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Managing Chloride Impairment by Expanding and Strengthening Stormwater Regulation in Maine

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MANAGING CHLORIDE IMPAIRMENT BY EXPANDING AND STRENGTHENING STORMWATER REGULATION IN MAINE

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ABSTRACT

A highly contributing factor to impairment of water quality is stormwater that flows across the urban landscape, picking up pollutants along the way, which is directed by a system of stormwater infrastructure to be deposited in the nearest water body. Though state regulations to manage stormwater are in place, there is a need to strengthen and expand them to address chloride impairment. Chloride impairment stems from the use of road salt during the winter season, and is a serious concern for current and future urban streams. The only cost-effective method to address this impairment is by reducing the amount that is used. Such a reduction must come from public and private property owners alike. This can be achieved through permitting via the National Pollutant Discharge Elimination System, which Maine is authorized to implement, or through the state-wide stormwater regulations that apply when property is developed. Not doing so means the quality of Maine's water will continue to further degrade, an unacceptable option in the face of the Clean Water Act and the health of the public and our environment.

INTRODUCTION

For most, the sound, smell, and sight of a spring rain brings a sense of renewal—a sense that after the rain stops everything is refreshed and revitalized. For some though, as the rain pours down, all that can be seen are the invisible pollutants that covered the roads and sidewalks being washed into the nearest stream. There, it is likely to wreak havoc on the aquatic habitat, disrupting at a foundational level the ecosystem services this habitat provides. A sense of reinvigoration is replaced by a slight pang of dread, knowing what is really being washed away.

A highly contributing factor to impairment of water quality is stormwater that flows across the urban landscape. As stormwater runs across the numerous impervious surfaces that make up our cities and towns, it picks up pollutants along the way, is collected by a system of natural and artificial conveyances, and is directed to a water body to be discharged.[1] In other cases, stormwater is not collected by any system, but rather sheets off the landscape to be deposited in the nearest water body, wetland, or into the ground.[2] Regulations to manage stormwater are young and have encountered multiple issues in practice.[3] Further, due to urbanization, the hydrology of watersheds nationwide have been entirely reorganized, disturbing the systems that would process the stormwater if left in a natural state.[4] When hydrologic disturbance is coupled with the introduction of pollutants that accompanies urbanization, the result is the degradation of water quality and habitat in virtually every urban stream.[5]

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1. *See* COMM. ON REDUCING STORMWATER DISCHARGE CONTRIBUTION TO WATER POLLUTION, NAT'L RSCH. COUNCIL, URBAN STORMWATER MANAGEMENT IN THE UNITED STATES 22 (2008) [hereinafter COMM. ON REDUCING STORMWATER DISCHARGE].

2. This is also referred to as nonpoint source pollution. *Basic Information about Nonpoint Source Pollution*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/nps/basic-information-about-nonpoint-source-nps-pollution [https://perma.cc/WWN4-B4JD] (last visited Mar. 16, 2023). Section 319 of the Clean Water Act attempts to address nonpoint source pollution. *See generally* 33 U.S.C. § 1329 (1987). While nonpoint source pollution is a pressing issue that deserves attention, this article focuses on the regulatory framework of point source pollution. However, the solutions posed herein would also address nonpoint source pollution, strengthening the case for their implementation.

3. *See* COMM. ON REDUCING STORMWATER DISCHARGE, *supra* note 1, at 2-3. Because stormwater is being addressed after so much development has already taken place, laws are incomplete and inadequate at addressing the issue. *Id.*

4. *Id.* at 4. *See, e.g.,* Christopher J. Walsh et al., *The Urban Stream Syndrome: Current Knowledge and the Search for a Cure*, 24(3) J. OF THE N. AM. BENTHOLOGICAL SOC'Y 706, 707-16 (2005).

5. COMM. ON REDUCING STORMWATER DISCHARGE, *supra* note 1, at 4.

One such pollutant contributing to water quality impairment is chloride, the element that comprises road salt used to de-ice roads in the winter. Due to its toxic effects, chloride has been designated by the U.S. Environmental Protection Agency (EPA) as a pollutant.[6] Though it is documented to have several negative ecological impacts,[7] and may even be hazardous to human health,[8] road salt is applied at a rate of millions of tons each year.[9] Because of its designation as a pollutant that degrades water quality, it is regulated under the federal Clean Water Act.

When Congress passed the Clean Water Act, it did so with ambition, stating that the Act's objective is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[10] In complying with the Act, the right of the States to "prevent, reduce, and eliminate pollution" is recognized and protected,[11] though they are nonetheless required to develop and maintain specific water quality standards.[12]

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6. *National Recommended Water Quality Criteria – Aquatic Life Criteria Table*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/wqc/national-recommended-water-quality-criteria-aquatic-life-criteria-table [https://perma.cc/EF3Y-364P] (last visited Mar. 23, 2023).

7. *See generally* Athena Tiwari & Joseph W. Rachlin, *A Review of Road Salt Ecological Impacts*, 25(1) NE. NATURALIST 123 (2018); Nancy Karraker et al., *Impacts of Road Deicing Salt on the Demography of Vernal Pool-Breeding Amphibians*, 18(3) ECOLOGICAL APPLICATIONS 724 (2008); Sebastian Szklarek et al., *The Effects of Road Salt on Freshwater Ecosystems and Solutions for Mitigating Chloride Pollution – A Review*, 805 SCI. OF THE TOTAL ENV'T 150289 (2022).

8. *See* Kelsey J. Piper et al., *Impact of Road Salt on Drinking Water Quality and Infrastructure Corrosion in Private Wells*, 52 ENV'T SCI. AND TECH. 14078, 14084-85 (2018); William D. Hintz et al., *Road Salts*, *Human Safety, and the Rising Salinity of our Fresh Waters*, 20 FRONTIERS IN ECOLOGY AND THE ENV'T 22, 26-27 (2022).

9. JONATHAN RUBIN ET AL., ROAD SALT IN MAINE: AN ASSESSMENT OF PRACTICES, IMPACTS AND SAFETY 1 (2022) (noting Maine used approximately 535,852 tons of road salt in 2019-2020, which is equivalent to 787 pounds per person); *See generally* ROAD SALT: MOVING TOWARD THE SOLUTION, CARY INSTITUTE OF ECOSYSTEM STUDIES (2010).

10. 33 U.S.C. § 1251(a) (2021).

11. *Id.* § 1251(b).

12. 40 C.F.R. § 131.4(a) (2022). A water quality standard describes the desired condition of a water body and the means by which that condition will be protected. *What are Water Quality Standards?*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/standards-water-body-health/what-are-water-quality-standards [https://perma.cc/D658-X3JA] (last visited Apr. 2, 2023).
There are three core elements of a water quality standard: a designated use, water quality criteria, and antidegradation requirements. *Id.* Some common designated uses are protection and propagation of fish, shellfish, and wildlife; recreation; and public drinking water supply. *Id.* Water quality criteria are then set depending on the designated use. *Id.* For example, if the designated use is for propagation of fish, then certain dissolved

These water quality standards are taken into consideration when discharge permits are issued by the EPA or the State Department that has delegated authority to do so. Maine's Department of Environmental Protection (DEP) has implemented such water quality standards, several other laws (such as the Stormwater Management Law), and corresponding rules in an attempt to "maintain, restore, and protect water quality."[13] Maine's Stormwater Management Law operates to regulate the quantity and the quality of stormwater runoff through standards imposed on development.[14] DEP also issues municipal permits which allow stormwater discharge pursuant to certain criteria.[15] However, despite the Stormwater Management Law, its corresponding rules, and the issuance of various permits, the quality of Maine's urban streams leave much to be desired.

While the nation's stormwater regulations need revision,[16] and though there are multiple ways to approach this revision, states should not wait for a comprehensive update to national regulations. This article proposes two regulatory avenues that can be taken in order to move Maine closer to achieving DEP's stated goal of maintaining, restoring, and protecting the quality of Maine's waters. The first avenue is broadening the scope of Maine's Pollution Discharge Elimination System by seeking out discharges from private, commercial entities. The second avenue is updating Maine's stormwater rules to address the impairment caused by chloride.

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oxygen water quality criteria will be set for that water body. Antidegradation requirements maintain and protect water quality that has already been achieved. *Id.*

13. *Maine's Water Quality Standards,* ME DEP'T OF ENV'T PROT., https://www.maine.gov/dep/water/wqs/index.html [https://perma.cc/F3EF-B4LH] (last visited Mar. 16, 2023) (other than water quality standards and the Stormwater Management Law, Maine DEP has also implemented the Natural Resources Protection Act, Site Location Law, Erosion and Sedimentation Control Law, and certain limitations on and performance standards for mining, excavating, and quarrying).

