Joint Adaptive Management Plan (AMP)

Submitted by the following members of the Municipal Alliance for Adaptive Management (MAAM)

Dover, Epping, Milton, Newington, Portsmouth, Rochester and Rollinsford

(Exeter, a member of MAAM, will report separately)

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Prepared by the municipal members of the Municipal Alliance for Adaptive Management (MAAM), with assistance from NH Department of Environmental Services (NHDES), the consulting firm Brown & Caldwell, the University of New Hampshire Stormwater Center (UNHSC) and the Piscataqua Region Estuaries Partnership (PREP).

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Adaptive Management Update

The Municipal Alliance for Adaptive Management (MAAM) was formed in the winter and spring of 2021 to facilitate and enhance community collaboration, stakeholder input, resource sharing, expertise, and efficient use of investment to better understand the factors influencing water quality in the Great Bay Estuary. MAAM's formation recognized the need to develop and implement an adaptive management approach in response to the Total Nitrogen General Permit (TNGP) issued for 12 regulated communities in New Hampshire that discharge either directly or indirectly to the Great Bay. MAAM's membership currently includes eight of the twelve regulated communities including Rochester, Dover, Portsmouth, Exeter, Epping, Newington, Rollinsford and Milton. MAAM is also ready to accept membership of four Maine communities, who have recently received a similar permit through the Maine Department of Environmental Protection. MAAM holds regular public meetings providing a venue for presentations, project updates and general conversations and encourages all communities, state and federal regulators, researchers and other stakeholders, whether or not they are MAAM members, to attend and participate.

Over the last four years, MAAM communities have invested heavily in point source and non-point source reduction strategies to lessen Total Nitrogen (TN) loading to the Great Bay. Based on available data, MAAM community improvements since 2021 resulted in TN reductions of tens of thousands of lbs/yr from WWTF point sources and 21,440 lbs/yr from non-point sources. Though not specifically regulated under the TNGP, these improvements also resulted in substantial improvements to other water quality stressors including Total Suspended Solids (TSS) and Total Phosphorus (TP) loadings. These improvements are the direct result of the adaptive management approach implemented by MAAM's member communities and represent many millions of dollars of investments from those communities, with many more millions of dollars allocated toward future, pending projects.

MAAM communities have not only invested in the individual infrastructure improvement projects to address both point and non-point sources, but collectively MAAM substantially funded and actively participated in numerous initiatives and research collaborations with the Piscataqua Regional Estuaries Partnership (PREP) to further the goals of the adaptive management approach outlined in the TNGP. To date, MAAM directly funded $1,902,321 towards these joint research initiatives, secured a $1,000,000 Congressionally Directed Spending Grant for research of oyster bed and eelgrass health, and lead/supported several additional grant funded programs like the Great Bay 2030 water quality improvement projects. These initiatives are outlined in further detail in the MAAM's annual updates to its Adaptive Management Plan (AMP), that have been reviewed in meetings and submitted to the EPA.

The EPA's TNGP provides for and promotes an adaptive management framework to include ambient water quality monitoring, pollution tracking, and reduction planning/implementation along with creating a mechanism to review and revise approaches as we continue to develop a better understanding of the watershed. This review and adaptation process is essential for refining and advancing watershed-level water quality protection programs focusing on key stressors impacting the health of the Great Bay and supporting appropriate investments to advance those goals. Consistent with the concept of adaptive management, MAAM communities along with technical advisors and project partners, are reviewing the water quality monitoring, pollution tracking, and scientific research that has come from these efforts over the last three years. As outlined in the following AMP update, MAAM will seek to interpret findings and revise approaches as appropriate to further address the key stressors in the Great Bay watershed.

a) Monitor Ambient Water Quality in Great Bay

In accordance with Part 3-1.a. of the General Permit, this section of the joint AMP outlines the approach to monitor the ambient water quality and eelgrass in the Great Bay Estuary as part of the evaluation of factors affecting eelgrass health.

a.1 Statement of Responsibilities

The Piscataqua Regional Estuaries Partnership (PREP), part of the School of MarineScience and Ocean Engineering at the University of New Hampshire, is currently the organization relied upon by MAAM (and presumably other agencies and stakeholders given PREP's existing responsibilities and capabilities) for ambient water quality monitoring. Through the MAAM, the members are addressing Part 3-1.a. of the General Permit by funding an equitable and proportional amount of the PREP ambient monitoring in the estuary. To date, MAAM has directly funded $1,795,500 towards this work, as well as secured a $1,000,000 Congressionally Directed Spending Grant for continued efforts and is committed to continue funding monitoring efforts. Note that this far surpasses contributions by other non-MAAM affiliated regulated communities. Appendix A of this report details the PREP work that has been directly funded by the MAAM communities.

To fully implement the research initiatives, it is the hope that all regulated communities participate in proportional and equitable funding. MAAM understands that other communities are participating at some level, however, it is not at an equitable amount based on contributed flow. MAAM is also funding the work of its consultants, Brown and Caldwell, who have been working with the PREP team on the continued development of the monitoring program. See Appendix D of this report to see Intermunicipal Agreement and funding contribution structure.

a.2 Summary of Plan

This plan covers the monitoring of water quality and eelgrass to support interpretation of and potential physical and biological stressors that may be affecting eelgrass health in the estuary. The starting point for this plan was PREP's 2020 Draft Integrated Research and Monitoring Plan and the Piscataqua Region Monitoring Collaborative's 2020 Research/Monitoring Prospectus. Since 2020, PREP and MAAM have conducted an annual planning exercise to identify and prioritize research and monitoring needs for MAAM funding.

Workplans for ongoing monitoring activities led by PREP and UNH are available online at https://scholars.unh.edu/prep/. All monitoring data described in this section, including the underlying information used to calculate nutrient loads, will be made publicly available by the entity that leads the monitoring activity. The following list of data collection and analysis activities describe key components of the monitoring program.

Data Collection

- Nutrient load estimating
    - Calculated for point and non-point sources on an annual basis.
- Water quality monitoring[1].
    - These are ongoing monitoring programs conducted by PREP/UNH. Results are generally available by summer of the following year.
    - Head of tide water quality is collected in seven tributaries to Great Bay Estuary. Monthly grab samples are collected between March and December for each year of the permit period.
    - Estuarine water quality monitoring is conducted at approximately 12 stations in the Great Bay Estuary, including the same parameters monitored in the rivers, as well as light penetration, plankton and chl-a. Monthly grab samples are collected between April and December for each year of the permit period. In addition, datasondes will automatically collect certain data every 15 minutes.
    - Beginning in 2023, for both tributary and estuarine monitoring, sampling has been extended into the winter months for all stations that are accessible during these months.

- Eelgrass (and other seagrass)
    - Eelgrass monitoring is a combination of ongoing, long-term and newly developed studies. These studies are conducted by PREP/UNH. Results are generally available by summer of the following year.
    - Eelgrass Distribution: Aerial monitoring of eelgrass coverage ("Tier 1" monitoring) has been conducted annually or biennially. The MAAM communities have seen value in having annual coverage data and have prioritized funding this work if other funds are not available to cover it.
    - Eelgrass Abundance and "health": Monitoring of seagrass metrics such as percent cover, canopy height, biomass, density, epiphyte load, and other environmental variables starting in 2021 at 25 sites ("Tier 2" monitoring) and continuing at 3 long-term monitoring sites (SeagrassNet/"Tier 3" monitoring).

- River discharge
    - MAAM has engaged with PREP to study and identify a path forward for obtaining tributary discharge measurements or estimates in three tributaries to Great Bay: Bellamy River, Great Works River, Salmon Falls River.
        - The first step in the study, funded in 2023, was to a review methods used in other tributaries and assess whether the same methods are appropriate for the three new locations.
        - The second step may include working with USGS to deploy stage height sensor and build a rating curve to relate water level to flow.
    - MAAM has also engaged UNH researchers (through PREP) to begin data collection for a study of storm-related river inputs to Great Bay. Storm

[1] The complete list of water quality analytes will be specified in related monitoring documents and will include factors that potentially cause or contribute to conditions that many affect eelgrass health as well as other general water quality parameters.

events may have a significant impact on eelgrass distribution, survival, health, and resilience

- Seaweed
  - Seaweed monitoring would include compilation and synthesis of previous seaweed monitoring data; continuation of existing PREP or UNH monitoring efforts; and, potentially, implementation of new monitoring efforts dedicated to identifying the potential role of seaweeds on eelgrass health.
  - Synthesis and Recommendations: MAAM has engaged with PREP to (1) conduct a review of seaweed data collected to date, (2) prepare a report synthesizing the results and identify data gaps; (3) make recommendations about monitoring needs.
  - Ongoing monitoring: Measures of seaweed abundance (e.g., percent cover, biomass, ID of species) are incorporated into the Tier 2 eelgrass monitoring program mentioned above.
- Sediment quality
  - Ongoing PREP monitoring programs (e.g. Tier 2 eelgrass monitoring) include measurement of percent organic matter and grain size.
  - Measurement of toxic chemicals in Great Bay sediment is periodically conducted as part of the NOAA's National Coastal Condition Assessment and Mussel Watch programs. These programs are not funded as part of this Plan, but the data will be leveraged as needed to determine whether sediment toxics are a major eelgrass stressor in Great Bay. Additional data collection on sediment toxics may be included in this Plan in the future if warranted.

Special Studies and Data Analysis /Accessibility

- External advisors: Engagement of subject matter experts to provide important perspectives on Piscataqua Region issues and help guide future study development.
- Light attenuation synthesis report: Support for PREP to compile, review, and summarize work done to date related to major controls on light dynamics in GBE.
- Light monitoring and biooptical model: Support to PREP/UNH for data collection and preliminary development of a biooptical model to quantify the relative contribution of light-attenuating components.
- Green crabs
  - Recent studies have confirmed the continued presence of green crabs in Great Bay Estuary, as reported in the 2023 State of Our Estuaries: Extended Version (https://scholars.unh.edu/prep/466/).
  - To date, studies dedicated to investigating potential role of green grabs as an eelgrass stressor in Great Bay Estuary have been part of this Plan. However, further investigation into the potential role of green crabs as an eelgrass stressor may be warranted in the future.
- Other data analysis
  - The monitoring data described in the prior section is being evaluated to assess relationships between potential eelgrass stressors and the metrics of eelgrass health. Monitoring data is appended to prior monitoring data collected by PREP to contribute to the long-term data collection effort already underway.
  - Preliminary assessments are conducted as needed to inform upcoming research and

monitoring activities. Preliminary evaluations have been conducted by PREP for other endeavors, such as the SOOE Reports and the Eelgrass Resilience Project.

  - Temporal and spatial trends in the data will be assessed as new data become available. In addition, relationships among variables and between eelgrass and potential stressors will be assessed as new information is gained.

- Data Accessibility
  - PREP provides broad access to all data collected, so that the data will be available to the municipalities, EPA, NHDES, and stakeholders for their own analyses.
  - PREP intends that all data will be accessible to the public through PREP's new data management system. This system can be accessed through the Piscataqua Watershed Data Explorer (http://data.prepestuaries.org/data-explorer/).

Stakeholder Engagement

- The PRMC, meets periodically to coordinate monitoring and science for the Great Bay Estuary. Participation in the PRMC is open to all municipalities in the Piscataqua Watershed.
- Technical recommendations on science activities come from the PREP Technical Advisory Committee (TAC) process, which is open and transparent and consensus based.
- MAAM has hired Brown and Caldwell to consult and advise MAAM on current and future PREP ambient water quality monitoring and to make recommendations for both short-term and long- term efforts suited to informing the AMP and future efforts by the communities. In particular, Brown and Caldwell will be advising on the studies necessary to broaden our review of the stressors on eelgrass beyond simply measuring nitrogen levels in the estuary.
- A Stakeholder Committee has been convened by CLF to provide insight and recommendations on activities and efforts of MAAM, and to track progress on commitments made in the Settlement Agreement. The Stakeholder Committee includes technical experts as well as representatives from Dover, Portsmouth and Rochester.
- MAAM representatives participated in the Project Advisory Committee (PAC) of the Great Bay Eelgrass Resilience Project, a three-year NOAA-funded research project led by the University of New Hampshire, the Great Bay National Estuary Reserve System, and PREP.
- MAAM and the respective municipalities invite and encourage broad participation by interested parties in the stakeholder engagement process to provide insight and recommendations on activities and efforts of MAAM. MAAM meetings are publicly noticed and generally open to the public. Public MAAM meetings provide an opportunity for public input by those in attendance.

See Appendix A of this AMP for full list of monitoring activities funded by MAAM and additional ongoing studies and monitoring programs that are related to this AMP.

b) Methods to track reductions and additions of total nitrogen

In accordance with Part 3-1.b. of the General Permit, this section of the joint AMP outlines the method(s) to track reductions and additions of TN loads over the course of the permit.

b.1 Statement of Responsibilities

The municipalities are coordinating with NHDES, UNHSC, EPA Region 1, other permitted communities and other stakeholders to participate in the Pollution Tracking and Accounting Program (PTAP). The PTAP program has been developed by NHDES in response to the request for assistance by the regulated communities and is intended to provide a cost-effective means by which communities can effectively address the tracking and accounting requirements of this General Permit while also providing the flexibility and ability to track other potential water quality stressors. To date, NHDES has been the lead on implementing PTAP using resources developed by EPA Region 1 for this purpose. The MAAM members are addressing Part 3-1.b. of the General Permit through continued participation and equitable funding of PTAP efforts through MAAM as well as implementing the tracking and accounting program within the municipality. As with other aspects of this AMP, the proposed tracking and accounting program, PTAP, is reviewed annually and, if appropriate, updated to take into account the latest information. The PTAP program also has the ability to track other pollutants such as Total Phosphorus, Total Suspended Solids, metals and runoff volume within the same program.

PTAP, previously funded primarily by NHDES, has now received $253,000 from the MAAM communities. These funds are intended to provide additional technical assistance and assist in one-on-one community support for any municipality that needs it in the watershed regardless of their affiliation with MAAM. In fact, PTAP is open to all New Hampshire and now Maine communities, to use to track pollutant reductions. In future years, additional appropriations would be needed to fund and operate this program.

b.2 Summary of Plan

PTAP is a comprehensive sub-watershed based tracking system for quantifying the nitrogen load reductions and additions through implementation activities that include, but are not limited to:

a. New or modified structural stormwater control measures
b. New or modified non-structural activities
c. New, modified or removed septic systems

Tracking elements include parcel/treatment area identification information that document the municipality, land use, hydrologic unit code (HUC-10), hydrologic soil group or estimated infiltration rate, drainage area, and impervious cover area.

Additional information regarding structural stormwater control measures collected from each community include structural control measure type, runoff volume storage at design capacity (also known as design storage volume), and runoff depth from impervious cover.

Additional information regarding non-structural implementation measures for each community is also collected, including catch basin cleaning, street sweeping, leaf litter collection and fertilizer control programs. Units and metrics to track these efforts more effectively are still being developed. In keeping with the EPA Region 1 letter of endorsement dated August 15, 2022 and signed by Melville Cote, Chief Surface Water Protection Branch Water Division, the current accounting for sweeping includes use of the credits developed under the Clean Sweep Panel Process.

MAAM has also funded in-depth literature reviews of other promising nonstructural control measures such as catch basin cleaning and fertilizer control programs. MAAM will share research findings with EPA, CLF and other interested entities as they emerge. These assessments are being conducted in good faith with all relevant parties ensuring that municipalities are implementing the most cost-effective methods first so as to engender a supported culture of stewardship that everyone can get behind.

Additional nonstructural practices for tracking include outreach and education, wetland buffer protection/conservation land, pet waste collection and oyster bed restoration along with other efforts, with the intent of identifying promising future water quality improvement activities. It should be noted that there are no existing approved nitrogen load reduction credits that exist for these important efforts and future collaborations to create them are anticipated. Metrics for additional nonstructural controls are constantly being collected and evaluated for future credit potential.

Finally, wastewater management approaches planned for tracking include installation of innovative septic systems and enhanced treatment technologies and connection of septic systems to public sewer. Another area for technical assistance from the region is the determination of appropriate credits for these methods, particularly elimination of NPS loads through sanitary sewering. This year PTAP developed a draft crediting method for sewering projects that is reflected in this years reporting. This method was completed with assistance from the cities of Rochester and Portsmouth which are the only municipal entities reporting these credits this year. Many methods to credit this exist, we anticipate a collaborative effort will be necessary to standardize attendant load reduction credits. The method was published in a memo by UNSHC called *Methods for TN Reduction of Sewering*.

Accounting

The PTAP database tracks accounting metrics regarding development, implementation efforts, and SCM design details. Technical assistance to develop a comprehensive PTAP Reporting Tool (PRT) was provided by UNHSC to calculate the nitrogen, phosphorus, and TSS loads and reductions attributable to changes in effective impervious area as entered into PTAP. The PRT was built on the EPA Performance Curves which is the backbone of other accounting tools such as the EPA Region 1 BMP Accounting and Tracking Tool (BATT). The PRT provides reporting features to credit tracked structural, nonstructural, and septic conversion implementation measures and provides reduction estimates consistent with the methodologies presented in Appendix F of the MA and NH MS4 permits.

Results from permit year 2-3 are included for all participating communities in Appendix C.

This is the first year that PTAP is reporting load reduction trends from participating MAAM communities. This trend line demonstrates the growing commitment from member communities to increasing nitrogen reductions from both structural and nonstructural SCMs.

Long-term tracking of nitrogen loads from land use conversions

In combination with local tracking and accounting, MAAM expects to track changes to TN loadings as well as other nutrient and pollutant changes due to land use, through Geographic Information Systems (GIS) analysis. MAAM will continue to support regional methods for accounting for land use changes

demonstrated through local, state and national GIS layers. MAAM will support preliminary assessments of various GIS protocols to accurately track regional trends. Changes to nitrogen loads associated with land use changes over the permit term will use EPA provided NLERs and the best available applicable GIS data. Tracking land use changes at the site scale as is currently being performed is difficult, time consuming, and inconsistent across users. A regional approach to tracking land use change trends will provide a cost-effective, consistent, repeatable, and reliable method for all communities in the GBTNGP and set an example to other watersheds with similar needs. MAAM communities anticipate a collaborative effort to distill and standardize these methods over the next permit year. Determination of positive or negative pollutant loading due to land use change requires collaboration and agreement between all parties involved in the GBTNGP.

Municipal Participation: Program Development and Technical Assistance for Tracking Activities

Community participation in PTAP is supported through regular workgroup meetings to provide opportunities for end users to offer input on PTAP tracking database functionality, reporting units for tracking, accounting methods, and more. To date, the PTAP workgroup has met 23 times over the course of several years and has a strong record of collaborative PTAP tool development. MAAM member communities will continue to participate in these work groups. Work group meetings are typically facilitated by UNHSC and NHDES staff and have clear outcomes that are intended to further PTAP tracking tool development. Additionally, UNHSC and NHDES staff offer technical assistance for PTAP database use, as needed. Assistance includes one-on-one trainings, focused workshops, expert panel reviews, and resources made available on the internet on UNHSC, GRANIT, and NHDES platforms.

Tracking of activities is accomplished through the addition of PTAP filing as part of a land development permitting requirement. Much of these tracking elements are already part of both state and local permitting requirements for many land development projects, such as changes in impervious cover, land use conversion, area and volume treated, treatment measures, etc. PTAP is a central repository where this information can be uploaded by project permittees and stored for later use by the municipality for annual reporting requirements.

c) Overall Source Reduction

In accordance with Part 3-1.c. of the General Permit, this section of the joint AMP provides an outline for overall source reductions of TN over the course of the permit.

c.1 Statement of Responsibilities

The MAAM members intend to address Part 3-1.c. of the General Permit by creating and maintaining an updated list of current and anticipated capital improvement projects, non-structural best management practices, stand-alone projects with structural best management practices, and municipally owned properties with high nitrogen removal potential, as well as diverse initiatives intended to address water quality improvement in the Great Bay Estuary.

c.2 Summary of Plan

The lists of projects, practices, properties and initiatives is intended as a non-binding statement of present intent by the MAAM members. Completion of these projects is dependent on the continued validity of the General Permit, technical study and feasibility, purchasing approvals from governing bodies of the respective municipalities and/or other public officials, funding appropriations of the respective Municipalities (which funding appropriations are at the sole discretion of the governing body of the respective municipalities), any other requirements of law, potentially including federal/state/local permitting, and general public support. The MAAM members may select projects that are likely to improve water quality, including those for which nitrogen removal is one of multiple benefits.

See Appendix B of this AMP for Current Source Reduction Plans for each MAAM member community.

d) Process for Comprehensively Evaluating Significant Scientific and Methodological Issues

In accordance with Part 3-1.d. of the General Permit, this section of the joint AMP outlines an inclusive and transparent process for comprehensively evaluating any significant scientific and methodological issues relating to the permit, including the choice of a load-based threshold a concentration-based threshold, or continued adaptive implementation until such thresholds can be developed. This submission shall include detailed milestones culminating in submission of a report to EPA for inclusion in the administrative record for permit renewal. That report shall be completed prior to expiration of the permit term and shall indicate whether NHDES concurs with the findings.

d.1 Statement of Responsibilities

The municipalities participate in a collaborative process building upon the research and monitoring efforts of PREP described above. Both non-regulatory and regulatory monitoring components of this plan are being implemented. The regulatory component encompasses the monitoring activities that are required by the General Permit. The municipalities expect that permit-related activities, including future modifications to discharge limits or loading targets, if applicable, will be undertaken cooperatively with NHDES, using data collected through this plan, which will be accessible to all parties. The non-regulatory component encompasses all other monitoring described in this plan. The non-regulatory components are facilitated by PREP through its Technical Advisory Committee and PRMC processes, both of which are open to the public, are transparent, and use consensus-based decision making

The MAAM members are addressing Part 3-1.d. of the General Permit by funding an equitable and proportional amount of the PREP work and other research initiatives through MAAM and by participating in both components individually or through MAAM representatives. To date MAAM has funded $1,795,500 towards this work, as well as secured a $1,000,000 Congressionally Directed Spending Grant for continued efforts and is committed to continue funding monitoring efforts which feeds data into the modeling and analysis components of Section d.

d.2 Summary of Plan

Through this plan, MAAM will collaborate with partners to evaluate potential eelgrass stressors in the Estuary and, when practical, identify levels of potential stressors that are protective of water quality and eelgrass health. This plan includes an evaluation of latest scientific data and information described above in this AMP, which is necessary to understand how various levels potential stressors affect eelgrass health and improve water quality.

Monitoring and research performed to date has helped characterize the water quality dynamics of the estuary and identify stressors on eelgrass. The configuration and physical characteristics of the Great Bay cause multiple stressors to be relevant, including hydraulic shear stress,

sediment loading/resuspension, nitrogen/algal effects, and grazing. A mid-to-long term goal of the partnership is to develop a quantitative understanding of the relative importance of these stressors, sufficient to predict water clarity or eelgrass responses to specific loading/concentration targets or management actions. That modeling framework is in development and is expected to include following elements:

- A bio-optical model to quantify the relevant contributions of different light-attenuating constituents (e.g., inorganic turbidity, chlorophyll-a, colored dissolved organic matter) on photosynthetically active radiation.
- A recently developed 3D hydrodynamic model that can be used to predict water movement in the estuary over short and long-time scales.
- A water quality and sediment transport model (i.e., a "translator") to simulate water quality responses to internal and external sediment and nutrient loading.

Although the load-concentration translator model is not expected to be ready for full application this general permit term, some version of this tool is expected to be available the following permit term. MAAM anticipates that this work will contribute to refining the scientific understanding on the factors affecting eelgrass health in the estuary. Depending on the capabilities of the model, it might be used directly to establish appropriate water quality goals that promote eelgrass restoration and improved water quality.

External Review Panel

Support of an expert review panel has an element of this project to date. The panel has met with stakeholders to understand the issues, review the data and other study outcomes, and share scientific interpretations. Currently, an expert panel comprised of four external scientists is advising PREP and partners with regard to the Research and Monitoring Plan (RAMP)and the NOAA-funded "Eelgrass Resilience Project": Jud Kenworthy, Simon Courtenay, Michael van den Heuvel, and Lora Harris. These advisors have also been engaged on matters related to the monitoring program presented in Section a.2 of this Plan. The composition of the expert panel may need to change as the focus shifts to specific scientific/regulatory topics, modeling, or the development an advance restoration plan (ARP) or TMDL.

Pollutant Reduction Progress as Modeling Framework Develops

MAAM emphasizes that the availability of a water quality model or quantitative watershed-wide load or concentration targets has not been a prerequisite to significant and steady progress at reducing pollutant loading to the GBE. MAAM already operates under stringent point nitrogen loading caps, and has also pursued a variety of structural and non-structural practices to reduce sediment and nutrient loading from stormwater runoff (See Appendix B and Appendix C). These public investments will continue as the scientific/modeling framework develops and the partnership moves closer to an ARP or TMDL.

Inclusivity and Transparency

Using the information gathered in that project, MAAM plans to complete a report prior to the permit term as required by Part 3 of the General Permit. This report will include status of technical activities and interpretations of stressor-response, including the current understanding of the role of nitrogen and associated loading or concentration thresholds. It will also outline a path forward for refinement of technical tools and completing a TMDL or ARP. At this time, the MAAM members anticipate submitting a report to EPA for inclusion in the administrative record.

The processes outlined above includes periodic discussion and review by MAAM members and/or its Executive Board. MAAM continues to consult its members, non-MAAM members, state and federal regulators, and other stakeholders throughout the process for their input. Additionally, the MAAM's Stakeholder Committee, led by Conservation Law Foundation, attends MAAM meetings to provide input, perspective, and any data or other information to be considered. Finally, as outlined above, the technical work will be completed by PREP and will consider input from any interested party.

Engagement with NHDES is an important component of this Plan. MAAM members coordinate with NHDES periodically and at critical decision-making intervals on plan components, monitoring procedures and goals, and analysis and interpretation approaches. The goal of this coordination is that the NHDES will either concur with the submission entirely or to the maximum extent of possible consensus, with any areas lacking consensus called out and the parties' respective views explained. Because NHDES would ultimately take the lead on establishment of a TMDL (or ARP), MAAM will consult with NHDES when determining how to assess what has been done in the first perm it cycle and identifying next steps for permit renewal.

e) Timeline for Completion of TMDL or ARP

In accordance with Part 3-1.e. of the General Permit, this section of the joint AMP outlines a proposed timeline for completing a Total Maximum Daily Load (TMDL) or advance restoration plan (ARP) for water quality in Great Bay and for submitting it to EPA for review and approval.

e.1 Statement of Responsibilities

The MAAM members are strongly committed to supporting appropriate efforts to establish a scientifically-sound, cost-effective approach to determining appropriate TN threshold targets for the Great Bay Estuary and recognize that establishing a TMDL and/or ARP The currently proposed timeline for completion of a TMDL (or ARP) is set forth in section e.2. below. As with other aspects of this AMP, the proposed timeline will be reviewed annually and, if appropriate, updated to take into account the latest information. Ultimately, NHDES will take the lead on the establishment of a TMDL (or ARP), and will dictate the final timeline.

e.2 Summary of Plan

As described in previous sections, this AMP includes new monitoring, pollution tracking, reduction planning, scientific investigation and analysis, and related decision-making elements for the Great Bay Estuary. These elements will improve our scientific understanding of the Great Bay estuary, the role of nitrogen, and the role of other stressors. Toward the end of the first permit term, it is anticipated that sufficient new information will become available to support thoughtful selection of potential regulatory and non-regulatory planning and implementation approaches, including potentially a TMDL or ARP to be completed over the subsequent permit term(s).

