Petition to the U.S. Environmental Protection Agency to Exercise Residual Designation Authority Over Stormwater Discharges Contributing to Violations of Water Quality Standards in the Great Bay Estuary Watershed[1]

> *"[T]he eutrophic cycle is self-reinforcing and any delay could mean the difference between potential recovery or collapse of the [Great Bay estuary] ecosystem . . . ."*
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> *"[W]hat is certain is that large amounts of nitrogen contribute to water quality impairments throughout the Great Bay estuary, which is consistent with EPA's judgment that these waters have reached their assimilative capacity for nitrogen."*
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> -U.S. EPA, November 24, 2020, Response to Comments for Great Bay Total Nitrogen Permit

Pursuant to 40 C.F.R. § 122.26(f)(2), Conservation Law Foundation ("CLF") hereby petitions the U.S. Environmental Protection Agency ("EPA") to exercise residual designation authority ("RDA") under 40 C.F.R. § 122.26(a)(9)(i)(D) to regulate under the National Pollutant Discharge Elimination ("NPDES") permitting program the following categories of unpermitted discharges located in the New Hampshire portion of the Great Bay estuary watershed, on the ground that they are contributing to violations of state water quality standards in the estuary: (1) non-*de minimis* stormwater discharges from commercial, industrial, and institutional properties located in communities regulated under the New Hampshire Small Municipal Separate Storm Sewer System ("MS4") General Permit[2] and having 0.75 acres or more of impervious cover, and (2) non-*de minimis* discharges from commercial, industrial, and institutional properties located in

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[1] CLF is providing herewith, and incorporates as if fully set forth herein, a Statement of Undisputed Facts ("Statement of Facts") to support this petition.

[2] The MS4 communities in the Great Bay estuary watershed, including communities that have obtained a waiver from the MS4 General Permit, are: Barrington, Brentwood, Candia, Chester, Danville, Dover, Durham, East Kingston, Epping, Exeter, Fremont, Greenland, Hampton Falls, Kingston, Lee, Madbury, Milton, New Castle, Newfields, Newington, Newmarket, North Hampton, Portsmouth, Raymond, Rochester, Rollinsford, Rye, Sandown, Somersworth, and Stratham. *See* Statement of Facts, ¶¶ 71-72.

non-MS4 communities[3] and having 1.5 acres or more of impervious cover, hereinafter referred to collectively as "Contributing Discharges."

The Great Bay estuary is a critically important and irreplaceable national resource, yet it is experiencing serious degradation due to excessive nitrogen pollution. The New Hampshire Department of Environmental Services ("NHDES") has designated waters that are part of the Great Bay estuary as impaired as a result of nitrogen and / or loss of eelgrass, and the EPA has recognized that "the entire estuary is suffering from significant and pervasive nutrient-related impacts." Statement of Facts, ¶¶ 43, 45. Most of the nitrogen in the estuary comes from stormwater point sources and non-point sources. Nitrogen discharges into the estuary from stormwater runoff are contributing to violations of water quality standards and must be regulated to protect and restore this vital estuarine ecosystem.

As set forth below, the law and facts require that these unpermitted discharges be regulated under the NPDES permit program to restore and protect the water quality of the Great Bay estuary.

I. <u>Introduction</u>

CLF is a non-profit environmental advocacy organization working to protect New England's environment for the benefit of all people. Working in New Hampshire and states across the region, CLF seeks solutions to protect natural resources, build healthy communities, and sustain a vibrant economy. For years, CLF has engaged in advocacy under the Clean Water Act ("CWA") to ensure our waters benefit from the full protection of the law. CLF successfully petitioned EPA under the CWA to require cleanup of stormwater discharges from numerous industrial and commercial properties in the Long Creek watershed in Maine,[4] and has successfully litigated in the Vermont Supreme Court and agency tribunals to require Vermont's Agency of Natural Resources to extend its CWA permitting authority to certain unregulated

[3] The non-MS4 communities in the Great Bay estuary watershed are: Brookfield, Deerfield, Farmington, Kensington, Middleton, New Durham, Northwood, Nottingham, Strafford and Wakefield. *See* Statement of Facts, ¶¶ 71-72.
[4] *See* CLF's Petition For a Determination that Existing, Non-De Minimis, Un-Permitted Stormwater Discharges from Impervious Surfaces into Long Creek South Portland, Maine Require a Clean Water Act Permit, filed with Robert Varney, Administrator, EPA Region 1 (March 6, 2008).

stormwater pollution discharges in five badly polluted watersheds surrounding Burlington, Vermont.[5] Most recently, CLF successfully petitioned EPA to exercise its residual designation authority and determine that CWA permits are necessary to regulate certain categories of stormwater discharges in the Charles River, Mystic River, and Neponset River watersheds in Massachusetts.[6]

CLF has long been concerned about the declining health of the Great Bay estuary and has been working for more than 15 years – through legal advocacy and our Great Bay-Piscataqua Waterkeeper program – to restore and protect this critically important resource of local, regional, and national significance. We have been particularly concerned about excessive nitrogen levels that are a significant cause of the estuary's declining health and the failure of waters throughout the estuary to attain state water quality standards. We appreciate the attention EPA and NHDES have given to the problem of nitrogen pollution in the estuary, but urgent action is needed to address more of the nitrogen load in the estuary.

Exercising its residual designation authority will allow EPA to regulate currently unregulated discharges of nitrogen that are harming the estuary. Existing mechanisms, including the Great Bay Total Nitrogen General Permit ("GBTNGP")[7] and New Hampshire Small Municipal Separate Storm Sewer System General Permit ("MS4 permit"), control for some nitrogen in the estuary, but are limited in scope and application and do not address most of the

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[5] *See In re Stormwater NPDES Petition*, 2006 VT 91.

[6] EPA, Clean Water Act Residual Designation Determination for Certain Stormwater Discharges in the Charles, Mystic, and Neponset River Watersheds, in Massachusetts (Sept. 14, 2022) ("Charles, Mystic & Neponset RDA Determination"). On November 2, 2022, CLF and the Charles River Watershed Association filed a lawsuit against EPA for failing to issue the necessary permits to protect the Charles, Mystic, and Neponset Rivers. *See Conservation Law Found., Inc. and Charles River Watershed Ass'n, Inc. v. EPA*, Case No. 1:22-cv-11863 (D. Mass. Nov. 2, 2022).

[7] The GBTNGP regulates some, but not most, of the nitrogen entering the estuary by regulating discharges from thirteen wastewater treatment facilities. Critically, the GBTNGP assumes that meaningful and necessary nitrogen reductions will be achieved by other means, including voluntary reductions through stormwater and non-point source management. CLF participated extensively in the GBTNGP process, including submitting comments on the draft permit and entering into a settlement agreement with certain municipalities regarding the permit. CLF submitted a letter to EPA on March 25, 2022, commenting on municipal adaptive management plans under the permit. CLF incorporates by reference its comments and statements regarding the GBTNGP here.

nitrogen affecting the estuary. As a result, the estuary is in a state of critical decline and is becoming less and less resilient. Climate change increases and compounds estuarine stressors. Absent RDA designation, an inequitable regulatory burden falls on GBTNGP and MS4 permittees. This is not only unfair, but ineffective. Attainment of water quality standards in the Great Bay estuary will only occur when nitrogen discharges from all significant sources of pollution, including the Contributing Discharges, is regulated.

The requirements of the Clean Water Act are clear: if unregulated stormwater discharges are contributing to a water quality impairment, EPA must act to regulate or prohibit those discharges. In the Great Bay estuary watershed, stormwater point sources from the Contributing Discharges discharge excessive nitrogen to the Great Bay estuary, causing water quality impairments. EPA must use NPDES permitting to regulate the Contributing Discharges.

II. Factual Background

A statement of undisputed facts is attached to this petition and is incorporated by reference. A summary of those facts is recited below.

The Great Bay estuary is a network of rivers, bays, and harbors.

The Great Bay estuary consists of a network of tidal rivers, inland bays, and coastal harbors in New Hampshire and Maine, extending inland from the mouth of the Piscataqua River at the Atlantic Ocean. Statement of Facts, ¶ 1. The estuary covers approximately 21 square miles, with 144 miles of shoreline, and encompasses Great Bay proper and Little Bay, which are fed by the Winnicut, Squamscott, Lamprey, Oyster, and Bellamy Rivers. The estuary also includes the Upper Piscataqua River, which is fed by the Cocheco, Salmon Falls, and Great Works Rivers; the Lower Piscataqua River; Portsmouth Harbor; and Little Harbor/Back Channel. *Id.*, ¶ 2. The Great Bay estuary watershed is defined as the land area from which rainwater drains, through surface water or groundwater, into the Great Bay estuary. *Id.*, ¶ 3. The Great Bay estuary constitutes approximately 86% of all New Hampshire estuaries. *Id.*, ¶ 4.

The Great Bay estuary is a critically important and irreplaceable national resource.

The Great Bay estuary is one of 28 estuaries of national significance established under EPA's National Estuary Program. *Id.*, ¶ 5. Estuarine environments are irreplaceable natural resources that create some of the most productive environments on the planet, supporting many different communities of plants and animals specifically adapted to estuarine environments. *Id.*, ¶

6. Estuaries provide critical habitats for the survival of many species of fish, birds, and other wildlife. *Id.* Estuaries additionally provide for many recreational opportunities such as swimming, boating, fishing, and bird watching. *Id.*, ¶ 7. Estuaries have important commercial value, providing the nursery grounds for two-thirds of the nation's commercial fish and shellfish, and supporting tourism economies. *Id.*

The Great Bay estuary is an invaluable environmental, social, and economic resource. *Id.*, ¶ 8. "The Great Bay Estuary is unusual because of its inland location, more than five miles up the Piscataqua River from the ocean. It is a popular location for kayaking, birdwatching, commercial lobstering, commercial oyster aquaculture, recreational oyster harvesting, and sportfishing for rainbow smelt, striped bass, and winter flounder." *Id.*, ¶ 9. There are 169 bird, fish, and plant species that use the Great Bay estuary in different ways at different times. Twenty-three of these species are threatened or endangered at the state or federal level. *Id.*, ¶¶10, 12. The estuary is a federally recognized Essential Fish Habitat. *Id.*, ¶ 11.

<u>The Great Bay estuary is impaired due to eutrophication from excessive nitrogen.</u>

The Great Bay estuary is suffering from eutrophication caused by excessive nitrogen. *Id.*, ¶¶ 13-35. Eutrophication occurs when surface waters become enriched with nutrients, including nitrogen, which in turn increases plant and algae growth. *Id.*, ¶ 13. In estuarine environments, and in the case of the Great Bay estuary, excessive growth of seaweed and phytoplankton negatively impact eelgrass, growing so abundantly they crowd out eelgrass. *Id.* When these organisms die, oxygen is used to break down the organic matter, decreasing oxygen in the water. *Id.* Excessive algal blooms and low-oxygen waters can kill fish and seagrass and reduce essential fish habitats. *Id.* Overabundant algae and plants eventually decompose, producing large amounts of carbon dioxide, which in turn increases the acidity of the water and slows the growth of fish and shellfish. *Id.*

The Great Bay estuary exhibits all of the characteristics of eutrophication, including increasing nitrogen concentrations, low dissolved oxygen, macroalgae blooms, and disappearing eelgrass habitat. *Id.*, ¶¶ 14-17. Eelgrass, a key indicator of estuarine health and critical component of the estuarine ecosystem, has declined so severely that in some places in the estuary only half the population remains, and in other estuarine locations eelgrass has disappeared entirely. *Id.*, ¶¶ 25-33. The estuary is burdened by nitrogen levels as high as three times the levels acceptable for eelgrass health. *Id.*, ¶ 24. Other environmental indicators provide evidence of the declining health of the Great Bay estuary, including an increase in seaweed, invasive seaweed, macroalgae and suspended sediments, and decrease in dissolved oxygen, water clarity, light penetration, migratory fish, and shellfish. *Id.*, ¶¶ 34-35. Nitrogen-fueled eutrophication in the estuary is well documented and recognized by both EPA and NHDES. *Id.*, ¶¶ 13-35.

As a result of eutrophication from excess nitrogen, waters in the Great Bay estuary are impaired and violate state water quality standards. *Id.*, ¶¶ 36-45. NHDES has designated waters in the Great Bay estuary as impaired and placed those waters on New Hampshire's 303(d) List. *Id.*, ¶ 38; *see also id.* at ¶ 43. In doing so, NHDES explained that eutrophication from excess nutrients causes violations of state water quality standards. *Id.*, ¶ 39 (NHDES, 2012 Section 305(b) and 303(d) Surface Water Quality Report (2012), at 36-37 ("Eutrophication from excess nutrients is a critical issue affecting the aquatic life designated use in the Great Bay Estuary. . . . These symptoms of eutrophication from excess nutrients impair the aquatic life designated use which is a violation of the state water quality standards for nutrients (Env-Wq 1703.14) and biological and aquatic community integrity (Env-Wq 1703.19).")). EPA has similarly stated conclusively that nitrogen is contributing to water quality impairments in the estuary, and that nutrient-related impairments are pervasive throughout the entire estuary: "it is apparent that the entire estuary is suffering from significant and pervasive nutrient-related impacts which are not isolated to the most susceptible areas." *Id.*, ¶ 45. Nitrogen-related impairments in the Great Bay estuary have increased over time. *See id.*, ¶¶ 20, 38, 43.