14. *Stormwater,* ME DEP'T OF ENV'T PROT., https://www.maine.gov/dep/land/stormwater/index.html [https://perma.cc/VY52-KTXQ] (last visited Mar. 16, 2023).

15. 33 U.S.C. § 1251; 38 M.R.S. § 414-A (2011) (these permits are issued under the authority of the Clean Water Act and Maine's Waste Discharge Law); *see* ME DEP'T OF ENV'T PROT., MER041000, GENERAL PERMIT FOR THE DISCHARGE OF STORMWATER FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4) 2 (2020). In Maine, a waste discharge license is required for the discharge of pollutants to Maine's environment. *Id.* One such license is the Municipal Separate Storm Sewer Systems General Permit. *Id.* DEP also issues other stormwater permits, in addition to permits for wastewater from public sewer systems and process water from industrial activities. *Id.*

16. *See* COMM. ON REDUCING STORMWATER DISCHARGE, *supra* note 1, at 9.

Part I discusses the role urbanization and stormwater play in water quality impairment and structural attempts at addressing the issue. This part also discusses chloride pollution, which is contributing to water quality impairment in Maine's urban streams. Part II summarizes the Clean Water Act and takes a detailed look at the National Pollutant Discharge Elimination System, developed to tackle the stormwater issue, and how Maine has implemented those regulations at the state level. This part also identifies certain gaps that exist in regulation. Part III discusses current case law that poses an opportunity to bring more entities within the scope of the stormwater permitting scheme by petitioning EPA or Maine to designate currently unregulated entities. Lastly, Part IV argues that Maine's stormwater rules must be updated and includes various avenues for doing so.

I. THE PROBLEM WITH STORMWATER

Undisturbed watersheds are geographic units naturally designed to address the cumulative impacts of stormwater.[17] Urbanization of a watershed results in changes to these natural systems.[18] These changes typically occur in a certain sequence. First, the landscape becomes altered due to the removal of vegetation and topsoil in order to make room for agriculture, buildings, roads, and other urban infrastructure.[19] These changes, along with the introduction of a human built drainage network, subsequently alter the hydrology of the area.[20] Receiving waters of the watershed then experience radically different flow regimes and are introduced to a variety of pollutant sources, which ultimately lead to water quality degradation.[21]

17. Pamela J. Edwards et al., *Fundamentals of Watershed Hydrology*, 154 J. OF CONTEMP. WATER RSCH. & EDUC. 3, 3-4 (2015). A watershed is an area of land in which all the precipitation occurring in that area drains to the same water body or lower topographic area. *Id.* at 3. In an entirely undisturbed watershed, the hydrologic cycle begins with precipitation and proceeds as it naturally would through the remaining components of the cycle: evaporation, transpiration, soil water, groundwater, and streamflow. *Id.* at 5. When an area is developed to become something other than what it is naturally, the components that comprise the hydrologic cycle, such as streamflow, are altered. *Id.* at 11-12.

18. *See* COMM. ON REDUCING STORMWATER DISCHARGE, *supra* note 1, at 109 (an urbanized watershed can be composed of both naturally formed and constructed drainage networks and can consist of undisturbed areas as well as anthropogenic landscape elements); *see also* Christopher J. Walsh et al., *supra* note 4, at 707.

19. *See* COMM. ON REDUCING STORMWATER DISCHARGE, *supra* note 1, at 109.

20. *Id*.

21. *Id*.

A. Land Use and Development Contribute to Water Quality Impairment

EPA estimates that at any time, the total number of permittees covered by the National Pollutant Discharge Elimination System (NPDES) stormwater program exceeds half a million.[22] Despite this estimation, stormwater pollution continues to contribute extensively to water quality degradation.[23] The complex interplay between land use and water quality plays an increasingly important role due to the impact that various land development projects have on water quality. Urban development generates pollutants that enter water from point and nonpoint sources, such as pesticide and fertilizer use in agricultural operations, toxic waste production in industrial operations, stormwater runoff from roads and parking lots, and sewage from failing septic systems, aging urban sewer systems and combined sewer-stormwater systems overflows.[24] In addition to disturbing the soil—which creates sediment that has a variety of impacts when it enters nearby waterbodies—urbanization changes the landscape of watersheds such that they are not able to function healthily.[25] Lastly, urban development adds impervious surfaces to land, compacts the soil, and removes trees and vegetation, thus increasing the quantity and velocity of stormwater runoff.[26]

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22. *Id.* at 1.

23. *Id*. at 1-4. When watersheds drain to coastal areas, the nearshore environment also becomes impacted by pollutants. Thomas E. Jordan et al., *Effects of Local Watershed Land Use on Water Quality in Mid-Atlantic Coastal Bays and Subestuaries of the Chesapeake Bay*, 41 ESTUARIES & COASTS S38, S38 (2018); s*ee also* ENV'T PROT. AGENCY, EPA 842-F098-007, NEARSHORE WATERS AND YOUR COASTAL WATERSHED 1 (1998) (explaining that industrial and municipal wastewater, stormwater and agricultural runoff are contributing to the general degradation of nearshore waters). Though chloride may not be as detrimental to saline waters as it is to freshwater, an unhealthy watershed above head of tide is likely to impact the ecology of the coastal environment. Further, efforts to address other pollutants that are detrimental to coastal ecosystems will be less effective without a holistic approach to all pollutants in a watershed.

24. Craig Anthony Arnold, *Fourth Generation Environmental Law: Integrationist and Multimodal*, 35 WM. & MARY ENV'T L. & POL'Y REV. 771, 799 (2011). Urbanization of an area can take many forms. The infinite combinations of industry, commerce, residency, pace of development, impervious surface networks, and alterations to topography, soils, and vegetation do not allow for a single definition of urbanization. Rather, the variety of characteristics taken all together in a specific area is what profoundly influences urban streams.

25. *Id*. at 801-802 (sediment that enters nearby waterbodies can cause diminished water quality, habitat alteration, impairment of fish spawning, and raising the cost to treat drinking water).

26. *Id*. at 800.

Zeroing in on development and the addition of impervious surfaces to the landscape, three issues specifically related to stormwater can be highlighted. First, as mentioned above, impervious surfaces are a source of "increased quantities and velocities" of polluted runoff.[27] Second, when an impervious landscape contributes to a degraded water body, it is *in addition to* other impervious surfaces as well as other non-stormwater sources of pollutants.[28] Third, polluted stormwater runoff occurs alongside other effects of development such as loss of wetlands, deforestation, alteration of riparian zones, and channelization of stream morphology, all of which play their own important role in contributing to the problem of stormwater runoff.[29] Ultimately, stormwater discharge contributes to "unhealthy stream flow regimes marked by high peak flows and chronic flash flooding, altered stream morphologies, elevated nutrient and contaminant levels, excessive sedimentation, loss of species diversity, and higher water temperatures."[30]

B. An Initial Attempt to Address Stormwater Runoff

In a traditional attempt to address stormwater runoff, networks of drainage systems combining gutters, curbs, storm sewers and ditches (also known as gray or hard infrastructure) were (and still are) constructed to carry the runoff to the nearest receiving water body.[31] However, regulatory authorities realized that this gray infrastructure was an insufficient response to the water quality impairment caused by stormwater runoff. As recognition of the problems highlighted in the previous section began to grow, the first generation of stormwater regulation focused on addressing the increased rate of storm water discharge from storm events that caused flooding.[32] Regulations began to

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27. *Id*. at 811.

28. *Id*. at 810 (the author points out five other causes that act together: "1) the placement of pollutants and polluting substances on lands from which they can run off; 2) choices to use certain amounts and concentrations of impervious cover in certain locations; 3) choices to use certain pollutants in certain ways in certain locations; 4) legal and regulatory systems that allow the impervious cover choices that were made; and 5) legal and regulatory systems that allow the pollution choices that were made.") (emphasis added).

29. *Id*. at 811.

30. Julie Moore, *Stormwater Runoff from Developed Lands*, 17 VT. J. ENV'T L. 766, 768 (2016).

31. *Id*.