As discussed in section d, existing information supports actions in advance of a TMDL for addressing water quality actions that are necessary for eelgrass protection. Many of those actions are already underway as part of the General Permit and this AMP. Regarding the next stage watershed planning approach, an ARP may be a more immediately beneficial and practicable approach than a TMDL[2] for Great Bay Estuary. The ARP would be a near-term plan that includes specific actions, with a schedule and milestones, for restoring water quality.

With this background, and with the support of NHDES, the MAAM communities are currently envisioning a TMDL or ARP completion timeline of Year 5 of the Second Permit Term (or at the end of 10 years in the event that the EPA is delayed in issuing a second permit term). This is an expeditious timeline that supports municipal investment in data monitoring, data analysis, related studies, computer modeling, and long-term management plans. Pursuant to the General Permit and this AMP, TN reductions will occur in parallel with these important activities.

[2] USEPA. 2024. Information Concerning 2024 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions. Memo from Brian Frazer to Water Division Directors. https://www.epa.gov/system/files/documents/2023-03/2024IRmemo_032923.pdf

By the end of the first permit term we anticipate making a recommendation to either pursue a TMDL or ARP. Our proposal would include a rationale and recommendations for technical approaches for developing the TMDL or ARP. The envisioned timeline for completion accommodates elements for reaching consensus on the path forward in time to incorporate elements of the restoration planning process into the second General Permit.

Regardless of which restoration planning approach is chosen, we anticipate that its development will be a major activity of the second permit term. The timeline accommodates adaptation of data and tools for regulatory purposes, additional modeling, drafting of the TMDL or ARP, and extensive stakeholder review/communications to achieve consensus. Because the completion timeline aligns with the end of the second General Permit term, the results would be available in time to inform the permit renewal for the third term. This completion timeline is subject to revision as appropriate based on future developments.

Illustration of MAAM Anticipation Milestones Associated with Proposed Completion Timeline for Final Plan – Final timeline to be dictated by NHDES

Activity	First Permit Term					Second Permit Term				
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Monitoring & scientific studies										
Synthesis and interpretation of first term monitoring										
Proposal: Restoration planning approach (TMDL vs. ARP)										
Reach consensus on restoration planning approach										
Modeling/technical analysis to support restoration plan										
Draft plan										
Final plan										

Appendix A

MAAM funded work by year

Year	Type	Name	Status
2021-2024	Annual Monitoring	Light Arrays	Data collected, data/report not available
2023*- 2024	Annual Monitoring	Tier 2 Seagrass	Data collected, data/report not available
2022	Special Study	Light Synthesis Report	Draft compete, revisions pending
2023	Special Study	Seaweed Synthesis Report	Not started
2023	Special Study	Shoreline Hardening Survey	Not started, delayed due to staffing issues, matching funding now in place
2023	Special Study	Storm Add-on	Data collected, data/report not available
2023	Special Study	Tributary Discharge	Data collected, data/report not available
2023 - 2025	Special Study	Eelgrass and Oyster Bed Habitat Restoration and monitoring	Data collected, draft report compete, review and revisions pending
2023 - 2024	Special Study	Eelgrass Resiliency Project	Initial Reporting Completed/ further analysis planned in future
2023 - 2024	Special Study	Bio-optical Model	Data collected, draft report compete, review and revisions pending

Appendix B

Source Reduction Plans for MAAM communities

Dover

Planned and Completed Structural BMPs – The following list includes projects that are planned in CIP, design phase, etc. and updated to indicate what projects were completed between September 2024 and August 2025. Completed projects have been uploaded into PTAP where estimated load reductions are available.

Year	Project	Description	2024/2025 Update
2023	Hough Street Culvert Replacement	Emergency repair to old and undersized culvert network that conveyed Berry Brook.	**Complete**
2022-2025	Fifth and Grove Streets	Reconstruction to upgrade underground utilities and address drainage concerns and roadway/sidewalk conditions.	The project would implement improvements to Fifth Street from Central Avenue to Fourth Street and to Grove Street from Sixth Street to Fourth Street. Improvements include pedestrian, drainage, and street tree improvements. By improving the existing drainage, the project will provide water quality benefits within the Great Bay watershed. The project would be a Complete Streets update, as per the City's Complete Street and Traffic Calming policy. This project is substantially complete as of August 2025 with final cleanup and striping the last remaining items for final completion.
2022-2038	Oak, Broadway, Central neighborhood reconstruction	Reconstruction to upgrade underground utilities and address drainage concerns and roadway/sidewalk conditions within the Broadway neighborhood.	A stormwater master plan for the Broadway neighborhood was completed in 2023 with recommendations for improvements being provided from the City's design consultant. The recommendations included an opinion of cost for a total street reconstruction that is north of $35 million in 2024 dollars and divided up over 8 phases. Funding for the individual phases has been added to the CIP which is up for approval in fall 2024. This neighborhood drains to the Cocheco St outfall that is located below Portland Ave and runs through the Chapel St Ravine. Some water main within the project area was replaced in 2025 and RFP is expected to be released in late 2025 or early 2026 for design services for utilities and drainage.
2024-2026	Court, Union, and Middle Streets	Reconstruction to upgrade underground utilities and address drainage concerns and roadway/sidewalk conditions.	Improvements include pedestrian, drainage, and street tree improvements. By improving the existing drainage, the project will provide water quality benefits within the Great Bay watershed. The project would be a Complete Streets update, as per the City's Complete Street and Traffic Calming policy. The project was bid in early 2025 and awarded for construction. Construction of the project will commence in September 2025 and last approximately 2 years.
2025-2026	Retaining Wall Reconstruction – Portland Avenue	The retaining wall along Portland Avenue, near the intersection with Cochecho Street and adjacent to the private marina, is showing signs of distress.	FY22 CIP funds were approved to evaluate the wall for repair or replacement. The City hired a consultant to evaluate the wall and concluded the wall required replacement in its entirety. The wall was constructed in 2024 and was completed at the start of 2025. This wall is located adjacent to, and over, the Cocheco St outfall.

Year	Project	Description	2024/2025 Update
2025	Henry Law and River Street Reconstruction	The design for this project will incorporate the elements and principles laid out in the City of Dover Complete Streets & Traffic Calming Guidelines to ensure the design of streets and sidewalks will be safe and accessible for all users regardless of age, physical ability or mode of transport. The design is to also incorporate innovative and easily maintainable low impact development stormwater management practices as part of the roadway improvements where feasible.	Drainage improvements throughout the project area, including a subsurface stormwater best management practice (BMP) in Henry Law Park; the BMP design is federally funded, and Kleinfelder Northeast, Inc., has partnered with the UNH Stormwater Center to prepare an innovative design to provide stormwater treatment, flood resiliency, and improve water quality in the Cochecho River and the Great Bay. Final permitting plans have been submitted for state permitting and the project expects to be bid for construction in early 2026.
2025-2026	Drainage System Improvement – Cochecho St. Outfall	Reconstructing and improving existing failing outfall near Cochecho Street into the Cochecho River south of the dam.	Project is in the preliminary design stage as additional negotiations were required between the City, Eversource and property Owners. An MOU detailing the responsibilities of all parties has been signed and the design is proceeding in 2024/2025. Construction has been delayed while property line adjustments and additional soils evaluations are conducted by Eversource's team. Work is anticipated for winter 2026 at the earliest but depends on soil remediation by Eversource.
2025 - 2029	Lower Central Ave Street Reconstruction	This street reconstruction project will implement improvements to Central Ave from Silver St to Stark Ave (the main gateway to the southern portion of the City). Improvements include bicycle & pedestrian accommodations, intersection improvements, lighting, drainage upgrades, and full reconstruction of the roadway. The existing drainage is in poor condition, a section of pipe has collapsed and been temporarily repaired. Green infrastructure components will be implemented. The design for this project will incorporate the elements and principles laid out in the City of Dover Complete Streets & Traffic Calming Guidelines to ensure the design of streets and sidewalks will be safe and accessible for all users regardless of age, physical ability or mode of transport.	The design of this project is approx. 90% complete. CDS funding has been secured which will require some additional design effort. The design consultant and City regularly meet with the NHDOT to discuss the project and final plans are expected by mid-2026. Project must be out to bid by fall of 2026. Construction is expected to take 2 years.
2025-2026	Sixth Street Bridge Replacement	Replace an existing undersized bridge that is restricting flow under Sixth Street.	RFP for analysis and design was sent out and awarded in 2024. Permitting efforts are underway for a new bridge that will allow for the restoration of a previously constricted stream channel up-stream of the bridge. Construction is anticipated for 2026.
2025	Reyners Brook Bridge Reconstruction	Capital Improvement work to improve and widen an existing culvert to remove flow restrictions.	RFP for analysis and design is pending for a possible 2026 release.
2026	Bellamy Culvert	The City of Dover was recently selected for FEMA grant funding to improve an existing culvert and dam abutment restriction in the Bellamy River which will enable approximately 11 miles of new fish passage.	The NHDES and the City interviewed consultants to complete the project but costs have come in above the FEMA grant award. The City is looking at funding alternatives to move forward with the project.

Year	Project	Description	2024/2025 Update
2026	Chapel Street Ravine	Using NHDES SRF loan program to design a plan to incorporate water quality treatment and flood management downstream of substantial stormwater culvert	The City has hired a consultant, and the study is currently underway to determine the value of the land based on an analysis completed in 2021. If the property can be secured construction would be completed no sooner than 2026. NHDES funding for the land acquisition is pending completion of the study.
2026	Jenness Street Reconstruction	Capital Improvement Plan to improve Jenness Street including drainage system.	Jenness Street was repaved in 2024. Major upgrades to this gateway are planned for 2026-2027 from Silver to Stark. Drainage in Jenness will be addressed as part of the Lower Central Reconstruction Project.
2028	Crosby Road Industrial Area	Capital Improvement Plan to improve flooding in low lying area	An analysis was conducted by VHB in late 2024 and finished in early 2025. The analysis identified what improvements could be made to the industrial park to address flooding. Meetings with the various private owners need to be scheduled to start implementation.
2032	Atlantic Avenue	Reconstruction to upgrade underground utilities and address drainage concerns and roadway/sidewalk conditions.	This project was recommended by Engineering in the next round of CIP funding. The CIP will be voted on in late 2025.
2032	Horne St	Reconstruction to upgrade underground utilities and address drainage concerns and roadway/sidewalk conditions.	This project was recommended by Engineering in the next round of CIP funding. The CIP will be voted on in late 2025.
2032	Tanglewood	Capital Improvement work to improve drainage to include BMP's	Paving of this road was completed in 2024. Larger project will be needed in future CIP for drainage upgrades.
2032	Central Ave Drainage (Old Rollinsford to 6th street)	Capital Improvement Plan to improve drainage along Central Ave.	A water main project in this area is almost 100% designed and funding is being provided by CIP. Drainage improvements will need to follow in a subsequent CIP beyond 2032.
Planning	Rutland Street Reconstruction	Capital Improvement Plan to improve Rutland Street including drainage system.	This project is not currently in the CIP but is under consideration for future CIPs and remains on the City's priority list.

Non-structural BMPs – The following list includes existing ongoing and future planned efforts:

Year	Project	Description	2024/2025 Update
Ongoing	Stormwater and Flood Resilience Utility	City is looking to adopt a Stormwater and flood resilience utility which will incentivize implementation and maintenance of Best Management Practices including reduced nitrogen fertilizer.	City voted to implement a stormwater utility in December 2023; however, the vote failed due to a need for additional outreach and education to property owners. Therefore, the City will focus on public education and outreach and revisit a vote in the future.
Ongoing	Great Bay 2030 Street Sweeping	Mechanically sweep downtown area (50 miles) once a week for 9 months of the year	City is currently working on the Clean Sweep Program with Woodward and Curran. This program is studying the benefits gained from sweeping organic leaf debris in the fall. A final study with recommendations is expected by the end of 2025. Total wet mass of street sweepings is 27,320lbs, which includes 12lbs of Total Phosphorus and 39lbs of Total Nitrogen.
Ongoing	Leaf Litter Management	Leaf litter collection is conducted for 6 weeks in the fall. Residents can drop off leaf and yard waste year-round at the Dover Transfer Station.	City continues to provide curb side collection of leaves from residents, approximately 125 tons were collected in 2024. Approximately 350 tons of leaf and yard waste were collected in Fall/Spring.
Ongoing	Catch Basin Cleaning	CBs are cleaned in the Fall in accordance with MS4 Requirements. 1,546 catch basins were cleaned in 2024.	Pending State permit approval of the operationally generated materials sorting facility, pre and post cleaning for use before facility can become fully operational.
In Place	Wetland Buffer	Ordinance has increased wetland buffers (see credit for going green project)	Ordinance is in place
In Place	Stormwater Regulations	Site Plan Regulations include SWA recommendations for development and redevelopment (reduction = 0.012 * baseline)	Private projects are continuing to comply with the site plan and subdivision regulation updates. Projects are being entered into PTAP and approved by City staff upon completion.
In Place	Low phosphorus and slow-release nitrogen fertilizer requirement for all new projects	As part of Site Plan approval, a maintenance plan shall be in place and *"Best practices to minimize environmental impacts, such as the use of low-phosphorus fertilizer and slow-release nitrogen, shall be included in the management plan."*	
Ongoing	Atmospheric Deposition	Assumes a 14% reduction off the baseline for TN	
Ongoing	City Organic Fertilizer Program	The city is committed to using only organic, slow- release fertilizers on city owned and maintained properties (1,000,000 sf and 80% reduction).	
Ongoing	Fertilizer Bans and Reductions	Including a credit in the Stormwater Utility	The Stormwater Utility did not pass in late 2023. It will likely be revisited in 2026.
Ongoing	Fertilizer Outreach and Education Program	Provide and promote landscaping for water quality initiatives and programs	Posted "Smart Lawns, Clean Water" video for tips on fertilizing and seeding responsibly to the Dover Channel 22 Live Streaming and On-Demand video webpage.

Year	Project	Description	2024/2025 Update
Ongoing	Pet Waste Outreach and Education Program	Provide pet waste management educational flyer to residents with every dog license renewal notification.	3,108 flyers distributed with dog licensing notifications and 325 flyers handed out at local veterinary clinics, dog day care businesses, and pet food supply stores.
Ongoing	Leaf and Yard Waste Outreach and Education Program	Promote proper leaf and yard waste management. Provide yard waste pick up for 6 weeks every fall season and allow residents to drop off yard waste, year-round at the Dover Transfer Station.	
Ongoing	Septic System Outreach and Education Program	Participate and promote NHDES Septic Smart Week. Send septic smart information to private septic system owners.	
Ongoing	Outreach and Education	The City outreach and education exceeds what is required by the MS4. Staff regularly hold tours or give presentations of the innovative BMP's being implemented. Additionally, completed and shared a video for the installation of a filtering catch basin BMP. Staff also regularly speak at conferences about technologies and particularly focus on maintenance and long-term performance.	
Planning	Septic System Performance Requirements	Advocate for a state-wide requirement to remove nitrogen in septic systems.	A handful of conversions from septic to sewer (2 – 5 that have connected). Sewer extension projects are anticipated in the coming years including a North End Sewer extension. CIP funding has been secured for further preliminary design of a gravity sewer north of Weeks Crossing to eliminate septic systems.

Other Efforts – The following list includes innovative efforts

Anticipated Year	Project	Description	2024/2025 Update
2021 and ongoing	Inflow/Infiltration	Inflow and infiltration into the sewer collection system can result in elevated peak flows through the WWTP biological system, which can affect the nutrient reduction capacity during those events.	Ongoing efforts include lining of sewers and disconnection of flat roofs.
2026	Citywide Drainage Model & Master Plan	Develop a strategic plan for stormwater improvements	
Ongoing	Extending sewer to existing areas serviced by septic systems	Continually assessing opportunities	
Ongoing	Commitment to exploring new BMP's and participating in innovative initiatives	Berry Brook and the continuation of bringing new BMPs into urban redevelopment settings and working with UNHSC to evaluate the effectiveness. Volunteering to work with the NHDES/PREP team to investigate SAFE strategies for Stormwater Funding, Volunteer to work with SRPC to analyze urban trees and innovative tree box filters, Volunteer to work with SRPC to look at BMPs vs. socioeconomic disparities, participating in the PTAP program, participating in multiple credit for going green projects lead by PREP.	City invests approximately $350,000 per year to identify retrofit and upgrade opportunities. City is focusing efforts on re-ditching, water quality reduction, and water quality treatment. New BMPs have been installed in the Fifth and Grove area and a study for BMPs in the Crosby Rd area has been completed as well. A BMP retrofit project is underway with UNH and the City at multiple locations within the city.
Ongoing	Training and Commitment to Innovation	Leadership in NEWEA/ Biological Nutrient Removal Classes - Our WWTP staff are at the forefront of discussions for WWTP practices.	Continuing these efforts. Working with the UNH Stormwater Center to conduct a study of using water treatment residuals to enhance phosphorus removal from stormwater through stormwater filter systems, i.e., bio-retentions, tree filters, and rain gardens.
Ongoing	Professional Staff	The City created an Environmental Project Manager Position. This position's focus is dedicated entirely to environmental improvements, including a commitment to the protection and improvement of the Great Bay. This person is taking an active role in organizing regional commitment and implementation of the MS4 permit and the new NGP permit.	
Ongoing	Intern Work	Additional Staff to meet MS4 outfall testing requirements. Wet weather testing in particular is dangerous.	

Anticipated Year	Project	Description	2024/2025 Update
Ongoing	Water Quality BMP's as standard practice for city reconstruction projects	This is the language from Dover's standard RFQ for design of reconstruction projects: *"As part of the drainage improvements, the City wishes to enhance the drainage system and incorporate easily maintainable, low impact development strategies to provide conveyance, treatment, and infiltration where practical. The Consultant shall make recommendations for an improved drainage system.* The commitment to implementing the water quality work is demonstrated in several recent redevelopment projects.	City continues to include this language on all RFQs to ensure that when projects are implemented, low impact development strategies to provide conveyance, treatment, and infiltration are incorporated.

Pilot Projects – The following list includes pilot projects:

Anticipated Year	Project	Description	2023/2024 Update
2021	Stakeholder Committee Project	MAAM communities fund $45,000 towards Great Bay water quality related project as selected by the Stakeholder Committee (CLF).	A project has not been selected by CLF yet however, Dover contributed $15,000 for this effort.
Completed	Catch Basin Spoils Facility	Remove decant water from sump and treat at WWTF to 5-8 mg/l of total nitrogen	Spoils facility is currently active and permitting of the facility is underway with NHDES.

Initiatives at WWTFs – The following list includes efforts aimed at reducing TN output from WWTFs during the eelgrass growing season. Such efforts may include optimization of treatment plants, projects aimed at reducing inflow/infiltration, facility upgrades, and/or similar measures.

Anticipated Year	Project	Description	2024/2025 Update
Nutrient Load Reduction	New aeration and secondary settling tank.	The City has just completed a project to improve the aeration in the WWTF treatment stream. The city is currently constructing a third secondary settling tank. These two improvements will result in enhanced nutrient reduction, particularly improving treatment during rain events.	Construction has begun on the clarifier and will create additional capacity at the WWTF.
Nutrient Load Reduction	Reductions below 167 lb/day during non-growing season	The growing season improvements will also improve conditions in off season.	

Co-Benefits of Nonpoint Source Reductions – Though beyond the scope of the submission called for in Part 3-1. c. of the General Permit, the MAAM communities feel it is important to plan and account for the removal of other pollutants or stressors of eelgrass coincident to the TN source reductions listed above. This dovetails with the monitoring efforts undertaken by MAAM and its partners, which is expected to include study of confounding factors and stressors. PTAP tracking and accounting has been created to also calculate phosphorus and total suspended solid reductions.

Town of Epping

Point Source Reduction Strategies

A variety of measures to reduce wastewater point source nitrogen are being evaluated as part of the AMF Proposal. The strategies evaluated and a description of how the Town will implement these strategies is summarized in **Table 1**.

Table 1. Proposed Point Source Reduction Strategies

STRATEGY	DESCRIPTION OF PROPOSAL	SUMMARY OF PROGRESS
WWTF Upgrade	The Town is issuing a warrant article to raise and appropriate the sum of $20,000,000.00 (gross budget) for the purpose of design and construction of WWTF upgrades, which will improve hydraulic capacity and provide redundancy.	A $1.8 million warrant article passed the Town vote in March 2025, and the Town is in the process of designing the WWTF upgrades.
WWTF Nitrogen Reduction	The Town will continue to operate the WWTF to achieve the total nitrogen limits established in the GBTNGP.	The Town's seasonal rolling average is approximately 11.4 lbs/day. The GBTNGP limit is 43 lbs/day.
Inflow and Infiltration	The Town received a $100,000 loan from NHDES to perform an Inflow and Infiltration (I&I) study for the Town to identify high priority areas to reduce I&I from the sanitary sewer system. This funding needs to be approved by voters in March 2025. If approved, this loan will allow the Town to target future removal of high I&I areas to preserve flow capacity at the plant, which will ultimately reduce total nitrogen loads from the WWTF. The Town plans to line a section of sewer pipe with known I&I issues exist ($50,000 allocated).	In August, the Town completed CIPP lining of 1,200 feet of pipe and cementitious lined 5 manholes, all cross-country along the River. Three of these manholes are also getting water-tight manhole covers. Total cost- $73,000. The Town is planning to inspect 27,500 feet of pipe and 115 manholes. This work will focus on the interceptor and collector sewers along Elm Street, Main Street, Water Street, and Pleasant Street. This work is scheduled for September 2025. Once the inspections are done, the Town will compile the data and create summary tables listing the defects found, with recommended rehabilitation repairs identified and estimated costs for the repair. This document will serve as the roadmap to perform future I/I rehabilitation construction projects.

Nonpoint Source Reduction Strategies

A variety of measures to reduce nonpoint source (stormwater and groundwater) nitrogen are being evaluated as part of the AMF Proposal. The strategies evaluated, the targeted land use/source, a description of how the Town plans to implement these strategies, and a summary of the progress to date is summarized in **Table 2**.

Table 2. Proposed Non-point Source Reduction Strategies

STRATEGY	TARGET LAND USE/SOURCE	DESCRIPTION OF PROPOSAL	SUMMARY OF PROGRESS
Fertilizer and Turf Management Program	Pervious Developed Land	The Town will develop and implement a fertilizer outreach and education program targeted at reducing the application of fertilizer and using turf management best practices. The Town will apply this outreach program to both Town staff and departments as well as to the public.	The Town submitted a CWSRF Stormwater Planning application to provide funding for the Town to develop a fertilizer and turf management program.
Post-Construction Regulations	Impervious	The Town will review current Site Plan and Subdivision regulations and make recommendations to incorporate post-construction stormwater controls optimized for the removal of nitrogen. The Town will bring these recommendations to the Planning Board and Select Board for consideration.	The Town submitted a CWSRF Stormwater Planning application to provide funding for the Town to review and make recommendations on post-construction regulations.
Land Use Regulation Review	Impervious	The Town will review current land use regulations to determine barriers to low impact develop and green infrastructure best management practices. The Town will evaluate setback limits from wetland and shoreline to determine potential benefits from increased setbacks.	The Town submitted a CWSRF Stormwater Planning application to provide funding for the Town to review and make recommendations on land use regulations that could be improved.
Identify and Quantify Stormwater Best Management Practices on Private Property	Developed Pervious Impervious	The Town will make recommendations to Site Plan and Subdivision regulations to require private property owners to enter proposed projects into the PTAP database to quantify total nitrogen impacts. The Town will identify and locate the stormwater management practices already installed on existing private properties in the Town. The Town will use this information to quantify the estimated pollutant load reduction, using PTAP, for the identified stormwater management practices.	The Town submitted a CWSRF Stormwater Planning application to provide funding for the Town to update regulations requiring that private property owners use PTAP. The Town reviewed all private property site and subdivision plans constructed in Town over the past 10 years. The Town inventoried these plans to identify those where stormwater treatment practices were installed to reduce water quality impacts from the development. Working with a consultant, the Town inventoried these practices and prepared a batch upload for input into the pollution tracking and accounting program (PTAP). The projects will be batch uploaded in September 2025, and the nitrogen reduction associated with implementation of these treatment practices on private property calculated.
Pet Waste Station Program	Pervious Developed Land Impervious	The Town will evaluate potential locations for installation of additional pet waste stations and prepare public education and outreach materials to be handed out to dog owners when applying for a dog license in Spring.	The Town submitted a CWSRF Stormwater Planning application to evaluate potential future locations for pet waste stations and to develop education and outreach materials.
Infrastructure Maintenance Program	Impervious	The Town will develop and implement a program detailing the activities and procedures to maintain storm drainage infrastructure in a timely manner. The program may include routine inspections, cleaning and maintenance of catch basins to maintain 50% free-storage capacity in the catch basin sump.	The Town submitted a CWSRF Stormwater Planning application to develop and implement a program to maintain stormwater infrastructure in Town.