Nitrogen is discharged into the Great Bay estuary from wastewater treatment facilities.

As much as 33% of the nitrogen in the estuary is discharged from wastewater treatment facilities ("WWTF"). *Id.*, ¶ 46. Several WWTFs in the estuary have undergone plant upgrades to optimize nitrogen removal. While some of these upgrades have been substantial and will benefit water quality in the estuary, these actions are not enough, on their own, to restore the health of the estuary. *Id.*, ¶ 47. In 2020, EPA issued the GBTNGP to regulate nitrogen discharges from thirteen New Hampshire WWTFs that discharge wastewater into the Great Bay estuary watershed. *Id.*, ¶ 48. Importantly, the limits in the GBTNGP alone are not sufficient to address the excessive nitrogen in the Great Bay estuary, because the GBTNGP does not impose requirements on stormwater point source discharges, including the Contributing Discharges. *See id.*, ¶¶ 49-51.

Most nitrogen in the Great Bay estuary comes from stormwater point sources and nonpoint sources.

Most of the nitrogen in the Great Bay estuary – an estimated 68% – comes from sources other than WWTFs – mainly stormwater point sources and non-point sources. *Id.*, ¶¶ 52-54. As described by NHDES, nitrogen reaches the estuary "from atmospheric deposition, chemical fertilizers, human waste through septic systems, and animal wastes. These sources are then routed through surface waters, stormwater, and groundwater to the estuary as a delivered load of nitrogen." *Id.*, ¶ 53. Stormwater runoff, which increases with the addition of impervious surfaces, carries nitrogen into the estuary. *Id.*, ¶¶ 55-60. The Piscataqua Region Estuaries Partnership ("PREP") describes this process:

> Impervious surfaces are man-made features, such as parking lots, roads, and buildings, that do not allow precipitation to infiltrate into the ground. When precipitation falls on impervious surfaces, it runs off those surfaces carrying pollutants and sediments into nearby waterways. Watersheds reach a tipping point around 10% impervious cover, beyond which water quality impacts become increasingly severe.

Id., ¶ 60.

The total nitrogen load delivered from stormwater sources varies based on land use type, the amount of impervious surfaces, and precipitation patterns. *Id.*, ¶ 58. In New England, the average annual nitrogen loading from impervious surfaces ranges from 10.5 to 17 pounds per acre per year, depending on land use type. *Id.*, ¶ 59. The average annual nitrogen loading from commercial, industrial, and institutional land uses in New England is 15 pounds per acre per year. *Id.* Moreover, impervious surfaces absorb and emit heat and increase the temperature of the stormwater runoff that flows from those surfaces, heating the water temperature in the estuary. *Id.*, ¶ 66. Communities in the Great Bay estuary watershed have high levels of impervious cover, with some communities exceeding the tipping point of 10% impervious cover. *Id.*, ¶¶ 61-62.

The growing population in the Great Bay estuary watershed has increased, and continues to increase harmful stress on the estuary. As the population grows, impervious surfaces increase, along with increased stormwater runoff and greater nitrogen loading in the estuary. *Id.*, ¶¶ 81-88. In some places in the estuary watershed, growth of impervious cover outpaces population growth. *Id.*, ¶ 87.

As a result of climate change, the Great Bay region is experiencing changing precipitation patterns, more extreme storm events, and increasing colored dissolved organic matter, coastal acidification, and sea level rise. *Id.*, ¶¶ 89-90. Increased rainfall causes increased stormwater, delivering even more sediments and nutrients, including nitrogen, into the estuary. *Id.* Increased climate impacts act as additional stressors on the estuary and magnify each other to make the estuary less and less resilient. *Id.*, ¶¶ 89, 92.

Discharges of nitrogen from stormwater point sources are causing and contributing to violations of water quality standards in the Great Bay estuary. *Id.*, ¶¶ 36-45, 52-69. To protect and restore the estuary and achieve acceptable nitrogen loads, nitrogen discharges from stormwater point sources must be reduced. *Id.*, ¶¶ 73-80, 93-94.

III. <u>Statutory and Regulatory Framework</u>

A. <u>The Clean Water Act Prohibits the Discharge of Pollutants Into Waters of the United States Without a Permit.</u>

Congress established the Clean Water Act "("CWA") "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33. U.S.C. § 1251(a). To achieve this important objective, the CWA prohibits the "discharge of any pollutant[8] by any person" from any point source[9] into waters of the United States, except when the discharge is authorized by permit. 33 U.S.C. § 1311(a). The discharge of any pollutant is defined to include "any addition of any pollutant to navigable waters from any point source." 33 U.S.C. § 1362(12). Discharge permits are issued pursuant to the National Pollutant Discharge Elimination System ("NPDES"), 33 U.S.C. § 1342. Certain stormwater discharges require a NPDES permit.

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[8] "Pollutant" is defined as "dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water." 33 U.S.C. § 1362(6).

[9] "Point source" is defined as "any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture." 33 U.S.C. § 1362(14).

B. <u>Congress Expressly Provided for Residual Designation of Unpermitted Stormwater Pollution Under the Clean Water Act.</u>

Stormwater was not always regulated by the CWA, but in 1987, in recognition of the serious environmental problems caused by stormwater pollution and out of frustration with EPA's failure to control stormwater discharges, Congress directed EPA to phase-in a comprehensive national regulatory program to issue NPDES permits for stormwater discharges. 33 U.S.C. §§ 1342(p)(4), (6); *Los Angeles Waterkeeper v. Pruitt*, 320 F.Supp.3d 1115, 1119 (C.D. Cal. 2018). While the CWA generally does not require a permit for discharges composed entirely of stormwater, 33 U.S.C. § 1342(p)(1), Congress amended the CWA to create five categories of high-priority stormwater discharges for immediate and ongoing NPDES regulation. 33 U.S.C. §§ 1342(p)(1), (p)(2)(A)-(E). "If a category of stormwater falls within one of the five exceptions, then it is not subject to the moratorium on regulating stormwater and is placed back within the broader rule of the statute that all discharges of pollutants must be either subject to (1) a NPDES permit or (2) totally proscribed." *Los Angeles Waterkeeper*, 320 F.Supp.3d at 1122. In other words, if stormwater discharges fall within one of the exception categories, EPA must act and either engage in permitting of the discharge or prohibit it altogether. *Id.*; citing 33 U.S.C. §§ 1311(a); 1342(p)(1)-(2).

The five categories of stormwater discharges requiring NPDES permitting focus primarily on well-documented and significant sources of stormwater pollution, such as runoff associated with industrial activities and large urban areas.[10] The final category, however, requires NPDES permits for any stormwater discharge that EPA determines "contributes to a violation of

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[10] The five categories of stormwater discharges requiring NPDES permitting pursuant to 33 U.S.C. § 1342(p)(2) are:

(A) A discharge with respect to which a permit has been issued under this section before February 4, 1987.
(B) A discharge associated with an industrial activity.
(C) A discharge from a municipal separate storm sewer system serving a population of 250,000 or more.
(D) A discharge from a municipal separate storm sewer system serving a population of 100,000 or more but less than 250,000.
(E) A discharge for which the Administrator or the State, as the case may be, determines that the stormwater discharge contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States.

33 U.S.C. § 1342(p)(2)(A)-(E).

a water quality standard or is a significant contributor of pollutants to waters of the United States." 33 U.S.C. § 1342(p)(2)(E); *see also* 40 C.F.R.§ 122.26(a)(1)(v). This mandate to regulate stormwater discharges that contribute to water quality standard violations or that significantly contribute pollutants to waters of the United States is commonly known as EPA's Residual Designation Authority ("RDA").[11]

EPA promulgated stormwater rules in two phases. EPA's Phase I stormwater rule focused on industrial polluters and urban areas while continuing to recognize the need, pursuant to CWA § 402(p)(2)(E), for "immediate permitting" of stormwater discharges that contribute to violations of water quality standards. *Nat'l Pollutant Discharge Elimination Sys. Permit Application Regulations for Storm Water Discharges*, 55 Fed. Reg. 47990, 47993 (Nov. 16, 1990). In its Phase II stormwater rule, EPA affirmed the importance of regulating stormwater discharges that contribute to water quality impairments:

> Individual sources are subject to regulation if EPA or the State, as the case may be, determines that the storm water discharge from the source contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States. This standard is based on the text of section CWA 402(p). In today's rule, EPA believes, as Congress did in drafting section CWA 402(p)(2)(E), that individual instances of stormwater discharge might warrant special regulatory attention, but do not fall neatly into a discrete, predetermined category. *Today's rule preserves the regulatory authority to subsequently address a source (or category of sources) of stormwater discharges of concern on a localized or regional basis.* For example, as States and EPA implement TMDLs, permitting authorities may need to designate some point source discharges of storm water on a categorical basis either locally or regionally in order to assure progress toward compliance with water quality standards in the watershed.

Regulations for Revision of the Water Pollution Control Program Addressing Stormwater Discharge, 64 Fed. Reg. 68,721, 68,781 (Dec. 8, 1999), codified at 40 CFR §§ 122.26(a)(1)(v) and 122.26(a)(9)(i)(D) (emphasis added). *See also Envt'l Def. Ctr. v. EPA*, 344 F.3d 832, 875

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[11] RDA determinations may be made directly at the initiative of the NPDES permitting authority or result from the development of a wasteload allocation in a total maximum daily load ("TMDL") analysis. *See* 40 C.F.R. § 122.26(a)(9)(i)(C). Additionally, any person may petition the Director or Regional Administrator to designate a discharge or category of dischargers under RDA. 40 C.F.R. § 122.26(f)(2). Once an RDA petition is submitted to the Director or Regional Administrator, a final decision on the petition must be made within 90 days of its receipt. 40 C.F.R. § 122.26(f)(5).

(9th Cir. 2003) (affirming inclusion of residual designation authority "as a legitimate exercise of regulatory authority conferred by § 402(p)."). The Phase II rule authorized EPA to issue RDA discharge-permit determinations "on a categorical basis within identified geographic areas such as a State or watershed." 64 Fed. Reg. 68,736 (codified at 40 C.F.R. § 122.26(a)(9)(i)(D)). This action inherently "expanded [the agency's] authority to issue permits on a significantly broader basis, for wholesale categories of discharges in a geographic area." *In re Stormwater NPDES Petition*, 2006 VT 91, ¶ 12. The broader approach to stormwater permitting in EPA's Phase II stormwater rules facilitates EPA's overarching goal of coordinated watershed planning. *Id.* (citing 64 Fed. Reg. 68,739). "In promoting the watershed approach to program administration, EPA believes NPDES general permits can cover a category of dischargers within a defined geographic area. Areas can be defined very broadly to include political boundaries (e.g., county), watershed boundaries, or State and Tribal land." 64 Fed. Reg. 68,739.

C. **When EPA Determines Certain Stormwater Discharges Contribute to a Violation of Water Quality Standards, It Must Exercise Residual Designation Authority.**

Exercise of residual designation authority is not optional. *In re Stormwater NPDES Petition*, 2006 VT 91, ¶ 28. "The Clean Water Act [residual designation authority] provisions . . . provide that EPA must engage in the permitting process for stormwater discharges that contribute to water quality violations." *Los Angeles Waterkeeper*, 320 F.Supp.3d at 1124. Once a discharge, or a category of discharges, is determined to be contributing to a violation of water quality standards, the operator of those discharges "shall be required to obtain a [NPDES] permit." 40 C.F.R. § 122.26(a)(9)(i)(D); *see also* 33 U.S.C. § 1342(p)(2)(E); *Los Angeles Waterkeeper*, 320 F.Supp.3d at 1123 ("Accordingly, once EPA determined there are sufficient data available to demonstrate that stormwater discharges are contributing to water quality impairments… the statute *required* EPA to engage in the permitting process or prohibit the discharge.") (emphasis in original, internal citations omitted).

A pair of recent federal court decisions spell out EPA's responsibilities in making an RDA determination: EPA must first determine whether the stormwater discharges contribute to a water quality violation, and, if they do, either engage in NPDES permitting or prohibit the discharges. *Blue Water Baltimore*, *Inc. v. Wheeler*, 2019 WL 1317087, *5 (D. Md. March 22, 2019); *Los Angeles Waterkeeper*, 320 F.Supp.3d at 1123. EPA cannot consider factors outside the statutory bounds when making its RDA determination, such as other programs or permitting schemes that may address stormwater discharges. *Blue Water Baltimore*, at *5-6; *Los Angeles Waterkeeper*, 320 F.Supp.3d at 1125. If EPA concludes that stormwater discharges are contributing to water quality violations, it cannot decline to regulate because other programs may also be in place. *Id.*

The courts in *Los Angeles Waterkeeper* and *Blue Water Baltimore* based their analyses in part on the Supreme Court's decision in *Massachusetts v. EPA*, 549 U.S. 497 (2007). In *Massachusetts*, the Supreme Court ruled that, in the context of regulating greenhouse gas emissions, EPA could not consider factors outside of the Clean Air Act, including consideration of other programs that might be addressing the problem in question, to determine if regulations under that Act were necessary. The *Massachusetts* decision concluded that EPA cannot consider factors "divorced from the text" of the statute. *Massachusetts*, 549 U.S. at 532-33. Relying on *Massachusetts*, the *Blue Water Baltimore* court explained:

> Defendants argue that consideration of existing programs is a "reasonable explanation." But *Massachusetts* expressly rejected this argument. *Massachusetts* concluded that the "laundry list of reasons" EPA offered in declining to regulate greenhouse gases, including that various Executive Branch programs "already provide an effective response to the threat of global warming, . . . have nothing to do with whether greenhouse gas emissions contribute to climate change. Still less do they amount to a reasoned justification for declining to form a scientific judgment." Here too, EPA's reliance on existing programs does not amount to a reasoned justification for failing to determine whether stormwater discharges from [specific] sites contribute to violations of water quality standards.