32. *Id*. at 768 (explaining that in 2012 Vermont stormwater management design included "minimizing the increase in the peak runoff rate; providing storage for volume,

include engineering and hydrological requirements "pertaining to measurements of adequate levels of on-site water, flow rates off-site, erosion and sediment control, water quality levels, and minimum design standards."[33]

While standards such as these are important to have in place, permission to develop an area is nonetheless permission to pollute.[34] To illustrate, it is estimated that runoff from a forested acre yields 0.10 pounds of phosphorous annually, compared to 2.58 pounds of annual phosphorous runoff from an acre in a medium density urban area.[35] Typical literature values for phosphorous removal in post-construction stormwater practices averages 40-65%.[36] Thus, even if stormwater management practices capture 65% of the 2.58 pounds of annual phosphorous, "there is still a net increase of phosphorous loading of about 0.90 pounds per year as a result of every acre of impervious surface created."[37]

Moreover, the gray infrastructure created by stormwater regulations is outdated and not equipped to adapt to changes, and the millions of small, private projects incorporating such infrastructure deserve just as much attention as large public infrastructure projects.[38] As society faces an uncertain future of changing climate conditions, experts warn that there are "no analogies to understand, model, or predict" such changes.[39] In 2017, the American Society of Civil Engineers assigned a "D+" grade to U.S. infrastructure, meaning it "is in poor to fair condition and mostly below standard, with many elements approaching the end of their service life."[40] Simply put, the decaying infrastructure that the U.S. currently relies on to manage stormwater is ill-equipped to reduce the quantity and improve the quality of stormwater runoff.

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peak flow control, and water quality; and, providing detention storage, if required, to prevent flooding").

33. Jonathan Rosenbloom, *Fifty Shades of Gray Infrastructure: Land Use and the Failure to Create Resilient Cities*, 93 WASH. L. REV. 317, 359 (2018).

34. Moore, *supra* note 30, at 772.

35. *Id*.

36. *Id*.

37. *Id*.

38. Rosenbloom, *supra* note 33, at 322, 324.

39. *Id*. at 334.

40. *Id*. at 336.

C. Maine is Currently Experiencing Water Quality Impairment

In 2016, the Gulf of Maine Council found that the main anthropogenic forces driving watershed changes in Maine are climate stressors, population growth concentrated in the southern coastal regions, land use changes such as residential and industrial development, and pollution.[41] In addition, "seventy-nine percent of streams assessed in the three U.S. states bordering the Gulf of Maine exhibited modified streamflows . . . from a variety of factors such as . . . urban runoff/impervious cover [in which] the most urbanized areas within the watershed displayed the most alterations."[42] The Scientific and Technical Subcommittee of the Maine Climate Council recently found that Maine has received increased precipitation and runoff over the last century, and increases in the volume of stormwater runoff particularly has resulted in the transport of tons of soil and pollutants into U.S. waters; therefore, regulations may need adjustment.[43] Maine DEP has identified thirty-five urban impaired streams due to failure of water quality standards because of effects of stormwater runoff from developed land.[44] DEP specifically notes that "additional stormwater treatment controls are necessary in urban watersheds of impaired streams because proposed stormwater sources in urban and urbanizing areas contribute to the further degradation of stream water quality."[45]

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41. GLENN A. BENOY ET AL., GULF OF MAINE COUNCIL ON THE MARINE ENVIRONMENT, STATE OF THE GULF OF MAINE REPORT: WATERSHED STATUS 6-10 (2016). The Gulf of Maine Council was formed in 1989 by the governors and premiers of the five Gulf jurisdictions – Massachusetts, New Hampshire, Maine, New Brunswick, and Nova Scotia. *About the Council,* GULF OF MAINE COUNCIL ON THE MARINE ENVIRONMENT, http://www.gulfofmaine.org/public/gulf-of-maine-council-on-the-marine-environment/about-the-council [https://perma.cc/2B32-5V3K] (last visited Apr. 5, 2023). It is a Canadian-American regional partnership that provides collaborative leadership on cross-border issues such as ecosystem conditions, water quality, and climate change within the Gulf of Maine watershed. *Id.*

42. *Id*. at 11.

43. SUSIE ARNOLD ET AL., MAINE CLIMATE COUNCIL SCIENTIFIC AND TECHNICAL SUBCOMMITTEE, SCIENTIFIC ASSESSMENT OF CLIMATE CHANGE AND ITS EFFECTS IN MAINE 10 (Ivan Fernandez & Robert Marvinney eds.) (2020).

44. 06-096 CMR Ch. 502(3)(B).

45. *Id.*

1. Chloride Contributes to Water Quality Impairment

Chloride is the negatively charged ion contained in many salts. In excessive concentrations, it can be detrimental to aquatic life.[46] In order to keep citizens safe during the winter season, state and municipal governments routinely employ chloride-based de-icing and anti-icing practices.[47] In addition, commercial and residential surfaces under private ownership are routinely treated with chloride-based agents during the winter months.[48] Elevated chloride concentrations are highly correlated with impervious surfaces and while some efforts have been made to address the overuse of chlorides, concentrations in waterways continue to increase.[49]

The EPA, finding chloride to be a pollutant, recommends that criteria be set for waterways to reduce harm to aquatic life. Aquatic life criteria are defined as "the highest concentration of specific pollutants or parameters in water that are not expected to pose a significant risk to the majority of species in a given environment."[50] For freshwater that receives runoff containing chloride, the EPA recommends an acute toxicity threshold of 860,000 micrograms per liter and a chronic toxicity threshold of 230,000 micrograms per liter.[51] Pursuant to the Clean Water Act, state governments are required to establish water quality standards, and states may do so by adopting these criteria or using them as guidance to develop their own water quality standards.[52] Maine's DEP has adopted

46. David A. Strifling, *Reducing Chloride Discharges to Surface Water and Groundwater: A Menu of Options for Policymakers*, 48 ENV'T L. 167, 169 (2018).

47. *Id.* at 170.

48. *Id*. at 171.

49. *Id*. at 175-76.

50. *National Recommended Water Quality Criteria – Aquatic Life Criteria Table*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/wqc/national-recommended-water-quality-criteria-aquatic-life-criteria-table [https://perma.cc/Y594-ABUW] (last visited Mar. 21, 2023).

51. *Id*. EPA defines acute and chronic criterion as follows: acute criterion is the estimate of the highest concentration of a material in ambient water to which an aquatic community can be *exposed briefly* without resulting in an unacceptable adverse effect; chronic criterion is the estimate of the highest concentration of a material in ambient water to which an aquatic community can be *exposed indefinitely* without resulting in an unacceptable adverse effect. *Supplemental Module: Aquatic Life Criteria*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/wqs-tech/supplemental-module-aquatic-life-criteria#tab-2 [https://perma.cc/ZV4H-EKAC] (last visited Mar. 21, 2023).

52. *National Recommended Water Quality Criteria – Aquatic Life Criteria Table*, U.S. ENV'T PROT. AGENCY.

EPA's aquatic life criteria for chloride to guide water quality decision-making surrounding this pollutant.[53]

Streams that are greatly threatened by chloride toxicity are those where commercial, office, institutional, multi-unit residential and interstate exchange development is significant.[54] Because there is no best management practice that removes chloride from stormwater or the groundwater, chloride toxicity is becoming Maine's "most challenging urban stream issue[,]" due to an increased use of de-icers during the winter, coupled with the increasing frequency and duration of drought periods.[55]

2. An Attempt to Address Chloride Pollution in Maine's Long Creek Watershed

When the Phase I and II amendments to the Clean Water Act were passed,[56] a provision known as the residual designation authority was included in each, in which a permit may be required if the EPA administrator or the State determined the "stormwater discharge contributes to a violation of a water quality standard or is a significant contributor of pollutants to water of the United States."[57] On December 3, 2008, EPA and the state of Maine made a preliminary determination under this provision that designating stormwater discharges in the Long Creek Watershed was necessary because such discharges were contributing to water quality violations, and a stormwater discharge

53. 06-096 CMR Ch. 584, App. A.

54. *See* ARNOLD ET AL., *supra* note 43, at 208 (noting the effect chloride has on the macroinvertebrate community).

55. *Id*. at 209; *See also* Maria Schuck & Maria Greger, *Chloride Removal Capacity and Salinity Tolerance in Wetland Plants*, 308 J. OF ENV'T MGMT. 1, 6 (2022) (stating current stormwater treatment methods are unable to remove chloride, but the study reveals there are some plants that have removal capacity); *Chloride Management Plan*, MINN. STORMWATER MANUAL (Nov. 23, 2022), https://stormwater.pca.state.mn.us/index.php?title=Chloride_Management_Plan_combined [https://perma.cc/7EGC-LL7C] (stating "once chloride is in water, the only known technology for its removal is reverse osmosis through massive infiltration plants, which is not economically feasible"); Don Talend, *Salt: No Easy Answers*, STORMWATER SOLUTIONS (Jan. 20, 2016), https://www.stormh2o.com/bmps/article/13021552/salt-no-easy-answers [https://perma.cc/749P-VW5E] (stating "nothing can be done to remove salt and its compounds once they get into water supplies, so the management focus is on reducing or eliminating salt in point and nonpoint sources before stormwater becomes a carrier of pollution to groundwater and surface waters").

56. *See infra* Part II(A).