STRATEGY	TARGET LAND USE/SOURCE	DESCRIPTION OF PROPOSAL	SUMMARY OF PROGRESS
Organic Waste and Leaf Litter Collection Program	Developed Pervious Impervious	The Town will develop an organic waste and leaf litter program aimed at: • Explore methods to effectively and efficiently collect and dispose of leaves on Town owned properties • Provide public education and outreach to homeowners encouraging them not to deposit leaves into wetlands and waterbodies and bring them to the transfer station. Additionally, encourage residents to remove them from street/catch basins.	The Town submitted a CWSRF Stormwater Planning application to develop and implement an organic waste and leaf litter collection program.
Enhanced Street/Pavement Cleaning Program	Impervious	The Town will increase street sweeping from 1 time per year to 2 times per year and explore areas where targeted street sweeping can be conducted.	The Town conducted street sweeping in May and plans to conduct an additional round of sweeping in November.
Septic System Program	Septic	The Town will consider evaluating a potential septic system retrofit program for septic systems within proximity of waterbodies. In doing so, the Town will collect research materials to gain a better understanding of how septic system retrofits. The Town has a warrant article out that will increase hydraulic capacity at the WWTF, which would allow for existing development served by septic systems to connect to the WWTF. If the warrant article passes and the upgrades implemented, the Town will quantify the load removed from septic systems and transferred to the WWTF in PTAP.	The Town submitted a CWSRF Stormwater Planning application to evaluate the potential for a septic system retrofit program. The warrant article passed to increase hydraulic capacity at the WWTF. The Town is in the process of designing the WWTF upgrades which would allow for existing development served by septic systems to connect to the WWTF.
Well Head Protection	Developed Pervious Impervious	The Town will implement measures to reduce salt use within the Epping Crossing Well Head Protection Area. The measures will include engagement and education of stakeholders, including owners of large and small parking lots, consider the use of brine to replace rock salt, when possible, monitor conductivity levels in the well head protection area, and further characterize stormwater management systems on private properties.	The Town is drafting an ordinance to enforce salt-reduction requirements within the wellhead protection area. The Town has engaged NHDOT to reduce the use of road salt in the wellhead protection area.
Stormwater Structural BMP Construction	Impervious	The Town will prepare designs to provide drainage improvements of existing impervious area at the following sites: • Hickory Hills • Outfall on Main Street across from Town Hall • Safety facility	The Town prepared designs for Hickory Hills to install deep sump catch basins and a new outfall. The drainage from this area discharges to a wooded area. The Town is continuing to evaluate opportunities for stormwater improvement of existing impervious area.
Evaluate Town-Owned and Right-of-Way Properties for Stormwater Structural BMP Sites	Impervious	The Town will assess Town owned properties to identify conceptual stormwater BMP locations and designs for retrofitting existing impervious cover.	The Town retained a consultant to evaluate Town owned properties for opportunities for stormwater treatment practices. This work will be completed by October 2025.

STRATEGY	TARGET LAND USE/SOURCE	DESCRIPTION OF PROPOSAL	SUMMARY OF PROGRESS
Atmospheric Deposition	Pervious Impervious	The Town will work with USEPA and NHDES to understand how levels of nitrogen from atmospheric deposition are changing over time. The Town will account for changes in the atmospheric load as part of the tracking and accounting framework on an annual basis (or as data becomes available).	The Town will continue to work with USEPA and NHDES to understand how levels of nitrogen from atmospheric deposition are changing over time.

Milton- MAAM AMP Statement

The Town of Milton continues to monitor effluent at the Wastewater Treatment Facility as required by the Total Nitrogen General Permit. In 2025, we improved our management practices required in the MS4 permit by adding an ARCGIS system to all for better management of our stormwater and wastewater assets. With the assistance of Strafford Regional Planning Commission (SRPC) and Geosyntec Consultants, the Town of Milton will be finishing our Nitrogen Control Plan. Milton will continue to study and work towards replacement of the Wastewater Treatment Facility. Milton is committed to continuing to participate in MAAM and the Total Nitrogen General Permit.

Newington - MAAM AMP STATEMENT

The Town of Newington has invested heavily in the Wastewater Treatment Plant, which is currently operating at around 2mg/l of TN in effluent discharges. Additionally, the town is not a MS4 regulated community, however, many of the best management practices required in the MS4 permit have been implemented including a street sweeping and catchbasin cleaning program. The town has adopted a stormwater ordinance based on the Southeast Watershed Alliance model ordinance, requiring stormwater management for all new and redevelopment projects that come to the Newington Planning Board. Newington has many areas of the community with large swaths of privately owned pavement. Redevelopment has already begun, and it is anticipated that redevelopment will continue in the next few years resulting in load reductions.

Portsmouth

The City of Portsmouth (City) is a historic community located in southeastern New Hampshire at the mouth of the Piscataqua River. The City has a population of approximately 22,000 people and is a frequently visited tourist destination due to its restaurants, historic past, geographic location, and other amenities. The overall land area of the City is approximately 16.8 square miles (15.6 square miles of land and 1.2 square miles of water). Downtown Portsmouth is densely developed with mixed commercial and residential properties with intermixed industrial development. Outside the downtown, land use is still urban in nature and primarily residential and multi-unit residential with mixed commercial zones. The City has within its boundaries the Pease International Tradeport and NH Air National Guard. The primary land area of the City is private property (~71%) with the remaining land area comprised of Department of Transportation roadway right-of-way (~6%), City roadway right-of-way (7%) and City owned properties (16%). Growth in the City is controlled through land use and zoning ordinances and approval of proposed development through the Planning Board, Zoning Board of Adjustment, Historic District Commission and Conservation Commission as applicable. The City is compliant with its MS4 permit effective July 1, 2018 and NPDES permits for its two wastewater treatment facilities (WWTF), Pease Tradeport WWTF and Peirce Island WWTF.

The City's Department of Public Works is organized into six divisions Highway, Parking and Transportation, Prescott Park, Stormwater, Sewer and Water. The Stormwater Division oversees the stormwater collection system and MS4 permitting activities and coordinates closely with the Highway, Sewer and Water Divisions with regard to project planning and maintenance of infrastructure. The Sewer Division oversees the treatment of sewage at the Pease Tradeport WWTF and Peirce Island WWTF as well as the collection system. The water group oversees treatment at the Madbury Water Treatment Plant and the Pease Water Treatment Plant and the water distribution system, water source protection and water conservation.

The City has long been a regional leader in environmental stewardship and innovation. In 2007 the City Council voted on a resolution to become an Eco-Municipality and use the four principles of The Natural Step (https://thenaturalstep.org/approach/) to guide sustainable decision-making. The City's commitment to sustainability and environmental stewardship shows up in its many proactive efforts to curb pollution, support science, and minimize impacts on the Estuary. These items cannot always be quantified as specific nitrogen reduction actions but are important to support the nitrogen control and reduction efforts and include the following:

- Professional Staffing and Organizational Structure: The City has developed a Stormwater Specialist Position and reorganized personnel to establish a Stormwater Division within the Public Works Department. The City has also hired seasonal interns for the past eleven years who's primary work is associated with stormwater field data collection, sampling, and GIS updates. In 2020, the City sponsored a University of New Hampshire Capstone project where four engineering students assisted in field work and data input to evaluate stormwater Best Management Practices (BMPs) throughout the City. They utilized the UNH Stormwater Center's Pollution Tracking and Accounting (PTAP (Pollutant Tracking and Accounting Program)) methodology in this project. At the Planning Department there are staff dedicated to site plan regulation compliance for private property and developments. Wastewater operations staff are trained licensed professionals who participate in professional organizations including New Hampshire

Water Pollution Control Association, New England Water Environment Association/WEF, and others. Staff participate in these associations to maintain training and stay in front of the most recent industry trends and to optimize treatment operations. NH Department of Environmental Services joined the New Hampshire Water Pollution Control Association to present the 2023 NDES Wastewater Plant of the Year Award to the City's Peirce Island WWTF at the August 21, 2023 City Council meeting.

- Incorporation of Stormwater BMPs: The City incorporates stormwater controls and other BMPs into City projects. Staff continue to work on developing new BMPs by working with consultants and the UNH Stormwater Center. Some examples include Community Campus Athletic Fields gravel wetland and bio retention stormwater treatment, State Street sand filtration and tree box filters, use of compost tea and incorporation of pervious pavement and other LID (Low Impact Development) type projects within the City. The City has and will continue to work with private and public entities in the installation of rain gardens, tree box filters and other stormwater controls.
- Consulting Services: The City is continuing to work with its stormwater consultant and rate modelling team to identify projects and to initiate a stormwater utility depending on the regulatory landscape.
- Regulations and Ordinance Adjustments: The City Site Plan Review Regulations promote the use of Low Impact Development to the maximum extent practical and set limits more restrictive than the MS4 permit for redevelopment projects. Ordinance changes have increased wetland buffers with credit for going green projects that show added nitrogen removal. Recent efforts include further strengthening controls in the wetland buffers to protect water quality. For example, the City prohibits the use of any fertilizer in a wetland, vegetated buffer strip or limited cut area. Within a wetland buffer, only low phosphate and slow-release nitrogen fertilizers are permitted.
- Outreach and Education: City staff work with the Seacoast Stormwater Coalition to develop BMP implementation and regular operation and maintenance requirements for private properties.
- Address the Future: Working with stakeholders, the City seeks to address stormwater, sea level rise, and coastal resiliency issues that impact Portsmouth. This includes addressing the overlap in project needs to address coastal resiliency and impact of tidal changes on stormwater controls in areas like Prescott Park. The City also held a City Council work session to discuss future stormwater management options, including the potential to develop a stormwater utility.

These are some of the efforts put forth by Portsmouth toward supporting improvement of water quality for the Great Bay Estuary. The greatest and most impactful, however, is the recently completed upgrade of the Peirce Island WWTF. Completed in 2020, the Peirce Island WWTF underwent a significant upgrade converting the once primary level treatment facility to a tertiary level nitrogen removal facility with biological treatment. This $92 Million project has decreased the amount of nitrogen discharged to the estuary by over 84%, total suspended solids by over 86%, and biochemical oxygen demand by over 90%.

The following narratives and tables describe completed, on-going and planned nitrogen reduction activities for the City of Portsmouth. This list is a snapshot of the ongoing and planned activities funded through the City's annual operating budget and Capital Improvement Plan (CIP). The City will update and adjust this list as needed based on changes in anticipated funding, adjustments

to achieve the highest efficiencies for nitrogen reduction and other conditions or technical reasons that may not be known or anticipated at this time.

Innovative WWTF Operations: As stated above, in 2020, the City completed a major facility upgrade at the Peirce Island Wastewater Treatment WWTF which has resulted in significant nitrogen load reductions. The load reduction calculations in the following paragraphs incorporate data from the Pease WWTF as well as the Peirce WWTF since the Great Bay Total Nitrogen General Permit limits nitrogen for the combined effluent.

During the non-growing season, a conventional WWTF configured and properly sized for nitrogen removal would achieve a total nitrogen effluent concentration in the range of 10 to 12 mg/L. The Peirce Island WWTF is configured and has been operated in a manner to achieve concentrations that are substantially lower than conventional treatment. See the summary table below of nitrogen load reductions. The City anticipates continuing to run the Peirce Island WWTF in this configuration for continued substantial nitrogen removal.

Significant nitrogen load reductions have been achieved when comparing the observed average daily loads of 708 lbs. and 204 lbs. TN /day for the 7-month growing seasons of 2019 (prior to biological treatment) and 2020 (startup/operation of biological treatment), respectively, based on effluent data.

Summary of WWTF Recent Nitrogen Load Reductions (2024-2025)

WWTF Facility	Season	Description	Load Reduction (lbs. TN)
Peirce Island & Pease	7-month growing season	Total Lbs. TN = Permitted Daily (341 lbs./d) – Observed (195.9 lbs./d) = 145.1 lbs./d x 213 days (Apr 1 – Oct 31)	~30,906 lbs.
Peirce Island & Pease	5-month non-growing season	Total Lbs. TN = Ave Conc Decrease = 5 mg/L x avg. daily flow (4.06 MGD) x 8.345 x 150 days	~25,401 lbs.
		Annual Total	**~56,307 lbs.**

Stormwater and Other Nutrient Reduction BMPs

Structural BMPs Completed: The following projects were previously reported in this AMP and have been completed. The nitrogen load reduction values represent general estimates based on the methods and assumptions included in the "Credit Calculation from Tech Memo Measured Method" provided by UNH Stormwater Center for municipal use in preparing Element C of the Adaptive Management Plan.

Project	Catch-ment Area	Description	Load Reduction (lbs. TN/yr.)
Islington Street Compete Streets – Phase II	~18 ac	Roadway reconstruction (sidewalk, curb, grass strip, roadway and utilities) from the Dover Street intersection to the intersection with Congress/Maplewood Streets (5,000 linear feet). The work included sewer separation with separated stormwater being redirected through water quality units upstream of the Brewster and Cabot Streets stormwater outfalls to North Mill Pond. Tree box filters used for roadway runoff..	~12.7 Nitrogen levels and overall loads are generally higher in CSO discharges than in stormwater.
Willard Ave Sewer Separation	~3.4 ac	Roadway reconstruction (sidewalk, curb, grass strip, roadway and utilities) along Willard Avenue from the intersection with Marston Street to the intersection with Lafayette Road, Ash Street from the intersection with Willard Avenue to Orchard Street and Orchard Street (2,000 linear feet). The work included sewer separation with separated stormwater being redirected through water quality units near Parrott Avenue upstream of the stormwater outfall to South Mill Pond.	~2.4 Nitrogen levels and overall loads are generally higher in CSO discharges than in stormwater
Union Street Sewer Separation	~1.9 ac	Roadway reconstruction (sidewalk, curb, grass strip, roadway and utilities) along Union Street from the Middle Street intersection to the State Street intersection (1,000 linear feet). The work included sewer separation with separated stormwater being redirected to the stormwater system on Middle Street that discharges through water quality units near Parrott Avenue upstream of the stormwater outfall to South Mill Pond.	~1.3 Nitrogen levels and overall loads are generally higher in CSO discharges than in stormwater
Gravel wetland /Bioretention System at DPW/Recreation Fields	~51.8 ac	New gravel wetland treating ~ 25 acres of 2021 existing IC area with WQv = 0.18" N Rem Eff = 33%; Bioretention system w/ internal storage reservoir treating ~ 51.8 acres of existing IC	412
>428.4	**Estimated Annual N Load Reduction Total (lbs./yr.)**		

Structural BMPs Planned or Anticipated: The following projects are underway or identified as future capital projects.

Project	Anticipated Year and Costs	Description	Approx. Load Reduction (lbs. TN/yr.)
Peverly Hill Road Reconstruction	2026-2027 Engineering Study & Preliminary Design: $630,000 Permitting and ROW: TBD Final Design and Bidding: $811,000 Construction Engineering: TBD Construction: $5.5 M	This project will include full roadway reconstruction from the intersection with Middle Road to the intersection with West Road (5,000 linear feet). The work will include construction of a new sidewalk from Middle Road to Mirona Road on the north side of the roadway (3,600 linear feet) and construction of a new 8 to 10-ft wide shared use path from Middle Road to Banfield Road on the south side of the roadway (3,400 linear feet). Curbs will be added to the roadway and stormwater will be re-routed through a planned stormwater gravel wetland that will discharge to the headwaters of Sagamore Creek. The overall stormwater catchment area served by this project is approximately 17 acres.	See Note 1
Fleet Street Sewer Separation	2025-2028 Preliminary Design: $288,350 75% Final Design: $300,00 100% Final Design: TBD Bidding and Construction Engineering: ~$600,000 Construction: ~$19M	This project will include full roadway reconstruction (sidewalk, curb, roadway, and utilities) along Fleet Street from the Court Street intersection to the intersection with Hanover Street (1,000 linear feet). The work will include sewer separation with separated stormwater being redirected through an upsized existing outfall and a new water quality unit near Maplewood Avenue upstream of the stormwater outfall to North Mill Pond. The project may result in a net increase in overall stormwater discharge to the North Mill Pond but will remove stormwater from the combined sewer collection system thus reducing combined sewer overflow events during wet weather. The overall stormwater catchment area served by this project is approximately 38 acres. The project limits have been expanded to include an area of Congress Street from Fleet Street to Maplewood Avenue (540 linear feet) and Vaughan Mall from Congress Street to Hanover Street (450 linear feet). The scope of work and ultimate discharge of separated stormwater is the same as described above for the Fleet Street work. The overall stormwater catchment area served by this additional area is approximately 1.6 acres.	~280 See Note 1

Project	Anticipated Year and Costs	Description	Approx. Load Reduction (lbs. TN/yr.)
Corporate Drive Road and Drainage Upgrade	2025 Phase 2 - Design Preliminary Design $101,300 Final Design: $71,800 Construction: ~$4.98M	The project is being conducted in two phases. Phase 1 consisted of initial drainage and swale improvements and culvert modifications on adjacent areas. That work is being followed by roadway reconstruction, stormwater quality unit installation and selective drainage improvements along Corporate Drive from Rye Street to Grafton Road (6,000 linear feet). The overall stormwater catchment area served by this additional area is approximately 5 acres.	~412
Prescott Park Master Plan Phase 1	2027-2028	This project consists of drainage improvements and resiliency efforts to protect Prescott Park infrastructure and buildings. Stormwater management elements are anticipated to be part of the design and may involve coordination with improvements to be undertaken by the adjacent property owner, Strawbery Banke Museum which is planning rain gardens and other features.	See Note 1
Pease Wastewater Treatment Plant Upgrade	2026-2028 Total project cost estimated at 25M	This project includes a substantial upgrade to the facility including new electrical building, generator, improvements to solids processing, chemical storage, additions to administration building, and removal of contaminated operations building. The current site includes no treatment of impervious surface runoff, and the new project will add two bioretention systems to treat existing and proposed impervious surfaces.	~4.2
Elwyn Park Traffic Calming and Pedestrian Improvements	2026-2028	This multiphase project will provide safer pedestrian connections and traffic calming throughout the Elwyn Park neighborhood. The design is anticipated to include improvements to the stormwater collection system, including treatment and outfall improvements.	To Be Determined
>696.2	**Estimated Annual N Load Reduction Total (lbs./yr.)**		

Notes:

1. Engineering design for these planned road/drainage system improvements are not complete. As a result, the potential stormwater nitrogen discharge cannot be determined. The feasibility for stormwater treatment will be evaluated as part of the design efforts.

2. Construction of these projects is ongoing with the completion dates as indicated. Estimates are provided based on the final design and a final estimate of annual total nitrogen load reduction will be provided for the as-built condition.

Non-Structural BMPs: Annual nitrogen load reductions due to ongoing operation and maintenance activities and recent connected impervious (IC) area disconnection included in this plan. The effect of the program on homeowners or commercial applicators' behavior could be measured through pre and post random surveys.

Annual non-structural BMP efforts	Project	Description	Approx. Load Reduction (lbs. TN/yr.)[1]
Street Sweeping	Ongoing Maintenance	City sweeps all streets monthly, 8 months of the year with High Efficiency Regenerative Vacuum Sweeper on estimated 345 acres of area. FY2024: Fall = 137 tons; Non-fall = 413 tons.	1034[2]
Leaf Litter Management	Ongoing Maintenance	City provides curbside leaf litter pickup for Residential Areas (~80% of City)	250
Catch Basin Cleaning	Ongoing Maintenance	City cleans approx. 25% of the total CB's each year	24
Regulations	New Regulations adopted Jan. '21	City adopted new stormwater treatment requirements for new & redevelopment disturbing 15,000 sq ft or more area. Load reduction is based on current inventory of private stormwater BMPs.	314
Impervious Disconnection	Recent IC disconnection	City has installed at least 18 tree filters, 4 rain gardens, converted ~ 0.5 mile of road shoulder and 0.3-acres of parking lot at Four Tree Island to porous pavement; IC disconnect ~ 3 acres	81
Organic Fertilizer Program	Ongoing Maintenance	City switched to an organic compost tea to fertilize its recreational fields; Results in an application rate of 0.7 lbs. N /1000 sf or ~30% less than a more typical application rate of at least 1 lb. /1000 sf	570
	Estimated Annual N Load Reduction Total (lbs./yr.)		**2,273**

Notes:

1. The nitrogen load reduction values represent general estimates based on the methods and assumptions included in the generic load reduction template spreadsheet provided by the UNH Stormwater Center for municipal use in preparing Element C of the Adaptive Management Plan with some minor adjustments to reflect City specific conditions especially with respect to fertilizer use and IC disconnection.

2. The nitrogen load reduction values represent general estimates based on the methods and assumptions included in the "Credit Calculation from Tech Memo Measured Method" provided by UNH Stormwater Center for municipal use in preparing Element C of the Adaptive Management Plan.

Potential Future BMPs on Municipal Lands

Anticipated Year	Project	Description	Load Reduction (lbs. TN/yr.)
By 2026	Raingarden at DPW for Parking Lot & Facility Expansion	The Department of Public Works is undergoing a facility expansion. New and existing roofs and parking areas will have drainage directed to a proposed gravel wetland. The City is evaluating the potential for piloting high-rate sedimentation technology.	To Be Determined
Completed	Nitrogen Source Identification Report	The report was completed in 2022 and is reviewed/updated annually for MS4 permit compliance. The report identifies potentially feasible stormwater BMP retrofit locations on City owned property for planning purposes. The results will be used to assess the potential feasibility and cost-effectiveness of constructing stormwater BMP retrofits to achieve additional nitrogen load reductions as either standalone projects or as part future facility upgrades of municipal properties. The LSIR can be found on the City's stormwater website. *portsmouthnh.gov/publicworks/stormwater/reports*	To Be Determined
2027	Lafayette Park and Monroe Avenue Sewer Separation	The Department of Public Works is continuing combined sewer separation projects. The City is in early design phases to disconnect drainage collection systems from the existing sewer system on Monroe Avenue. The City is designing stormwater detention and treatment systems in Lafayette Park to minimize peak stormwater runoff and provide strormwater treatment.	To Be Determined
To Be Determined	Collins Well #2	Work and permitting is underway for this new water supply. As part of the project, the City anticipates that stormwater currently discharging within the wellhead protection area will be diverted to a new and/or existing stormwater treatment system outside the well head protection area.	To be Determined

Other Efforts: Summary of Other Innovative Efforts/Pilot Programs

Anticipated Year	Project	Description	Approx. Load Reduction (lbs. TN/yr.)[1]
Ongoing	Sewer Extension to Sagamore Creek Area (approx. 88 homes)	As of August 2025, 51 homes have connected.	5,230
Ongoing	Atmospheric Load Reduction based on more current air quality data	UNH SC/NHDES suggests atmospheric N load has decreased by ~14%; GBNNPS study estimated delivered atmospheric N Load for Portsmouth = 18,618 lbs./yr.	2,610
Complete	Land Protection in Bellamy Reservoir	The City has partnered with Southeast Land Trust (SELT) to establish a conservation easement on an approximately 45-acre portion of a property known as the 'Fernald Parcel' - prevents additional stormwater and septic load from ~ 7 homes	127
Complete	Land Protection in Bellamy Reservoir	City purchased conservation easement for ~180 acres of land adjacent to Bellamy Reservoir targeted for development – prevents additional stormwater and septic load from ~ 32 homes	1,010
	Estimated Annual N Load Reduction Total (lbs./yr.)		**8,977**

Notes:

1. The N load reduction values represent general estimates based on the methods and assumptions provided by the UNH Stormwater Center for municipal use in developing Element C of the Adaptive Management Plan.

Outreach and Education: In addition to using an organic compost tea produced from yard waste compost to fertilize City fields as well as updating the Site Plan Regulations to include language that encourages new development to minimize the creation of new managed turf, the City would support a statewide or regional effort to ban or limit the use of lawn fertilizer and/or a collaborative regional education and outreach effort that engages homeowners and commercial applicators to minimize its use and/or apply only when necessary.
The NHDES Great Bay Nitrogen Nonpoint Source Study (GBNNPSS) estimated an annual N load of just under 90,000 lbs/yr contributed from lawn fertilizer usage within the 12 communities subject to this GBTN GP, which represents approximately 25% of the total estimated N load from these communities. Published data from the Chesapeake Bay Network suggests that developing a comprehensive education and outreach campaign designed to change homeowner behavior and commercial applicator practices could reduce fertilizer usage by anywhere from 5% to 15% depending in the program elements. If such a program could reduce fertilizer use by event 5%, this could result in a significant benefit relative to the load reduction estimates for the other activities

Explore Long Term Sustainable Funding Mechanisms: The City previously conducted a stormwater utility feasibility study that was completed in 2011 but it did not gain approval by City Council to move forward at that time. The City plans to revisit the feasibility of stormwater utility. In 2022 the City contracted with two engineering firms to explore the feasible options for creating a stormwater utility. These options were presented to City Council in October 2022. Staff continued to work on this project through 2023 but work was suspended due to the Conservation Law Foundation's filing of a petition with the Environmental Protection Agency

requesting that the EPA exercise its residual designation authority in the Great Bay Estuary. The City continues to evaluate options for implementing a stormwater utility.

Tracking Post-Development Stormwater Treatment BMP Inspection and Maintenance (I&M) Activity: The City is taking the lead in managing and administrating a project being funded by and in collaboration with various communities that are part of the Seacoast Stormwater Coalition to develop methods to assist communities in tracking post-development I&M activity for stormwater BMPs on private property that were approved through local site plan regulations and related ordinances. The goal is to ensure that the long-term stormwater treatment performance is maintained through I&M activity and the potential pollutant load reduction credits particularly for redevelopment projects can be tracked and accounted for through the NHDES/UNH SC PTAP system or an equivalent process. This project builds off an initial pilot study conducted by a student Capstone project done in conjunction with the UNH Engineering Department and UNH Stormwater Center.

Think Blue Outreach:

- Postcards and video campaigns have been developed by the stormwater division that focus on: Lawn care, Yard waste and Pet waste, with consistent "Think Blue" branding and web page links for more information.
- Household Hazardous Waste Collection Days are held each May and October. They are hosted by the City of Portsmouth at our DPW facilities and include Newington and Greenland.
- Safe Water Advisory Group (City Council Advisory Committee) meets quarterly in collaboration with the Water/Stormwater Division to raise public awareness of the Great Bay Watershed and residents' impact.
- The City is currently collaborating with Strawbery Banke Museum to update and reinstall the "Water Has a Memory: Preserving Strawbery Banke and Portsmouth from Sea Level Rise" exhibit in a different location at Stawbery Banke Museum.

Rochester

Financial Update –
For many reasons, costs associated with ongoing maintenance of the City of Rochester Sewer System have dramatically increased over recent years and will continue to do so in the foreseeable future. The City is in the process of developing a basis of design for major upgrades to the Wastewater Treatment Plant primarily driven by the EPA nutrient load requirements. The most recent engineers cost estimate for this work is $100,000,000. Though, there is still much to be vetted before actual cost estimates can be developed, it gives a sense of what rate payers are poised to face in the near future.

In addition to higher spending needs, the most recent City financial audit resulted in a non-spendable designation of $5,000,000 to be held in the City's sewer enterprise fund.

To make up for current sewer fund shortfalls, sewer rates increased 15% in 2024, 25% in 2025, and will be raised 25% in 2026 and another 20% in 2027. Even with these very substantial rate increases, funding for the necessary upgrades to the WWTF, will require substantial contributions from the general tax fund. This will pull from the funding otherwise allocated to general fund uses such as Schools, Police, Fire, Public Works, Welfare etc.

The current median household income in the City of Rochester is $80k/yr. Approximately 8.5% of City residents are below the poverty limit, which is down from over 10% in 2022 (a statistic/trend the City is very proud of). Total assessed property value in the City is $5 billion, which has risen over recent years. While the property values have increased, many property owners remain on fixed incomes, so an added tax burden associated with any property value increase is making it difficult to continue to afford owning the property.