Blue Water Baltimore, at *6 (quoting and discussing *Massachusetts*, 549 U.S. at 533-34.). EPA can only decline to exercise its RDA authority if it determines that the discharges do not contribute to the water quality violations. *Id.* ("In other words, EPA may only decline to regulate if it answers this scientific question in the negative or concludes that there is insufficient information to make this determination.")

Importantly, EPA cannot decline to exercise RDA in favor of existing or preferred methods of addressing stormwater runoff. *Los Angeles Waterkeeper*, 320 F.Supp.3d at 1125. EPA cannot abstain from RDA permitting even if existing permits are already in place that may address the stormwater discharges, including other NPDES permits such as MS4 permits. In making an RDA determination, EPA must answer "the scientific question posed by the text of § 1342(p)(2)(E) – whether the stormwater discharges at issue contribute to violations of water quality standards." *Blue Water Baltimore,* at *5. EPA cannot consider factors beyond this scientific inquiry. *Id.* at *5-6 (citing § 1342(p)(2)(E); *Massachusetts*, 549 U.S at 534-35). If EPA determines that the stormwater discharge is contributing to water quality violations in any way that is more than *de minimis*, EPA must engage in the permitting process. *Los Angeles Waterkeeper*, 320 F.Supp.3d at 1125.

D. New Hampshire's Surface Water Quality Standards Were Enacted to Protect Public Health, Enhance Water Quality, and Serve the Purposes of the Clean Water Act.

The CWA requires states to establish minimum water quality standards sufficient to carry out the overall purpose of the CWA. 33 U.S.C. § 1313; 40 C.F.R. § 131.2. Water quality standards are meant to "protect public health or welfare, enhance the quality of water, and serve the purposes of the [CWA]."[12] 40 C.F.R. § 131.2. Pursuant to the CWA, "[a] water quality standard defines the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water or by setting criteria that protect the designated uses." 40 C.F.R. § 131.2.

Pursuant to the CWA, New Hampshire has enacted Surface Water Quality Standards, Env-Wq 1700 et seq., to "protect public health and welfare, enhance the quality of water and serve the purpose of the [CWA]." Env-Wq 1701.01 (internal citations omitted). New Hampshire established a statutory goal "that all surface waters attain and maintain specific standards of water quality . . . ." RSA 485-A:8. Surface waters are divided into two classifications, and water quality standards vary by class: Class A (highest quality waters, acceptable for use as drinking water) and Class B (second highest quality waters, acceptable for fishing, swimming, and other recreational uses). RSA 485-A:8, I, II. As required by the state's water quality standards: "All surface waters shall be restored to meet the water quality criteria for their designated classification including existing and designated uses, and to maintain the chemical, physical, and biological integrity of surface waters." Env-Wq 1703.01(b). Additionally, "[a]ll surface waters

[12] Serving the purposes of the CWA "means the water quality standards should, wherever attainable, provide water quality for the protection and propagation of fish, shellfish and wildlife and for recreation in and on the water and take into consideration their use and value of public water supplies, propagation of fish, shellfish, and wildlife, recreation in and on the water, and agricultural, industrial, and other purposes including navigation." 40 C.F.R. § 131.2.

shall provide, wherever attainable, for the protection and propagation of fish, shellfish and wildlife, and for recreation in and on the surface waters." Env-Wq 1703.01(c).

All waters in the Great Bay estuary are classified as Class B waters. As such, they must meet the numeric water quality criterion for dissolved oxygen and satisfy the following narrative water quality criteria:

- "All surface waters shall support and maintain a balanced, integrated, and adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of similar natural habitats of a region." Env-Wq 1703.19(a).
- "Class B waters shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring. Existing discharges containing phosphorus or nitrogen, or both, which encourage cultural eutrophication shall be treated to remove the nutrient(s) to ensure attainment and maintenance of water quality standards." Env-Wq 1703.14(b) & (c).

See also Statement of Facts, ¶ 37. New Hampshire's surface water quality standards define "cultural eutrophication" as "the human-induced addition of wastes that contain nutrients to surface waters, resulting in excessive plant growth or a decrease in dissolved oxygen, or both." Env-Wq 1702.15.

The CWA further requires states to identify impaired water bodies that do not meet water quality standards, and to list those waterbodies on their 303(d) lists. *See* 33 U.S.C. § 1313(d). Pursuant to the CWA, NHDES evaluates the quality of New Hampshire's surface waters every two years, and produces a list of impaired waters, called New Hampshire's 303(d) List. Statement of Facts, ¶ 36. As discussed *supra* at 5-6, NHDES has designated waters in the Great Bay estuary as impaired and placed those waters on New Hampshire's 303(d) List of impaired waters. Statement of Facts, ¶¶ 38-45.

IV. Analysis

A. The Contributing Discharges Require a NPDES Permit Because They Contribute to Ongoing Violations of Water Quality Standards.

Stormwater pollution from the Contributing Discharges is contributing to ongoing violations of water quality standards in the Great Bay estuary, and EPA must exercise RDA and require all persons responsible for those discharges to obtain a NPDES permit. There is a clear and decisive record establishing that nitrogen from the Contributing Discharges is contributing to water quality standard violations in the Great Bay estuary. Statement of Facts, ¶¶ 13-94; *see also supra* at 5-8. As EPA has already found:

> The Great Bay estuary is composed of a complex network of tidal rivers, inland bays, and coastal harbors. The estuary receives treated wastewater effluent containing nitrogen from 17 publicly owned treatment works (POTWs) located in New Hampshire and Maine. Additionally, the estuary receives a significant nitrogen load from a variety of nonpoint sources and stormwater point sources throughout the watershed. Upon an evaluation of years of ambient monitoring data and other relevant technical and scientific information, EPA has determined that the nitrogen load is exceeding the assimilative capacity of the estuary and is causing or contributing, or has the reasonable potential to cause or contribute, to pervasive nutrient-related impairments and violations of water quality standards. EPA's conclusions are based on the weight of the evidence and draw on multiple lines of evidence. . . . These factual determinations are largely uncontested.

EPA, Great Bay Total Nitrogen General Permit, NPDES Permit No. NHG58A000, Response to Comments ("GBTNGP Response to Comments") at 5 (internal citations omitted); *see also* Statement of Facts, ¶ 69. Moreover, conditions in the estuary require immediate attention. In 2020 EPA described the eutrophic cycle in the Great Bay estuary as self-reinforcing and noted that any delay in addressing the cycle "could mean the difference between potential recovery or collapse of the ecosystem." Statement of Facts, ¶ 93 (quoting GBTNGP Response to Comments at 7-8). As a result, EPA concluded that there is an urgent need to regulate nitrogen in the estuary. *Id.*

i. <u>Impairments due to excessive nitrogen in the Great Bay estuary are well documented.</u>

The Great Bay estuary is suffering from eutrophication caused by excessive nitrogen. *See supra*, at 5; Statement of Facts, ¶¶ 13-35. The estuary exhibits all of the characteristics of eutrophication, including increasing nitrogen concentrations, low dissolved oxygen, macroalgae blooms, and disappearing eelgrass habitat. *Id.*, ¶¶ 17-24. Eelgrass, a key indicator of estuarine health and critical component of the estuarine ecosystem, has declined so severely that in some places in the estuary only half the population remains, and in other locations eelgrass has disappeared entirely. *Id.*, ¶¶ 25-33. The estuary is burdened by nitrogen levels as high as three times the levels acceptable for eelgrass health. *Id.*, ¶ 24. Other environmental indicators reveal the declining health of the estuary. *Id.*, ¶¶ 34-35. Eutrophication in the estuary due to excessive nitrogen is well documented and recognized by both EPA and NHDES. *See id.*, ¶¶ 13-35.

As a result of excess nitrogen, waters in the Great Bay estuary are impaired and violate state water quality standards. *Id.*, ¶¶ 36-45. NHDES has designated waters in the Great Bay estuary as impaired and placed those waters on New Hampshire's 303(d) List. *Id.*, ¶¶ 38-43. In doing so, NHDES explicitly stated that eutrophication from excess nutrients cause violations of state water quality standards. "Eutrophication from excess nutrients is a critical issue affecting the aquatic life designated use in the Great Bay Estuary. . . . These symptoms of eutrophication from excess nutrients impair the aquatic life designated use which is a violation of the state water quality standards for nutrients (Env-Wq 1703.14) and biological and aquatic community integrity (Env-Wq 1703.19)." *Id.*, ¶ 39 (quoting NHDES, 2012 303(d) Report, at 36-37). EPA has similarly stated conclusively that nitrogen is contributing to water quality impairments in the estuary. According to EPA: "what is certain is that large amounts of nitrogen contribute to water quality impairments throughout the Great Bay estuary, which is consistent with EPA's judgment that these waters have reached their assimilative capacity for nitrogen." *Id.*, ¶ 15. Moreover, EPA has concluded that nutrient-related impairments are pervasive throughout the entire estuary: "it is apparent that the entire estuary is suffering from significant and pervasive nutrient-related impacts which are not isolated to the most susceptible areas." *Id.*, ¶ 45. Nitrogen-related impairments in the Great Bay estuary have been and are increasing over time. *Id.*, ¶ 20.

ii. <u>The Contributing Discharges contribute to violations of water quality standards in the Great Bay estuary.</u>

Most of the nitrogen in the Great Bay estuary comes from stormwater point sources and non-point sources. *Id.*, ¶¶ 52-69; *see supra* at 6-8. NHDES estimates that 68% of the nitrogen in the estuary originates from sources other than wastewater treatment facilities. Statement of Facts, ¶ 53. NHDES identified nitrogen sources "from atmospheric deposition, chemical fertilizers, human waste through septic systems, and animal wastes. These sources are then routed through surface waters, stormwater, and groundwater to the estuary as a delivered load of nitrogen." *Id.* The Piscataqua Region Estuaries Partnership ("PREP") describes how nitrogen from stormwater reaches the estuary:

> Non-point source[13] nitrogen enters our estuaries in two major ways: 1) from stormwater runoff, which carries nitrogen from atmospheric deposition (including mobile transportation sources – cars, trucks, trains; and stationary stack emissions

[13] PREP uses the term "non-point source" to describe discharges that are both non-point source discharges and stormwater point source discharges.

> – smoke stacks), fertilizers, and animal waste to the estuaries; and 2) from groundwater contribution, which carries nitrogen from septic systems, sewer leakage, and infiltrated stormwater runoff into streams, rivers, and the estuary itself. These non-point sources (NPS) accounted for 606.6 tons per year or 67% of the nitrogen load for 2012 – 2016. It is important to understand that NPS loads are much more difficult to manage than point source loads because they come from a variety of sources, many of which are controlled by private land owners.

Id., ¶ 56.

Stormwater runoff, and associated nitrogen loading, increases with impervious surfaces. *Id.*, ¶ 60. Development decreases vegetative areas that naturally filter stormwater and increases the amount of pollutants carried by stormwater runoff and discharged into receiving waters.[14] *Id.*, ¶ 85. Because only a limited amount – 2.6% – of Great Bay estuary watershed is occupied by wetlands, which buffer pollution entering the estuary, PREP describes the estuary as "extremely vulnerable" to nitrogen loading from stormwater runoff. *Id.*, ¶ 55.

Watersheds reach a tipping point when approximately ten percent or more of the watershed is covered with impervious surfaces, beyond which adverse water quality impacts become increasingly severe. *Id.*, ¶¶ 60-61. Communities in the Great Bay estuary watershed have high levels of impervious cover, with some communities exceeding the tipping point of ten percent impervious cover, including but not limited to Portsmouth (26.7% impervious cover) and New Castle (20% impervious cover). *Id.*, ¶ 62.

Stormwater point source discharges of nitrogen from the Contributing Discharges are contributing to violations of water quality standards in the Great Bay estuary. EPA has stated:

> EPA has determined – and NHDES has concurred – that the overall nitrogen loading to the Great Bay estuary has exceeded the estuary's assimilative capacity. Given the tidal nature of the estuary, *all* significant discharges of nitrogen throughout the watershed . . . are clearly contributing to this excessive load and are, therefore, contributing to a variety of excursions of water quality standards.