57. 33 U.S.C. § 1342(p)(2)(E) (2019); *see* 40 C.F.R. § 122.26(a)(9)(i)(D) (2021).

general permit was approved by DEP on October 29, 2009.[58] Long Creek is a winding urban stream with a 3.8 mile main branch and five tributaries that converge and flow into Clark's Pond in South Portland, Maine.[59] The watershed consists of three and a half square miles in a commercial and retail district located partly within the bounds of four municipalities.[60] Long Creek currently does not meet state established water quality standards due to changes in the landscape. This change "created intense stormwater conditions that carry pollutants causing degraded water quality, ero[sion] [of] the stream channel, and increase[d] water temperatures. These combined effects have degraded the habitat for aquatic life."[61]

In EPA's preliminary residual designation, many pollutants were identified as contributing to impaired water quality of the watershed, one of which was chloride.[62] Due to such water quality findings, the general permit that was issued applies to post-construction stormwater discharges from *any* property in the Watershed on which there is an impervious area equal to or greater than one acre, including discharges to small municipal separate storm sewer systems or other private or public conveyance systems that convey stormwater to Long Creek or its tributaries.[63] The permit establishes the Long Creek Watershed Management District (LCWMD) in order to ensure compliance with the permit requirements.[64] LCWMD implements the Long Creek Watershed Management Plan (the Plan) for ninety-five permittees, including eighty-nine private landowners, who are primarily commercial and retail properties, three municipalities, Maine Department of Transportation, Maine Turnpike Authority, and ecomaine, a quasi-municipal, waste management facility that provides services to a number of southern Maine municipalities.[65]

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58. ME. DEP'T OF ENV'T PROT., MEPDES PERMIT NO. MEG190000 – POST CONSTRUCTION DISCHARGE OF STORMWATER IN THE LONG CREEK WATERSHED (2015) [hereinafter LONG CREEK PERMIT].

59. *About – Long Creek Watershed*, LONG CREEK WATERSHED MGMT. DIST., https://www.restorelongcreek.org/about [https://perma.cc/SAV2-TGEH] (last visited Mar. 21, 2023).

60. *Id.* (the municipalities are Portland, Scarborough, South Portland, and Westbrook).

61. *Id.*

62. Preliminary Residual Designation of Certain Storm Water Discharges in the State of Maine Under the National Pollutant Discharge Elimination System of the Clean Water Act, 73 Fed. Reg. 80,388 (Dec. 31, 2008).

63. LONG CREEK PERMIT, *supra* note 58, at 7.

64. *About – Long Creek Watershed*, *supra* note 59.

65. *Id.*

The Plan developed in 2009 notes that both structural retrofits to the existing stormwater system and non-structural practices are necessary to restore the watershed.[66] Non-structural best management practices include land use planning and standards, pollution prevention and good housekeeping measures, and education and outreach.[67] The Plan also contains suggestions for four primary types of pollution prevention and good housekeeping tools that will contribute to minimization of polluted stormwater runoff: "(1) pavement sweeping; (2) materials substitution and management; (3) landscaping management; and (4) a private facility inspection and maintenance program."[68] LCWMD has developed a Standard Operating Procedure for implementation of the Inspection and Maintenance Program "to ensure that LCWMD and Participating Landowners meet their respective obligations to implement the pollution prevention and good housekeeping tools required by the Plan, as further detailed in Participating Landowner Agreements."[69]

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66. FB ENV'T ASSOCS., INC., LONG CREEK WATERSHED MANAGEMENT PLAN 26-28 (2009) [hereinafter LONG CREEK PLAN].

67. *Id.* at 28. The plan notes that land use planning and zoning must occur at the municipal level and points out that requiring stormwater treatment for redevelopment projects as being "the single greatest mechanism for enhanced stormwater management over the long-term" especially considering that "current state stormwater management law does not comprehensively require redevelopment projects to meet stormwater management standards upon project completion." *Id.* at 29, 43. It further notes that the four municipalities involved with this watershed issue should "[c]onsider exceeding Maine's Chapter 500 stormwater thresholds for new development." *Id.* at 43. The Plan also suggests that local code, design standards, and guidelines should incorporate LID techniques. *Id.* at 44. The recently issued MS4 permit does contain a permit modification after an appeal by Friends of Casco Bay that requires 1) the permittee to develop a Model LID Ordinance in order to address MCM5 Post-Construction Stormwater Management in New Development and Redevelopment, and 2) the permittee's Stormwater Management Plans to propose clear, specific, and measurable actions where the waterbody to which a point source discharge drains is impaired and has an EPA approved total maximum daily load (TMDL) in order to comply with the TMDL waste load allocation and any implementation plan. ME. DEP'T OF ENV'T PROT., MEPDES GENERAL PERMIT NO. MER041000 – FINAL GENERAL PERMIT MODIFICATION FOR THE DISCHARGE OF STORMWATER FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS (2021) [hereinafter FINAL MS4 GENERAL PERMIT MODIFICATION].

68. LONG CREEK PLAN, *supra* note 66, at 46. The Plan additionally considers the development of "a targeted watershed street and parking area sweeping program" and "a research program to identify winter deicer alternatives and their cost and benefits for commercial and municipal use." *Id.* at 46-47.

69. LONG CREEK WATERSHED MANAGEMENT DISTRICT, STANDARD OPERATING PROCEDURE: IMPLEMENTATION OF THE INSPECTION AND MAINTENANCE PROGRAM UNDER THE LONG CREEK WATERSHED MANAGEMENT PLAN 1 (2017) [hereinafter LONG CREEK SOP].

A permittee can either pay LCWMD for the implementation of pollution prevention and good housekeeping measures, or the permittee can implement such measures themselves and receive a credit toward their assessment fees so long as the housekeeping activities meet minimum standards.[70] Pursuant to its Standard Operating Procedure, LCWMD's obligations include pavement sweeping on Participating Landowner parcels; annual inspection and maintenance of LCWMD-owned-or-operated best management practices; annual inspection of Participating Landowner parcels for pollution prevention and good housekeeping; and annual catch basin inspection and cleaning on Participating Landowners' parcels.[71]

A number of structural restoration efforts have also been completed in the Long Creek Watershed. "Implementation of the structural aspects of the Plan includes, but is not limited to, design, engineering, construction, and reconstruction of public and private stormwater management structures."[72] As of 2021, over $5.9 million dollars have been spent on structural restoration in the Long Creek Watershed, which has provided treatment for approximately 102 acres of impervious cover.[73] During 2021, another structural project was aimed to be completed at a cost of $1.39 million dollars.[74] Lastly, $1.2 million dollars has been spent on restoration measures to improve the aquatic environment, including improvements to in-stream habitat, riparian habitat, and floodplain restoration.[75]

Despite the extensive efforts of the Long Creek Watershed Management District to restore and protect Long Creek and its tributaries (not to mention the millions of dollars spent), Long Creek continues to be impaired by chloride. According to the Management District's 2021 Annual Report, all but one of the nine monitoring locations failed to attain the chloride water quality criteria.[76] South Portland's Stormwater

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70. *See* LONG CREEK PLAN, *supra* note 66, at 68-74. Pursuant to the Participating Landowner Agreement, in order to receive credit a permittee must street sweep, inspect and clean catch basins, have a site-specific operation and maintenance plan, and inspect and maintain reporting for their site with inspections of best management practices to be carried out by a Qualified Third-Party Inspector. LONG CREEK WATERSHED MANAGEMENT DISTRICT, AGREEMENT BETWEEN PARTICIPATING LANDOWNER AND LONG CREEK WATERSHED MANAGEMENT DISTRICT 42 (2010).

71. LONG CREEK SOP, *supra* note 69, at 4-5.

72. LONG CREEK WATERSHED MGMT. DIST., LONG CREEK GENERAL PERMIT ANNUAL REPORT 2021 8 (2021).

73. *Id.* at 10.

74. *Id.* at 11.

75. *Id.* at 12.

76. *Id.* at 19-23.

Coordinator also stated that recent testing of the South Branch indicates that "many areas of the stream [have] chloride concentrations well above EPA's 230 ppm chronic toxicity threshold."[77] These findings are significant because all entities in the watershed, even private ones, are subject to stormwater regulation, which is beyond what federal and state regulations typically require. The case of the Long Creek Watershed demonstrates that addressing chloride impairment is going to require regulations with more teeth.[78]

II. THE CLEAN WATER ACT ATTEMPTS TO ADDRESS STORMWATER RUNOFF

The Clean Water Act establishes the foundation for regulating "discharges of pollutants into the waters of the United States" as well as "quality standards for surface waters."[79] The Clean Water Act was originally titled the Federal Water Pollution Control Act and enacted in 1948.[80] However, in 1972, it was reorganized and expanded upon and became known as the Clean Water Act, at which point the discharge of a pollutant from a point source into navigable waters was deemed unlawful.[81] The Clean Water Act defines "discharge of a pollutant" to mean "any addition of any pollutant to navigable waters from any point source."[82] A point source is defined as "any discernable, confined, and discrete conveyance, including but not limited to, any pipe, ditch,

77. Fred Dillon, *Too Much Salt: Creative Solutions for Reducing Chlorides in the Long Creek Watershed (and Beyond)*, ME. WATER ENV'T NEWS 2, 2 (Nov., 2019).