As property values in and around the Great Bay continue to increase there has become a housing crises for the working class. Rochester is becoming an attractive and viable option for these folks by providing affordable housing alternatives within commuting distance to some of the seacoast communities.

Baseline Reduction due to distance from the Great Bay –
The City of Rochester is located several miles from the Great Bay and any tidal portion of the tributary that is impaired by Nitrogen. There is a natural TN attenuation that occurs to all point and non-point source loads from the City of Rochester. According to the EPA "this attenuation is predicated on the idea that some degree of nitrogen removal due to permanent uptake or denitrification occurs in the river". The EPA has determined the delivery factor for the City of Rochester to be 75.65%. That means that there is naturally a 24.35% TN reduction of all loading from the City of Rochester. Though the EPA recognizes this delivery factor, it was not accounted for in the WWTF annual load calculation. This should be considered when looking at Rochester's overall nutrient load reductions.

Nutrient Reduction Report – Prepared by Weston and Sampson dated October 2024 - The City of Rochester, prepared and submitted a comprehensive Nitrogen Reduction Report in accordance with Section IV, Paragraph 6 of the Administrative Order on Consent, Docket No. CWA-AO-R01-FY21-10 (AOC), between the City and the United States Environmental Protection Agency Region 1 (EPA), concerning the City's Wastewater Treatment Facility and its discharges under the National Pollutant Discharge Elimination System ("NPDES") Permit NHG58A001 effective May 1, 2021, which regulates nitrogen discharges to the Great Bay Estuary. This report was over 2,000 pages and fully outlines the City's Nutrient Reduction efforts.

Planned Structural BMPs – The following list includes projects that are already planned in CIP, design phase, etc. The City of Rochester reserves the right to update the project year/start dates, estimated load reductions, estimated costs or items listed as "TBD" in the columns below either annually or as appropriate.

Year	Project	Description	Estimated Load Reduction Potential (lbs TN/yr)	Costs	2025Progress Update	2026 Anticipated Progress
2021-25	Colonial Pines Sewer Extension - Phase 4	Phase 4 of a neighborhood sewer extension project with drainage infrastructure improvements	TBD	$3,700,000	Complete Phase 4.	
2022-25	Woodman Area Infrastructure Improvements	Neighborhood Complete Streets project with drainage infrastructure improvements including improved outfalls and new BMPs	TBD	$7,000,000	Complete	
2025	Union Street Municipal Parking Lot	Parking lot reconstruction with drainage infrastructure improvements including new BMPs	7.14	$1.5M+	Under Construction	To be completed.
TBD	Wakefield Street Reconstruction	Complete Streets project with drainage infrastructure improvements including new BMPs	16.54	TBD	Differed due to competing funding needs.	

Year	Project	Description	Estimated Load Reduction Potential (lbs TN/yr)	Costs	2025 Progress Update	2026 Anticipated Progress
2023 – 25	Columbus Ave/Summer St. Intersection Improvements	Includes stormwater treatment prior to discharge to Cocheco River.	TBD	$2M+	In final design	Under Construction
2023-	Water St. Redevelopment Project	Borders Cocheco River. Design to include pollutant reductions.	TBD	TBD	Continues design- project lead by Economic Development	Continue design
2026-	Summer Street Drainage Improvements	Fix drainage and roadway in Summer Street and Olde Farm Road	TBD	1,200,000	Differed due to competing funding needs.	
2024	Portland St Culvert	Fix undersized and failing culvert, project to include a new BMP	TBD	100,000	Very high bids received. Progress unknow.	Anticipate construction
Ongoing	Corrective Drainage	Unforeseen Drainage improvements	TBD	$150,000/yr	Ongoing	Ongoing
2026	Granite Ridge	Phase 2 of development – coordinated with private development	TBD	>$8,000,000	Ongoing	Ongoing
2026	Milton Road/Amarosa intersection	Round about associated with SIG	TBD	>$3,000,000	Ongoing	Ongoing
2026	Tebbets Rd / Old Dover intersection	Intersection improvements	TBD	>$1,500,000	Ongoing	Ongoing
2026	Gonic Dam Removal	Remove Dam from Cochecho River	TBD	ARPA & SRF funded	Ongoing	Under construction
2026	Salmon Fall School	New Elementary School	TBD	School Funded	Complete	
2026	Rochester Hill Neighborhood	Neighborhood improvements	TBD	$2,300,000	-	-
2025	City BMP Maintenance	Major improvements to older BMP's	TBD	$5,250,000	No one responded to the Bid.	City is working with on-call contractor and inhouse staff
2026	Winter Street Neighborhood	Neighborhood improvements	TBD	$2,300,000		
2028	North Main Street	Roadway improvements	TBD	$275.000	-	

Non-structural BMPs – The following list includes existing ongoing and future planned efforts:

Anticipated Year of initial implementation (ongoing work)	Project	Description	Estimated Load Reduction Potential (lbs TN/yr)	Costs	2024 Progress Update	2025 Anticipated Progress
Ongoing	MS4 Compliance	The City of Dover uses MS4 permit compliance as a baseline from which additional work is completed	TBD	$300,000/ yr	Ongoing – special effort on catchment investigations	Ongoing
Ongoing	Street Sweeping	Sweep curbed streets monthly (Apr-Nov); sweep Downtown weekly (Apr-Nov)	See PTAP		Ongoing	Ongoing
Ongoing	Leaf Litter Management	Collect leaf litter monthly (Apr-May, Oct-Nov); collect bagged organic waste for 2 wks in spring and fall	See PTAP		Ongoing	Ongoing
Ongoing	Leaf Litter Management	Provide location for residents to drop off leaf and yard waste year-round	See PTAP		Ongoing	Ongoing
Ongoing	Catch Basin Cleaning	Ensure CB sumps are no more than 50% full at any time	See PTAP		Ongoing	Ongoing
Ongoing	Fertilizer Program	Exclusively use slow release fertilizer on municipal property; advocate for and work with State RE: nitrogen fertilizer restrictions	TBD		Continued stated fertilizer practices on municipal property.	Continue fertilizer practices and advocate with the State.

Other Efforts – The following list includes innovative efforts

Anticipated Year	Project	Description	Estimated Load Reduction Potential (lbs TN/yr)	Costs	2025 Progress Update	2026 Anticipated Progress
Ongoing	Existing Municipal Structural BMPs	77 existing municipal structural stormwater BMPs have been catalogued in the City's Asset Management Program.	1,080		BMPs inspected and begun to track for improved maintenance.	Entry of BMPs into PTAP complete.
2023-25	Colonial Pines Sewer Extension	Extension of public sewer collection system to connect homes on septic systems	2,560		150 homes removed to date	Last Phase is under construction
Ongoing	Nitrogen Source Identification Report	Identify catchment areas with potentially high nitrogen loading and BMP potential, including primarily municipal properties.	TBD	TBD	Comprehensive report submitted in October 2024.	
Ongoing	Public Education/ Outreach	Distribute targeted messaging regarding grass clippings/ fertilizer (Apr-May), pet waste (Jun-Jul), and leaf litter (Aug-Oct)	TBD	TBD	Grass clippings/ fertilizer, pet waste, and leaf litter messages delivered.	Continue messaging to target audiences during seasonally appropriate time periods.
Ongoing	Public Education/ Outreach	Distribute targeted messaging regarding septic system maintenance and LID development	TBD	TBD	Septic system and LID messages delivered.	Continue messaging to target audiences.
Ongoing	Existing Private BMPs: Quantify nutrient load reductions	City to catalog inventory of existing privately owned BMPs, quantify nutrient load reductions and enter into PTAP	TBD	$22,000	Catalog Complete	Ongoing outreach
Ongoing	Private Development/ Redevelopment	Enforce City's updated Chapter 218 Stormwater Ordinance requiring treatment	100-300[1]	TBD	June 7, 2022 Stormwater Ordinance revision requires	Continued enforcement of Stormwater Ordinance/use of PTAP for

[1] The City's estimates for load reductions of 100 to 300 lbs. N/year were estimated to occur as a result of structural BMP retrofits through redevelopment on commercial properties as required by revised City stormwater ordinance. These estimates were based on an assumption that 10 to 50 acres of impervious area are redeveloped and retrofitted with BMPs, which depends upon actual development activity.

Anticipated Year	Project	Description	Estimated Load Reduction Potential (lbs TN/yr)	Costs	2025 Progress Update	2026 Anticipated Progress
					pollutant accounting information by developers.	pollutant tracking.
Ongoing	Staffing/Resources	City has a strong team of engineers reviewing all proposed construction projects for stormwater compliance, additionally larger projects are subject to a third party review with Geosyentec	TBD	TBD	Ongoing	Ongoing
Ongoing	Septic System Programs	Advocate for and work with State RE: advanced septic system treatment for nitrogen and enforcement of connection to public sewer law within 100’	TBD	TBD	NHDES met with certain communities	Continue to advocate for amendments to the septic system requirements.
Ongoing	Water Pollution and Flooding Reduction Study	Through a public workgroup and broader public outreach the City will consider a dedicated stormwater funding source.	TBD	TBD	Presentation was made to city council end of 2023	Continued outreach and education about importance of water pollution and flood reduction

Pilot Projects – The following list includes pilot projects:

Anticipated Year	Project	Description	Estimated Load Reduction Potential (lbs TN/yr)	Costs	2025 Progress Update	2026 Anticipated Progress
2025	Stakeholder Committee Project	MAAM communities fund $45,000 towards Great Bay water quality- related project as selected by the Stakeholder Committee (CLF)	TBD	$45,000	No progress	Rochester continues to encourage CLF to select a project that has measurable TN reductions and requires work on private property. This is the most difficult thing for communities and would be helpful for us to see a successful piolet project that could be successfully expanded.

Initiatives at WWTFs – The following list includes efforts aimed at reducing TN output from WWTFs during the eelgrass growing season. Such efforts may include optimization of plants, projects aimed at reducing inflow/infiltration, facility upgrades, or similar measures.

Anticipated Year	Project	Description	Estimated Load Reduction Potential (lbs TN/yr)	Costs	2023 Progress Update	2024 Anticipated Progress
2023 -	Septage Receiving Facility Upgrade	Construct new septage receiving facility at a location more favorable for nitrogen treatment at the WWTF	TBD	$600,000+	Complete	
2021-26	Sewer System Master Plan	Evaluate sewer collection system for sources of Inflow/ Infiltration	TBD	TBD	Massive amount of work done to reduce I/I. Still seeing peak flows at the WWTF.	City anticipates continuing the master planning effort over the next several years, culminating in a final Master Plan.

Co-Benefits of Nonpoint Source Reductions – Though beyond the scope of the submission called for in Part 3-1.c. of the General Permit, the MAAM communities feel it is important to plan and account for the removal of other pollutants or stressors of eelgrass coincident to the TN source reductions listed above. This dovetails with the monitoring efforts undertaken by MAAM and its partners, which is expected to include study of confounding factors and stressors. PTAP tracking and accounting has been created to also calculate phosphorus and total suspended solid reductions.

Rollinsford - MAAM AMP STATEMENT

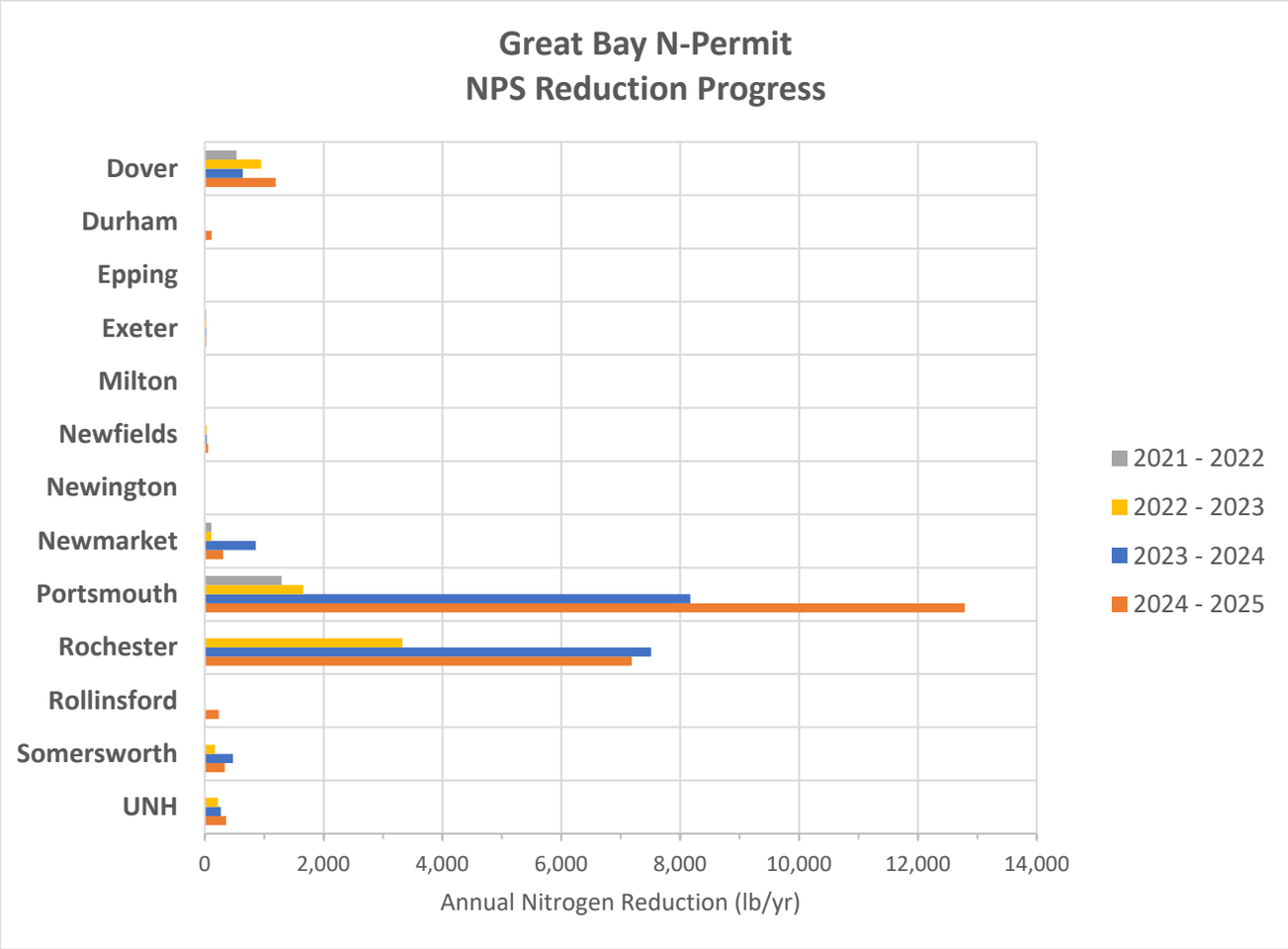
The Town of Rollinsford continues to monitor effluent at the Wastewater Treatment Facility as required by the Total Nitrogen General Permit. Additionally, the town is implementing the best management practices required in the MS4 permit including a street sweeping and catchbasin cleaning program. The town has adopted a stormwater ordinance based on the Southeast Watershed Alliance model ordinance, requiring stormwater management for all new and redevelopment projects that come to the Planning Board. Rollinsford is committed to continuing to participate in MAAM and the Total Nitrogen General Permit.

Appendix C

Pollutant Load Reduction Reports

PTAP Nitrogen NPS Reduction Report

Updated 8/29/2025



	2021 - 2022	2022 - 2023	2023 - 2024	2024 - 2025
Dover	534	947	638	1,194
Durham	0	0	0	118
Epping	0	0	0	0
Exeter	23	23	23	23
Milton	0	0	0	2
Newfields	0	34	34	56
Newington	0	9	9	9
Newmarket	110	111	860	309
Portsmouth	1,294	1,654	8,172	12,786
Rochester	0	3,327	7,513	7,186
Rollinsford	0	0	0	240
Somersworth	0	172	473	337
UNH	0	222	268	356

Note that only PTAP entries with the status of "Approved and Implemented" are given credit.

UNIVERSITY OF NEW HAMPSHIRE STORMWATER CENTER

PTAP Credit Summary Table

Municipality: Dover, NH

Permit Year: 2024 - 2025

	Vol (cf/yr)	TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)
Structural	2,201,311.00	91.30	637.99	29,258.19
Non-Structural	0.00	187.00	555.72	0.00
Wastewater	0.00	0.00	0.00	0.00
TOTAL	**2,201,311.00**	**278.30**	**1,193.71**	**29,258.19**

UNHSC PTAP Reporting Tool
Version 1.251 - Updated Aug 2025
UNH Stormwater Center
https://extension.unh.edu/stormwater-center

PTAP Credit Summary Table

Municipality: Epping, NH

Permit Year: 2024 - 2025

	Vol (cf/yr)	TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)
Structural	0.00	0.00	0.00	0.00
Non-Structural	0.00	0.00	0.00	0.00
Wastewater	0.00	0.00	0.00	0.00
TOTAL	**0.00**	**0.00**	**0.00**	**0.00**

UNHSC PTAP Reporting Tool
Version 1.251 - Updated Aug 2025
UNH Stormwater Center
https://extension.unh.edu/stormwater-center

PTAP Credit Summary Table

Municipality: Milton, NH

Permit Year: 2024 - 2025

	Vol (cf/yr)	TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)
Structural	0.00	0.00	0.00	0.00
Non-Structural	0.00	0.08	1.79	0.00
Wastewater	0.00	0.00	0.00	0.00
TOTAL	**0.00**	**0.08**	**1.79**	**0.00**

UNHSC PTAP Reporting Tool
Version 1.251 - Updated Aug 2025
UNH Stormwater Center
https://extension.unh.edu/stormwater-center

PTAP Credit Summary Table

Municipality: Newington, NH

Permit Year: 2024 - 2025

	Vol (cf/yr)	TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)
Structural	0.00	1.76	8.80	526.85
Non-Structural	0.00	0.00	0.00	0.00
Wastewater	0.00	0.00	0.00	0.00
TOTAL	**0.00**	**1.76**	**8.80**	**526.85**

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UNH Stormwater Center
https://extension.unh.edu/stormwater-center

PTAP Credit Summary Table

Municipality: Portsmouth, NH

Permit Year: 2024 - 2025

	Vol (cf/yr)	TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)
Structural	3,546,109.90	177.44	1,506.75	60,377.81
Non-Structural	0.00	74.84	234.37	0.00
Wastewater	0.00	0.00	11,044.40	0.00
TOTAL	**3,546,109.90**	**252.27**	**12,785.53**	**60,377.81**

UNHSC PTAP Reporting Tool
Version 1.251 - Updated Aug 2025
UNH Stormwater Center
https://extension.unh.edu/stormwater-center

PTAP Credit Summary Table

Municipality: Rochester, NH

Permit Year: 2024 - 2025

	Vol (cf/yr)	TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)
Structural	5,848,022.52	621.12	3,918.84	310,703.77
Non-Structural	0.00	0.04	0.93	0.00
Wastewater	0.00	0.00	3,265.86	0.00
TOTAL	**5,848,022.52**	**621.16**	**7,185.62**	**310,703.77**

UNHSC PTAP Reporting Tool
Version 1.251 - Updated Aug 2025
UNH Stormwater Center
https://extension.unh.edu/stormwater-center

PTAP Credit Summary Table

Municipality: Rollinsford, NH

Permit Year: 2024 - 2025

	Vol (cf/yr)	TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)
Structural	2,051,957.08	26.78	213.41	6,367.27
Non-Structural	0.00	8.87	26.82	0.00
Wastewater	0.00	0.00	0.00	0.00
TOTAL	**2,051,957.08**	**35.65**	**240.23**	**6,367.27**

UNHSC PTAP Reporting Tool
Version 1.251 - Updated Aug 2025
UNH Stormwater Center
https://extension.unh.edu/stormwater-center

Appendix D

Municipal Alliance or Adaptive Management (MAAM)
Intermunicipal Agreement

April 8, 2021

INTERMUNICIPAL AGREEMENT FOR DEVELOPMENT OF AN ADAPTIVE WATER QUALITY MANAGEMENT PLAN FOR GREAT BAY ESTUARY

The parties to this Intermunicipal Agreement are the City of Rochester, the City of Dover and the City of Portsmouth and those additional municipalities and towns that have executed this Agreement in accord with its provisions below.

WHEREAS, the U.S. Environmental Protection Agency Region I ("EPA") issued the Great Bay Total Nitrogen General Permit (NPDES Permit No. NHG58A000) on November 24, 2020 (the "General Permit");

WHEREAS, municipalities and towns that own or operate any of 13 certain municipal wastewater treatment facilities covered by the General Permit may choose to Opt-In to the General Permit by April 2, 2021 and become permittees (the "Permittees");

WHEREAS, the Cities of Rochester, Dover and Portsmouth operate wastewater treatment facilities in the Great Bay Estuary plan to Opt-In to the General Permit;

WHEREAS, the Cities of Rochester, Dover and Portsmouth are seeking to collaborate with each other, with other Permittees, with other communities in the watershed as well as with all involved regulators and stakeholders in an adaptive management framework addressing water quality and overall TN source reductions to the Great Bay estuary as described in Part 3 of the General Permit;

WHEREAS, the General Permit envisions the elements of an adaptive management framework for the Great Bay estuary as including (1) ambient water quality monitoring (2) pollution tracking (3) pollution reduction planning and implementation, and (4) review of significant scientific, methodological, and protective target nitrogen load issues of importance to the Permittees;

WHEREAS, the General Permit describes adaptive management implementation as including collaboration between Permittees and EPA, the State of New Hampshire through its Department of Environmental Services, ("NHDES"), and public, private, commercial, and other stakeholders including the Conservation Law Foundation ("CLF");

WHEREAS, Permittees are required by the General Permit to submit a detailed proposal on or before July 31, 2021; and

WHEREAS, through this Intermunicipal Agreement, the Permittees seek to implement the Intermunicipal Plan For Adaptive Water Quality Management In the Great Bay Estuary dated December 14, 2020 ("Plan") and included as Attachment 1.

WHEREAS, RSA 53-A:1 permits "...municipalities and counties to make the most efficient use of their powers by enabling them to cooperate with other municipalities and

counties on a basis of mutual advantage and thereby to provide services and facilities in a manner and pursuant to forms of governmental organization that will accord best with geographic, economic, population and other factors influencing the needs and development of local communities";

THEREFORE, pursuant to RSA 53-A:3, the Permittees enter into this Agreement for the purposes described above as follows:

I. DEFINITIONS

A. "Contribution Formula" that mechanism for allocating costs among the Members who are Permittees.

B. "Executive Board" that administrative and management body charged with the responsibilities described in paragraph V.

C. "Member" that municipality or town in the Great Bay estuary watershed, whether located in New Hampshire or Maine, that has indicated its intent to be a part of this Agreement by executing Attachment 2.

D. "Recommended Annual Contribution for Monitoring" that amount recommended annually by the Executive Board and adopted by the Members for water quality monitoring and analysis.

II. PURPOSE OF THIS AGREEMENT

The purpose of this Agreement is to implement the Plan to improve water quality in the Great Bay estuary and to take such other and further collaborative action which may be agreed upon to fulfill or assist Permittees' compliance with the General Permit. No separate corporate entity is being created as this instrument is intended to assist with joint administrative and executive functions associated with implementation of the Plan and to generate and coordinate funding recommendations necessary to implement the Plan.

III. DURATION OF AGREEMENT

The term of this Agreement runs from March 1, 2021 to February 28, 2026. This Agreement may be renewed for an additional term to be determined by vote of the majority of the Members.

IV. MEMBERS

A. Membership. The initiating Members to this Agreement are: the City of Rochester acting through its City Manager; the City of Dover acting through its City Manager and the City of Portsmouth acting through its City Manager. Additional Members may be added to this Agreement by

executing Attachment 2 and identifying the acting authority (such as Town Manager, Town Administrator, Sewer Commission) and providing an executed Attachment 2 to the Executive Board . Any municipality or town in the Great Bay estuary watershed, whether located in New Hampshire or Maine, is eligible to be a Member.

The Members for purposes of this Agreement shall be called the Municipal Alliance for Adaptive Management.

B. Organizational Meeting There will be an initial meeting of Members after the Opt-in date of April 2, 2021 but before April 30, 2021 to be set by the City Manager of the City of Rochester. The purpose of the meeting will be to have the Members vote on appointing up to two At-Large Members to the Executive Board and setting the recommended 2021 Contribution Goal. The Executive Board is further defined in Section V. Meetings are discussed further in Section VI.

V. EXECUTIVE BOARD

A. Purpose and Authority of Executive Board. The Executive Board has the authority to enter into contracts on behalf of the Municipal Alliance for Adaptive Management in order to implement the Plan, to receive and manage funds by way of the fiscal agent (defined below), to approve bills and disbursements, to make funding recommendations and to circulate documents necessary in order to keep Members informed, to set the annual meeting of the members, to participate in discussions with stakeholders, and to conduct such other activities as the Executive Board deems necessary and proper to carry out the purposes of this Agreement. The Executive Board does not otherwise have authority to acquire or hold items of personal or real property.

B. Officers. Beginning with its first meeting and then annually thereafter, the Executive Board shall elect a Chair, Vice Chair and a Clerk from the members of the Executive Board.

C. Membership of Executive Board. The Executive Board shall be composed of three Standing Members consisting of the city managers of the City of Rochester, the City of Dover, and the City of Portsmouth. The Members may select up to two additional At-Large Members of the Executive Board from other communities.

At-Large Members of the Executive Board members shall be nominated at the Members' Organizational Meeting and serve through the expiration of the term of this Agreement. If this Agreement is renewed by the Members for an additional term, the Members will elect/re-elect At-Large Executive Board members at the meeting in which an extension of the term of this

Agreement is made. At-Large Executive Board Members must be Permittees.

There are no term limits for Executive Board members. Executive Board members may appoint designees if that designee has decision-making authority.

In the event any vacancy occurs for At-Large Executive Board Members, the Executive Board shall within thirty (30) days of the vacancy call a meeting of the Members so that the Members may select a replacement.

In the event more than three Members are communities from Maine, those members from Maine may request that the Executive Board be expanded to include a Member from Maine, which request will be granted provided there is an agreement on a formula for contribution to the activities contemplated by this Agreement.

D. No Personal Liability. Executive Board members and its officers shall not be personally liable for any debt, liability or obligation of the Municipal Alliance for Adaptive Management. All persons having any claim against the Municipal Alliance for Adaptive Management may look only to its funds for payment of any such contract or claim, or for the payment of any debt, damages, judgment or decrees, or of any money that may otherwise become due and payable to them from the Municipal Alliance for Adaptive Management.

VI. MEETINGS

A. Annual meetings of the Members. After the initial Organizational Meeting a meeting of the Members shall be held at least annually in the last quarter of each calendar year. At the Annual Meeting the Members shall vote on the Recommended Contribution for the following calendar year.