[14] PREP has described this process: "Impervious surfaces are man-made features, such as parking lots, roads, and buildings, that do not allow precipitation to infiltrate into the ground. When precipitation falls on impervious surfaces, it runs off those surfaces carrying pollutants and sediments into nearby waterways. Watersheds reach a tipping point around 10% impervious cover, beyond which water quality impacts become increasingly severe." Statement of Facts, ¶ 60.

Id., ¶ 41 (quoting 2020 Fact Sheet, at 19) (emphasis added). EPA has concluded that "[t]o achieve acceptable nitrogen loads… significant point source and non-point source reductions are necessary." *Id.*, ¶ 73. According to EPA, a reduction of approximately 45% of non-point source and stormwater point source load reduction is necessary to achieve desired nitrogen levels in the estuary. *Id.*

The Contributing Discharges consist of discharges from properties meeting or exceeding impervious cover thresholds (0.75 and 1.5 acres) in three specific land use categories: commercial, industrial, and institutional. Regulating these land use types is warranted, because of the nitrogen loads they contribute. In New England, the average annual nitrogen loading from impervious surfaces ranges from 10.5 to 17 pounds per acre per year, depending on land use type (and ranges from 0.3 to 3.6 pounds per acre per year for pervious areas). *Id.*, ¶ 59. Commercial, industrial, and institutional properties have a greater pollutant loading impact – averaging 15 pounds per acre per year – as compared to residential parcels. *Id.*, ¶¶ 59, 64. In EPA's recent determination to exercise residual designation authority over certain stormwater discharges in the Charles River, Neponset River, and Mystic River watersheds in Massachusetts, EPA selected discharges from commercial, industrial, and institutional properties because of their greater pollutant loading impact on a per parcel basis. Charles, Mystic & Neponset RDA Determination, at 25.

For purposes of this petition, Contributing Discharges consist of unpermitted discharges located in the New Hampshire portion of the Great Bay estuary in the following two categories: (1) non-*de minimis* stormwater discharges from commercial, industrial, and institutional properties located in communities regulated under the New Hampshire MS4 General Permit[15] and having 0.75 acres or more of impervious cover, and (2) non-*de minimis* discharges from

[15] The MS4 communities in the Great Bay estuary watershed, including communities that have obtained a waiver from the MS4 General Permit, are: Barrington, Brentwood, Candia, Chester, Danville, Dover, Durham, East Kingston, Epping, Exeter, Fremont, Greenland, Hampton Falls, Kingston, Lee, Madbury, Milton, New Castle, Newfields, Newington, Newmarket, North Hampton, Portsmouth, Raymond, Rochester, Rollinsford, Rye, Sandown, Somersworth, and Stratham. *See* Statement of Facts, ¶¶ 71-72.

commercial, industrial, and institutional properties located in non-MS4 communities[16] and having 1.5 acres or more of impervious cover.

The lower impervious cover threshold (0.75 acres) for commercial, industrial, and institutional properties located in MS4 communities is warranted because they are in close proximity to the estuary and located in or near urbanized areas; accordingly, they have a greater nitrogen loading impact. *See* NH MS4 General Permit, at 1.1, 1.2.1; Statement of Facts, ¶ 65, 71, 82-87.[17] Stormwater discharges from properties in communities located farther from the estuary, on the other hand, have less of a nitrogen loading impact in the estuary because some nitrogen is lost through attenuation during transport in tributary rivers from the point of discharge to the estuary. *See* Statement of Facts, ¶ 65.

Parcels with large amounts of impervious cover, of at least 0.75 acres or 1.5 acres, represent a small percentage of properties in the estuary watershed, but contain a significant amount of impervious cover per parcel. Waterstone Engineering Technical Memorandum at 2.[18] Contributing Discharges with 0.75 acres or more of impervious cover are typically large commercial and industrial land uses, with impervious cover from driveways, parking lots, and rooftops. *See id.* at 3. Selecting discharges for RDA permitting based on commercial, industrial, and institutional properties with high levels of impervious cover is consistent with the approach recommended by the University of New Hampshire Stormwater Center in a report modeling the watershed effects of stormwater. *See* University of New Hampshire Stormwater Center, Technical Report on Modeling Results, Modeling the Effect of Local Stormwater Regulations on Future Pollutant Loads in the Oyster River Watershed (2015) ("UNH Stormwater Modeling

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[16] The non-MS4 communities in the Great Bay estuary watershed are: Brookfield, Deerfield, Farmington, Kensington, Middleton, New Durham, Northwood, Nottingham, Strafford and Wakefield. *See* Statement of Facts, ¶¶ 71-72.

[17] If EPA determines that a Great Bay estuary watershed community currently not regulated under the MS4 permit should be designated an MS4 community, the RDA threshold for MS4 communities, 0.75 acres or more impervious cover, would then apply to Contributing Discharges in that community.

[18] To support this Petition, CLF commissioned a technical memorandum from Waterstone Engineering which provides technical support for designation of the Contributing Discharges causing nitrogen-related impairments in the Great Bay estuary. Technical Memorandum on Designation of Contributing Discharges for Nitrogen Impairment to the Great Bay, New Hampshire, Robert Roseen, PHD, PE, DWRE, Waterstone Engineering (March 21, 2022) ("Waterstone Engineering Technical Memo."), attached.

Report") at 1-2. Of course, EPA may also consider using RDA to regulate stormwater discharges from parcels with a lower threshold amount of impervious cover, which would address a greater number of properties and an even greater nitrogen load.[19] UNH Stormwater Modeling Report at 10.

B. <u>Residual Designation Will Supplement and Enhance Existing Programs.</u>

Because the Contributing Discharges are contributing to violations of water quality standards, EPA must begin permitting pursuant to its RDA authority, and EPA cannot decline to regulate the Contributing Discharges in light of existing permits already in place that address some of the nitrogen entering the estuary. *See supra*, at 11-12. While not relevant to EPA's RDA determination under 33 U.S.C. § 1342(p)(2)(E), it is important to note that permitting of the Contributing Discharges will supplement and enhance existing NPDES permit programs affecting the Great Bay estuary watershed.

Some Great Bay estuary watershed communities are covered by permits that regulate some, but not all or even most, of their nitrogen loads. EPA issued the GBTNGP in 2020 to regulate discharges containing nitrogen from 13 New Hampshire WWTFs into the Great Bay estuary. Through the GBTNGP, EPA chose to regulate nitrogen discharges across numerous WWTFs while recognizing that meaningful nitrogen reductions from other sources would be necessary. Statement of Facts, ¶¶ 48-51. In describing the GBTNGP, EPA acknowledged two limitations in the permit: first, it does not address all, or even most, sources of nitrogen in the estuary; second, where the permit does extend beyond the WWTFs, it relies on *voluntary* action by municipalities. According to EPA:

> EPA acknowledges that water quality standards will not be achieved in the Great Bay estuary by means of reductions at POTWs [publicly owned treatment works] alone due to the large amount of load from nonpoint sources and stormwater point

[19] The UNH Stormwater Modeling Report used a threshold of 5,000 square feet impervious cover. UNH Stormwater Modeling Report, at 10. A threshold of 5,000 square feet is equivalent to 0.115 acres of impervious cover. Waterstone Engineering Technical Memo., at 2. Data from NHDES and UNH demonstrate that, while the greater the size of the impervious surface, the greater the pollutant load generated, smaller impervious areas predominate and have an important cumulative effect on carrying nutrient pollution to surface waters. Waterstone Engineering Technical Memo, at 1. For example, properties with 5,000 square feet of impervious cover represent approximately 55% of all impervious surfaces in the NHDES and UNH dataset. *Id.* at 2.

> sources. . . . Critically, this approach [in the GBTNGP] is predicated on the support of NHDES and the municipalities to carry out nitrogen reductions from nonpoint sources voluntarily . . .

Id., ¶¶ 50 (quoting GBTNGP Response to Comments at 8). EPA further recognizes "that reliance on purely optional nitrogen reductions is not an effective permitting strategy toward achieving water quality standards." Statement of Facts, ¶ 51 (quoting GBTNGP Response to Comments at 53).

Some Great Bay estuary watershed communities are covered by the New Hampshire MS4 permit, which addresses some, but not all or most, of the nitrogen entering the estuary through stormwater runoff. Many communities have obtained waivers from the MS4 permit. Statement of Facts, ¶¶ 71-72. Moreover, EPA has specifically noted that the MS4 permit does not contain up to date nitrogen control requirements for all communities under that permit or in the watershed, and that estuary impairments persist despite MS4 permit requirements. *Id.*, ¶ 71. The MS4 permit also does not regulate the Contributing Discharges.

A permitting program from EPA in response to this Petition would complement and build upon the existing GBTNGP and MS4 permit to reduce nitrogen loads in the estuary.

C. Residual Designation is an Equitable Approach to Regulating Nitrogen Discharges.

Absent RDA designation, the regulatory burden for attainment of water quality standards falls only upon those stormwater dischargers and GBTNGP dischargers that are currently being regulated. *See id.*, ¶¶ 70-72. As indicated by long-standing water quality violations in the Great Bay estuary, not regulating additional sources will prevent attainment of water quality standards. The Great Bay estuary is wide ranging, covering approximately 21 square miles over numerous rivers and tributaries, and the estuary watershed extends even further. *Id.*, ¶¶ 1-4. Forty-two New Hampshire communities are completely or partially in the Great Bay estuary watershed. *Id.*, ¶ 71. In contrast, only a portion of those communities have some form of NPDES permitting, *see id.*, and that permitting does not address most of the nitrogen load discharged into the estuary. Permitting under RDA would distribute more broadly the regulatory actions needed to restore the estuary's health and attain water quality standards.

D. Residual Designation is Needed to Mitigate the Effects of Climate Change on the Estuary.

The changing climate is exacerbating stressors in the Great Bay estuary. As a result of the impacts of climate change, the Great Bay region is experiencing changing precipitation patterns, more extreme storm events, and increasing colored dissolved organic matter, coastal acidification, and sea level rise. *Id.*, ¶ 89. Increased rainfall causes more stormwater, delivering even more sediments and nutrients, including nitrogen, into the estuary. *Id.*, ¶¶ 89-90. These impacts increase stress on the estuary and compound one another. *Id.*, ¶ 89. As estuarine health declines, the estuary becomes less and less resilient. Statement of Facts, ¶¶ 89, 92.

The increasing and compounding effects of climate change make the need for action in the estuary even more urgent. According to EPA: "Protective actions to increase resilience for eelgrass habitat are critical as climate science predicts an increase of stressful events, such as extreme storms with increased rains and higher winds." *Id.*, ¶ 91. Requiring better stormwater management is essential to enhancing the resilience of communities in the face of climate change and associated increase in severe storm events and flooding. *Id.*, ¶¶ 89-92. "Wet weather and heavy precipitation can have a significant effect on communities, especially in areas with high amounts of impervious cover, and climate change augments those effects. Increased (or decreased) flows of stormwater from climate change will likely lead to increased pollution, either from additional loads (from increased flows), or greater concentration (from decreased flows)." *Id.*, ¶ 90 (quoting Charles, Mystic & Neponset RDA Determination, at 19 (internal citations omitted)). As the estuary faces increased stressors, EPA must act to protect and restore the Great Bay estuary. As EPA has already concluded, urgent action to regulate nitrogen in the Great Bay estuary is necessary, and "any delay could mean the difference between potential recovery or collapse of the system . . . ." *Id.*, ¶ 93.

V. Conclusion

For the reasons stated above and in the attached Statement of Facts, the Contributing Discharges are contributing to violations of water quality standards in the Great Bay estuary. Given the consistent and unequivocal nature of these findings, EPA must determine pursuant to 33 U.S.C. § 1342(p)(2)(E) and 40 CFR §§ 122.26(a)(1)(v) that stormwater pollution from the Contributing Discharges contribute to water quality standard violations in the Great Bay estuary, and must take all necessary actions, using its residual designation authority, to regulate those discharges under the NPDES program.

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Respectfully submitted,

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Statement of Undisputed Facts in Support of
Conservation Law Foundation's Petition to the U.S. Environmental Protection Agency
to Exercise Residual Designation Authority Over Stormwater Discharges Contributing to
Violations of Water Quality Standards in the Great Bay Estuary Watershed

The Great Bay estuary is a network of rivers, bays, and harbors.

1. An estuary is a coastal water body where freshwater and saltwater mix. The Great Bay estuary is made up of a network of tidal rivers, inland bays, and coastal harbors in New Hampshire and Maine. The estuary extends inland from the mouth of the Piscataqua River at the Atlantic Ocean. U.S. Environmental Protection Agency ("EPA") Great Bay Total Nitrogen General Permit, NPDES Permit No. NHG58A000, 2020 Fact Sheet (hereinafter "2020 Fact Sheet"), at 11.[1]

2. The Great Bay estuary covers approximately 21 square miles, with 144 miles of shoreline. The estuary encompasses Great Bay proper and Little Bay, which are fed by the Winnicut, Squamscott, Lamprey, Oyster, and Bellamy Rivers. The estuary also includes the Upper Piscataqua River, which is fed by the Cocheco, Salmon Falls, and Great Works Rivers; the Lower Piscataqua River; Portsmouth Harbor; and Little Harbor/Back Channel. 2020 Fact Sheet, at 13.