78. The Long Creek Watershed Management District continues to pursue creative approaches to address chloride contamination, including data collection to inform possible efforts at the state level for limited liability legislation. *Id*. at 3. Salt is often over-applied because property owners are concerned with potential litigation from slips, falls, and vehicle crashes. *Id*. at 3. Additionally, LCWMD is piloting a salt reduction program on three properties in the watershed with the goal of expanding it to other properties. This article in no way criticizes the management of the Long Creek, which is thoughtfully and meticulously carried out, but rather suggests that although addressing pollutant contamination is typically effectively achieved on a watershed basis, an argument can be made that once a watershed reaches a certain point of development, a watershed approach to regulation is not going to be successful. Once this point is reached, individual property management must be considered through statewide stormwater regulation, as is being argued in this article.

79. *Summary of the Clean Water Act*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/laws-regulations/summary-clean-water-act [https://perma.cc/9UT4-UY78] (last visited Mar. 21, 2023).

80. *Id.*

81. 33 U.S.C. § 1251 et seq. (1972).

82. 33 U.S.C. § 1362(12) (2019).

channel, tunnel, conduit, well, discrete fissure, [or] container . . . from which pollutants are or may be discharged."[83] The definition of the term "navigable waters" has been the subject of debate, but pursuant to the Clean Water Act, it simply means "the waters of the United States, including the territorial seas."[84]

A. National Pollutant Discharge Elimination System Developed to Tackle Stormwater Runoff

Despite the Clean Water Act's prohibition on the discharge of pollutants into navigable waters, an entity may obtain a permit from EPA allowing such a discharge, albeit under the regulation of the Clean Water Act.[85] As mentioned above, the program that regulates these permits is known as the National Pollutant Discharge Elimination System (NPDES), and it "requires permits for the discharge of 'pollutants' from any 'point source' into 'waters of the United States.'"[86]

In 1987, Congress amended the Clean Water Act yet again, requiring implementation of a national program specifically aimed at addressing municipal stormwater discharges.[87] This amendment was enacted because rain and snowmelt events generate stormwater runoff that flows over land and impervious surfaces picking up pollutants such as trash, chemicals, oils, and sediment, all of which have the capability of harming rivers, streams, lakes, and coastal waters.[88] Polluted stormwater runoff is typically transported through a municipal separate storm sewer system (referred to as an MS4), which is defined as a "conveyance or system of conveyances [that is] owned by a State, city, town . . . or other public body . . . having jurisdiction over disposal of . . . stormwater . . . that discharges to waters of the U.S., designed or used for collecting or conveying stormwater, which is not a combined sewer."[89] A MS4 does not consist solely of a system of underground pipes, as the definition includes "roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains."[90]

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83. *Id.* § 1362(14).
84. *Id.* § 1362(7).
85. *About NPDES*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/npdes/about-npdes [https://perma.cc/6T4V-KTPH] (last visited Mar. 21, 2023).
86. 40 C.F.R. § 122.1(b)(1) (2019).
87. *See* 33 U.S.C. § 1342(p) (2022).
88. *About NPDES*, *supra* note 85.
89. 40 C.F.R. § 122.26(b)(8)(i)-(iv).
90. *Id*. at § 122.26(b)(8).

The NPDES program was implemented in two phases: Phase I, implemented in 1990, required NPDES permits for stormwater discharges from medium and large MS4's, and Phase II, implemented in 1999, required NPDES permits for stormwater discharges from small MS4s.[91] A medium MS4 was designated as such if it was located in an incorporated place or county with a population between 100,000 and 249,999, and a large MS4 required a population of 250,000 or greater.[92] A small MS4 is any MS4 not already covered by Phase I, but not every small MS4 is covered by the Phase II rule; only those designated as a regulated small MS4 need be covered.[93] Designation occurs either through automatic nationwide designation or designation on a case-by-case basis by the NPDES permitting authority.[94] Automatic designation occurs for all small MS4s that are defined as an "urbanized area" based on the latest decennial Census, an "urbanized area" being a calculation that the Bureau of the Census uses to determine the geographic boundaries of the most heavily developed and dense urban areas.[95] The NPDES permitting authority may also designate a small MS4 located outside of an urbanized area as requiring a permit if the permitting

91. 33 U.S.C. § 1342. Other than municipal separate storm sewer systems, the federal NPDES stormwater program regulates two other potential sources of stormwater: construction activities and industrial activities. There are eleven specific categories of industrial activity required to be covered by a permit. 40 C.F.R. 122.26(b)(14)(i)-(xi) (where category ten requires a permit for construction sites that disturb five acres or more). In addition, construction activity that results in land disturbance equal to or greater than one acre, but less than five acres requires a NPDES permit. 40 C.F.R. 122.26(b)(15)(i). The construction regulations here deal with the proper control of pollutants such as sediment, debris, and chemicals resulting from soil loosened during the construction process. *Stormwater Discharges from Construction* Activities, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/npdes/stormwater-discharges-construction-activities [https://perma.cc/MT58-T48X] (last visited Mar. 21, 2023).

92. U.S. ENV'T PROT. AGENCY, STORMWATER PHASE II FINAL RULE FACT SHEET SERIES, WHO'S COVERED? DESIGNATION AND WAIVERS OF REGULATED SMALL MS4S 2 (2000 (revised 2012)).

93. *Id*.

94. *Id*.

95. *Id*. On Mar. 24, 2022, the U.S. Census Bureau decided to no longer distinguish between different types of urban areas, including "urbanized areas." Because the Phase II regulations are written to cover MS4s located in such urbanized areas, EPA is currently evaluating next steps in order to provide clarity on this issue. *Id.*; *see also Interim Guidance on Census Elimination of "Urbanized Area" Definition*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/npdes/interim-guidance-census-elimination-urbanized-area-definition [https://perma.cc/7BA4-5UYM] (last visited Mar. 21, 2023).

authority determines that its discharges cause, or have the potential to cause, an adverse impact on water quality.[96]

In order to comply, the NPDES permit "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and systems, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."[97] The permit requires six minimum control measures to be in place to prevent or minimize water quality impacts: public education and outreach; public participation and involvement; illicit discharge detection and elimination; construction site runoff control; post construction site runoff control; and pollution prevention and good housekeeping.[98]

The fifth minimum control measure—post construction site runoff control—requires the permittee to implement a combination of structural and/or non-structural best management practices (BMPs), use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects, and adequately maintain and operate the BMPs.[99] These controls are further broken down into detailed and complex requirements within the permit itself,[100] which are necessary when reflecting back on the original goal of the Clean Water Act and the NPDES permitting program, and when considering the issues generated by stormwater runoff.

B. Stormwater Regulation in Maine

Under the Clean Water Act, EPA authorizes state, tribal, and territorial governments to implement the NPDES permit program, enabling them to carry out many aspects of the program such as permitting, administration, and enforcement while remaining under the oversight of EPA.[101] In 2003, the Ninth Circuit held, in relevant part, that the Phase II General Permit option of NPDES violated "the Clean Water

96. U.S. ENV'T PROT. AGENCY, *supra* note 92; *see* 40 C.F.R. §§ 122.32(a)(2), 123.35(b)(3)-(4), 122.26(f).

97. 33 U.S.C. § 1342(p)(3)(B)(iii).

98. 40 C.F.R. § 122.34(b)(1)-(6).

99. 40 C.F.R. § 122.34(b)(5)(i).

100. *See generally* ME. DEP'T OF ENV'T PROT., FINAL GENERAL PERMIT FOR THE DISCHARGE OF STORMWATER FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4) (2020) [hereinafter FINAL MS4 GENERAL PERMIT]; FINAL MS4 GENERAL PERMIT MODIFICATION, *supra* note 67.

101. *About NPDES*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/npdes/about-npdes [https://perma.cc/S4DN-YSBH] (last visited Mar. 21, 2023).