Annual meetings of the Members shall be subject to the requirements of public meetings as required by NH RSA 91-A. Members shall have the ability to participate telephonically and by video conference as may be permitted under NH RSA 91-A.

Each Member is afforded one vote in all matters that require action. A majority vote of those Members present and voting shall be needed to act upon any business associated with this Agreement. One third of the total Membership shall constitute a quorum.

B. Executive Board Meetings. The Executive Board shall meet at least biannually or more frequently at the call of the Chair at such times and places that are mutually convenient. The meetings of the Executive Board are not public meetings as that term is defined by NH RSA 91-A.

Voting. If there are three Executive Board Members, a quorum is two (2) Members. If there are five or more Executive Board members a quorum is three Members. All votes will pass by simple majority.

Attendance. Attendance for purposes of quorum and voting may be by telephone or video conference. A record of the actions taken by the Executive Board shall be distributed to the Members within ten (10) calendar days of any meeting. Distribution may be by e-mail.

VII. WORK AND COST -SHARING

A. Initial Water Quality Work. The Cities of Rochester, Dover and Portsmouth identified an initial scope of work necessary to initiate the adaptive management opportunity identified in Part 3 of the General Permit. Water quality specialists within the engineering firm of Brown and Caldwell were solicited to submit a proposal to complete the scope of work. Due to the time constraints imposed by the Permit and the schedule of other stakeholders including PREP to develop a water quality monitoring plan for the upcoming sampling season, the three cities entered into a memorandum of agreement to share equally the costs of the work described. The Memorandum of Agreement and the Scope of Work is set forth at Attachment 3. This paragraph is for informational purposes only and will not form a part of a request for financial contribution from other Members.

B. Participation in Water Quality Monitoring, Data Gathering and Analysis. Members are expected to participate in the planning and cost of ambient water quality monitoring, data gathering and water quality analysis along with other stakeholders ("Annual Contribution for Monitoring"). The recommended formula for such cost sharing for Members who are Permittees is set forth in Attachment 4 ("Contribution Formula"). The Contribution Formula may be amended by a majority vote of the Members who are also Permittees.

C. Recommended Annual Contribution for Monitoring. The Annual Contribution for Monitoring, in the aggregate for all Members, shall be no less than $200,000 and no more than $500,000. The Executive Board shall develop a Recommended Annual Contribution for Monitoring to be presented to the Members at the Members Annual Meeting in the fall of each calendar year. The Members who are also Permittees shall vote on and set the Recommended Annual Contribution for Monitoring. Members shall make good faith efforts to budget and appropriate the funds in accord with the Recommended Annual Contribution for Monitoring and Contribution Formula adopted at the Members Meeting.

D. Other Work. The Executive Board may make such additional recommendations to the Members to finance other work consistent with the Plan. Such other work if voted upon by the Members shall be financed according to the Contribution Formula.

E. Fiscal Agent. The Members agree that the City of Rochester ("City") will be the fiscal agent for Municipal Alliance for Adaptive Management, with the authority to collect, hold, invest, disperse and pay funds held on behalf of the Municipal Alliance for Adaptive Management at the direction of the Executive Board.

F. Accounting for Funds. The Executive Board with assistance from the Fiscal Agent shall provide to the Members an annual accounting of monies received, spent, and obligated, and a final accounting upon the termination of the Agreement.

G. Funds upon Termination. Upon termination of this Agreement, no individual employee or member of the Executive Board shall be entitled to a share in the distribution of any funds upon dissolution. Upon termination, the funds shall be distributed to each Member at the time of distribution in proportion to the percentage of its contribution relative to the total contribution of all the Members made in the year of distribution.

VIII POLLUTION TRACKING

The Executive Board anticipates making recommendations to Members to participate in certain pollutant tracking programs. Members agree to make good faith efforts to participate in such pollution tracking programs.

IX. TERMINATION

A. Mutual Agreement. This Agreement may be terminated prior to the end of the term upon mutual agreement of the Members.

B. Withdrawal of a Member at the Conclusion of the Term . A Member wishing to withdraw from the Agreement at the end of the term and not interested in renewal shall give written notice to the Executive Board at least three months before the expiration of the term . The Executive Board will notify the other Members of any Member's withdrawal through their authorized agents who have executed this Agreement.

C. Withdrawal of Member Prior to Expiration of Term. A Member wishing to withdraw from the Agreement before the end of the term shall be responsible for its share of any outstanding Recommended Annual Contribution for Monitoring for the year in which the terminating Member gives notice of termination . Notice of withdrawal shall be in writing from the Member to the Executive Board at least thirty (30) days prior to termination. The Executive Board will notify the other Members of any

Member's withdrawal through their authorized agents who have executed this Agreement.

D. Appeal of General Permit. This Agreement is being entered into prior to the expiration of the period of appeal of the General Permit. In the event of any appeal of the General Permit, any Member may withdraw from this Agreement without penalty as described in paragraph C..

X. ISSUANCE OF BONDS

The Members do not intend to issue bonds jointly as permitted by RSA 53-A:6. Should the Members decided to do so at a later time, an amendment to this Agreement shall be undertaken to specify those items required by RSA 53-A:6, II.

XI. OTHER

A. Amendment. This Agreement may be amended only by written Agreement signed by two-thirds of the Members.

B. Authority. All Members undersigned represent and agree that they have the authority to enter into this Agreement.

C. Notices. Notices for each party shall be in writing and mailed to the individuals listed in Exhibit B which is attached and incorporated hereto.

D. Severability. If any provision of this Agreement is deemed invalid or unenforceable, the remaining provisions shall remain in full force and effect.

E. Governing Law. This Agreement shall be governed by and interpreted in accordance with the provisions of the laws of the State of New Hampshire.

F. Separate Document. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

G. Compliance with RSA 53-A:

- Pursuant to RSA 53-A:3 IV, this Agreement does not relieve any of the Members of any obligation or responsibility imposed upon it by law except to the extent of actual and timely performance thereof by the Executive Board. Performance may be offered in satisfaction of the obligation or responsibility.

- Pursuant to RSA 53-A:3 V, this Agreement shall be submitted to the NH Attorney General who shall determine whether the

agreement is in proper form and compatible with the laws of this state.

- Pursuant to RSA 53-A:4, this Agreement shall be filed with the clerk of each municipality and with the NH Secretary of State.

- Pursuant to 53-A:5, this Agreement shall be submitted to the NH Department of Revenue Administration as a condition precedent to its entry into force.

This Submission and approval shall be in addition to and not in substitution for the requirement of submission to and approval by the NH Attorney General.

[SIGNATURES FOLLOW]

Dated this 8 day of April, 2021.

CITY OF ROCHESTER

By: _____
Blaine Cox, City Manager

Dated this 8th day of April, 2021.

CITY OF DOVER

By: _____
J. Michael Joyal, Jr., City Manager

Dated this 8th day of April, 2021.

CITY OF PORTSMOUTH

By: _____
Karen S. Conard, City Manager

Dated this 8th day of April, 2021.

TOWN OF NEWINGTON

By: _____
Denis Mercier, Wastewater Treatment Plant Manager

Dated this 8th day of April, 2021.

TOWN OF MILTON

By: _____
Julius Peel, Interim Town Administrator

INTERMUNICIPAL PLAN FOR ADAPTIVE WATER QUALITY MANAGEMENT IN THE GREAT BAY ESTUARY

DECEMBER 14, 2020 DRAFT

This plan outlines a collaborative effort by and among municipalities in furtherance of their mutual interests in appropriate management and protection of water quality in the Great Bay estuary and, for those that opt for coverage under NPDES Great Bay Total Nitrogen General Permit (NPDES Permit No. NHG58A000) issued by U.S. Environmental Protection Agency Region I ("EPA") on November 24, 2020 (the "General Permit"), in the coordinated, cost-effective implementation of the permit's adaptive management framework.

BACKGROUND

A. General Permit Overview. The General Permit was recently established as an available permitting option for eligible municipal permittees (the "Permittees") that own or operate any of 13 certain municipal wastewater treatment facilities ("WWTFs"). Its optional approach for the limitation and control of total nitrogen ("TN") discharges from covered WWTFs combines relatively less stringent TN effluent limitations (as compared to those EPA would otherwise anticipate imposing under individual permits) with the opportunity for the Permittees to collaborate in an adaptive management framework addressing overall TN source reductions to the Great Bay estuary.

B. Adaptive Management Opportunity. As set forth in Part 3 of the General Permit, EPA envisions the elements of an adaptive management framework for the Great Bay estuary as including the General Permit, ambient monitoring, pollution tracking, reduction planning, and review of significant scientific, methodological, and protective target nitrogen load issues of great importance to the Permittees. The General Permit also describes adaptive management implementation as including collaboration between or among EPA, the State of New Hampshire (including the Department of Environmental Services, "NHDES"), and public, private, commercial, and other stakeholders (including the Conservation Law Foundation ("CLF") with which the Permittees desire to increase coordination to achieve mutual goals). For Permittees that opt for coverage, the General Permit contemplates that the Permittees will participate in this collaboration by submitting a detailed proposal on or before the associated July 31, 2021 deadline.

C. Consistency with Municipal Goals. The adaptive management framework of the General Permit provides an approach to advancing mutual water quality protection interests while also correcting and improving the scientific and technical basis for proper water quality management and protection of the Great Bay estuary. This framework generally has the potential to meet important goals identified by the Permittees during the NPDES permitting process such as improving and protecting water quality based on sound science and public policy, increasing collaboration, resolving significant municipal concerns, aligning governmental authorities on near-term actions and investments, supporting wastewater and stormwater nitrogen removal, supporting ambient monitoring efforts, adopting measurable and achievable TN reductions protective of ecosystem health and resilience, laying a solid foundation for appropriate future investments, and avoiding disputes and delays. This framework is also generally consistent with

certain guiding principles that the Permittees identified during the permitting process, including timely issuance of the first watershed-scale TN General Permit for Great Bay, effectiveness and cost-effectiveness of wastewater and stormwater controls, and steady progress and true adaptive management building on significant WWTF nitrogen reductions already made.

D. Acknowledgment of Common Interests. The Permittees acknowledge and share certain interests with EPA, NHDES, and key stakeholders such as CLF in successful implementation of the adaptive management framework. The Permittees desire to fully and effectively participate in the adaptive management process, not only to meet their own goals and interests, but also to address the scientifically-defensible reasonable interests of these governmental and non-governmental stakeholders in a fiscally responsible manner.

Therefore, in furtherance of mutual interests of the Permittees in continuing to be good stewards of the Great Bay estuary, appropriately protecting water quality, and meeting the needs of the citizens of their communities, the Permittees have established this intermunicipal plan for the development of a joint adaptive management framework proposal in accordance with the General Permit.

JOINT ADAPTIVE MANAGEMENT FRAMEWORK PROPOSAL DEVELOPMENT PROCESS

1. Collaborative Development Process. The Permittees recognize and support the collaborative nature of the adaptive management framework and welcome the opportunity to work in partnership with EPA, NHDES, Piscataqua Region Estuaries Partnership ("PREP"), CLF and other relevant entities to advance nitrogen management in the Great Bay estuary.

a. Municipal Cooperation and Coordination. The Permittees intend to confer and coordinate with one another on all relevant aspects of developing an approvable joint proposal addressing the adaptive management framework elements specified by the General Permit (the "Joint Proposal") as generally described herein. Although it assumed that most if not all Permittees will prefer to opt for coverage under the General Permit, Permittees that instead opt for individual permit coverage may still participate in this watershed-level process.

b. Consultation with Interested Third Parties. In the course of developing the Joint Proposal, the General Permit's adaptive management framework encourages, and the Permittees intend to engage in, consultation from time to time as appropriate with EPA, NHDES, PREP, and CLF, , which the Permittees consider to be key governmental partners or stakeholders that share certain goals and interests in common with the Permittees. In addition, significant public participation is anticipated and welcomed by the Permittees. Without limiting the foregoing overarching intent, certain specific opportunities for consultation with identified partners and stakeholders are identified below.

2. Planned Scope of Joint Proposal. The scope of the Joint Proposal is expected to be developed in a manner that meets or exceeds the minimum requirements of Part 3 of the General Permit summarized below and further organized on the basis of priority Nitrogen Reduction Efforts (Paragraph 3 below) and concurrent Endpoint Planning Efforts (Paragraph 4 below).

3. Nitrogen Reduction Efforts. The Permittees intend to prioritize planning and implementation of the following Nitrogen Reduction Efforts during the 2021-2025 permit term, without delay, concurrent with Endpoint Planning Efforts useful for determining long-term water quality goals.

a. Nitrogen Source Reduction Plans. The General Permit (Part 3, Paragraph 1.c.) seeks a proposed outline or plan for overall source reductions of TN over the course of the permit term. The Joint Proposal will address a process and timeline for developing and implementing such TN control measures, including specific short-term control measures for various sources of TN loadings as well as the identification, design, installation, operation and maintenance of specific projects to reduce TN loads. Without limiting the foregoing measures, consideration will be given to the feasibility of regional fertilizer regulation and potential oyster restoration projects. The Joint Proposal will also address pollutant reduction estimations for other pollutants of concern such as TSS/sediment in addition to TN.

b. Consultation with CLF on Nitrogen Project Planning. For purposes of this prioritized nitrogen source reduction planning efforts, the Permittees intend to consult with key stakeholders that possess the technical resources and capability to provide relevant assistance such as on identification of potential projects and opportunities to optimize pollutant reduction benefits through consideration of project types, locations, and costs. The Permittees specifically envision consulting with CLF, assuming CLF interest, during the Joint Proposal development phase as well as during the Joint Proposal implementation phase.

c. Nitrogen Load Tracking Methods. The General Permit (Part 3, Paragraph 1.b.) seeks a proposed method(s) to be used to track reductions and additions of TN over the course of the permit term. The Joint Proposal will address such method(s) with specific consideration being given to potentially using NHDES's Pollution Tracking and Accounting Program ("PTAP") as tracking/accounting system for quantifying the nitrogen loading changes to the Great Bay estuary associated with activities within each municipality such as new/modified septic systems, decentralized wastewater treatment facilities, changes to the amount of effective impervious cover, changes to the amount of disconnected impervious cover, conversion of existing landscape to lawns/turf, and any new or modified structural or non-structural best management practices.

4. Endpoint Planning Efforts. Concurrent with Nitrogen Reduction Efforts, the Permittees intend to support the following Endpoint Planning Efforts useful for determining long-term water quality goals and the basis for future permit renewals.

a. Ambient Water Quality Monitoring. The General Permit (Part 3, Paragraph 1.a.) seeks a proposed approach to ambient water quality monitoring in the Great Bay estuary to determine progress and trends. The Permittees recognize that PREP, as part of EPA's National estuary Program, has benefited the region by tracking environmental trends through long-term monitoring. The Permittees anticipate making additional contribution toward a portion of the overall cost of an expanded, coordinated, non-duplicative, properly-designed ambient monitoring program that the Permittees participate in developing. The Permittees envision the resulting enhanced monitoring effort as being designed to better understand the role of nitrogen, including other factors affecting eelgrass such as sediment characteristics, suspended sediment

concentrations and loads, bioturbation, epiphytic growth, and macroalgal community abundance. In developing the Joint Plan, the Permittees intend to consult with PREP and key partners and stakeholders regarding the design, implementation, cost, and financial and in-kind contributions to an enhanced monitoring effort. The Permittees further intend that their respective individual contributions to their total contribution will be allocated by and among themselves in a fair and equitable manner to be agreed upon.

b. Significant Scientific and Methodological Issue Evaluation. The General Permit (Part 3, Paragraph 1.d.) provides the opportunity for, and the Joint Proposal will include, an inclusive and transparent process for comprehensively evaluating any significant scientific and methodological issues relating to the permit, including the choice of a load-based threshold of 100 kg ha^{-1} yr^{-1} (a longstanding concern of the Permittees for reasons memorialized in formal public comments in the administrative record for the General Permit) versus any other proposed threshold, including a concentration-based threshold. The Joint Proposal will include detailed milestones culminating in submission of a report to EPA, prior to expiration of the permit terms, for inclusion in the administrative record for permit renewal. That report will indicate whether the NHDES concurs with the findings.

c. Loading Capacity Determination. The General Permit (Part 3, Paragraph 1.e.) seeks a proposed timeline for completing a Total Maximum Daily Load ("TMDL") for TN in Great Bay and for submitting it to EPA for review and approval. The Joint Proposal will include such a timeline and may include alternative approaches to identifying Great Bay's assimilative capacity for TN as a scientifically-defensible and reasonable basis for permit renewal and for implementation activities.

5. Administrative Matters. The Permittees desire to implement this plan and, for those opting for coverage under the General Permit, to develop and implement the Joint Proposal, all in a timely, coordinated, and cost-effective manner.

a. Joint Resources & Cost-Savings. The Permittees' development and, if approved, implementation of the Joint Proposal will benefit from the assistance of highly-specialized experts such as consultants with substantial expertise in the field of water quality science or knowledge of the Great Bay system. To obtain such expertise, avoid duplication, and minimize total costs, such resources may be secured on a cost-sharing basis as mutually agreed by the Permittees.

b. Intermunicipal Agreement. To facilitate the development and implementation of appropriate aspects of the Joint Proposal on a group basis, including the joint selection and cost-sharing of expert resources, the Permittees or a subset of the Permittees may enter into an intermunicipal agreement pursuant to RSA 53-A:3 (Joint Exercise of Powers). Among other requirements, any such agreement will address the duration, purpose, financing, budget, and administration of such endeavor.

c. Further Efforts. This plan is a non-binding working document that provides a preliminary framework for promptly advancing the important endeavors described herein consistent with the short timeline established in the General Permit, including for submittal of a

Notice of Intent to opt for coverage (by April 2, 2021) and for submittal of the Joint Proposal (by July 31, 2021). This plan does not represent a funding commitment or require any appropriation by any governmental body, nor does it fix the terms and conditions of the anticipated intermunicipal agreement, which is intended to be developed jointly by the participating Permittees. Consistent with the foregoing deadlines, the goal for executing the intermunicipal agreement is March 31, 2021.

* * *

Attachment 2

Election to Join
Intermunicipal Agreement
for Development of an Adaptive Water Quality Management Plan
for Great Bay Estuary

City/Town: _____

Election Date: _____

The Acting Authority (City Manager,Town Administrator, Town Manager or Sewer Commissioner) for purposes of this Intermunicipal Agreement is identified below with contact information:

By signing below I, _____, in my capacity as _____, affirm that I am authorized to enter into this Agreement on behalf of the City/Town.

_____

Prism Project _____

AGREEMENT FOR CONSULTING SERVICES BETWEEN CITY OF ROCHESTER, NH AND BROWN AND CALDWELL FOR PREP ENGAGEMENT

THIS AGREEMENT is made and entered into on this 26th day of January, 2021 by and between the City of Rochester, NH, hereinafter referred to as "Client," and Brown and Caldwell, a California corporation, its affiliates and subsidiaries, hereinafter referred to as "Consultant."

RECITALS:

WHEREAS, Client is authorized to and desires to retain Consultant to engage with the Piscataqua Region Estuaries Partnership (PREP), DES, and other stakeholders, as PREP develops the research and monitoring initiative required by the National Discharge Elimination System Great Bay Total Nitrogen General Permit for Wastewater Treatment Facilities in New Hampshire.

WHEREAS, Consultant has available and offers to provide personnel and facilities necessary to perform the desired services within the required time; and

WHEREAS, Client desires to retain Consultant to perform the services in the manner, at the time, and for the compensation set forth herein;

NOW, THEREFORE, Client and Consultant agree as follows:

I. DESCRIPTION OF PROJECT

Client and Consultant agree that Project is as described in Exhibit A, entitled "Description of Project," dated January 4, 2021. If, during the course of Project, Client and Consultant agree to changes in Project, such changes shall be incorporated in this Agreement by written amendment.

II. SCOPE OF CONSULTANT SERVICES

Consultant agrees to perform those services described hereafter. Unless modified in writing by both parties, duties of Consultant shall not be construed to exceed those services specifically set forth herein.

A. Basic Services

Consultant agrees to perform those basic services described in Exhibit B entitled "Scope of Services," dated January 4, 2021 (the "Services"). Any tasks not specifically described in Exhibit B are Additional Services.

B. Additional Services

Client shall pay Consultant all fees and costs incurred in performing Additional Services provided the services were either (a) authorized by Client, or (b) required to be performed due to emergency conditions at the project site. Client will be deemed to

have authorized the Additional Services if Consultant provides Client with notification that the Additional Services will be performed and Client does not object within five (5) working days after notification. Unless otherwise agreed in writing, Additional Services shall be performed in accordance with Consultant's standard billing rates at the time the Additional Services are performed.

C. Litigation Assistance

Unless specifically stated therein, the Scope of Services does not include assistance to support, prepare, document, bring, defend, or assist in litigation undertaken or defended by Client. All such services required or requested of the Consultant by Client or any third party (except claims between Client and Consultant) will be reimbursed at Consultant's applicable rates for such litigation services.

D. Document Productions

In the event Brown and Caldwell is requested pursuant to subpoena or other legal process to produce its documents or any other information relating to Brown and Caldwell's services under this agreement in judicial or administrative proceedings to which Brown and Caldwell is not a party, Client shall reimburse Brown and Caldwell at standard billing rates for its time and expenses incurred in responding to such requests.

III. RESPONSIBILITIES OF CLIENT

In addition to payment for the Services performed under this Agreement, Client shall:

1. Assist and cooperate with Consultant in any manner necessary and within its ability to facilitate Consultant's performance under this Agreement.
2. Designate in writing a person to act as Client's representative with respect to this Agreement. Such person shall have complete authority to transmit instructions, receive information, interpret and define Client's policies, make decisions and execute documents on Client's behalf.
3. Furnish Consultant with all technical data in Client's possession including, but not limited to, maps, surveys, drawings, soils or geotechnical reports, and any other information required by, or useful to, Consultant in performance of its Services under this Agreement. Consultant shall be entitled to rely upon the information supplied by Client.
4. Notify Consultant of any known or potential health or safety hazards existing at or near the project site.
5. Provide access to and/or obtain permission for Consultant to enter upon all property, whether or not owned by Client, as required to perform and complete the Services.
6. If Consultant's scope of work includes services during construction, Client will require the construction contractor to indemnify and hold harmless Consultant, its officers, employees, agents, and consultants against claims, suits, demands, liabilities, losses, damages, and costs, including reasonable attorneys' fees and all other costs of defense, arising out of the performance of the work of the contractor, breach of contract, or willful misconduct of the contractor or its subcontractors, employees, and agents.

   Client will require the contractor to name Consultant, its directors, officers and employees as additional insureds on the contractor's general liability insurance and/or

Owner's and Contractor's Protective policy (OCP), and any builder's risk, or other property insurance purchased by Client or the contractor to protect work in progress or any materials, supplies, or equipment purchased for installation therein.

Client will furnish contractor's certificates of insurance evidencing that Consultant, its officers, employees, agents, and consultants are named as additional insureds on contractor's general liability and property insurance applicable to the Project. Contractor's policies shall be primary and any such insurance carried by the Consultant shall be excess and noncontributory. The certificates shall provide that Consultant be given 30 days' written notice prior to any cancellation thereof.

IV. AMERICANS WITH DISABILITIES ACT

Any other provision of this Agreement to the contrary notwithstanding, unless otherwise specified in the Scope of Services, Client shall have sole responsibility as between Client and Consultant for compliance with the Americans With Disabilities Act ("ADA") 42 U.S.C. 12101 et. Seq. and the related regulations.

V. AUTHORIZATION AND COMPLETION

In signing this Agreement, Client grants Consultant specific authorization to proceed with work specified in Exhibit B. The estimated time for completion is within 120 calendar days of the date Consultant receives authorization to proceed with the work from Client. Consultant shall use its best efforts to perform the work specified in Exhibit B within the estimated time.

VI. COMPENSATION

A. Amount

For the Services described in Exhibit B, Client agrees to pay, and Consultant agrees to accept compensation in accordance with Exhibit C, which shall not be exceeded without the consent of the Client. Where Consultant has provided Client with a breakdown of the total compensation into subtasks, such breakdowns are estimates only. Consultant may reallocate compensation between tasks, provided total compensation is not exceeded without the approval of Client. Consultant will provide Client with an updated estimate of the cost to complete this work s once approximately 75% of the work is completed.

B. Payment

As long as Consultant has not defaulted under this Agreement, Client shall pay Consultant within 30 days of the date of Consultant's invoices for services performed and reimbursable expenses incurred under this Agreement. If Client has reason to question or contest any portion of any such invoice, amounts questioned or contested shall be identified and notice given to Consultant, within 30 days of the date of the invoice. Any portion of any invoice not contested shall be deemed to be accepted and approved for payment and shall be paid to Consultant within 30 days of the date of the invoice. Client agrees to cooperate with Consultant in a mutual effort to resolve promptly any contested portions of Consultant's invoices.

In the event any uncontested portions of any invoice are not paid within 30 days of the date of Consultant's invoice, interest on the unpaid balance shall accrue beginning with the 31st day at the maximum interest rate permitted by law, and Consultant shall have the

right to suspend work per Article XV, Suspension of Work.

VII. RESPONSIBILITY OF CONSULTANT

A. Standard of Care—Professional Services

Subject to the express provisions of the agreed scope of work as to the degree of care, amount of time and expenses to be incurred, and subject to any other limitations contained in this Agreement, Consultant shall perform its Services in accordance with generally accepted standards and practices customarily utilized by competent engineering firms in effect at the time Consultant's Services are rendered. Consultant does not expressly or impliedly warrant or guarantee its Services.

B. Reliance upon Information Provided by Others

If Consultant's performance of services hereunder requires Consultant to rely on information provided by other parties (excepting Consultant's subcontractors), Consultant shall not independently verify the validity, completeness, or accuracy of such information unless otherwise expressly engaged to do so in writing by Client.

VIII. ASSIGNMENT OF TASKS TO AFFILIATES

A. If the authorized scope of work includes construction activities or the oversight of construction, Consultant may, at its discretion and upon notice to Client, assign all of its contractual rights and obligations with respect to such activities or services to Brown and Caldwell Constructors, its wholly owned affiliate.

B. If the authorized scope of work requires professional services to be performed in a jurisdiction in which Consultant renders professional services solely through a locally registered engineering affiliate for purposes of compliance with professional licensing requirements in that jurisdiction, Consultant may, in its discretion, upon notice to Client, and with Client's written consent, assign its contractual rights and obligations with respect to such activities or services to such locally registered engineering affiliate.

IX. CONSULTANT'S WORK PRODUCT

A. Scope

Consultant's work product which is prepared solely for the purposes of this Agreement, including, but not limited to, drawings, test results, recommendations and technical specifications, whether in hard copy or electronic form, shall become the property of Client when Consultant has been fully compensated as set forth herein. Consultant may keep copies of all work product for its records.