3. The Great Bay estuary watershed is defined as the land area from which rainwater drains, through surface water or groundwater sources, into the Great Bay estuary. New Hampshire Department of Environmental Services ("NHDES"), Great Bay Nitrogen Non-Point Source Study (2014) (hereinafter "GBNNPSS"), at ii.

4. The Great Bay estuary constitutes approximately 86% (by area) of all New Hampshire estuaries. NHDES, Technical Support Document for the Great Bay Estuary Aquatic Life Integrity Designated Use Assessments, 2020/2022 305(b) Report/303(d) List (2022) (hereinafter "2022 303(d) Technical Support Doc."), at 4.

The Great Bay estuary is a critically important and irreplaceable national resource.

5. The Great Bay estuary is one of 28 estuaries of national significance established under the EPA's National Estuary Program. GBNNPSS, at 1.

6. Estuarine environments are among the most productive environments on the planet. Estuaries contain many different habitat types and support unique communities of plants and animals specifically adapted to estuarine environments, making them irreplaceable

[1] This statement of undisputed facts references documents prepared by EPA, prepared by the N.H. Department of Environmental Services, or publicly available online. CLF has not provided such documents as attachments but would be pleased to do so upon request.

natural resources. EPA, National Estuary Program, Basic Information About Estuaries.[2] "Estuaries, especially large, productive ones like Great Bay, are extremely significant aquatic resources. An estuary is a partially enclosed coastal body of water located between freshwater ecosystems … and coastal shelf systems where freshwater from the land measurably dilutes saltwater from the ocean. This mixture of water types creates a unique transitional environment that is critical for the survival of many species of fish, birds, and other wildlife." 2020 Fact Sheet, at 13.

7. Estuaries provide for many recreational opportunities such as swimming, boating, fishing, and bird watching. Estuaries have important commercial value, including providing the nursery grounds for two-thirds of the nation's commercial fish and shellfish, and supporting tourism economies. 2020 Fact Sheet, at 13.

8. The Great Bay estuary is an invaluable environmental, social, and economic resource. "These estuaries are not just places of biological value; they also provide social value, economic benefits, and many other quality-of-life assets such as recreational opportunities and community character. They are where rivers meet the sea, where land meets the water, and where people meet the water." Piscataqua Region Estuaries Partnership ("PREP"), State of Our Estuaries 2018 ("PREP SOOE 2018"), at 40.

9. "The Great Bay Estuary is unusual because of its inland location, more than five miles up the Piscataqua River from the ocean. It is a popular location for kayaking, birdwatching, commercial lobstering, commercial oyster aquaculture, recreational oyster harvesting, and sportfishing for rainbow smelt, striped bass, and winter flounder." 2020 Fact Sheet, at 13.

10. There are 169 bird, fish, and plant species that use the Great Bay Estuary in different ways at different times. Twenty-three of these species are threatened or endangered at the state or federal level.[3]

11. The National Oceanic and Atmospheric Administration has designated the estuary as Essential Fish Habitat for many species of fish at various stages of their lifecycles.[4]

12. The Great Bay estuary may provide habitat for threatened and endangered species, including Atlantic Sturgeon and Shortnose Sturgeon.[5]

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[2] Available at https://www.epa.gov/nep/basic-information-about-estuaries (last accessed December 1, 2022).
[3] Piscataqua Region Estuaries Partnership, Great Bay Estuary, available at https://prepestuaries.org/where-we-work/our-region/ (last accessed December 1, 2022).
[4] National Ocean and Atmospheric Administration, Essential Fish Habitat Mapper, available at https://www.fisheries.noaa.gov/resource/map/essential-fish-habitat-mapper (last accessed January 30, 2023).
[5] New Hampshire Fish and Game, N.H. Wildlife Action Plan (2015), Appendix A: Fish, at 1, 6, available at https://www.wildlife.state.nh.us/wildlife/documents/wap/appendixa-fish.pdf (last accessed December 1, 2022).

The Great Bay estuary is deteriorating from eutrophication caused by excessive nitrogen.

13. The Great Bay estuary is suffering from eutrophication. Eutrophication occurs when an environment becomes enriched with nutrients, including nitrogen, which in turn increases the amount of plant and algae growth in the estuary. Excessive growth of seaweed and phytoplankton negatively impact eelgrass, growing so abundantly they crowd out eelgrass. When these organisms die, oxygen is used to break down the organic matter, decreasing oxygen in the water. PREP SOOE 2018, at 16, 21. Excessive algal blooms and low-oxygen waters can kill fish and seagrass and reduce essential fish habitats. Overabundant algae and plants eventually decompose, producing large amounts of carbon dioxide, which in turn increase the acidity of the water and slow the growth of fish and shellfish.[6]

14. There is a "growing body of technical and scientific literature [that] describes the Great Bay estuary as an estuary in environmental decline because of nutrient overloading." 2020 Fact Sheet, at 14.

15. EPA has stated conclusively that nitrogen is contributing to water quality impairments in the estuary. According to EPA, "what is certain is that large amounts of nitrogen contribute to water quality impairments throughout the Great Bay estuary, which is consistent with EPA's judgment that these waters have reached their assimilative capacity for nitrogen." EPA, Great Bay Total Nitrogen General Permit ("GBTNGP") NPDES Permit No. NHG58A000, Response to Comments (hereinafter "GBTNGP Response to Comments"), at 18.

16. A 1999 National Oceanic and Atmospheric Administration ("NOAA") study on estuaries in the United States found that "[b]y the year 2020, eutrophication symptoms are expected to worsen in about one-third of the systems, primarily due to increased nutrient inputs from population increases and the growth of the aquaculture industry. Of these estuaries, St. Croix River/Cobscook Bay, Great Bay, and Plum Island Sound are expected to worsen the most." 2020 Fact Sheet, at 14 (citing NOAA, National Estuarine Eutrophication Assessment: Effects of Nutrient Enrichment in the Nation's Estuaries (1999)).

17. PREP and NHDES have concluded that the Great Bay estuary is experiencing "all the classic signs of eutrophication: increasing nitrogen concentrations, low dissolved oxygen, and disappearing eelgrass habitat." 2022 303(d) Technical Support Doc., at 4-5 (citing PREP, State of Our Estuaries, 2013 ("PREP SOOE 2013"); *see also* GBNNPSS, at 1 ("The estuary is experiencing the signs of eutrophication, specifically, low dissolved oxygen, macroalgae blooms, and declining eelgrass habitat.") (internal citation omitted).

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[6] National Oceanic and Atmospheric Administration, What is eutrophication?, available at https://oceanservice.noaa.gov/facts/eutrophication.html (last accessed December 1, 2022).

18. PREP further concluded that environmental indicators in the estuary "are sending a clear signal that our estuaries have declined and are under stress." PREP SOOE 2018, at 6.

19. Nutrient loading is a critical stressor on the estuary. PREP SOOE 2018, at 6.

20. The five PREP State of the Estuaries Reports (2003, 2006, 2009, 2013 and 2018) have detailed an increasing trend of nitrogen-related impairments in the Great Bay estuary. 2020 Fact Sheet, at 15.

21. Nitrogen loads to the Great Bay Estuary are 4 to 5 times above "pre-development" levels (estimated levels prior to human disturbance). GBNNPSS, at 20.

22. In 2012, NHDES reported that total nitrogen in the Great Bay estuary had increased 42% in the prior five years, and in the Great Bay the concentrations of dissolved inorganic nitrogen, a major component of total nitrogen, had increased 44% in the prior 28 years. NHDES concluded that "[t]he symptoms of increasing nutrient loads in the estuary system are evident in the decline in water clarity, eelgrass habitat loss, and failure to meet water quality standards for dissolved oxygen in tidal rivers." NHDES, 2012 Section 305(b) and 303(d) Surface Water Quality Report (2012) (hereinafter "2012 303(d) Report"), at 32.

23. "The average annual load of total nitrogen into the Great Bay Estuary from 2012 to 2016 was 903.1 tons per year. In 2016, the total nitrogen load was 707.8 tons per year, the lowest since consistent monitoring of loads began in 2003." PREP SOOE 2018, at 16.

24. The Great Bay Estuary has three times the level of tons of nitrogen per square mile (43.6 tons per square mile) than scientists believe to be the threshold level (14 tons per square mile) for eelgrass health. PREP SOOE 2018, at 8.

<u>Eelgrass loss is a critically important indicator of the declining health of the estuary.</u>

25. Eelgrass is an indicator of estuarine health. NHDES uses aerial eelgrass mapping in the estuary to assess the health of the estuary. 2022 303(d) Technical Support Doc., at 6-7. Declining eelgrass in the estuary is evidence of broad water quality impairment due to nutrient over-enrichment. 2020 Fact Sheet, at 19.

26. EPA believes eelgrass to be such a complete indicator of estuarine health that EPA predicts that if necessary nutrient reductions are made to restore and protect eelgrass, the Great Bay estuary will attain all water quality standards for other nutrient-related impairments. 2020 Fact Sheet, at 24.

27. The Great Bay estuary has experienced "severe declines in eelgrass acreage for many years." 2020 Fact Sheet, at 19.

28. "During [the period of 1996 to 2017] the Great Bay estuary lost 1300 acres [of eelgrass], or nearly half of its eelgrass acreage. Additionally, all eelgrass has been lost in the tidal tributaries feeding into the Great Bay estuary and in the upper Piscataqua River." 2020 Fact Sheet, at 19.

29. In its 2018 State of the Estuaries Report, PREP estimated that Great Bay estuary eelgrass coverage levels were at roughly 54% of a science-based goal of 2,900 acres adopted by PREP. PREP SOOE 2018, at 23.

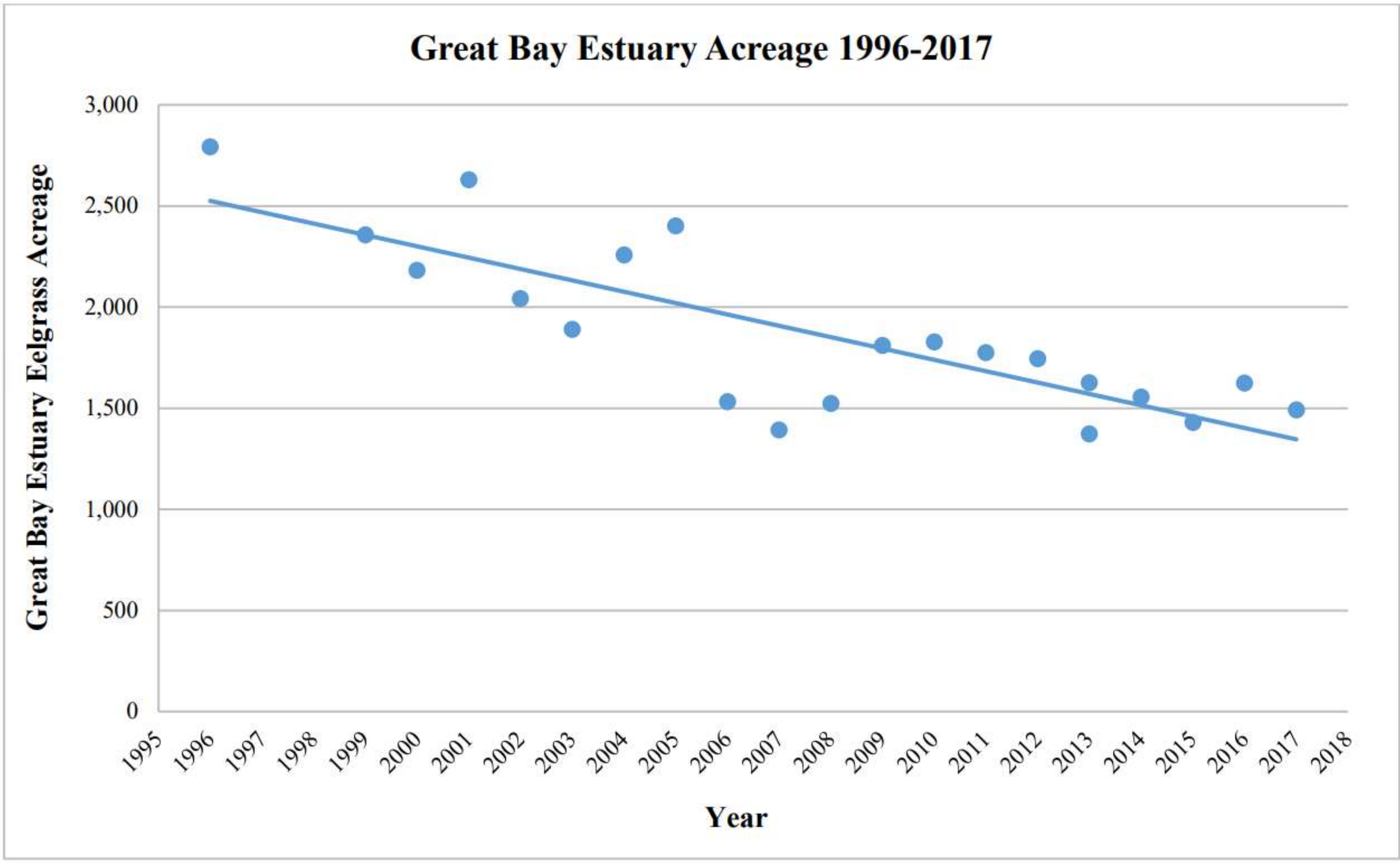
30. According to PREP, "[e]elgrass in the Great Bay Estuary shows an overall decline and, more importantly, a clear deterioration in its ability to recover from episodic stress." PREP SOOE 2018, at 6; *see also id.* at 24 (noting a "broad scientific consensus that eelgrass in the Great Bay shows a consistent pattern of being less and less able to rebound from episodic stresses.").