Act's requirement that permits for discharges 'require controls to reduce the discharge of pollutants to the maximum extent practicable.'"[102] The Court remanded the rule to be revised, and on January 9, 2017, EPA's final rule revising the regulations governing small MS4s became effective.[103] For any permit issued to small MS4s, Section 122.34(a) requires "the NPDES permitting authority [to] include permit terms and conditions to reduce the discharge of pollutants from the MS4 to the maximum extent practicable (MEP). Terms and conditions that satisfy the requirements of the section must be expressed in clear, specific, and measurable terms."[104]

1. NPDES in Maine

Maine was authorized to implement the NPDES program on January 12, 2001,[105] and it currently issues permits under the Maine Pollutant Discharge Elimination System (MEPDES).[106] Maine has complied with the Remand Rule by issuing a revised General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems effective July 1, 2022.[107] The new permit includes a number of positive changes, including improvements on discharges to impaired waters by including an Urban Impaired Stream standard that requires the permittee to propose and fully implement at least three structural or non-structural best management practices.[108] The best management practices must address a specific impairment from the MS4 discharge within the urbanized area and can be selected from any of the six minimum control measures, an existing Department approved Watershed Management Plan, Appendix D of the permit which contains best management practices for discharges to urban impaired streams, or best management practices more specifically developed by the permittee.[109] Appendix D is

102. Env't Def. Ctr., Inc. v. U.S. E.P.A., 344 F.3d 832, 842 (9th Cir. 2003) (quoting 33 U.S.C. § 1342(p)(3)(B)(iii)).

103. 40 C.F.R. § 122.34 (this final rule is also known as the Remand Rule. National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System General Permit Remand Rule, 81 Fed. Reg. 89320 (proposed Dec. 9, 2016)).

104. 40 C.F.R. § 122.34(a).

105. *NPDES State Program Authority*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/npdes/npdes-state-program-authority [https://perma.cc/9YZB-FLHC] (last visited Jan. 7, 2023).

106. *See* FINAL MS4 GENERAL PERMIT, *supra* note 100, at 2.

107. *Id.* at 4.

108. *Id.* 51-52.

109. *Id.* at 52.

notable because it includes structural and non-structural best management practices for watersheds with chloride as a stressor.[110]

2. Stormwater Regulation in Maine

In addition to the MEPDES permit program, Maine has enacted numerous water quality protection statutes,[111] such as Section 420-D of Title 38, titled Stormwater Management,[112] which requires DEP to adopt rules detailing quantity and quality standards for stormwater.[113] Under the oversight of Maine's Administrative Procedure Act, DEP has adopted such rules,[114] colloquially referred to as Chapter 500. These rules are applicable to projects statewide that disturb one acre or more of land area and require a stormwater permit pursuant to Stormwater Management Law, 38 M.R.S. §420-D.[115]

The standards of Chapter 500 are divided into basic and general standards.[116] The basic standards require that all applicants demonstrate that they meet the standards for erosion and sedimentation control, inspection and maintenance, and housekeeping.[117] The general standards, which impose more requirements than the basic standards, apply if the project results in (a) "20,000 square feet or more of impervious area, or 5 acres or more of developed area, in the direct watershed of an urban impaired stream;" or (b) "one acre or more of impervious area, or 5 acres or more of developed area anywhere else for a project that is not in the direct watershed of a lake."[118] The general standards are then broken down further to include treatment requirements (treatment level, upgradient runoff, mitigation, treatment for redevelopment project),

110. *Id.* at Appendix D (titled Attachment D in the permit but referred to as Appendix D in the body of the permit).

111. *See generally* 38 M.R.S. Ch. 3 (listing the various statutes enacted for protection and improvement of waters).

112. 38 M.R.S. § 420-D (2023).

113. *Id.* at § 420-D(1).

114. 06-096 CMR Ch. 500.

115. 06-096 CMR Ch. 500(2). Chapter 500 also applies to a development that requires a Site Location of Development Law permit pursuant to 38 M.R.S. §§ 481 – 4901 because of the potential to substantially affect the environment, and certain discharges of stormwater to groundwater that may be exempt from licensing under 38 M.R.S. § 413. *Id.* Chapter 500 may also apply in addition to other "stormwater standards and requirements, such as those involving the Maine Pollutant Discharge Elimination System (MEPDES) program and the Municipal Separate Storm Sewer System (MS4) program." *Id.*

116. *Id.* at Ch. 500(4)(B)-(C).

117. *Id.* at Ch. 500(4)(B).

118. *Id.* at Ch. 500(4)(C)(1).

types of treatment measures allowed (wetpond, vegetated soil filter, infiltration, buffers, innovation treatment measures), and low impact development credit.[119] Chapter 500 also includes an urban impaired stream standard which must be met if the project is located in the direct watershed of an urban impaired stream and requires a Site Law permit or permit modification.[120] In order to meet the urban impaired stream standard, the applicant is required to either pay a compensation fee or mitigate project impacts by reducing or eliminating an off-site or on-site pre-development impervious stormwater source.[121]

Lastly, Maine has also created a statewide Impervious Cover Total Maximum Daily Load to address water quality impairments in multiple urban impaired streams affected by stormwater runoff.[122] Section 303(d) of the Clean Water Act requires states to develop a list of impaired waters for which technology-based regulations and other required controls are not stringent enough to meet water quality standards and to subsequently develop a total maximum daily load (TMDL) for pollutants identified as contributing to impairment of a specific waterbody.[123] The process of a TMDL study "establishes the allowable loadings of pollutants for a waterbody based on the relationship between pollutant sources and instream water quality conditions."[124] Maine's TMDL was developed to address water quality impairments in thirty small urban/suburban stream segments which were not meeting state water quality standards for aquatic life and/or habitat use.[125] The report states that sensitive species of fish decline in watersheds with 4-6% impervious

119. *Id.* at Ch. 500(4)(C)(2)-(4).

120. *Id.* at Ch. 500(4)(E). A permit modification applies when a project has required a permit under Stormwater Management Law or Site Law and subsequent changes could affect the project's stormwater quality or quantity and require a modification of the project's license, in which case the basic and general standards must be met for the changes and the modification. 06-096 Ch. 500(16)).

121. *Id.* (referring the permittee to 06-096 CMR 501 which establishes standards for stormwater management compensation fees and mitigation credit).

122. *See generally* ME. DEP'T OF ENV'T PROT., DEPLW-1239, MAINE IMPERVIOUS COVER TOTAL MAXIMUM DAILY LOAD ASSESSMENT (TMDL) FOR IMPAIRED STREAMS (2012) [hereinafter MAINE TMDL].

123. *See Overview of Total Maximum Daily Loads (TMDLs)*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/tmdl/overview-total-maximum-daily-loads-tmdls [https://perma.cc/BH4G-ATBG] (last visited Mar. 21, 2023).

124. NEW HAMPSHIRE DEP'T OF ENV'T SERVS., NHDES-R-WD-07-41, TOTAL MAXIMUM DAILY LOAD (TMDL) STUDY FOR WATERBODIES IN THE VICINITY OF THE I-93 CORRIDOR FROM MASSACHUSETTS TO MANCHESTER, NH: POLICY-PORCUPINE BROOK IN SALEM AND WINDHAM, NH 1 (2008) [hereinafter NEW HAMPSHIRE TMDL STUDY].

125. MAINE TMDL, *supra* note 122, at 1.

cover or less, and watersheds exceeding 12% often fail to meet aquatic life criteria and narrative standards.[126] Maine ultimately decided to settle on an impervious cover TMDL as a surrogate to represent the mix of pollutants contained in stormwater runoff, stating there is often not a direct link to a specific source that is causing water quality impairment.[127] The report provides estimates of target percent impervious cover for the watersheds of impaired streams, which represent the level of imperviousness at which the waterbody is capable of meeting state water quality standards.[128]

3. Limitations in Maine's Stormwater Regulation

Despite the regulations covered in the previous two sections, several shortcomings are of note. First, because the NPDES (and MEPDES) permitting authority only regulates specific entities,[129] certain development is not captured, and this development has the potential nonetheless to contribute to water quality impairment via stormwater runoff. Namely, this includes municipalities that do not meet the definition of an urbanized area or have not been designated as contributing, or having the potential to contribute, to water quality impairment.[130]

Second, the MS4 permit has an urban stream standard that does specifically take chloride into account but that standard applies only to municipalities, not the private commercial development within municipalities.[131] This causes the municipalities to assume responsibility, so to speak, of what occurs on private development.[132] Additionally, the

126. *Id.*

127. *Id.* at 1-2.

128. *Id.* at 2.

129. *See supra* Part II(A) and accompanying text. In Maine, only those municipalities meeting the definition of a small municipality under NPDES are covered. *See* FINAL MS4 GENERAL PERMIT, *supra* note 100 (noting that Maine does not have municipalities large enough to qualify as medium or large).

130. See *infra* Part III(B) and accompanying text.

131. *See* FINAL MS4 GENERAL PERMIT, *supra* note 100, at 51-52, Appendix D.