Consultant and Client recognize that Consultant's work product submitted in performance of this Agreement is intended only for the project described in this Agreement. Client's alteration of Consultant's work product or its use by Client for any other purpose shall be at Client's sole risk.

B. Electronic Copies

If requested, solely as an aid and accommodation to Client, Consultant may provide copies of its work product documents in computer-readable media ("electronic copies," "CADD"). These documents will duplicate the documents provided as work product,

but will not bear the signature and professional seals of the registered professionals responsible for the work. Client is cautioned that the accuracy of electronic copies and CADD documents may be compromised by electronic media degradation, errors in format translation, file corruption, printing errors and incompatibilities, operator inexperience and file modification. Consultant will maintain the original copy, which shall serve as the official, archived record of the electronic and CADD documents.

X. INDEMNIFICATION

A. Indemnification of Client

Consultant agrees to indemnify and hold Client harmless from and against any liability to the extent arising out of the negligent errors or negligent omissions of Consultant, its agents, employees, or representatives, in the performance of Consultant's duties under this Agreement.

B. Consequential Damages

Regardless of any other term of this Agreement, in no event shall either party be responsible or liable to the other for any incidental, consequential, or other indirect damages.

XI. CONSULTANT'S INSURANCE

Consultant shall procure and maintain the following minimum insurance:

1. Commercial general liability insurance, including personal injury liability, blanket contractual liability and broad-form property damage liability coverage. The combined single limit for bodily injury and property damage shall be not less than $1,000,000.
2. Automobile bodily injury and property damage liability insurance covering owned, non-owned, rented, and hired cars. The combined single limit for bodily injury and property damage shall be not less than $1,000,000.
3. Statutory workers' compensation and employer's liability insurance as required by state law.
4. Professional liability insurance. The policy limit shall be not less than $1,000,000.

Client shall be named as additional insured on policies 1 and 2 above. Upon request, a certificate of insurance will be provided to Client with a 30-day written notice in the event the above policies are cancelled.

XII. CONFIDENTIALITY

Consultant agrees it will maintain the confidentiality of material it receives from Client which Client has clearly identified as "Confidential" and will not disclose, distribute, or publish to any third party such confidential information without the prior permission of Client. Notwithstanding the foregoing, Consultant shall have no confidentiality obligation with respect to information that:

1) becomes generally available to the public other than as a result of disclosure by Consultant or its agents or employees;

2) was available to Consultant on a non-confidential basis prior to its disclosure by Client;

3) becomes available to Consultant from a third party who is not, to the knowledge of

Consultant, bound to retain such information in confidence.

In the event Consultant is compelled by subpoena, court order, or administrative order to disclose any confidential information, Consultant shall promptly notify Client and shall cooperate with Client prior to disclosure so that Client may take necessary actions to protect such confidential information from disclosure.

XIII. SUBCONTRACTS

Consultant shall be entitled, to the extent determined appropriate by Consultant, to subcontract any portion of the services to be performed under this Agreement with the written consent of Client. Subconsultant markup will be five (5) percent of subcontract cost.

XIV. SUSPENSION OF WORK

Work under this Agreement may be suspended as follows:

1. By Client. By written notice to Consultant, Client may suspend all or a portion of the Work under this Agreement if unforeseen circumstances beyond Client's control make normal progress of the Work impracticable. Consultant shall be compensated for its reasonable expenses resulting from such suspension including mobilization and demobilization. If suspension is greater than 30 days, then Consultant shall have the right to terminate this Agreement in accordance with Article XVI, Termination of Work.
2. By Consultant. By written notice to Client, Consultant may suspend the Work if Consultant reasonably determines that working conditions at the Site (outside Consultant's control) are unsafe, or in violation of applicable laws, or in the event Client has not made timely payment in accordance with Article VI, Compensation, or for other circumstances not caused by Consultant that are interfering with the normal progress of the Work. Consultant's suspension of Work hereunder shall be without prejudice to any other remedy of Consultant at law or equity.

XV. TERMINATION OF WORK

A. This Agreement may be terminated by Client as follows: (1) for its convenience on 30 days' notice to Consultant, or (2) for cause, if Consultant materially breaches this Agreement through no fault of Client and Consultant neither cures such material breach nor makes reasonable progress toward cure within 15 days after Client has given written notice of the alleged breach to Consultant.

B. This Agreement may be terminated by Consultant as follows: (1) for cause, if Client materially breaches this Agreement through no fault of Consultant and Client neither cures such material breach nor makes reasonable progress toward cure within 15 days after Consultant has given written notice of the alleged breach to Client, or (2) upon five days' notice if work under this Agreement has been suspended by either Client or Consultant for more than 30 days in the aggregate.

C. Payment upon Termination

In the event of termination, Consultant shall perform such additional work as is reasonably necessary for the orderly closing of the Work. Consultant shall be compensated for all work performed prior to the effective date of termination, plus work required for the orderly closing of the Work, including: (1) authorized work performed up to the termination date plus termination expenses, including all labor and expenses, at Consultant's standard billing rates, directly attributable to termination; (2) all efforts necessary to document the work completed or in progress; and (3) any termination reports requested by Client.

XVI. ASSIGNMENT

This Agreement is binding on the heirs, successors, and assigns of the parties hereto. This Agreement may not be assigned by Client or Consultant without prior, written consent of the other. Notwithstanding the foregoing, this Agreement may be assigned by Client to the Municipal Alliance for Adaptive Management.

XVII. NO BENEFIT FOR THIRD PARTIES

The services to be performed by Consultant are intended solely for the benefit of Client, and no benefit is conferred on, nor contractual relationship established with any person or entity not a party to this Agreement. No such person or entity shall be entitled to rely on Consultant's services, opinions, recommendations, plans, or specifications without the express written consent of Consultant. No right to assert a claim against the Consultant, its officers, employees, agents, or consultants shall accrue to the construction Contractor or to any subcontractor, supplier, manufacturer, lender, insurer, surety, or any other third party as a result of this Agreement or the performance or nonperformance of the Consultant's services hereunder. Notwithstanding the foregoing, the Cities of Dover and Portsmouth are third-party beneficiaries with full access to Consultant's work product, data and communications.

XIII. FORCE MAJEURE

Consultant shall not be responsible for delays caused by circumstances beyond its reasonable control, including, but not limited to (1) strikes, lockouts, work slowdowns or stoppages, or accidents, (2) acts of God, (3) failure of Client to furnish timely information or to approve or disapprove Consultant's instruments of service promptly, and (4) faulty performance or nonperformance by Client, Client's independent consultants or contractors, or governmental agencies. Consultant shall not be liable for damages arising out of any such delay, nor shall the Consultant be deemed to be in breach of this Agreement as a result thereof.

XIX. INTEGRATION

This Agreement represents the entire understanding of Client and Consultant as to those matters contained herein. No prior oral or written understanding shall be of any force or effect with respect to those matters covered herein. This Agreement may not be modified or altered except in writing signed by both parties. Any purchase order issued by Client, whether or not signed by Consultant, and any terms and conditions contained in such purchase order which are inconsistent with this Agreement shall be of no force and effect.

XX. SEVERABILITY

If any part of this Agreement is found unenforceable under applicable laws, such part shall be inoperative, null, and void insofar as it conflicts with said laws, but the remainder of this Agreement shall be in full force and effect.

XXI. CHOICE OF LAW/JURISDICTION

This Agreement shall be administered and interpreted under the laws of the State of New Hampshire. Jurisdiction of litigation arising from the Agreement shall be in that state.

XXII. NOTICES

All notices required under this Agreement shall be delivered by facsimile, personal delivery or mail and shall be addressed to the following persons:

Mark Allenwood, PE
Project Manager
Brown and Caldwell
One Tech Drive Suite 310
Andover, MA 01810-2435

Michael Bezanson, PE
City Engineer
City of Rochester
45 Old Dover Road
Rochester, NH 03867

Notice shall be effective upon delivery to the above addresses. Either party may notify the other that a new person has been designated by it to receive notices, or that the address or Fax number for the delivery of such notices has been changed, provided that, until such time as the other party receives such notice in the manner provided for herein, any notice addressed to the previously-designated person and/or delivered to the previously-designated address or Fax number shall be effective.

XXV AUTHORIZATION

The persons executing this Agreement on behalf of the parties hereto represent and warrant that the parties have all legal authority and authorization necessary to enter into this Agreement, and that such persons have been duly authorized to execute this Agreement on their behalf.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date first above written.

Brown and Caldwell

Signature

Printed Name Deborah Mahoney

Title Senior Director Client Services

City of Rochester, NH

Signature

Printed Name Blaine Cox

Title City Manager

Federal Tax ID number: 94-1446346

EXHIBIT A

DESCRIPTION OF PROJECT

The Environmental Protection Agency (EPA) has issued the *National Pollutant Discharge Elimination System Great Bay Total Nitrogen General Permit for Wastewater Treatment Facilities in New Hampshire,* Permit Number NHG58A000. This NPDES permit includes an Adaptive Management Framework Voluntary Submittal, which will require ambient water quality monitoring, ~~nitrogen~~ pollution tracking and reporting these findings to the EPA. These efforts related to the Adaptive Management Framework will be undertaken by the Piscataqua Region Estuaries Partnership (PREP), DES and other stakeholders with active participation by the GBE municipalities.

Deborah Mahoney

BMC 1-27-21

The Project will be BC's engagement with PREP and others regarding the research and monitoring plan currently being developed for the Great Bay Estuary (GBE). BC's tasks specific to the Project include Project Management and Administration, Existing Document Review, PREP Meeting Participation, Technical Support for Monitoring and Study Plans and Technical Support for Adaptive Management Framework.

These tasks will be completed by the BC team of Mark Allenwood, Clifton Bell, Dan Hammond, Stacy Villanueva, Kirk Westphal and Andrew Goldberg. Mark Allenwood will serve as project manager, assisted by Andrew Goldberg. Clifton Bell will serve as the lead scientist, and specifically lead project components that involve communication of technical positions to PREP,regulatory agencies, and other stakeholders. Clifton Bell, Dan Hammond, Stacy Villanueva and Kirk Westphal will provide technical support on individual tasks as needed.

EXHIBIT B

SCOPE OF SERVICES

The following tasks will be performed to engage with the Piscataqua Region Estuaries Partnership (PREP) regarding the research and monitoring plan currently being developed for the Great Bay Estuary (GBE).

Task 1 –Project Management and Administration

BC shall perform project management and administration while performing Engineering Services throughout the project. Project management and administration shall include:

i) Preparation of monthly invoices;

ii) Preparation of monthly summaries of work;

iii) Routine project management.

A total of 16 hours has been budgeted for Task 1.

Task 2- Existing Document Review

The initial task will involve review and comment on the existing documentation related to the recently issued Great Bay Total Nitrogen General Permit and the PREP monitoring initiative. The specific documents to be reviewed as a part of this task are:

- Great Bay Total Nitrogen General Permit
- EPA Response to Comments on the Great Bay General Permit
- PREP – RAMP document
- PREP Prospectus
- McDowell Pre-Proposal

Review of these documents is necessary to understand the current status of the PREP initiative, the intersection(s) between the General Permit and the PREP effort, and prepare action items in the best interests of the affected municipalities. Following review of these documents, BC will prepare a tech memo summarizing the current plan to date and providing recommended action items for involvement with PREP.

A total of 64 hours has been budgeted for Task 2.

Task 3 – PREP meeting participation

BC will participate in upcoming PREP working group meetings regarding the research and monitoring initiative. This scope assumes all meeting participation will occur virtually and no travel is included in this scope. Based on PREP's previous schedule, meetings are generally assumed to occur quarterly. Additional meetings with participating municipalities, DES, or other stakeholders might take place. Therefore, this scope assumes participation in five meetings between January and June 2021. This task

includes prep for each meeting, meeting participation, and an email summary of meeting notes and any proposed action items submitted to Rochester, Dover, and Portsmouth within seven working days of the meeting.

A total of 74 hours has been budgeted for Task 3.

Task 4 – As-Needed Technical Support for Monitoring and Study Plans

BC anticipates new documents or revised versions of current documents will be developed by PREP and/or EPA as this process continues. The number of documents or level of review needed cannot be anticipated at this time. Therefore, BC has included an as-needed task to cover additional technical support that may arise during our engagement with PREP and their research and monitoring initiative. Examples of activities that could be accomplished under this task include additional literature reviews, independent data analyses, reviews of PREP/agency documents, and drafting of letters or other communications to advocate technical positions.

A total of 120 hours has been budgeted for Task 4.

Task 5 - As Needed Technical Support for Adaptive Management Framework

The general permit provides the option for permittees to submit an adaptive management framework within 180 days of the effective date. This task includes technical activities to make progress on the adaptive management framework through June 1, 2020. This could include the development of recommendations for monitoring, tracking nitrogen reductions, developing water quality endpoints, or modeling. As with Task 3, Task 4 is limited by the available labor hours and will be managed accordingly. This task does not include the complete development of an adaptive management framework document, which it is assumed will occur after June 2020.

A total of 56 hours has been budgeted for Task 5.

EXHIBIT C

COMPENSATION

For the work described in Exhibit B, compensation shall be a not to exceed fee of $65,530.00, including labor and expenses.

DRAFT - INTERMUNICIPAL AGREEMENT - COST ALLOCATION SHARE RANGES (Comparison)

FACILITY NAME	DESIGN FLOW	SHARE	Annual Cost Ranges $ 100,000.00	$ 250,000.00	$ 500,000.00
Large (> 2 MGD)					
Rochester	5.03	18.65%	$ 18,652.43	$ 46,631.07	$ 93,262.14
Portsmouth	6.13	22.73%	$ 22,731.49	$ 56,828.72	$ 113,657.43
Dover	4.70	17.43%	$ 17,428.71	$ 43,571.77	$ 87,143.55
Exeter	3.00	11.12%	$ 11,124.71	$ 27,811.77	$ 55,623.54
Durham	2.50	9.27%	$ 9,270.59	$ 23,176.47	$ 46,352.95
Somersworth	2.40	8.90%	$ 8,899.77	$ 22,249.42	$ 44,498.83
Subtotal	***23.76***	***88.11%***	***$ 88,107.69***	***$ 220,269.22***	***$ 440,538.44***
Small (<2 MGD)					
Pease ITP	1.20	4.45%	$ 4,449.88	$ 11,124.71	$ 22,249.42
Newmarket	0.85	3.15%	$ 3,152.00	$ 7,880.00	$ 15,760.00
Epping	0.50	1.85%	$ 1,854.12	$ 4,635.29	$ 9,270.59
Newington	0.29	1.08%	$ 1,075.39	$ 2,688.47	$ 5,376.94
Rollinsford	0.15	0.56%	$ 556.24	$ 1,390.59	$ 2,781.18
Newfields	0.12	0.43%	$ 433.86	$ 1,084.66	$ 2,169.32
Milton	0.10	0.37%	$ 370.82	$ 927.06	$ 1,854.12
Subtotal	***3.21***	***11.89%***	***$ 11,892.31***	***$ 29,730.78***	***$ 59,461.56***
TOTAL DESIGN FLOW	**26.97**	**100.00%**			

FACILITY NAME	Total Permit Nitrogen Load	SHARE	Annual Cost Ranges $ 100,000.00	$ 250,000.00	$ 500,000.00
Large (> 2 MGD)					
Rochester	198.00	18.17%	$ 18,165.14	$ 45,412.84	$ 90,825.69
Portsmouth	248.00	22.75%	$ 22,752.29	$ 56,880.73	$ 113,761.47
Dover	167.00	15.32%	$ 15,321.10	$ 38,302.75	$ 76,605.50
Exeter	106.00	9.72%	$ 9,724.77	$ 24,311.93	$ 48,623.85
Durham	59.00	5.41%	$ 5,412.84	$ 13,532.11	$ 27,064.22
Somersworth	92.00	8.44%	$ 8,440.37	$ 21,100.92	$ 42,201.83
Subtotal	***870.00***	***79.82%***	***$ 79,816.51***	***$ 199,541.28***	***$ 399,082.57***
Small (<2 MGD)					
Pease ITP	93.00	8.53%	$ 8,532.11	$ 21,330.28	$ 42,660.55
Newmarket	30.00	2.75%	$ 2,752.29	$ 6,880.73	$ 13,761.47
Epping	43.00	3.94%	$ 3,944.95	$ 9,862.39	$ 19,724.77
Newington	15.00	1.38%	$ 1,376.15	$ 3,440.37	$ 6,880.73
Rollinsford	12.00	1.10%	$ 1,100.92	$ 2,752.29	$ 5,504.59
Newfields	16.00	1.47%	$ 1,467.89	$ 3,669.72	$ 7,339.45
Milton	11.00	1.01%	$ 1,009.17	$ 2,522.94	$ 5,045.87
Subtotal	***220.00***	***20.18%***	***$ 20,183.49***	***$ 50,458.72***	***$ 100,917.43***
TOTAL Permit Load	**1,090.00**	**100.00%**			

Percentage Contribution Comparison

Large (> 2 MGD)	Design Flow	Permit N Load
Rochester	18.65%	18.17%
Portsmouth	22.73%	22.75%
Dover	17.43%	15.32%
Exeter	11.12%	9.72%
Durham	9.27%	5.41%
Somersworth	8.90%	8.44%
Subtotal	88.11%	79.82%
Small (<2 MGD)		
Pease ITP	4.45%	8.53%
Newmarket	3.15%	2.75%
Epping	1.85%	3.94%
Newington	1.08%	1.38%
Rollinsford	0.56%	1.10%
Newfields	0.43%	1.47%
Milton	0.37%	1.01%
Subtotal	11.89%	20.18%
Total	100.00%	100.00%

DRAFT DESIGN FLOW BASED COST ALLOCATION

FACILITY NAME	DESIGN FLOW	SHARE	Annual Cost Range $ 100,000.00	$ 250,000.00	$ 500,000.00
Large (> 2 MGD)					
Rochester	5.03	18.65%	$ 18,652.43	$ 46,631.07	$ 93,262.14
Portsmouth	6.13	22.73%	$ 22,731.49	$ 56,828.72	$ 113,657.43
Dover	4.70	17.43%	$ 17,428.71	$ 43,571.77	$ 87,143.55
Exeter	3.00	11.12%	$ 11,124.71	$ 27,811.77	$ 55,623.54
Durham	2.50	9.27%	$ 9,270.59	$ 23,176.47	$ 46,352.95
Somersworth	2.40	8.90%	$ 8,899.77	$ 22,249.42	$ 44,498.83
Subtotal	***23.76***	***88.11%***	***$ 88,107.69***	***$ 220,269.22***	***$ 440,538.44***
Small (<2 MGD)					
Pease ITP	1.20	4.45%	$ 4,449.88	$ 11,124.71	$ 22,249.42
Newmarket	0.85	3.15%	$ 3,152.00	$ 7,880.00	$ 15,760.00
Epping	0.50	1.85%	$ 1,854.12	$ 4,635.29	$ 9,270.59
Newington	0.29	1.08%	$ 1,075.39	$ 2,688.47	$ 5,376.94
Rollinsford	0.15	0.56%	$ 556.24	$ 1,390.59	$ 2,781.18
Newfields	0.12	0.43%	$ 433.86	$ 1,084.66	$ 2,169.32
Milton	0.10	0.37%	$ 370.82	$ 927.06	$ 1,854.12
Subtotal	***3.21***	***11.89%***	***$ 11,892.31***	***$ 29,730.78***	***$ 59,461.56***
TOTAL DESIGN FLOW	**26.97**	**100.00%**			

DRAFT PERMIT NITROGEN LOAD BASED COST ALLOCATION

FACILITY NAME	Total Permit Nitrogen Load	SHARE	Annual Cost Range $ 100,000.00	$ 250,000.00
Large (> 2 MGD)				
Rochester	198.00	18.17%	$ 18,165.14	$ 45,412.84
Portsmouth	248.00	22.75%	$ 22,752.29	$ 56,880.73
Dover	167.00	15.32%	$ 15,321.10	$ 38,302.75
Exeter	106.00	9.72%	$ 9,724.77	$ 24,311.93
Durham	59.00	5.41%	$ 5,412.84	$ 13,532.11
Somersworth	92.00	8.44%	$ 8,440.37	$ 21,100.92
Subtotal	***870.00***	***79.82%***	***$ 79,816.51***	***$ 199,541.28***
Small (<2 MGD)				
Pease ITP	93.00	8.53%	$ 8,532.11	$ 21,330.28
Newmarket	30.00	2.75%	$ 2,752.29	$ 6,880.73
Epping	43.00	3.94%	$ 3,944.95	$ 9,862.39
Newington	15.00	1.38%	$ 1,376.15	$ 3,440.37
Rollinsford*	12.00	1.10%	$ 1,100.92	$ 2,752.29
Newfields	16.00	1.47%	$ 1,467.89	$ 3,669.72
Milton*	11.00	1.01%	$ 1,009.17	$ 2,522.94
Subtotal	***220.00***	***20.18%***	***$ 20,183.49***	***$ 50,458.72***
TOTAL Permit N Load	**1,090.00**	**100.00%**		

*Permit requires Rollinsford & Milton to monitor & report only for 1st 24 month (14 growing
These values are calculated from the January 2020 Draft Permit.

$	**500,000.00**
$	90,825.69
$	113,761.47
$	76,605.50
$	48,623.85
$	27,064.22
$	42,201.83
$	***399,082.57***
$	42,660.55
$	13,761.47
$	19,724.77
$	6,880.73
$	5,504.59
$	7,339.45
$	5,045.87
$	***100,917.43***

season months).

Appendix E

Great Bay Settlement Agreement
Dover, Rochester, Portsmouth, CLF

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SETTLEMENT AGREEMENT BY AND BETWEEN CONSERVATION LAW FOUNDATION AND CITIES OF DOVER, ROCHESTER, AND PORTSMOUTH

The Cities of Dover, Rochester, and Portsmouth (collectively "the Municipalities") and the Conservation Law Foundation, Inc. ("CLF"), for good and valuable consideration mutually exchanged and acknowledged, hereby enter into this Settlement Agreement ("Agreement") by and between as follows:

WHEREAS, in January 2020, the United States Environmental Protection Agency (Region 1) ("EPA") issued the "Draft National Pollutant Discharge Elimination System (NPDES) Great Bay Total Nitrogen General Permit for Wastewater Treatment Facilities in New Hampshire" (NPDES Permit No. NHG58A000) (hereinafter "Draft General Permit");

WHEREAS, the Municipalities, CLF, and other interested parties submitted extensive written comments on the Draft General Permit;

WHEREAS, on November 24, 2020, EPA issued the final Great Bay Total Nitrogen General Permit (NPDES Permit No. NHG58A000) (the "General Permit") along with EPA's Fact Sheet and Response to Public Comments, each *available at* https://www.epa.gov/npdes-permits/great-bay-total-nitrogen-general-permit;

WHEREAS, Part 2 of the General Permit contains final effluent limitations and monitoring requirements for each Permittee's wastewater treatment facility ("WWTF") similar to those in the draft permit, although with more recent (updated) flow data and, in keeping with scientific knowledge and past EPA permitting practice, a total nitrogen load limit based on the growing season of eelgrass;

WHEREAS, Part 3 of the General Permit provides for the voluntary submission of a proposal, within 180 days of the effective date of the permit, outlining: (1) an approach to ambient water quality monitoring to determine progress and trends; (2) a method of tracking total nitrogen reductions and additions over the course of the permit; (3) an outline/plan for overall source reductions of total nitrogen over the course of the permit; (4) an inclusive and transparent process for comprehensively evaluating significant scientific and methodological issues relating to the permit, including the assumption of a load-based threshold of 100 kg ha^{-1} yr^{-1} versus any other proposed threshold that might be used for future permitting or planning purposes, including a concentration-based threshold of .32 mg/L;

WHEREAS, the Municipalities may choose to Opt-In to the General Permit and become permittees (the "Permittees");

WHEREAS, EPA's Responses to Comments accompanying the General Permit state that the "assessment of progress on nonpoint source reductions could lead EPA to reissue an adaptive management permit if reasonable grounds exist to do so, or to abandon that approach in

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favor of a more traditional one insofar as insufficient progress is being made on necessary nonpoint source reductions";

WHEREAS, the Municipalities have opted, or are expected to opt, into the General Permit;

WHEREAS, the Municipalities, along with other permittees, have begun the work of developing an Adaptive Management Plan for submission to the EPA by July 31, 2021;

WHEREAS, CLF has considered appealing EPA's final agency action to issue the General Permit;

WHEREAS, CLF, Dover, Rochester, and Portsmouth have, in good faith, engaged in a facilitated process to reach a negotiated resolution of the General Permit and its administration;

WHEREAS, this Agreement is a resolution of a dispute between the parties relative to the value of the General Permit to achieve a measurable environmental benefit.

NOW THEREFORE, the Parties, for themselves, their successors and assigns, enter into this Agreement for the purposes described above on the terms set forth below:

1. Recitals: The above recitals are incorporated herein by reference.

2. Definitions:

"Consult" or "consultation": Any requirement in this Agreement to "consult" or engage in "consultation" means that the party actor solicits non-binding input, information, or commentary. "Consult" or "consultation" does not in any way mean or imply an approval authority is needed from the party who is being consulted. A party required to "consult" or seek "consultation" with another party retains sole discretion concerning the matter for which consultation is made.

"Eelgrass growing season": The eelgrass growing season refers to that period of each calendar year from April 1 to October 31.

"IMA" or "IMA Group": IMA or IMA group refers to those municipalities who have or are expected to formally execute the Intermunicipal Agreement for Development of an Adaptive Water Quality Management Plan for Great Bay Estuary. Dover, Rochester, Portsmouth, Milton, Newington, and Exeter, so far, have indicated a willingness to execute the IMA, while others have the IMA under consideration.;

"Structural Best Management Practices": A measure or facility intended to treat, prevent, and/or reduce water pollution through installation of a permanent or semi-permanent structure that is either stand-alone or part of a larger construction project.

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"Nonstructural Best Management Practices": A measure, facility, practice, or action intended to treat, prevent, and/or reduce water pollution through any means other than a structural best management practice.

3. Purpose: The overriding purpose of this Agreement is to collaboratively implement a plan and set forth commitments between the Municipalities and CLF to improve water quality in the Great Bay Estuary and to take such further collaborative actions in compliance with, and furtherance of, the General Permit and the goals stated in the General Permit and associated Fact Sheet and Response to Comments. For purposes of clarity, this Agreement is solely entered into by Dover, Rochester, and Portsmouth in their capacity as individual communities, and not on behalf of the IMA group of municipalities, and this Agreement does not bind the unincorporated association of Permittees forming the IMA group.