31. Eelgrass is not only an indicator of the health of the estuary, but also is critically important to maintaining a healthy estuarine ecosystem. "The long leaves of eelgrass (Zostera marina) slow the flow of water, encouraging suspended materials to settle, thereby promoting water clarity. Eelgrass roots stabilize sediments and both the roots and leaves take up nutrients from sediments and the water. Eelgrass provides habitat for fish and shellfish, and it produces significant amounts of organic matter for the larger food web." PREP SOOE 2018, at 23.

32. "Eelgrass (Zostera marina) is the base of the estuarine food web in the Great Bay Estuary. Healthy eelgrass beds filter water and stabilize sediments and provide habitat for fish and shellfish. While eelgrass is only one species in the estuarine community, the presence of eelgrass is critical for the survival of many species. Loss of eelgrass habitat changes the species composition of the estuary, resulting in a detrimental difference in the aquatic community. In particular, if eelgrass habitat is lost, the estuary will likely be colonized by macroalgae species which do not provide the same habitat functions as eelgrass." 2020 Fact Sheet, at 16 (internal citations omitted).

33. The decline in eelgrass in the Great Bay estuary is well documented. *See, e.g.* 2020 Fact Sheet, at 19-21. EPA has provided the following graph demonstrating the decline in eelgrass acreage in the Great Bay estuary from 1996 to 2017:

Figure 2 - Eelgrass Acreage in the Great Bay Estuary from 1996-2017



2020 Fact Sheet, at 20.

<u>Other indicators, including loss of shellfish, increased seaweed, and declining levels of dissolved oxygen are all evidence of deterioration in the Great Bay estuary</u>.

34. Other environmental indicators are evidence of the declining health of the Great Bay estuary. PREP has documented negative and cautionary trends, including an increase in seaweed (including invasive seaweed), a decrease in migratory fish, a decrease in shellfish, and a decrease in dissolved oxygen. PREP SOOE 2018, at 11. PREP reports that: "Shellfish are at extremely low levels compared with populations in the 1980s and early 1990s. Critical habitats for … oysters in the Great Bay Estuary are close to being completely decimated." PREP SOOE 2018, at 6.

35. In 2020 EPA recognized the "increasing nitrogen-related impairments in the Great Bay estuary" that have been reported by PREP through various environmental indicators and documented over the course of five State of Our Estuaries reports since 2003. These indicators include dissolved oxygen concentrations consistently failing to meet state water quality standards, increased nitrogen concentrations, decreased eelgrass, decline in

water clarity, increased macroalgae, and increased suspended sediments and associated decrease of light penetration. 2020 Fact Sheet, at 15-16.

Waters in the Great Bay estuary are impaired due to eutrophication from excess nitrogen.

36. Pursuant to the Clean Water Act, NHDES evaluates the quality of New Hampshire's surface waters every two years and produces a list of impaired waters, called New Hampshire's 303(d) List.[7] NHDES determines whether waters comply with New Hampshire's Surface Water Quality Regulations, Env-Wq 1700 et seq., to support specific designated uses, such as drinking, swimming, and Aquatic Life Integrity (waters that support aquatic life). 2022 303(d) Technical Support Doc., at 4.

37. The Great Bay estuary is classified as a Class B water. As described by EPA:

> Pursuant to New Hampshire water quality standards (NHWQS), "[a]ll surface waters shall be restored to meet the water quality criteria for their designated classification including existing and designated uses, and to maintain the chemical, physical, and biological integrity of surface waters. All surface waters shall provide, wherever attainable, for the protection and propagation of fish, shellfish and wildlife, and for recreation in and on the surface waters." Env-Wq 1703.01(b) & (c). Class B waters must also meet the numeric water quality criterion of at least 75% of dissolved oxygen saturation (daily average) and an instantaneous minimum of 5 mg/L of dissolved oxygen. Env-Wq 1703.07. Furthermore, they must satisfy the following narrative water quality criteria:
>
> - All surface waters shall support and maintain a balanced, integrated, and adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of similar natural habitats of a region. Env-Wq 1703.19(a).
> - Class B waters shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring. Existing discharges containing phosphorus or nitrogen, or both, which encourage cultural eutrophication shall be treated to remove the nutrient(s) to ensure attainment and maintenance of water quality standards. Env-Wq 1703.14(b) & (c).

2020 Fact Sheet, at 17.

[7] NHDES's lists of impaired waters, known as the 303(d) List, can be found by year at: https://www.des.nh.gov/water/rivers-and-lakes/water-quality-assessment (last accessed December 1, 2022).

38. Since at least 2010, NHDES has designated waters in the Great Bay estuary as impaired for nitrogen or eelgrass loss and placed those waters on New Hampshire's 303(d) List of impaired waters. *See supra*, note 7.

39. "Eutrophication from excess nutrients is a critical issue affecting the aquatic life designated use in the Great Bay Estuary. . . . These symptoms of eutrophication from excess nutrients impair the aquatic life designated use which is a violation of the state water quality standards for nutrients (Env-Wq 1703.14) and biological and aquatic community integrity (Env-Wq 1703.19). Reducing nitrogen loads to the estuary to remove these impairments and restore the estuary are top priorities for DES and EPA." 2012 303(d) Report, at 36-37; *see also* 2022 303(d) Technical Support Doc., at 4-5.

40. "Great Bay and many of the rivers that feed it are approaching or have reached their assimilative capacity for nitrogen and are suffering from the adverse impacts of human-derived nutrient over-enrichment, including cultural eutrophication. The impacts of excessive nutrients are evident throughout the Great Bay estuary, including the Piscataqua River." 2020 Fact Sheet, at 17.

41. "EPA has determined – and NHDES has concurred – that the overall nitrogen loading to the Great Bay estuary has exceeded the estuary's assimilative capacity. Given the tidal nature of the estuary, all significant discharges of nitrogen throughout the watershed (including the 13 WWTFs subject to [the GBTNGP general permit]) are clearly contributing to this excessive load and are, therefore, contributing to a variety of excursions of water quality standards." 2020 Fact Sheet, at 19.

42. Water quality impairments in the Great Bay estuary include impairments evidenced by levels of chlorophyll-a, dissolved oxygen, eelgrass, water clarity, and total nitrogen. *See*, *e.g.*, 2022 303(d) Technical Support Doc., at 11-12.

43. Water quality impairments in the Great Bay estuary are summarized in the following 2022 table from NHDES:

Aquatic Life Integrity Designated Use Assessment Summary Table

Comparison of the Final 2016 and Final 2018 (based on assessment zone) to the 2020/2022 assessment of eutrophication parameters for the Aquatic Life designated use in the Great Bay Estuary assessment zones. Assessment category definitions are provided in sections 3.1.3 and 3.1.5 of the 2020/2022 CALM.

De-impairment	New Impairment

Assessment Zone	Cycle	Chlorophyll-a	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Sat)	Estuarine Bioassessments (eelgrass)	Water Clarity (Light Attenuation Coefficient, Kd)	Total Nitrogen
Squamscott River South	2018	5-P	5-P	5-M	No Std	No Std	5-P
	2020/2022	5-P	5-P	5-P	No Std	No Std	5-P
Squamscott River North	2018	5-P	5-P	5-M	5-P	5-P	5-P
	2020/2022	5-P	5-P	5-M	5-P	5-P	5-P
Lamprey River North	2018	5-M	5-P	5-P	No Std	No Std	5-M
	2020/2022	5-M	5-P	5-P	No Std	No Std	5-M
Lamprey River South	2018	5-M	2-G	3-ND	5-P	5-P	5-M
	2020/2022	5-M	3-PNS	3-PNS	5-P	5-P	5-M
Winnicut River	2018	3-ND	3-ND	3-ND	5-P	3-ND	3-ND
	2020/2022	3-ND	3-ND	3-ND	5-P	3-ND	3-ND
Great Bay	*2016*	3-PNS	3-PNS	2-M	5-P	5-M	3-PNS
	2020/2022	5-M	3-PNS	2-M	5-P	5-M	5-M
Oyster River	2018	2-M	5-P	5-P	5-P	5-P	5-P
	2020/2022	5-M	5-P	5-P	5-P	5-P	5-M
Bellamy River	*2016*	3-ND	3-ND	3-ND	5-P	3-ND	3-ND
	2020/2022	5-M	5-P	2-M	5-P	5-P	5-P
Little Bay	*2016*	3-PNS	2-G	2-G	5-P	5-M	3-PNS
	2020/2022	3-PNS	2-G	2-G	5-P	5-M	3-PNS
Cocheco River	2018	5-P	5-M	2-M	No Std	No Std	5-M
	2020/2022	5-P	5-M	3-PAS	No Std	No Std	5-M
Salmon Falls River	2018	5-P	5-P	5-M	No Std	No Std	5-M
	2020/2022	5-P	5-P	5-M	No Std	No Std	5-M
Upper Piscataqua River	*2016*	2-M	3-PNS	2-G	5-P	5-P	3-PNS
	2020/2022	2-M	2-M	2-M	5-P	5-M	3-PNS
Lower Piscataqua River - North	2018	2-G	2-G	3-PAS	5-P	3-PNS	3-PAS
	2020/2022	3-PAS	2-G	2-G	5-P	3-ND	3-PAS
Lower Piscataqua River - South	2018	2-G	2-G	3-PAS	5-P	3-PAS	3-PAS
	2020/2022	3-PAS	2-G	2-G	5-P	3-ND	3-PAS
North Mill Pond	2018	3-ND	3-ND	3-ND	3-ND	3-ND	3-ND
	2020/2022	3-ND	3-ND	3-ND	3-ND	3-ND	3-ND
South Mill Pond	2018	3-ND	3-ND	3-ND	3-PAS	3-ND	3-ND
	2020/2022	3-ND	3-ND	3-ND	3-PAS	3-ND	3-ND
Portsmouth Harbor	*2016*	2-G	2-G	3-PAS	5-P	5-M	2-M
	2020/2022	2-G	2-G	2-G	5-P	5-M	2-M
Sagamore Creek	2018	3-ND	5-M	3-PNS	5-P	3-ND	3-ND
	2020/2022	5-P	5-P	2-M	5-P	3-ND	5-M

Assessment Zone	Cycle	Chlorophyll-a	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Sat)	Estuarine Bioassessments (eelgrass)	Water Clarity (Light Attenuation Coefficient, Kd)	Total Nitrogen
Little Harbor/Back Channel	2016	3-ND	2-M	3-ND	5-P	5-M	3-ND
	2020/2022	3-PAS	3-PAS	3-ND	5-M	5-M	3-ND

2022 303(d) Technical Support Doc., at 11-12.

44. NHDES describes the assessment categories used in the above Aquatic Life Integrity Designated Use Assessment Table in its 2020/22 Consolidated Assessment and Listing Methodology ("CALM").[8] Under the CALM, each assessment unit is assigned one numeric assessment category (numbered 1 through 5) and one lettered subcategory. Assessment units in categories 1 and 2 attain some or all designated uses, units in category 3 have insufficient data, and units in categories 4 and 5 are impaired or threatened for one or more designated use. CALM 3.1.3. Subcategory letters following the numeric category indicate the following: G indicates Good, M indicates Marginal, P indicates Poor, PAS indicates Potentially Attaining Standards, PNS indicates Potentially Not Supporting, T indicates Threatened, and ND indicates No Current Data. CALM 3.1.5. In the 2022 table, above, there are numerous nitrogen-related impairments throughout the estuary (impairments for total nitrogen, eelgrass, water clarity, chlorophyll-a, and dissolved oxygen), including nine new impairments, indicated by orange shading, and no "de-impairments."

45. In response to NHDES's 303(d) list of impaired waters, which includes impairments dispersed over various assessment zones in the Great Bay estuary, as depicted in the table above, EPA concluded that nutrient-related impairments are pervasive throughout the estuary: "EPA notes, however, that the entire Great Bay estuary is a single estuarine system characterized by different levels of mixing of the same source waters, continual exchange of waters among estuarine segments, the same sources for sediment, and the same climatic conditions. Given that there are 50 individual impairments throughout the estuary listed in [the 303(d) list table], it is apparent that the entire estuary is suffering from significant and pervasive nutrient-related impacts which are not isolated to the most susceptible areas." 2020 Fact Sheet, at 18 (citing NHDES, 2012 303(d) List, Table 2, 2012 Nutrient-Related Water Quality Impairments in the Great Bay Estuary).