132. To some extent, a municipality can regulate entities within its borders through a post development ordinance. 40 C.F.R. § 122.34(b)(5)(i). Moreover, minimum control measure five of the revised General Permit requires each permittee to implement and enforce a program to address post construction stormwater runoff from new development and redevelopment projects. FINAL MS4 GENERAL PERMIT MODIFICATION, *supra* note 67. However, two problems emerge. First, such programs are limited to the municipalities required to be regulated under the MS4 General Permit, which is not all municipalities, as discussed. Second, such programs will differ across municipalities, the upside being that

MS4 permit does not *require* the permittee to address chloride impairment, as it allows the permittee to choose which impairment to address.[133] While chloride contamination is especially serious for urban impaired streams, it is an alarming problem for the state of Maine on the whole[134] and the state is struggling with how to combat it.[135] Moreover, Maine's revised General Permit for Small MS4s lists thirty-five urban impaired streams in nineteen of the covered municipalities.[136] Thus, not every municipality under the MS4 permit currently contains an urban impaired stream and is bound by the urban impaired stream standard. However, these municipalities are just as likely to partake in winter de-icing activities and without stronger statewide regulations, are also likely to end up with chloride-impaired streams.

Third, while Chapter 500 captures some private development that occurs in municipalities that are, and are not, covered by the MPEDES program,[137] it does not capture all development, and what it does capture, the regulations are not stringent enough. For example, though Chapter 500 includes an urban impaired stream standard, it fails to address chloride as a stressor[138] even though chloride from road salt has recently been identified as an issue for both streams and private wells,[139] and there is no stormwater treatment that is able to remove chloride from stormwater runoff.[140] Additionally, the rules explicitly state that "the use of low impact development strategies is optional and voluntary for all projects."[141] Moreover, the urban impaired stream standard includes an exception for:

> [P]ortions of a project in which impervious area that pre-dates the Stormwater Management Law is replaced is not required to

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it can be tailored to the municipalities needs, which may be appropriate for certain issues. However, with regard to chloride, this may result in municipalities fashioning various programs for an application practice that occurs statewide.

133. *See* FINAL MS4 GENERAL PERMIT, *supra* note 100, at 51-52, Appendix D (emphasis added).

134. *See* ME. SNOW & ICE CONTROL BEST PRACTICES WORKING GRP. ET AL., MAINE ENVIRONMENTAL BEST MANAGEMENT PRACTICES FOR SNOW AND ICE CONTROL 2 (2015).

135. *Id.* at 20.

136. FINAL MS4 GENERAL PERMIT, *supra* note 100, at Appendix B.

137. *See supra* Part II(B)(2) and accompanying text. 38 M.R.S. § 420-D(7) also lists multiple exemptions.

138. *See generally* 06-096-500 Me. Code R. (LexisNexis 2023).

139. JONATHAN RUBIN ET AL., *supra* note 9, at ES-3 to ES-4.

140. *See supra* notes 54 and 55.

141. 06-096-500 Me. Code R. § 4(C)(4) (LexisNexis 2023). Projects that use the LID credit are eligible to reduce the portion of the project's impervious or developed acreage that must be treated. *Id.*

> meet the urban impaired stream standard for that area provided the Department determines that the new use of the untreated area is not likely to increase stormwater impacts in the proposed project's stormwater runoff beyond the levels already present in the runoff.[142]

Thus, a property owner could replace their entire parking lot that predates Stormwater Management Law, so long as stormwater runoff levels have not increased with no obligation to consider the urban impaired stream. Lastly, a project can qualify for a stormwater Permit by Rule when it does not require a Site Law permit or permit modification and results in less than 20,000 square feet of impervious area and less than 5 acres of developed area in the direct watershed of an urban impaired stream.[143] Projects eligible for a Permit by Rule only need to meet the erosion and sedimentation control standards and inspection and maintenance requirements,[144] despite the fact that it is located in the direct watershed of an urban impaired stream.

Fourth, Maine's TMDL report states that since the overall goal is to reduce adverse impacts from stormwater, reduction of actual impervious cover is not necessary if water quality standards can be achieved otherwise, such as stormwater management techniques.[145]As explained earlier the report also states there is often not a direct link to a specific source that is causing water quality impairment. Two issues present themselves. First, chloride impairment of urban streams has been directly linked to a specific source, which is that of winter road maintenance.[146]

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142. *Id.* § 4(E)(3).

143. *Id.* § 6.

144. *Id.* § 6(D) (except that any permit by rule project proposing to use infiltration to control runoff must meet other standards of the Chapter or obtain a waste discharge license).

145. MAINE TMDL, *supra* note 122, at 2.

146. This has been clearly documented in New Hampshire's TMDL study. In 2008, New Hampshire listed nineteen chloride-impaired water bodies on the 303(d) list, after which studies were commenced to develop chloride TMDLs for watersheds with documented violations of water quality standards. According to one TMDL study, "[d]e[-]icing of roadways and parking lots accounted for 89 percent of [chloride] imports." NEW HAMPSHIRE TMDL STUDY, *supra* note 124, at 8. The TMDL is calculated by adding individual loads from point sources (waste load allocations) to load allocations from nonpoint sources. *Id.* at 10. The TMDL can be expressed as a percent reduction goal (PRG), which was determined to be 24.5 percent for the Policy-Porcupine Brook Watershed in New Hampshire for the July 1, 2006, to June 30, 2007 period. *Id.* at 12. Because the total salt imports during this period were 4,814 tons of salt per year, the PRG suggests that salt imports to the watershed should be less than 3,635 tons of salt per year. *Id*. (the 3,635-ton figure was reached by multiplying 4,814 tons of salt per year by 24.5

Second, due to such a link, without a requirement to remove impervious cover in addition to municipalities covered under the MS4 permit having the option to address chloride and no requirement at the state level to address salt use, chloride impairment have and will persist. With these limitations of stormwater regulation in mind and the water quality problems posed by stormwater runoff, stormwater regulation must be strengthened.

III. PETITIONING EPA OR MAINE TO DESIGNATE CURRENTLY UNREGULATED ENTITIES

In this section, two avenues are presented that would increase the number of permittees regulated under the MPDES program, as demonstrated by recent case law. The first, given that EPA retains residual designation authority, is designating currently unregulated entities such as private commercial development by petitioning EPA. The second is petitioning Maine to include unregulated municipalities under Maine's MS4 General Permit.

A. Petitioning EPA

Section 122.26(f)(2) of NPDES allows any person to "petition the Director to require a NPDES permit for a discharge which is composed entirely of stormwater which contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States."[147] Pursuant to this regulation, two cases are notable.

1. Los Angeles Waterkeeper v. Pruitt

In this case, plaintiffs submitted two petitions to EPA Region 9 requesting that EPA "make a determination that currently unpermitted stormwater discharges from privately-owned commercial, industrial, and institutional ("CII") sources are contributing to violations of water quality standards," thus requiring a NPDES permit, in two different Los Angeles-area watersheds.[148] EPA concluded NPDES permits were

percent reduction goal). Given that most salt imports to the watershed are due to deicing activities, "essentially all of the salt import reductions will need to come from reduced deicing loads." *Id.* at 13.

147. 40 C.F.R. § 122.26(f)(2) (2023).

148. L.A. Waterkeeper v. Pruitt, 320 F. Supp.3d 1115, 1119-20 (C.D. Cal. 2018). CII sources are not explicitly regulated under the NPDES stormwater permitting program, and may include such areas as shopping centers, office buildings, and parking lots. *Id.*

unnecessary, even though EPA also concluded that "stormwater discharges from CII sources were 'contributing to water quality impairments' at the watersheds."[149] In analyzing the petition, EPA considered three factors:

> (1) the likelihood of exposure of pollutants to precipitation at sites identified in Plaintiffs' petitions; (2) the sufficiency of the available data on which to make a determination that stormwater discharges from those sites contribute to a violation of water quality standards; and (3) whether other federal, state, or local programs adequately address the known stormwater discharge contribution to a violation of water quality standards.[150]

EPA found that the first two factors were satisfied. As to the third factor, EPA found that existing programs were being implemented to adequately address the impairments and thus, denied the petitions.[151] EPA based its conclusion primarily on the fact that NPDES permits had been issued to MS4s in the watersheds where these discharges were taking place, as well as citing to three other permits: "a statewide NPDES permit for the Department of Transportation, a statewide general permit for industrial facilities, and a statewide permit for small MS4s."[152] "None of these permits directly regulated the CII sources in the subject watersheds," yet EPA denied the petitions because of the existing permits.[153]

The plaintiffs filed a complaint in district court alleging EPA's denial of the petitions was arbitrary and capricious and in violation of the Administrative Procedure Act (APA).[154] Under the APA, judicial review requires a court to "hold unlawful and set aside agency action, findings, and conclusions found to be arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law."[155] In determining whether an agency decision is arbitrary and capricious, a court will look to whether the agency "relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, [or] offered an explanation for its decision that runs counter to the