4. Term: This Agreement is effective on the date last signed by all parties and will expire on February 28, 2026. However, any individual Municipality shall no longer be subject to this Agreement if and when that individual Municipality withdraws from or otherwise loses coverage under the General Permit.

5. IMA Executive Board Meetings:

   a. RSA 91-A: The Municipalities agree that, in conducting any and all meetings of the Executive Board of the IMA, the Municipalities will ensure that the requirements of New Hampshire RSA chapter 91-A are observed and followed, so long as not inconsistent with applicable law.

   b. Participation by Stakeholder Committee: The Municipalities agree to specifically invite one designated representative of the Stakeholder Committee (discussed below) to attend and speak at all Executive Board and IMA Member meetings, unless such meeting, or portion thereof, is a non-meeting and/or non-public meeting within the meaning of New Hampshire RSA chapter 91-A. In appropriate circumstances determined by the Executive Board of the IMA, the designated representative of the Stakeholder Committee may be permitted to enter into a non-disclosure agreement to enable the Stakeholder Committee's representative to attend an otherwise non-public meeting. Nothing within this provision is intended to limit the Executive Board's ability to adopt reasonable time, place, and manner requirements concerning the public's right to speak or participate in public meetings of the Executive Board.

   c. Meeting Frequency: Dover, Rochester, and Portsmouth agree to use best efforts to ensure that meetings of the IMA Executive Board and meetings of IMA Members occur at least twice per calendar year, beginning in calendar year 2022.

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6. Stakeholder Committee: CLF agrees to establish a Stakeholder Committee separate from the IMA (and not a committee, sub-committee or subsidiary body of the IMA) consisting of organizations and entities with a demonstrated interest in the health, sustainability, and resilience of the Great Bay ecosystem. CLF will engage in best efforts to include one or more members of the business and real estate community. The role of the Stakeholder Committee will be to provide input, perspective, information, review, and monitoring of the IMA activities. The Stakeholder Committee may submit a request for funding or particular cost items as part of the annual IMA budget, though the Municipalities do not hereby guarantee or make any representation herein that such a budget provision will be approved.

7. Tracking Nitrogen Reductions/Additions:

   a. PTAPP: The Municipalities expect that participation in the NHDES Pollutant Tracking and Accounting Pilot Project ("PTAPP") or an equivalent methodology/system will comprise the Municipalities' system and methodology for tracking total nitrogen additions and reductions, an identified part of the adaptive management plan in Part 3 of the General Permit. The Stakeholder Committee may submit any information it deems relevant to the Municipalities' forthcoming submittal of a proposed system and methodology for the aforesaid tracking.

   b. Periodic Consultation: After submitting the adaptive management plan due to EPA by July 31, 2021, the Municipalities or their designee shall thereafter consult with the Stakeholder Committee's designated representative to discuss the Municipalities' planning and execution of ambient water quality monitoring, data gathering, and water quality analysis.

   c. Annual Reporting to IMA: At least two weeks prior to the annual IMA Member meeting each year, and at least two weeks prior to any second meeting of the IMA that takes place in a given year**,** the Municipalities shall develop a report (to be publicly presented at said IMA Member meeting) on the following:

      i. Structural & Non-structural BMPs planned for the next year including, as applicable, location, estimated cost, and estimated reductions in total nitrogen and/or other pollutants to the extent known or capable of being estimated.

      ii. Structural & Non-structural BMPs implemented during past year including, as applicable, location, cost, and estimated or known reductions in total nitrogen and/or other pollutants to the extent known or capable of being estimated.

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The Municipalities shall encourage other IMA Members to provide the information described in subparts i. and ii. of this subparagraph for inclusion in the report. To facilitate this reporting, the Municipalities will work with the Stakeholder Committee to develop a standardized dashboard to compile and present the data in a manner enabling consistent and uniform reporting of implemented and planned progress by the Municipalities individually and collectively. The Stakeholder Committee and CLF may utilize the nitrogen reductions from implementation of the structural and non-structural BMPs reported on the dashboard and Annual Reports as a measure of performance by the Municipalities.

8. Funding Sustainability: Recognizing that sustainable funding is imperative for ongoing water quality efforts, the Municipalities shall consider the adoption (by local ordinance or act) of a stormwater utility by December of 2023. The Stakeholder Committee may provide input or information to the Municipalities by way of either submitting written comments or providing verbal comments, if permitted, during any public speaking forum held by any public body of the Municipalities, and shall be provided notice of such comment opportunities.

9. Total Nitrogen Source Reductions: With respect to voluntary submission of an outline/plan for overall source reductions of total nitrogen over the course of the permit (as called for in Part 3 of the General Permit), the Municipalities and CLF recognize that such submissions are voluntary and are not due to EPA until July 31, 2021. Moreover, CLF and the Municipalities recognize that true adaptive management depends on flexibility and the ability to adapt as more information becomes available. The Municipalities agree to make a submission to EPA as envisioned in Part 3 of the General Permit, to be updated and refined at least annually from the date of first submission and thereafter resubmitted annually to EPA after each annual update. Moreover, the Municipalities also agree to the following features of their overall source reduction plan, as drawn from (i) the "Feasibility Analysis for USEPA's Draft Great Bay Total Nitrogen General Permit" dated May 8, 2020 and drafted by Robert M. Roseen[1], and (ii) letter from NHDES Commissioner Robert Scott to Dennis Deziel dated July 27, 2020[2]:

   a) WWTF Effluent Measures: The Municipalities agree, as part of an overall source reduction plan for nitrogen, to consider, plan for, and implement measures, as funded by the governing bodies of each Municipality, that reduce nitrogen in the effluent from their respective WWTFs during the eelgrass

[1] In drawing from this study for purposes of settlement, the Municipalities do not indicate agreement with conclusions and assertions in that study, and reserve the right to disagree in part or in full with said study.

[2] The NHDES letter provides very helpful information and vision for forthcoming water quality project planning and ideas, though by referencing the NHDES letter here, the Municipalities do not adopt said letter, and reserve their rights and the flexibility accorded to them as outlined in Part 3 of the General Permit.

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growing season. For example, the Municipalities may develop optimization plans and/or projects aimed at reducing inflow/infiltration, as selected by the Municipalities in their sole discretion.

b) Funding Opportunities: As recognized by NHDES, "[k]ey to many of the actions in the NGP is funding." NHDES Letter of July 27, 2020, at 3. The Municipalities' agree to work with NHDES and others to identify and pursue applicable state, federal, or private grants, subsidies, or other measures aimed at water quality improvements, subject to prior approval of the governing body of Dover, Rochester, and Portsmouth to accept and expend such funding.

c) Structural Best Management Practices: The Municipalities shall plan for and undertake structural best management practices ("BMPs"), as either part of other projects or as stand-alone projects, which improve water quality in the Great Bay Estuary through removal of nitrogen and other pollutants. The structural BMPs shall be the same or similar to those identified or exemplified within Dr. Roseen's report. The structural BMPs undertaken by the Municipalities may include one or more of the following features:

   i. Low Impact Development (LID) Structural BMPs that effectively disconnect impervious surfaces through the use of enhanced infiltration and/or that provide area-wide stormwater treatment.

   ii. Low maintenance designs with an emphasis on pretreatment.

   iii. Regular inspections and maintenance.

d) Non-Structural Best Management Practices: The Municipalities shall plan for and undertake non-structural BMPs as part of the overall total nitrogen source reduction plan submitted to EPA and updated at least annually. Non-structural BMPs may include measures such as the following:

   i. Adoption of stormwater ordinances (or site regulations) that require LID site planning and design strategies to reduce the discharge of stormwater from new development or re-development of private property;
   ii. Leaf and yard waste collection;
   iii. Street sweeping;
   iv. Catch basin cleaning and support programs;
   v. Agricultural strategies;
   vi. Buffer protection;

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e) Pilot Testing of Structural or Nonstructural BMPs: The Municipalities agree to collectively fund and undertake pilot testing of innovative structural or non-structural BMPs, such as septic retrofit technology, as selected by the Municipalities in their sole discretion. The pilot testing shall be to determine the cost, feasibility, and efficacy of structural and nonstructural BMPs that the Municipalities have not, to date, attempted or utilized. The pilot testing, if successful, will improve future refinement of the overall source reduction plans and efforts by the Municipalities (and, presumably, other permittees).

f) Other Efforts: The Municipalities also agree to consider and, if authorized by their governing bodies, to undertake other efforts aimed at reducing total nitrogen loads to the Great Bay estuary, such as:

i. Urban fertilizer reduction efforts, including limiting the use and nitrogen content of fertilizers, voluntary incentive programs for residential and commercial properties to reduce fertilizer use, and advocacy for legislation as detailed in the NHDES letter of July 27, 2020 (p. 4);
ii. Oyster restoration, wetlands restoration, salt marsh restoration, and eelgrass restoration;
iii. Septic system retrofit programs;
iv. Septic system legislation, including statewide legislation as detailed in the NHDES letter of July 27, 2020 (p. 4).

10. Identified Water Quality Improvement Opportunities: In addition to the foregoing, the Municipalities have individually identified non-structural best management practices beyond current MS4 obligations; anticipated capital improvement projects and stand-alone projects with structural best management practices; as well as diverse initiatives intended to address water quality improvement in the Great Bay Estuary. These lists of water quality improvement opportunities are attached and incorporated to this Agreement as non-binding statements of present intent by the Municipalities. CLF understands and agrees that completion of these projects is dependent on the continued validity of the General Permit, purchasing approvals from governing bodies of the Municipalities and/or other public officials, funding appropriations of the respective Municipalities (which funding appropriations are at the sole discretion of the governing body of the respective Municipalities), and any other requirements of law, potentially including federal/state/local permitting. The parties recognize that the Municipalities may select projects that are likely to improve water quality, but for which nitrogen removal is only a partial benefit.

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11. Petition(s) for Individual Permits: The Municipalities and CLF anticipate that the petition process under EPA's general permit regulations may be used by CLF to request that any owner or operator authorized by the General Permit, including one or more of the Municipalities, be covered instead by an individual permit, *see* 40 C.F.R. § 122.28(b)(3)(i). The Municipalities and CLF expect such petition or possibility thereof will function as a continuing check and incentive to ensure that reasonable further progress is being made by the Municipalities to identify and implement total nitrogen source reductions under the General Permit over its 5-year term. Implementation of these reductions is recognized as a principal assumption of the General Permit. In order to conserve limited resources, and to facilitate speedy resolution of disputes, the Municipalities and CLF agree that any such petition may be concise, briefly setting forth material facts relevant to EPA's consideration of the petition. Any petition shall provide a time-limited opportunity for the Municipality to cure any alleged defect in nonpoint source reduction planning and implementation and, if timely cured to CLF's satisfaction, CLF agrees to withdraw such petition. If the alleged defect is not timely cured to the CLF's satisfaction, CLF will request that EPA promptly act on the petition on the record before it (including any information that may be supplied by the Municipalities and CLF in a reasonably timely manner) and the Municipalities will assent to said request of EPA for prompt action to approve or disapprove the petition. CLF may file a petition for failure of the Municipalities to make reasonable progress towards nitrogen reductions as measured by Paragraph 10. The Municipalities' continued and timely implementation of the lists referred to in the paragraph above, or substantially equivalent efforts in terms of nitrogen reductions (including but not limited to total nitrogen load outputs falling below that permitted by the General Permit for Dover and Portsmouth), during the first three years of the permit term constitute prima facie evidence of reasonable progress towards nitrogen reductions during such time period for the purposes of any petition filed by CLF under 40 CFR § 122.28(b)(3)(i) ("Prima Facie Benefit"). By February 1, 2024, each Municipality shall separately submit to CLF an updated list of water quality improvement opportunities as described in the paragraph above, premised on their respective nitrogen reduction planning efforts that each Municipality is in the process of developing or updating. Based on these updated lists CLF may, in its discretion, extend the Prima Facie Benefit for up to the remaining duration of the permit term on a municipality-specific basis.

12. Additional Great Bay Water Quality Projects: The Municipalities agree to fund, collectively, the total amount of forty five thousand dollars ($45,000) for one or more not-for-profit Great Bay water quality-related projects or initiatives in calendar year 2021, as selected by the Stakeholder Committee and approved by the Municipalities. The Municipalities' approval of the aforesaid water quality projects shall not be unreasonably withheld. The payment and use of the $45,000, or any portion thereof, shall be subject to a mutually satisfactory grant agreement to be drafted by the parties

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and executed by the Municipalities, CLF, and the recipient(s) of the $45,000 or any portion thereof.

13. Covenant not to appeal the General Permit: CLF hereby agrees and covenants not to appeal, contest, or otherwise assert any legal challenge to the General Permit. Nothing within this provision affects CLF's ability to timely appeal any final agency action on the petitions described in the preceding paragraph above. Nothing within this provision affects CLF's ability to comment on, appeal, contest, or otherwise challenge any future General Permit re-issuance, modification, or the issuance of an individual permit to Dover, Rochester, and/or Portsmouth. Nor does this provision in any way limit CLF's ability to engage in advocacy or any legal challenge with respect to municipalities that are not a party to this Agreement.

14. Enforceability/Binding/Fees: This Agreement shall be binding on all parties, including their corporate or entity parents, affiliates, successors and assigns. With the exception of petitions for individual permits discussed above (to be filed with EPA) or Clean Water Act citizen suits (to be filed in federal court), the exclusive venue for any disputes arising out of this Agreement shall be the Superior Courts of the State of New Hampshire, in either Rockingham County or Strafford County Superior Court. Each party shall bear their own litigation costs, attorney's fees, and/or expert fees in any such litigation. Prior to filing any action in Superior Court alleging a breach of this Agreement, the filing party shall provide the prospective defendant(s) with prior written notice of the alleged breach and a 30-day opportunity to cure any alleged violation.

15. Force Majeure. No party is considered in breach of this Agreement to the extent performance of their respective obligations is prevent by a force majeure event. "Force majeure event," for purposes of this Agreement, is defined as any event arising from causes beyond the control of the party that delays or prevents timely performance of any obligation under this Agreement despite the party's best efforts to fulfill the obligation. The requirement that the party exercise "best efforts to fulfill the obligation" includes using best efforts to anticipate any potential force majeure event and best efforts to address the effects of any such event (i) as it is occurring, and (ii) after it has occurred to prevent or minimize any resulting delay to the greatest extent possible.

16. Municipal Reservation of Rights: The General Permit includes an adaptive management framework at Part 3, which provides for an ongoing collaborative process. The adaptive management framework includes nitrogen monitoring and reductions elements as well as elements for comprehensively evaluating significant scientific and methodological issues and related load capacity determinations. Through the permitting process, the EPA has published data, analysis, and conclusions through fact sheets and response to comments related to elements subject

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to review and revaluation through the adaptive management process. In entering into this Agreement, the Municipalities are not accepting such data, analysis, and conclusions or waiving their objections thereto. Without affecting the Municipalities' obligation to comply with the General Permit during its term, the Municipalities hereby reserve the right to contest any such data, analysis, and conclusions in future proceedings to the extent that ongoing collaboration and the adaptive management process do not satisfactorily resolve such matters.

17. Other Municipalities: This Agreement may be amended by mutual agreement of the parties to include other municipalities who would like to join it for purposes of paragraphs 10 and 11.

18. Other:
    a. This Agreement, which may be executed in a number of counterparts, each of which shall be deemed an original, constitutes the entire agreement and understanding between the parties and supersedes all prior agreements and understandings relating hereto.
    b. This Agreement may be amended only by written Amendment signed by the Parties
    c. If any provision of this Agreement is deemed invalid or unenforceable, the remaining provisions shall remain in full force and effect.
    d. This Agreement shall be governed by and interpreted in accordance with the laws of the State of New Hampshire.
    e. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.
    f. This Agreement shall be deemed to have been jointly drafted by the parties.
    g. The signatories below expressly represent and warrant that they are authorized and empowered to enter into this Agreement.
    h. This Agreement shall be a public record on file with the City Clerk of each of the Municipalities.

[SIGNATURES FOLLOW]

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City of Dover

By: J. Michael Joyal, Jr. City Manager 2021.03.25 18:40:48 -04'00' *Dated:* _____

J. Michael Joyal, Jr., City Manager

City of Rochester

By: DocuSigned by: Blaine Cox B4F9B7BC7D0C4EB... *Dated:* 3/26/2021

Blaine Cox, City Manager

City of Portsmouth

By: _____ *Dated:* 3/26/2021

Karen Conard, City Manager

Conservation Law Foundation, Inc.

By: _____ *Dated:* 3/26/2021

Thomas F. Irwin, Vice President, Director CLF New Hampshire

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3.24.2021

Attachment

Dover Overall Source Reduction Projected Project List[1]

[1] This list is a statement of present intent, is illustrative, and is non-binding. The estimated costs and estimated nitrogen reduction stated below are based on current best estimates and assumptions, and are not intended as binding commitments or as performance guarantees.

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Structural Best Management Practices

Fiscal Year	Project	Description	Projected Reduction (lb/yr)	Estimated Cost
Ongoing	I/I	Inflow and Infiltration into the sewer collection system results in elevated peak flows through the WWTP biological system which can affect the nutrient reduction capacity during those events. The City continues to invest heavily in reducing I/I from the collection system	6,008[2]	
2022-2026	Court, Union, and Middle Streets	Capital Improvement Plan work to improve drainage to include BMPs	45[3]	$1,125,000
2022-2024	Fifth and Grove Streets	Capital Improvement Plan work to improve drainage to include BMPs	26[4]	$275,000
2022-2025	Oak Streets	Capital Improvement Plan work to improve drainage to include BMPs	412[5]	$250,000
2026	Atlantic Ave.	Capital Improvement Plan work to improve drainage to include BMPs	17[6]	$375,000
2026	Horne Street	Capital Improvement Plan work to improve drainage to include BMPs	35[7]	$62,500
Planning	Henry Law Park	City is currently looking for funding opportunities to design	568[8]	

[2] Assumption: A storm event causes the effluent to peak to 14 mg/l - assume storm event happens 12 times per year for 2 days each - assume I/I work reduces peak to 8 mg/l - assume during this peak time the flow rate is 5 mg. Equation: LB/YR=6mg/l*5MGD*8.345*24 day/yr

[3] Assumption: Ability to treat approximately 50% of the length of street (5000lf), and associated 60' wide buffer of residential area, with 60% reduction, use Highway rate and residential rate. Equation: LB/YR = Area * NLER*0.6

[4] Assumption: Ability to treat approximately 50% of the length of street (3000lf), and associated 60' wide buffer of residential area, with 60% reduction, use Highway rate and residential rate. Equation: LB/YR = Area * NLER*0.6

[5] Assumption: Ability to treat approximately 50% of the neighborhood area (87 acres) use residential rate. Equation: LB/YR = Area * NLER*0.6

[6] Assumption: Ability to treat approximately 50% of the length of street (2000lf), and associated 60' wide buffer of residential area, with 60% reduction, use Highway rate and residential rate. Equation: LB/YR = Area * NLER*0.6

[7] Assumption: Ability to treat approximately 50% of the length of street (4000lf), and associated 60' wide buffer of residential area, with 60% reduction, use Highway rate and residential rate. Equation: LB/YR = Area * NLER*0.6

[8] Assumption: Ability to treat approximately 50% of the neighborhood area (120 acres) use residential rate. Equation: LB/YR = Area * NLER*0.6

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		and construct an innovative, Nitrogen focused Water Quality BMP in the Henry Law Park area. This would be able to capture and provide treatment for approximately 120 acres of highly urbanized commercial and residential areas in the City's Downtown.		

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Non-Structural Best Management Practices

Fiscal Year	Project	Description	Projected Reduction (lb/yr)	Estimated Cost
Ongoing	Street Sweeping	The City sweeps the downtown streets approximately 1 time a week. The MS4 permit only requires cleaning twice per year.	43[9]	
Ongoing	Catch Basin Cleaning	Catch Basins are cleaned semi-annually regardless of whether they have reached the MS4 triggering thresholds of 1/2 full sump.	17[10]	
Ongoing	Slow Release nitrogen requirement for all new projects	As part of Site Plan approval, a maintenance plan shall be in place and *"Best practices to minimize environmental impacts, such as the use of low-phosphorus fertilizer and slow-release nitrogen, shall be included in the management plan."*	350[11]	
Ongoing	Water Quality BMP's as standard practice for city reconstruction projects	This is the language from our standard RFQ for design of reconstruction projects: *"As part of the drainage improvements, the City wishes to enhance the drainage system and incorporate easily maintainable, low impact development strategies to provide conveyance, treatment, and infiltration where practical. The Consultant shall make recommendations for an improved drainage system."* The commitment to implementing the water quality work is demonstrated in several recent redevelopment projects.		

[9] Assumption: mechanical, weekly, 9 months, estimate of swept area (50 miles, 30' wide average) use Highway NLER = 10.5. Equation: LB/YR =IA*NLER*0.03*9/12

[10] Assumption: Per Hot Spot Map info, there is 108 ac of city owned impervious area. Assume 1/4 of that area drains to a CB that is cleaned regularly use highway NLER 10.5. Equation: lb/yr = IA*NLER*.06

[11] Assumption: Impact 10 acers of development with reduction assumptions same as above. Equation: lb/yr = Turf Area *1/1000*.9

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Ongoing	Ordinances	Threshold for stormwater implementation with 50% nitrogen limits is set at 20,000 square feet or creates more than 4,000 square feet of new impervious area. This is much more stringent than the MS4 requirements which only pertain to disturbance over an acre	75[12]	
2021	Catch Basin Spoils Facility	Capital Improvement plan work to create a facility to clean and treat the liquid/debris from the catch basin maintenance program. Potential to open for other communities to use in the future.		$3,5000,000
2021	SRF Loan for Chapel St. Ravine	Working to incorporate water quality treatment and flood management downstream of substantial stormwater culvert		
Ongoing	Buffers	Ordinance has increased the wetland buffers gaining credit for going green project that shows added nitrogen removal.		
Ongoing	Yard Waste Program	Leaf pick up 6 times annually	95[13]	
Planning	Leaf Pick Up	Bulk leaf pick up program	766[14]	

[12] Assumption: 10 acres of redevelopment a year that fall within the delta between what is required per MS4 and what is included per City of Dover. Assume Commercial Runoff rates apply to all. Equation: LB/YR = Area * NLER*0.5

[13] Assumption: the folks using the leaf removal program are the ones who own residential for 100' along to the 50 miles of city roadway. Assume 10% use the services. Equation: LB/YR = Area * NLER*0.05

[14] Assumption: Increases the area to 80% using service. Equation: LB/YR = Area * NLER*0.05

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Innovative Efforts/ Pilot Programs

Fiscal Year	Project	Description	Projected Reduction (lb/yr)	Estimated Cost
Ongoing	Professional Staff	The City has created an Environmental Project Manager Position. This positions focus is dedicated entirely to environmental improvements, including a commitment to the protection and improvement of the Great Bay. This person is taking an active role in organizing regional commitment and implementation of the MS4 permit and the new NGP permit. Just this year, this person participated and was acceded through the NOFA Organic Land Care Program. Additionally, other staff members, particularly Bill Boulanger, is regularly recognized for contributions to innovative stormwater quality improvements and environmental stewardship.		
Ongoing	Training and Commitment to Innovation	Leadership in NEWEA/ Biological Nutrient Removal Classes - Our WWTP staff are at the forefront of discussions for WWTP practices. Ray Vermette acts as president of NEWEA and has traveled around the world looking at innovative technologies and bring them to Dover.		
Ongoing	Organic Fertilizer Program	The city is committed to using only organic, slow-release fertilizers on city owned and maintained properties.	800[15]	
Ongoing	Commitment to exploring new BMP's and participating in innovative initiatives	Berry Brook and the continuation of bringing new BMP's into urban redevelopment settings and working with UNHSWC to test the effect, Volunteering to work with the NHDES/Prep Fellowship team to investigate SAFE strategies for Stormwater Funding, Volunteer to work with SRPC to analyze urban trees and innovative tree box filters, Volunteer to work with SRPC to look at BMP's v/s socioeconomic disparities, participating in the PTAP program, participating in multiple		

[15] Assumption: City maintains 1,000,000 sf of turf. Assume regular application rate for nitrogen of 1 lb/1,000 sf. Assume organic cuts the runoff by 80%. Equation: lb/yr = Turf Area *1/1000*.8

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		credit for going green projects lead by PREP		
Summer 2021	Fertilizer Bans and Reductions	Supporting a statewide ban of high nitrogen synthetic fertilizers		
Ongoing	Outreach and Education	The City outreach and education exceeds what is required by the MS4. Staff regularly hold tours or presentations of the innovative BMP's being implemented. Additionally, we are working on a video for the installation of a filtering catch basin BMP. Staff also regularly speak at conferences about technologies and particularly focus on maintenance and long-term performance.		
2021	Climate Adaptation Grant	As part of Climate Adaptation work with the SRPC, city committed to installing a new catch basin filtering device with a tree - similar to a tree-box filter but with improved maintenance capacity	5	
Planning	Sewer System	Advocate for a state-wide requirement to remove nitrogen in septic systems.	381[16]	
Planning	Extending Sewer to Septiced areas	Continually assessing opportunities		

[16] Assumes 20 new septic a year - 60% reduction achieved.