<u>Nitrogen is discharged into the Great Bay estuary from wastewater treatment facilities.</u>

46. One source of nitrogen in the estuary is discharges from wastewater treatment facilities ("WWTF"). In 2018, PREP reported that 33% of the total annual nitrogen load in the

[8] NHDES, 2020/2022 Section 305(b) and 303(d) Consolidated Assessment and Listing Methodology (2022), available at https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/r-wd-20-20.pdf (last accessed December 1, 2022).

estuary from 2012-2016 came from discharges from 17 municipal WWTFs. PREP SOOE 2018, at 17.

47. Several WWTFs in the estuary have undergone plant upgrades to reduce nitrogen discharges to the estuary. While some of these efforts have been described by EPA as substantial and are expected to benefit the water quality of the estuary, these reductions are not enough to restore the health of the estuary. According to EPA, discharges from the WWTFs located in the Great Bay watershed "have the reasonable potential to cause or contribute to system-wide violations of water quality standards" in the estuary. 2020 Fact Sheet, at 26.

48. In 2020, EPA issued the Great Bay Total Nitrogen General Permit ("GBTNGP") covering thirteen New Hampshire WWTFs that discharge wastewater containing nitrogen into the Great Bay estuary watershed. Through the GBTNGP, EPA chose to regulate a single pollutant (nitrogen) across numerous WWTFs, and to impose a less stringent effluent limitation based on the assumption that meaningful pollutant reductions would be achieved by other means.[9]

49. Importantly, the limits in the GBTNGP alone are not sufficient to address the excessive nitrogen in the Great Bay estuary. In issuing the GBTNGP, EPA noted that the limitations and optimization requirements in that general permit, "along with significant non-point source and stormwater point source reductions" outside of the general permit, are necessary to protect the estuary. 2020 Fact Sheet, at 29.

50. The GBTNGP does not directly impose requirements pertaining to stormwater and non-point source pollution, however the general permit assumes that municipalities subject to the GBTNGP will implement voluntary reductions in nitrogen discharges from stormwater point source and non-point sources. *See* 2020 Fact Sheet, at 29-31; *see also* GBTNGP Response to Comments, at 8 ("EPA acknowledges that water quality standards will not be achieved in the Great Bay estuary by means of reductions at POTWs [publicly owned treatment works] alone due to the large amount of load from nonpoint sources and stormwater point sources. . . . Critically, this approach is predicated on the support of NHDES and the municipalities to carry out nitrogen reductions from nonpoint sources voluntarily . . .") (internal citation omitted); Correspondence from CLF to Mel Cote, EPA Region 1 Water Division (March 25, 2022) (summarizing GBTNGP permitting approach).

51. "EPA agrees that reliance on purely optional nitrogen reductions is not an effective permitting strategy toward achieving water quality standards." GBTNGP Response to Comments, at 53.

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[9] *See generally* https://www.epa.gov/npdes-permits/great-bay-total-nitrogen-general-permit (last accessed December 1, 2022). The discharge of other pollutants from the WWTFs is covered by separate individual NPDES permits.

Most of the nitrogen discharged into the Great Bay estuary comes from stormwater point sources and nonpoint sources.

52. Most of the nitrogen in the Great Bay estuary comes from stormwater point sources and non-point sources. 2020 Fact Sheet, at 28.

53. In 2014, NHDES estimated that 68% of the nitrogen in the estuary originates from sources outside of the WWTFs, spread across the watershed. GBNNPSS, at 1. NHDES identified nitrogen sources "from atmospheric deposition, chemical fertilizers, human waste through septic systems, and animal wastes. These sources are then routed through surface waters, stormwater, and groundwater to the estuary as a delivered load of nitrogen." GBNNPSS, at 1.

54. "While the discharge of nitrogen from the 17 WWTFs represents a significant portion of the controllable nitrogen load into the Great Bay estuary, non-point sources and stormwater point sources of pollution still represent the majority of the nitrogen load." 2020 Fact Sheet, at 28.

55. According to PREP, "it is evident that a large fraction of the nitrogen entering the system comes from non-point sources. Given that only 2.6% of its watershed is occupied by wetlands, which buffer non-point sources of pollution, the Great Bay Estuary is extremely vulnerable to non-point source loadings." PREP SOOE 2018, at 9. It is important to note that PREP includes stormwater point sources, also described as stormwater runoff, in its use of the term "non-point sources." *Id.*, at 17 (defining non-point sources as any sources in the watershed separate from WWTFs, specifically including nitrogen from stormwater runoff).

56. PREP has described how nitrogen reaches the estuary through non-point sources and stormwater point sources:

> Non-point source nitrogen enters our estuaries in two major ways: 1) from stormwater runoff, which carries nitrogen from atmospheric deposition (including mobile transportation sources – cars, trucks, trains; and stationary stack emissions – smoke stacks), fertilizers, and animal waste to the estuaries; and 2) from groundwater contribution, which carries nitrogen from septic systems, sewer leakage, and infiltrated stormwater runoff into streams, rivers, and the estuary itself. These non-point sources (NPS) accounted for 606.6 tons per year or 67% of the nitrogen load for 2012 – 2016. It is important to understand that NPS loads are much more difficult to manage than point source loads because they come from a variety of sources, many of which are controlled by private land owners.

PREP SOOE 2018, at 17 (internal citations omitted).

57. In New England, the median nutrient concentration of total nitrogen in stormwater is 2.0 mg/L. EPA, Clean Water Act Residual Designation Determination for Certain Stormwater Discharges in the Charles, Mystic, and Neponset River Watersheds, in

Massachusetts (Sept. 14, 2022) ("Charles, Mystic & Neponset RDA Determination"), at 21.

58. "The total nitrogen load delivered from stormwater sources in any given area is controlled by the precipitation patterns, the amount of impervious surface in the drainage area, and the land use type of that drainage area." Charles, Mystic & Neponset RDA Determination, at 21.

59. "In New England, the average annual nitrogen loading (export coefficient/rate) from impervious surfaces ranges from 10.5 and 17 pounds per acre per year depending on land use type and 0.3 and 3.6 pounds per acre per year from pervious areas depending on the infiltration rate of the pervious area." Charles, Mystic & Neponset RDA Determination, at 21 (internal citation omitted). The average annual nitrogen loading from commercial, industrial, and institutional land uses in New England is 15.0 pounds per acre per year. *Id.*, at 22.

60. Greater impervious surface cover increases the volume of stormwater runoff, which in turn increases the loading of pollutants, including nitrogen. Charles, Mystic & Neponset RDA Determination, at 27. PREP has described this process: "Impervious surfaces are man-made features, such as parking lots, roads, and buildings, that do not allow precipitation to infiltrate into the ground. When precipitation falls on impervious surfaces, it runs off those surfaces carrying pollutants and sediments into nearby waterways. Watersheds reach a tipping point around 10% impervious cover, beyond which water quality impacts become increasingly severe." PREP SOOE 2018, at 14.

61. Watersheds with impervious surface cover greater than the 10% impervious surface threshold have been linked to water quality impairments due to stormwater discharges. Charles, Mystic & Neponset RDA Determination, at 27.

62. Communities in the Great Bay estuary watershed have high levels of impervious cover, with some communities exceeding the tipping point of 10% impervious cover. These include Portsmouth, with 26.7% impervious cover, and New Castle, with 20% impervious cover. PREP SOOE 2018, at 14.

63. Stormwater point sources convey a significant amount of nitrogen into the estuary. Increased rainfall leads to increased stormwater runoff and higher levels of nitrogen in the estuary. "The highest loads since 2003 were seen in the 2005 to 2007 period (1,662.4 tons per year), a time that coincides with the highest total annual precipitation values. In comparison, the 2012 to 2016 period exhibited lower rainfall, a contributing factor to the 27% decrease in NPS loading since the 2009 – 2011 period. This underscores the association between nitrogen loading and run-off. Precipitation records and forecasts suggest that our region will continue to see periods of extreme highs and lows, which will continue to impact non-point source load." PREP SOOE 2018, at 17 (internal citations omitted).

64. Commercial, industrial, and institutional parcels have a greater pollutant loading impact on a per parcel basis, as opposed to residential parcels. EPA analysis of the Charles River watershed, which EPA has applied to other watersheds, "indicates that, generally, residential parcels have a smaller water quality impact from stormwater discharges on a per-parcel basis compared to commercial, industrial, and institutional parcels." Charles, Mystic & Neponset RDA Determination, at 25.

65. In the Great Bay estuary watershed, some nitrogen carried into surface waters by stormwater runoff is lost during transport through attenuation. GBNNPSS, at 9-10, n. 15. "Nitrogen attenuation refers to the loss of nitrogen that occurs during tributary river transport between the point of discharge and the point of impact. Attenuation is predicated on the idea that some degree of nitrogen removal due to permanent uptake or denitrification occurs in the river." GBTNGP Response to Comments, at 67.

66. Impervious surfaces absorb and emit heat and increase the temperature of the stormwater runoff that flows from those surfaces. This heated stormwater runoff can increase water temperature in the estuary. Increased impervious surfaces create higher temperatures and additional surface runoff, resulting in a larger volume of stormwater runoff with increased temperatures, threatening the ecological integrity of receiving waters. University of New Hampshire Stormwater Center, Thermal Impacts.[10]

67. Stormwater runoff is a main driver of declining water quality. PREP SOOE 2018, at 45.

68. Stormwater point source discharges of nitrogen are causing and contributing to violations of water quality standards in the Great Bay estuary. EPA has concluded "that all significant discharges of nitrogen into the Great Bay estuary, have the reasonable potential to cause or contribute to system-wide violations of water quality standards." 2020 Fact Sheet, at 26.

69. "The estuary receives treated wastewater effluent containing nitrogen from 17 publicly owned treatment works (POTWs) located in New Hampshire and Maine. Additionally, the estuary receives a significant nitrogen load from a variety of nonpoint sources and stormwater point sources throughout the watershed. Upon an evaluation of years of ambient monitoring data and other relevant technical and scientific information, EPA has determined that the nitrogen load is exceeding the assimilative capacity of the estuary and is causing or contributing, or has the reasonable potential to cause or contribute, to pervasive nutrient-related impairments and violations of water quality standards. EPA's conclusions are based on the weight of the evidence and draw on multiple lines of evidence. . . . These factual determinations are largely uncontested." GBTNGP Response to Comments, at 5 (internal citations omitted).

70. Some Great Bay estuary watershed communities are covered by permits that regulate some, but not all or even most, of the nitrogen entering the estuary. Twelve communities

[10] Available at https://www.unh.edu/unhsc/thermal-impacts (last accessed December 1, 2022).

are covered by the GBTNGP, which regulates discharges from thirteen WWTFs. 2020 Fact Sheet, at 5, 27.

71. Some Great Bay estuary watershed communities are covered by the New Hampshire Small Municipal Separate Storm Sewer System General Permit ("MS4 permit"), which addresses some, but not all or most, of the nitrogen entering the estuary in stormwater runoff. *See* 2020 Fact Sheet, at 28-29.[11] The New Hampshire MS4 permit applies to New Hampshire communities with urbanized areas or in geographic areas designated by EPA as requiring a permit. NH MS4 General Permit, at 1.2.1. Many communities have obtained a waiver from the MS4 permit. *See* GBTNGP Response to Comments, at 103-104. The NH MS4 permit, where applicable in the estuary watershed, does not cover all stormwater discharges from the covered communities. Moreover, EPA has specifically noted that the MS4 permit does not contain up to date nitrogen control requirements for all communities under that permit or in the watershed, and that estuary impairments persist despite MS4 permit requirements. 2020 Fact Sheet, at 28-29.

72. EPA has provided the following table demonstrating which Great Bay estuary watershed communities are completely or partially in the estuary watershed, and which of those communities are covered by the MS4 permit, are covered by the MS4 permit but have a waiver for that permit, and/or have a NPDES permit for a publicly owned treatment works:

Community	Town completely/partially in watershed?	MS4	NPDES Permit
Barrington	Complete	Waiver	N/A
Brentwood	Complete	Waiver	NH0100609
Brookfield	Partial	No	N/A
Candia	Partial	Waiver	N/A
Chester	Partial	Waiver	N/A
Danville	Partial	Yes	N/A
Deerfield	Complete	No	N/A
Dover	Complete	Yes	NH0101311
Durham	Complete	Yes	NH0100455
East Kingston	Partial	Waiver	N/A
Epping	Complete	Waiver	NH0100692
Exeter	Complete	Yes	NH0100871

[11] *See also* EPA, General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in New Hampshire (as modified) (2020) ("NH MS4 General Permit"), at 1.1, 1.2.1, Appendix A at 4.

