment effects need be revisited and updated before any potential treatment credits for mitigation measures can be finalized.