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PRIVILEGED & CONFIDENTIAL DRAFT

ROCHESTER, NH - Nitrogen Stormwater and Non-Point Source Reduction Projects

	Project Type	Project / Activity	Project Description	Estimated Load Reduction (lbs/N/yr)1	Notes / Additional Benefits
	Structural BMPS				
1		Structural SW BMPs3	City installs structural water quality best management practices (BMPs) in highway capital improvement projects, with a goal of treating 100% of the impervious cover. The City also maintains stormwater BMPs installed as part of private development when the City takes ownership of the road/utilities. Upcoming projects that will include stormwater structural practices include: 1. **Colonial Pines Drainage Improvements** - (project related to sewer extensions, below) 2. **Woodman Area Infrastructure Improvements** 3. **Stafford Square Roundabout Installation** 4. **Union Street Parking Lot Reconstruction**2 - will incorporate water quality treatment practices. 5. **Wakefield Street Reconstruction**2 - rehabilitation of infrastructure on Wakefield Street from Union Street to Chestnut Hill Road - rehabilitation of sidewalks, pavement and drainage improvements.	TBD	City is currently calculating the estimated nitrogen reductions for each of these projects which will be supplemented.
2		Sewer Extensions	City is in the middle of a sewer extension project (Colonial Pines) that could connect up to 225 homes, currently serviced by septic system, to sewer in an area of the City with high groundwater and a history of failed septic systems. To date 90 homes have been connected through Phase 2. Phase 3 is ongoing and could connect up to another 70 homes. Phase 4 could connect up to 65 homes to the sewer.2	1,154	Assumes nitrogen reductions for 225 homes @ 5.13 lbs/prop/yr.
3		Stormwater Outfall Restoration	Construct outfall improvements associated with Woodman Area Infrastructure Improvements. Review capital improvement projects to identify locations where erosion occurs at outfalls and/or where storm water quality improvements can be made.	N/A	Improvements will have secondary reductions in TSS.
	Non-Structural BMPs				
4		Catch Basin Cleaning	City will clean catch basins to ensure that sumps are no more than 50% full at any time. City collects leaf litter and organic waste along curbed streets, once per month as part of the street sweeping program, in the months of April, May, October and November. City/Waste Management also provides curb side collection of bagged leaves/organic waste for two weeks in the fall and two weeks in the spring.	290	CB cleaning also reduces TSS, P, oils/grease and other pollutant discharges
5		Organic Waste and Leaf Litter	City will collect leaf litter and organic waste along curbed streets, once per month as part of the street sweeping program, in the months of April, May, October and November. Provide curb side collection of bagged leaves/organic waste for two weeks in the fall and two weeks in the spring.	690	
6		Street and Pavement Cleaning	City sweeps all curbed streets once per month between April and November. City sweeps all downtown streets at a minimum of once per week between April and November. Sweeps directly connected impervious cover at least two times per year (once in Spring and once in Fall). Conduct a sweeping study to determine areas where additional optimized sweeping should be conducted to reduce curbed sediment load and catch basin loads.	250	Street Sweeping / Cleaning also reduces TSS, P, oils/grease, and other pollutant discharges
7		Fertilizer Program	Advocate for and work with the State to develop a Great Bay watershed total nitrogen fertilizer ordinance/regulation that would ban or control the sale of lawn fertilizer containing nitrogen in the watershed. City of Rochester already exclusively uses slow release fertilizer for its properties.		City anticipates nitrogen reductions if enacted, adopted and implemented.
	Other Projects				
8		Sewer System Master Plan	City has selected a contractor and is currently negotiating a scope of work for a Sewer System Master Plan. Once finalized, the City anticipates the Sewer System Master Plan study will be conducted over the next two to three years that will include flow metering and modelling efforts to fully evaluate and reduce sources of inflow and infiltration in the POTW.		The City anticipates the completed Sewer System Master Plan will identify priority projects for the City to implement for the reduction of infiltration and inflow to the POTW with anticipated nitrogen reductions.
9		Private Redevelopment	Enforce the Chapter 218 - Stormwater Ordinance (in place by June 30, 2021) governing new development and redevelopments by reviewing and inspecting private redevelopment in the City and requiring stormwater treatment.	100-300	Structural and non-structural BMPs required by the updated site plan regulations will also reduce other pollutants including TSS, P, oils/grease and other pollutants by disconnecting and treating impervious area.
10		Staffing / Resources	DPW has included in its proposed budget funding for another Assistant Engineer position to focus on stormwater related projects and ordinance enforcement.		
11		Septic System Programs	Advocate for and work with the State and region to develop a Great Bay watershed advanced septic system ordinance/regulation that would encourage advanced nitrogen treatment for private septic systems. Advocate for and work with the State to enforce its requirement for private septic systems to connect to public sewers within 100 feet of waterbodies.		City anticipates nitrogen reductions if enacted, adopted and implemented.
		Total Estimated Cost for SW and NPS Projects	~at least $2 million (excluding sewer extension costs)		

1These are estimates only and may not reflect the actual nitrogen loads resulting from the proposed projects and practices.
2These projects are planned but subject to City Council approval and funding.
3This list is not an exclusive list and is subject to further update and expansion on an annual basis by the City.

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City of Portsmouth Anticipated Source Reduction List

Note: This list is a statement of present intent, is illustrative, and is non-binding. The estimated nitrogen reduction stated above are based on current best estimates and assumptions, and are not intended as binding commitments or as performance guarantees.

Category	Project/Activity	Description	Reduction (lb TN/yr)
Non-structural	Professional Staff	The City has developed a Stormwater Specialist Position and reorganized personnel to establish a Stormwater Division within the Public Works Department. At the Planning Dept there are staff dedicated to site plan regulation compliance for private property and developments. The majority of the team has completed the Stormwater Management Certificate program offered by UNH Professional Development Training.	Note 1
Non-structural	Professional Consultant	The City has contracted with VHB to conduct past studies specific to stormwater and non-point source projects and planning. This work is ongoing and overlaps with multiple other items in this list.	Note 1
Non-structural	Training/Commitment To Innovation	City wastewater operations staff are trained licensed professionals who participate in professional organizations including New Hampshire Water Pollution Control Association, New England Water Environment Association/WEF, and others. Staff participate in these associations to maintain training and stay in front of the most recent industry trends and to optimize treatment operations.	Note 1
Non-structural	Commitment To New And Innovative BMPs	Commitment to developing new BMPs by working with consultants and the UNH Stormwater Center. Projects and BMP examples include: Community Campus Athletic Fields stormwater treatment, State Street sand filtration and tree box filters, use of compost tea and incorporation of pervious pavement and other LID type projects within the City. The City has and will continue to work with private and public entities in the installation of rain gardens, tree box filters and other stormwater controls.	Note 1
Non-structural	Continuous nutrient load reduction at WWTP	The City recently completed construction of the Peirce Island Wastewater Treatment Facility and are completing the first year of continuous operation. The upgraded facility is performing well and the City will continue to optimize performance moving forward. Recent results can be provided. The City has committed to a baseline monthly average of no more than 8 mg/L Total Nitrogen in addition to any permitted load under the GBTN GP. Operating the facility at 7.5 mg/L (0.5 mg/L reduction) of total nitrogen will result in 6,088 lbs TN/year removed when at a flow of 4.0 million gallons per day or 9,132 lbs TN/year removed when at a flow of 6.0 million gallons per day.	greater than 9,132
Non-structural	Street Sweeping	The City sweeps the downtown streets (weather permitting, 5 nights/week). <u>All</u> streets (100miles) in the City are swept once a month from April through November, well in excess of the MS4 required frequency of 2 times per year.	76
Non-structural	CB Cleaning	The City cleans catch basins bi-annually regardless of whether they have reached the MS4 triggering thresholds of 1/2 full sump.	73
Non-structural	Liquid Biological Soil Amendment Program	The City has restrictions fertilizer use within the limits of wetlands and wetland buffers. The City has switched from conventional fertilizers to using compost tea: this is a fully organic liquid biological soil amendment brewed with compost and amended with organic soluble kelp, humic acid, soluble fish and an organic 15-0-0 amino acid.	961
Non-structural	School Organic Fertilizer Program	Portsmouth Public Schools use only organic fertilizers on athletic fields.	522
Non-structural	Reduced Fertilizer Use Requirement For All New Projects	As part of Site Plan approval, a maintenance plan shall be in place and "*Minimizes the need for fertilizer and pesticide usage and the introduction of pollutants to the environment*" & "*Landscaped areas shall consist of a combination of large and small trees, shrubs, perennial and/or annual flowers, and groundcover. Managed turf areas should be kept to a minimum to reduce mowing and fertilizer needs.* "	Note 1
Non-structural	Fertilizer Bans or Reductions	The City is generally supportive of a statewide ban of high nitrogen synthetic fertilizers.	Note 2
Non-structural	Include Water Quality BMPs As Standard Practice	The City incorporates stormwater controls and other BMPs into City projects. Examples of projects that implemented BMPs include: Brewster Street Reconstruction, Maplewood Ave Reconstruction, Sagamore Ave Reconstruction, Four Tree Island Parking Lot, State Street Reconstruction, Lincoln Avenue Area Drainage Basin Sewer Separation, amongst others.	Note 3
Non-structural	Outreach and Education	Working with stakeholders in the City to address stormwater, sea level rise, and coastal resiliency issues that impact Portsmouth. Addressing the overlap in project needs to address coastal resiliency and impact of tidal changes on stormwater controls in areas like Prescott Park.	Note 1
Non-structural	Pollutant Removal/Outreach and Education	The City outreach and education exceeds what is required by the MS4. Staff regularly hold tours or presentations of the innovative BMP's being implemented. Staff also regularly speak at conferences about technologies and particularly focus on maintenance and long-term performance.	Note 1
Non-structural	Ordinances	Regulations updated with a threshold for stormwater implementation with 50% nitrogen limits set at 15,000 square feet. This is much more stringent than the MS4 requirements which only pertain to disturbance over an acre. Calculation assumes 10 acres of development per year.	75
Non-structural	Ordinances	The City Site Plan Review Regulations promotes the use of Low Impact Development (LID). Low "Applicants shall incorporate Low Impact Development (LID) site planning and design practices to the maximum extent practical (MEP) to reduce stormwater runoff volumes, maintain predevelopment site hydrology, and protect water quality in receiving waters. LID practices may include site design techniques (e.g., maintenance of vegetated buffers, minimizing of disturbance footprint) and structural measures to promote infiltration such as porous pavement, rain gardens or the capture / reuse of stormwater to reduce the stormwater volume discharged from the site.	Note 1

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City of Portsmouth Anticipated Source Reduction List

Note: This list is a statement of present intent, is illustrative, and is non-binding. The estimated nitrogen reduction stated above are based on current best estimates and assumptions, and are not intended as binding commitments or as performance guarantees.

Category	Project/Activity	Description	Reduction (lb TN/yr)
Non-structural	Development Of Water Quality improvement Recommendations	The City completed extensive water quality testing in the Sagamore Creek in 2018 and 2019. This data was used by the DES to evaluate 303(d) listing and will be a baseline for a Watershed Master Plan.	Note 1
Non-structural	IDDE Follow-up	The City is conducting follow-up testing to the water quality monitoring work completed in Sagamore Creek where pollutants were found to be high.	Note 1
Non-structural	Outreach and Education & Regional Coordination	The City sponsors twice annual Hazardous Household Waste days and collect materials from neighboring towns. Stormwater education and outreach materials are distributed at these events.	Note 1
Non-structural	Regional Coordination of Stormwater O&M	Coordinate with the Pease Development Authority on stormwater related activities, assisting them with their stormwater requirements	Note 3
Non-structural	Operation & Maintenance	Culvert lining at West Road and Edmond Ave which will prevent operational and water quality issues. Systematic video inspection and cleaning of stormwater collection system.	Note 1
Non-structural	Outreach and Education & Regional Coordination	Working with Seacoast Stormwater Coalition to develop BMP implementation and regular operation and maintenance requirements for private properties.	Note 1
Non-structural	Pollutant Tracking	Working with UNH graduate students to assess feasibility and effort to track land use change for the City of Portsmouth. Will assess the efficacy of BMP use for private and public projects.	Note 1
Non-structural	Stormwater Master Plan	Working with VHB to update the City's 2007 Stormwater Master Plan and review of stormwater utility funding option.	Note 1
Non-structural	Buffers	Ordinance has increased wetland buffers with credit for going green projects that show added nitrogen removal	Note 1
Non-structural	Yard Waste & Leaf Pick-up Program	Weekly yard/leaf waste pickups April - December. In 2020 over 1,300 tons of material were collected. Leaf collection requires the use of bags which maximizes the effect of the BMP.	1,608
Structural	Infiltration and Inflow Reduction	While Inflow and Infiltration (I/I) is often considered to be a collection system problem, the extraneous flows end up at the WWTF and can impact the performance of the biological treatment system. The City conducted an sewer system evaluation to identify infiltration and inflow in 2018. This project resulted in four contracts for sewer rehabilitation. The City will be completing the first of those four contracts by October 2023.	Note 3
Structural	Capital Improvements Plan	The City has a 6-year capital improvement plan that includes many projects that will address structural type stormwater and non-point source improvements including, but not limited to the following: Islington Street Phase 2 Complete Street Reconstruction, Peverly Hill Complete Street Reconstruction, Union Street & Willard Avenue Sewer Separation, Fleet Street Sewer Separation, Market Square Upgrade, and Corporate Drive Swales and Roadway.	Note 3

Notes:
1. While these items/projects do not have readily quantifiable nitrogen reduction, the function provided is critical to execution of best management practices, planning and engineering associated with nitrogen reduction.
2. These items will provide the City with additional support when implementing ordinance adjustments and other control and enforcement provisions.
3. The nitrogen reductions for these items will be calculated at a later date.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

March 25, 2021

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27 North Main Street
Concord, NH 03301-4930

Re: Great Bay Total Nitrogen General Permit

Dear Mr. Joyal, Mr. Cox, Ms. Conrad and Mr. Irwin:

EPA Region 1 is writing this letter in connection with the Great Bay Total Nitrogen General Permit, issued November 24, 2020. This permit represents a great stride forward in regulating nutrient loads into Great Bay by establishing effluent limitations on all 13 New Hampshire wastewater dischargers, in almost all cases for the first time. These limits will act to prevent any future increases in nitrogen load from these dischargers even in the midst of rapid population increases. EPA expects that all eligible dischargers will opt into the General Permit. Due to the mix of nitrogen loading into Great Bay, which is predominated by nonpoint sources of nitrogen, the permit provides a framework and incentive for covered dischargers to pursue nonpoint source reductions that will be necessary if designated uses are to be fully restored. For the reasons explained in the Response to Comments accompanying the General Permit, if these nonpoint source reductions are not diligently pursued, EPA has concluded that timely reissuance of a permit with more stringent effluent limitations will be critical to the

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expeditious achievement of uses. In furtherance of this goal, EPA also intends to act promptly on any petition for an individual permit under 40 C.F.R. § 122.28(b)(3)(i), for the reasons set forth in Section 11 ("Petition(s) for Individual Permit(s)") of the Settlement Agreement by and between Conservation Law Foundation and the Cities of Dover, Portsmouth and Rochester, dated March 25, 2021.

Ken Moraff

KENNETH MORAFF Digitally signed by KENNETH MORAFF Date: 2021.03.25 16:49:00 -04'00'

Water Division Director
EPA, Region 1

cc: Ted Diers, NHDES

Appendix F

Total Maximum Daily Loads (TMDLs) and
Advanced Restoration Approaches

Section e of the joint AMP proposes a timeline for completing a TMDL for total nitrogen for the Great Bay or an advance restoration plan. According to that schedule, the participating communities will make a recommendation to either pursue a TMDL or an advance restoration plan in the second general permit term. The development of the TMDL or advance restoration planwill be a major activity of the second permit term. This appendix describes the TMDL process and advance restoration planning approaches under the Clean Water Act framework. It also provides examples of TMDLs and advance restoration planning approaches.

Total Maximum Daily Loads

The USEPA provides the following basic information on its webpage entitled "Overview of Total Maximum Daily Loads"[1]:

> "A TMDL is the calculation of the maximum amount of a pollutant allowed to enter a waterbody so that the waterbody will meet and continue to meet water quality standards for that particular pollutant. A TMDL determines a pollutant reduction target and allocates load reductions necessary to the source(s) of the pollutant.
>
> Pollutant sources are characterized as either point sources that receive a wasteload allocation (WLA), or nonpoint sources that receive a load allocation (LA). For purposes of assigning WLAs, point sources include all sources subject to regulation under the National Pollutant Discharge Elimination System (NPDES) program, e.g. wastewater treatment facilities, some stormwater discharges and concentrated animal feeding operations (CAFOs). For purposes of assigning LAs, nonpoint sources include all remaining sources of the pollutant as well as natural background sources. TMDLs must also account for seasonal variations in water quality, and include a margin of safety (MOS) to account for uncertainty in predicting how well pollutant reductions will result in meeting water quality standards.
>
> Expressed mathematically, the TMDL equation is:
>
> **TMDL = ΣWLA + ΣLA + MOS**
>
> Where **WLA** is the sum of wasteload allocations (point sources), **LA** is the sum of load allocations (nonpoint sources and background) and **MOS** is the margin of safety.
>
> Each pollutant causing a waterbody to be impaired or threatened is referred to as a waterbody/pollutant combination, and typically a TMDL is developed for each waterbody/pollutant combination. For example, if one waterbody is impaired or threatened by three pollutants, three TMDLs might be developed for the waterbody. However, in other cases, a single TMDL document may be developed to address several waterbody/pollutants combinations. Neither the CWA nor EPA's regulations define or limit the scale of TMDLs. Some states have been developing TMDLs on a watershed-scale basis. Such state TMDLs may also cover multiple watersheds."

TMDLs are inherently quantitative, and developing TMDLs assumes the ability to identify in-stream water quality targets associated with use attainment and the pollutant loads to achieve those in-stream targets. Determining the appropriate water quality targets can be challenging if the stressors on uses are

[1] https://www.epa.gov/tmdl/overview-total-maximum-daily-loads-tmdls

not well understood or cannot be expressed as quantitative targets. Similarly, determining appropriate pollutant reduction targets and load allocations is not always straightforward because there can be a variety of potential point and non-point sources of pollutants in watersheds. Because of this, the analysis of historic water quality data, collection of field data, scientific interpretation, and the use of various modeling techniques is often needed prior to establishing TMDLs.

Under federal guidance (40 CFR § 122.44(d)(1)(vii)), water quality-based effluent limits in NPDES permits must be consistent with the assumptions and requirements of approved TMDL WLAs. After appropriate TMDL thresholds and allocations have been determined for a waterbody, an implementation plan can be developed to help jurisdictions or other stakeholders reach their numeric load reduction goals. Typically a plan achieves this by providing schedules, management goals, projects, partners, and priorities, as well as outlining monitoring and re-evaluation processes. The USEPA has developed guidance[2] for developing watershed management plans, and this guidance identifies nine key requirements of such plans:

1. Identify causes and sources. Identification of causes of impairment and pollutant sources that need to be controlled to achieve needed the needed load reductions.
2. Pollution reductions needed. An estimate of the load reductions expected from the planned management measures, and the load reductions needed to meet water quality standards.
3. Actions needed. A description of the management measures planned to achieve load reductions.
4. Costs and authority. Estimate of the amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that will be relied upon.
5. Outreach and education. An information and education component used to enhance public understanding of the project and participation.
6. Schedule. A schedule for implementing the nonpoint source management measures identified in this plan that is reasonably expeditious.
7. Milestones. A description of interim measurable milestones for determining whether management measures or other control actions are being implemented.
8. Success indicators and evaluation: A set of criteria that can be used to determine whether loading reductions are being achieved over time and substantial progress is being made toward attaining water quality standards.
9. Monitoring. A monitoring component to evaluate the effectiveness of the implementation efforts over time, measured against the criteria established under item 8 immediately above.

Examples of TMDLs

New Hampshire has 550 bacteria TMDLs, 31 lake phosphorus TMDLs, and statewide TMDLs that cover pH and mercury. These TMDLs not only include specific pollutant reduction targets, but also allocate necessary load reductions depending on the source. For stationary, point sources, allocations are characterized as a wasteload allocation (WLA) and for widely distributed, nonpoint sources, they are characterized as a load allocation (LA). Below are excerpts and summaries from several TMDL implementation plans developed for complex estuarine environments.

[2] U.S. Environmental Protection Agency. 2008. Handbook for Developing Watershed Plans to Restore and Protect Our Waters. EPA 841-B-08-002. 400 p. https://www.epa.gov/sites/production/files/2015-09/documents/2008_04_18_nps_watershed_handbook_handbook-2.pdf

Wild Harbor Total Nitrogen TMDL (Massachusetts)

https://www.epa.gov/sites/production/files/2018-10/documents/wild-harbor-tn-tmdl-report.pdf

The Wild Harbor estuarine system is located within Town of Falmouth on Cape Cod, Massachusetts. In order to restore and protect this estuarine system, N loadings, and subsequently the concentrations of N in the water, must be reduced to levels below the thresholds that cause the observed environmental impacts. This concentration will be referred to as the target threshold N concentration. It is the goal of the TMDL to reach this target threshold N concentration, as it has been determined for each impaired waterbody segment. The MEP has determined that a N concentration of 0.35 mg/L for this estuarine system at a sentinel station will restore eelgrass habitat in the main Wild Harbor basin. In addition, restoration of benthic habitat for infaunal animals will occur as management alternatives are implemented for eelgrass. To meet the TMDL, a 32% reduction of the total watershed nitrogen load for the entire system will be required.

Chesapeake Bay Nutrient and Sediment TMDL (Maryland and Virginia)

https://www.epa.gov/chesapeake-bay-tmdl

The Chesapeake Bay receives drainage from 64,000 mi2 in six states. The Bay experiences "dead zones" of low dissolved oxygen and has also lost much of its historical coverage of submerged aquatic vegetation. In the early 2000s, the USEPA ad states developed Bay-specific water quality criteria and use definitions. In 2010, the USEPA and states developed a TMDL for nitrogen, phosphorus, and sediment loads to the Bay, intended to achieve the Bay-specific dissolved oxygen and water clarity goals. A sophisticated modeling framework was used to identify nutrient loads that are expected to achieve dissolved criteria. The states have since developed watershed implementation plans to guide restoration.

Neuse River Basin Total Nitrogen TMDL (North Carolina)

https://files.nc.gov/ncdeq/Water%20Quality/Planning/TMDL/FINAL%20TMDLS/Neuse/Neuse%20TN%20TMDL%20II.pdf

The Neuse River basin encompasses nearly 6,000 square miles over 19 counties in eastern North Carolina. At New Bern, the Neuse takes on estuarine characteristics as it widens but remains shallow, frequently resulting in minimal discharge and long hydraulic residence times. The Neuse River Basin TMDL seeks to address chlorophyll-a exceedances in the estuary by managing total nitrogen levels. A sophisticated modeling framework was employed to predicted nutrient reductions needed to attain the in-stream chlorophyll-*a* target. North Carolina has also adopted nutrient offset and credit trading program to support implementation.

Advance Restoration Approaches

The TMDL is one approach for developing water quality restoration goals. However, EPA and New Hampshire recognize that other approaches are sometimes viable or even preferred under the Clean Water Act framework. USEPA has encouraged the use of "…alternative approaches, in addition to

TMDLs, that incorporate adaptive management and are tailored to specific circumstances where such approaches are better suited to implement priority watershed or water actions that achieve the water quality goals of each state…"[3] More recently, USEPA has favored the term "advance restoration plan" over "alternative restoration plan", and encouraged states to make the same change in terminology[4]. The intention with this change is to emphasize that TMDLs remain the primary tool for addressing impaired waters, and other planning approaches may precede rather replace a TMDL. MAAM has made this change in terminology in the AMP. The term "alternative" is still used in this appendix to refer to examples of past plans that carry that label. Regardless of the exact label, alternative or advance plans are based on the similar concept that, in some settings, non-TMDL restoration approaches are the most effective way to improve water quality in the near term.

The EPA describes an advance restoration plan as a "near-term plan, or description of actions, with a schedule and milestones, that is more immediately beneficial or practicable to achieving water quality standards [than a TMDL]"[5]. Because advance restoration plans are created and executed locally, they offer more flexibility for communities during the restoration process. They are especially well-suited for adaptive management efforts in which the understanding of stressors and responses is evolving based on iterative implementation and monitoring. In the past, many alternative restoration plans were categorized as 4b or 5r plans, corresponding to those sections of states' integrated reports. USEPA currently recommends the following elements of an advance restoration plan[5]:

- Identification of specific impaired water segments or waters addressed by the ARP and identification of all sources contributing to the impairment.
- Analysis to support why the state, territory, or authorized tribe believes that the implementation of the ARP is expected to achieve WQS.
- A description of the actions to address all sources (both point and nonpoint sources, as appropriate) necessary to achieve WQS and a schedule of actions designed to meet WQS with clear milestones and dates, which includes interim milestones and target dates with clear deliverables.
- Identification of available funding opportunities to implement the ARP.
- Identification of all parties committed, and/or additional parties needed, to take actions that are expected to meet WQS.
- An estimate or projection of the time when WQS will be met.
- Plans for effectiveness monitoring to demonstrate progress made toward achieving WQS following implementation, identify needed improvement for adaptive management as the project progresses, and evaluate the success of actions and outcomes.

-

[3] U.S. Environmental Protection Agency. 2013. A Long-Term Vision for Assessment, Restoration, and Protection under the
Clean Water Act Section 303(d) Program. https://www.epa.gov/sites/production/files/2015-07/documents/vision_303d_program_dec_2013.pdf

[4] U.S. Environmental Protection Agency. 2023. Information Concerning 2024 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions. Memorandum from Brian Frazer to Water Division Directors. 44 p. https://www.epa.gov/system/files/documents/2023-03/2024IRmemo_032923.pdf

[5] U.S Environmental Protection Agency. 2024. "Advance Restoration Plans".
https://www.epa.gov/tmdl/advance-restoration-plans

Examples of Alternative or Advance Watershed Restoration Plans

In New Hampshire, organizations and communities have worked with the NH Department of Environmental Services to produce 25 watershed-based plans, many of which represent alternatives to the traditional TMDL-based planning approach. As of August 2024, EPA has accepted 114 advance restoration plans from 27 states[4]. Below are several examples watershed-based restoration plans developed in New Hampshire and other states.

5R Plan for the Savannah River Basin, Georgia and South Carolina:

https://epd.georgia.gov/document/publication/savannahharbor5rplan09152015pdf/download

The Savannah River, including the Harbor, serves as the boundary between Georgia and South Carolina. The Savannah Harbor is located at the mouth of the Savannah River where it discharges to the Atlantic Ocean. This 5R plan documents the total pollutant loading of oxygen-demanding substances (5-day Carbonaceous Biochemical Oxygen Demand [CBOD5] and ammonia) that can assimilate and still prevent excessive exceedances of dissolved oxygen criteria. The 5R process allowed the major municipal and industrial point sources to cooperatively determine how the assimilative capacity would be divided among them, subject to state and USEPA approval.

Winnicut River Watershed Restoration and Management Plan, New Hampshire

https://nhrivers.org/wp-content/uploads/2019/10/WinnicutRiverWRMP.pdf

The Winnicut River is one of seven major tributaries to Great Bay. The water quality and habitat of the Winnicut River and several of its tributaries have been degraded by increased nonpoint source (NPS) pollution resulting from rapid land development in the watershed over the past 20 years. Impacts associated with NPS pollutants have led to impairments included on the NHDES 2014 303(d) list for Aquatic Life Use, Primary Contact Recreation, and Secondary Contact Recreation, due to low levels of dissolved oxygen and elevated levels of *E. coli* bacteria. The primary goal of this watershed management plan is to assess the Winnicut River watershed and identify actions that will improve in water quality and aquatic habitat.

Reedy River 5R Plan (South Carolina):

http://cleanreedy.org/

The Reedy River has headwaters near Greenville, SC, and is listed as impaired for excessive nutrients. Efforts at developing a TMDL in the 2010s were hampered by insufficient data and model calibration challenges. Local stakeholders chose the 5R process to take leadership in the monitoring, modeling, and restoration efforts. The Reedy River Water Quality Group includes a wide range of stakeholders from local governments and utilities to environmental groups and regional planning agencies. The South Carolina Department of Environmental Health Control and USEPA are active participants with approval authority of the 5R plan. The group is currently in the modeling stage.