Farmington	Complete	No	NH0100854
Fremont	Complete	Waiver	N/A
Greenland	Complete	Yes	N/A
Hampton	Complete	Yes	NH0022985
			NH0022055
			NH0100625
Hampton Falls	Complete	Waiver	N/A
Kensington	Complete	No	N/A
Kingston	Partial	Yes	N/A
Lee	Complete	Waiver	N/A
Madbury	Complete	Waiver	N/A
Middleton	Complete	No	N/A
Milton	Complete	Yes	NH0100676
New Castle	Complete	Yes	N/A
New Durham	Partial	No	N/A
Newfields	Complete	Waiver	NH0101192
Newington	Complete	Waiver	NH0020923
			NHG581141
Newmarket	Complete	Yes	NH0100196
North Hampton	Complete	Yes	N/A
Northwood	Partial	No	N/A
Nottingham	Complete	No	N/A
Portsmouth	Complete	Yes	NH0100234
			NH0090000
Raymond	Complete	Yes	N/A
Rochester	Complete	Yes	NH0100668
Rollinsford	Complete	Yes	NH0100251
Rye	Complete	Yes	N/A
Sandown	Partial	Yes	N/A
Seabrook	Complete	Yes	N/A
Somersworth	Complete	Yes	NH0100277
Strafford	Partial	No	N/A
Stratham	Complete	Yes	N/A
Wakefield	Partial	No	N/A
Alton	Negligible	No	N/A
Derry	Negligible	Yes	N/A
Hampstead	Negligible	Yes	N/A
Pittsfield	Negligible	No	N/A
Wolfeboro	Negligible	No	N/A

GBTNGP Response to Comments, at 103-104.[12]

<u>Nitrogen discharges through stormwater point sources must be reduced to restore the health of the estuary.</u>

73. Because stormwater runoff is a major contributor of nitrogen to the estuary, reducing stormwater pollution is necessary. "To achieve acceptable nitrogen loads… significant point source and non-point source reductions are necessary." 2020 Fact Sheet, at 26. According to EPA, a reduction of approximately 45% of non-point source and stormwater point source load is necessary to achieve desired nitrogen levels in the estuary. *Id.* at 28; *see also* GBTNGP Response to Comments, at 9-10.

74. "Based on the record before it, EPA acknowledges that water quality standards will not be achieved in the Great Bay estuary by means of reductions at POTWs alone due to the large amount of load from nonpoint sources and stormwater point sources." GBTNGP Response to Comments, at 8.

75. In addition to EPA, NHDES has stressed the importance of addressing nitrogen from point sources, stormwater point sources, and non-point sources. 2020 Fact Sheet, at 28.

76. Addressing stormwater point sources through stormwater management will significantly reduce nitrogen in the estuary. PREP SOOE 2018, at 45.

77. A study from the University of New Hampshire describes early adoption of stormwater regulations to require stormwater controls as "the greatest opportunity to minimize increased pollutant loading" that would result in "substantial water quality benefits." University of New Hampshire Stormwater Center, Technical Report on Modeling Results, Modeling the Effect of Local Stormwater Regulations on Future Pollutant Loads in the Oyster River Watershed (2015) ("UNH Stormwater Modeling Report"), at ii. Stormwater controls can mitigate the negative effects associated with increased development and expanding impervious cover. *Id.* The UNH Stormwater Modeling Report concluded that: "The findings of this analysis clearly demonstrate that adopting local stormwater regulations to require more stringent stormwater treatment standards could have a tremendous positive impact in minimizing and preventing the additional future pollutant loads that would be discharged in the Great Bay estuary. This would significantly alter the current trajectory of declining water quality conditions." *Id.* at iii.

78. Enhanced stormwater treatment in the Great Bay estuary watershed could result in potential future cost savings in the hundreds of millions of dollars. UNH Stormwater Modeling Report, at iii.

79. "[T]he key to effective management of stormwater runoff is to reduce the amount of stormwater generated in the first place by maintaining and working with the hydrology

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[12] In the table EPA includes Hampton and Seabrook in the watershed, but they are not in the Great Bay estuary watershed.

of a site and management stormwater at the source." NHDES, New Hampshire Stormwater Manual, Vol. 1 (Dec. 2008), at 18.

80. Effective stormwater management can increase the resilience of communities in the face of climate change and the associated increase in severe storm events and flooding. PREP SOOE 2018, at 45.

The growing population in the Great Bay estuary watershed puts increased pressure on the estuary and causes increased nitrogen loading in the estuary.

81. The population is growing in the Great Bay estuary watershed. For example, from 1990 to 2015, the combined population of the 52 towns in the Piscataqua Region watershed (10 in Maine and 42 in New Hampshire) grew by 38%, from 280,205 to 386,658. PREP SOOE 2018, at 7.

82. Increases in nitrogen loading mirror increasing population trends. GBNNPSS, at 5l; *see also* GBTNGP Response to Comments, at 8 ("total nitrogen load is population driven and the Great Bay estuary watershed is and has been fast growing.").

83. Coastal counties are growing three times faster than counties elsewhere in the nation. EPA reports that increasing concentrations of people in coastal counties upsets the natural balance of estuarine ecosystems, threatens their integrity, and imposes increased pressures on estuaries.[13]

84. Increased population adds stress to the environment through increased built infrastructure, wastewater, fertilizers, toxic contaminants, and impervious surfaces. PREP SOOE 2018, at 6, 7.

85. With population growth comes the growth of impervious surfaces. Between 1990 and 2010 impervious surfaces in the watershed increased by 120% and continue to increase. PREP SOOE 2018, at 8. Some of the largest increases in impervious surfaces occurred in watershed communities such as Rochester (increase of 122 impervious acres between 2010 and 2015) and Dover (increase of 56 acres between 2010 and 2015). PREP reports that for every one person increase in population in the region between 2010 and 2015, impervious surface increased by .06 acres. PREP SOOE 2018, at 14.

86. Increased development results in decreased vegetative areas that naturally treat stormwater, increasing pollutants in stormwater runoff. New Hampshire Stormwater Manual, Vol. 1, at 16.

87. Research reveals that in some places growth in impervious cover outpaces population growth. The UNH Stormwater Modeling Report found a disparity between population growth in the Oyster River Watershed and growth in impervious cover, with impervious cover increasing at a faster rate. Looking at historical data from 1990-2010, the UNH

[13] EPA, Basic Information About Estuaries, available at https://www.epa.gov/nep/basic-information-about-estuaries (last accessed December 1, 2022).

Stormwater Modeling Report found: "The amount of IC [impervious cover] area in the watershed is disproportionate to population growth; where population increased by 25 percent, IC increased over the corresponding time period by 123 percent. This could have major implications for water quality conditions within the watershed, especially if the stormwater runoff from these IC areas is left untreated." UNH Stormwater Modeling Report, at 4.

88. The newest development in the region is occurring in towns upwatershed from Great Bay and in traditionally rural communities, which can result in additional negative impacts as open space is developed. PREP SOOE 2018, at 43. The UNH Stormwater Modeling Report noted this trend and stressed the importance of stormwater regulations to address increasing impervious cover in watershed headwater regions. UNH Stormwater Modeling Report, at 4.

Climate change is causing additional harm to the estuary.

89. As a result of the impacts of climate change, the Great Bay region is experiencing changing precipitation patterns, more extreme storm events, and increasing colored dissolved organic matter, coastal acidification, and sea level rise. Increased rainfall causes increased stormwater delivering even more sediments and nutrients, including nitrogen, into the estuary. All of these climate impacts act as additional stressors on the estuary and magnify each other to make the estuary less and less resilient. PREP SOOE 2018, at 7.

90. "Wet weather and heavy precipitation can have a significant effect on communities, especially in areas with high amounts of impervious cover, and climate change augments those effects. Increased (or decreased) flows of stormwater from climate change will likely lead to increased pollution, either from additional loads (from increased flows), or greater concentration (from decreased flows)." Charles, Mystic & Neponset RDA Determination, at 19 (citing EPA, Climate Adaptation Action Plan 5 (Oct. 2021) (noting that climate change impacts, "if combined with sufficiently high nutrient levels and temperatures, [can lead to] more harmful algal blooms, pathogens, and water related illnesses"); EPA, Climate Change and Harmful Algal Blooms, available at https://www.epa.gov/nutrientpollution/climate-change-and-harmful-algal-blooms).

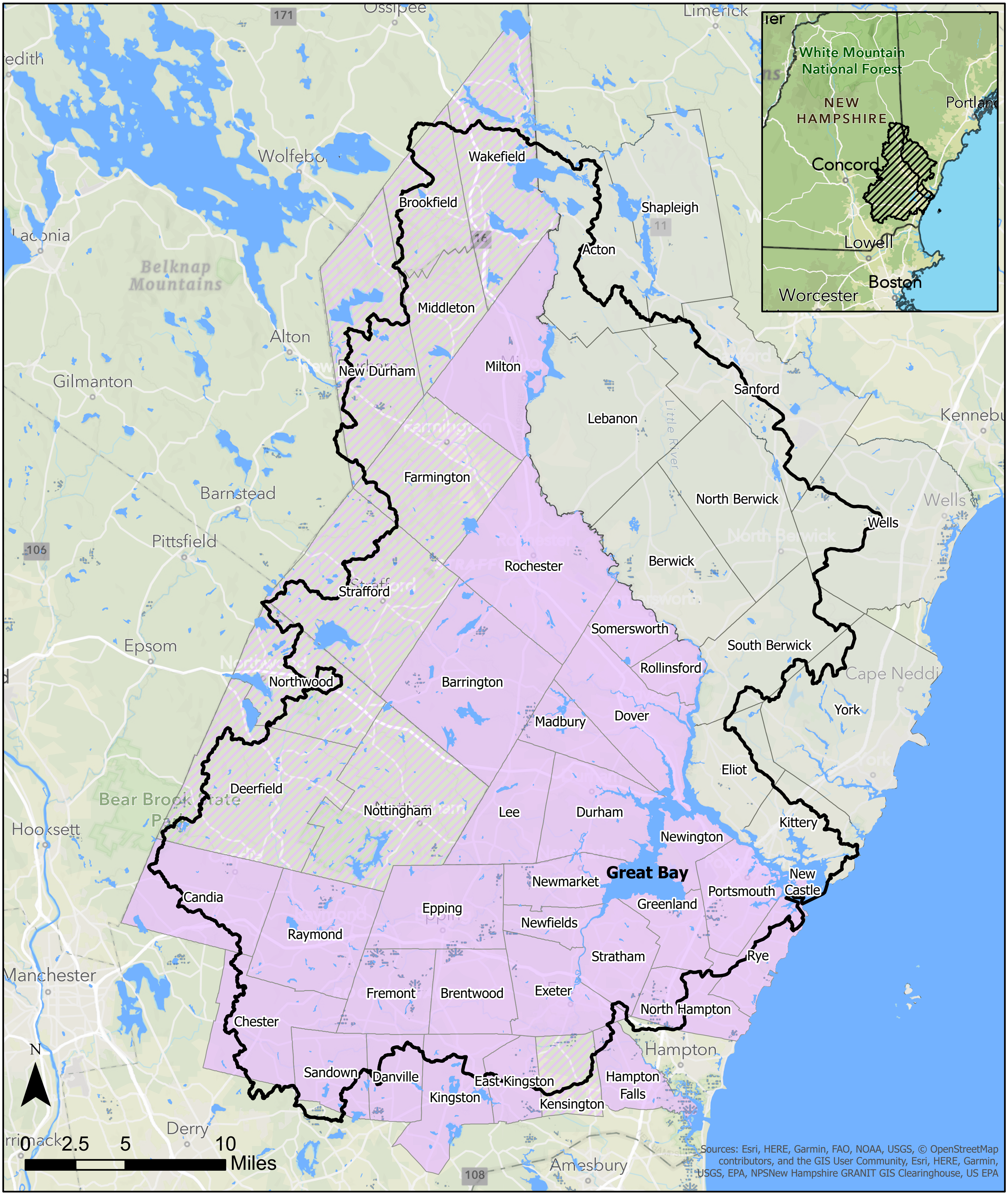
91. To protect against climate change, EPA has recognized that: "Protective actions to increase resilience for eelgrass habitat are critical as climate science predicts an increase of stressful events, such as extreme storms with increased rains and higher winds." 2020 Fact Sheet, at 17 (citing PREP SOOE 2018, at 6, 24).

92. As estuarine health continues to decline, estuaries become much less resilient to change and stress. PREP SOOE 2018, at 6.

There is an urgent need to regulate nitrogen in the estuary.

93. EPA has concluded that there is an urgent need to regulate nitrogen in the estuary. GBTNGP Response to Comments at 7-8. "[T]he eutrophic cycle is self-reinforcing and any delay could mean the difference between potential recovery or collapse of the ecosystem . . . . EPA concluded there is urgency to regulate nitrogen in order to prevent further degradation since total nitrogen load is population driven and the Great Bay estuary watershed population is and has been fast growing." GBTNGP Response to Comments, at 7-8.

94. Urgent action is needed to protect and restore the Great Bay estuary. "There is an urgent need for us to come together to make significant, strategic investments in increased monitoring and research, better shoreland protection policies, and infrastructure improvements. We cannot think in terms of a "silver bullet" action that will alleviate all of the stress on our estuaries. Instead, we must take cross-cutting steps that help our estuarine ecosystems be strong and healthy enough to rebound from the challenges we currently face and those we will encounter in the future." PREP SOOE 2018, at 6.



The Great Bay Estuary Watershed

New Hampshire municipalities within the Great Bay Estuary Watershed categorized by MS4 coverage

Map created February 2023 by the Conservation Law Foundation

Legend

- NH Municipalities Subject to MS4
- NH Municipalities Not Subject to MS4
- Great Bay Estuary Watershed

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