149. *Id*. at 1120 (quoting Dominguez Pet. Denial at 16; Los Cerritos Pet. Denial at 17).
150. *Id*.
151. *Id*.
152. *Id*.
153. *Id*.
154. *Id*.
155. 5 U.S.C. § 706(2)(A) (2018).

evidence before the agency[.]"[156] The court in this case concluded, for two reasons, that EPA acted arbitrarily and capriciously in denying the petitions and leaving the stormwater discharges unregulated.[157]

First, if EPA determines that a stormwater discharge contributes to a violation of a water quality standard, the Clean Water Act requires EPA to take one of two actions: (1) prohibit the discharge altogether; or (2) engage in the NPDES permitting process for the discharge, neither of which EPA did.[158] As to the first option, and as stated at the outset of this article, the Clean Water Act prohibits the discharge of pollutants into waters of the United States, but the Administrator may issue a permit for the discharge. The Court states that the permissive use of the term "may" means the Administrator can choose to issue the permit or not, but that if the Administrator chooses not to, the discharge falls back into the original proscription enforced by the Act.[159] As to the second action EPA may take, the Clean Water Act does not require a permit for discharges composed entirely of stormwater prior to October 1, 1994.[160] However, there are five exceptions to this moratorium, and the Court states that if one of the exceptions applies, the discharge is either subject to a NPDES permit or totally proscribed.[161] The Court then reasons that because the discharges at issue here fell within one of the exceptions, namely "[a] discharge for which the Administrator . . . 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," EPA was required to either engage in the permitting process or prohibit the discharge.[162] Because EPA left the discharges at issue here unregulated, EPA acted arbitrarily and capriciously.[163]

Second, EPA considered an improper factor in its decision to deny the petitions. The improper factor was the consideration of whether other federal, state, or local programs are adequately addressing the stormwater discharge that is contributing to a violation of water quality

156. Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983) (a court will also look to whether the agency decision "is so implausible that it could not be ascribed to a difference in view or the product of agency expertise").

157. L.A. Waterkeeper v. Pruitt, 320 F.Supp.3d at 1121.

158. *Id.* at 1121-22.

159. *Id.* at 1122.

160. 33 U.S.C. § 1342(p)(1).

161. L.A. Waterkeeper v. Pruitt, 320 F.Supp.3d at 1123.

162. *Id.* (quoting 33 U.S.C. § 1342(p)(2)).

163. *Id*. (noting that EPA's interpretation is not entitled to Chevron deference because Clean Water Act is unambiguous, and the intent of Congress is clear).

standards.[164] Relying on one of the Supreme Court's landmark environmental decisions, *Massachusetts v. EPA*, 549 U.S. 497 (2007), the Court here reasons that if EPA is not going to require that a discharge be regulated by a NPDES permit, it must "ground that decision in the text of the statute."[165] The Court explains that EPA's reason for "declining to issue permits must relate to whether the stormwater at issue contributes to a violation of a water quality standard," since the Clean Water Act provisions relevant to this case require EPA to engage in the permitting process for stormwater discharges that contribute to water quality violations.[166] Because EPA did not point to a provision of the Clean Water Act that indicates EPA may consider whether other federal, state, or local programs are adequately addressing the stormwater discharge that is contributing to a violation of water quality standards, thus considering a factor "divorced from the statutory text," the Court concludes that EPA acted arbitrarily and capriciously in denying the plaintiffs' petition.[167]

The Court's conclusion in this case is that "EPA must either (1) engage in the NPDES permitting process for stormwater discharges from the CII sources in Plaintiffs' petitions that EPA has determined contribute to a violation of water quality standards or (2) enforce the Clean Water Act's total proscription on the discharge of such pollutants."[168]

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164. *Id*. at 1124-25 (noting that the first two factors are permissible bases for EPA's denial because they relate to the scientific determination of whether stormwater discharges from CII sites contribute to violations of water quality standards).

165. *Id.*

166. *Id.* at 1125.

167. *Id.* (quoting Massachusetts v. EPA, 549 U.S. at 532).

168. *Id.* at 1126. The District Court clarified in a subsequent opinion upon Defendants' motion that the relief awarded to Plaintiffs for the arbitrary and capricious actions taken by EPA is that EPA's actions are vacated and remanded for agency consideration. L.A. Waterkeeper v. Pruitt, No. 2:17-CV-03454-SVW-KS, 2018 WL 6071084, at *2 (C.D. Cal. Oct. 17, 2018). In July of 2022, EPA recommended via memorandum that the regional administrator exercise discretionary authority to designate the CII stormwater discharges for NPDES permitting. *See generally* U.S. ENV'T PROT. AGENCY, REQUEST FOR PRELIMINARY DESIGNATION OF CERTAIN COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL STORMWATER DISCHARGES IN THE ALAMITOS BAY/LOS CERRITOS CHANNEL WATERSHED AND THE DOMINGUEZ CHANNEL AND LOS ANGELES/LONG BEACH INNER HARBOR WATERSHED IN LOS ANGELES COUNTY (2022).

2. Blue Water Baltimore, Inc. v. Wheeler

This case is factually similar to *Los Angeles Waterkeeper* but is included here to highlight EPA's arguments, which were more developed. Plaintiffs petitioned EPA asking the agency to determine whether "stormwater discharges from privately-owned commercial, industrial and institutional [("CII")] sites [to the Back River Watershed] [were] contributing to violations of water quality standards."[169] EPA based its decision on the same three factors cited in *Los Angeles Waterkeeper* and ultimately denied the petition based on the third factor (that existing programs are adequately addressing stormwater discharge from CII sites).[170] Plaintiffs filed suit under the APA, alleging EPA acted arbitrarily and capriciously because it relied on a factor Congress did not authorize it to consider, and in the alternative, because the decision ran counter to the evidence before the Agency.[171] Like the court in *Los Angeles Waterkeeper*, the Court in this case relied on the arbitrary and capricious standard of review and *Massachusetts v. EPA*, as well as on *Los Angeles Waterkeeper* itself, and concluded that "EPA acted arbitrarily and capriciously when it improperly considered other programs' efforts to address CII sites."[172]

In depending on the existing programs adequately addressing the stormwater discharges at issue as its reason for denying the petition, EPA makes several arguments. First, EPA relies on two statements made by the *Massachusetts* Court to support its position. The Court in *Massachusetts* stated that "'EPA can avoid taking further action only if it determines that greenhouse gases do not contribute to climate change or if it provides some reasonable explanation as to why it cannot or will not exercise its discretion to determine whether they do.'"[173] EPA argues that consideration of existing programs is a "reasonable explanation," yet this Court points out that the *Massachusetts* Court expressly rejected the existing programs argument because it has "'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.'"[174] According to the *Blue Water Baltimore* Court, EPA may

169. Blue Water Balt., Inc., v. Wheeler, No. CV GLR-17-1253, 2019 WL 1317087, at *1 (D. Md. Mar. 22, 2019) (quoting J.A. Ex. VI at 76).

170. *Id.* at *5. EPA also considered "resources, workload, and Maryland's preferred means of addressing stormwater-related pollution." *Id.* at *1.

171. *Id.* at *1.

172. *Id.* at *2, *4.

173. *Id.* at *6 (quoting Massachusetts v. EPA, 549 U.S. 497, 533 (2007)).

174. *Id.* at *4.

not rely on existing programs as a reasoned justification for failing to make the determination that stormwater discharges from CII sites do or do not contribute to violations of water quality standards.[175]

The second statement from *Massachusetts* that EPA relies on here is that EPA may consider policy concerns in determining whether the stormwater discharges contribute to violations of water quality standards because the *Massachusetts* Court declined to reach that question.[176] However, this Court clarifies that the question left unaddressed was whether policy concerns can inform actions taken by EPA *after* it forms the required scientific judgment per the text of the statute.[177]

EPA makes a second argument based on the text of the Clean Water Act. EPA argues the text does not put forth factors that must form the basis of EPA's decision, but merely "sets forth factual prerequisites that must be established before EPA exercises its discretion to issue permits."[178] This Court reasons, in light of *Massachusetts*, that EPA may only decline to regulate the discharges in the event that it first determines the discharges do not contribute to violations of water quality standards or concludes there is insufficient information to make that determination.[179] The Court here ultimately concludes that EPA acted arbitrarily and capriciously in denying the petitions because, again, it considered a factor "divorced from the statutory text."[180]

3. Designating Unregulated Entities

By statute, two possibilities exist to designate unregulated entities. The first, as exemplified in *Los Angeles Waterkeeper* and *Blue Water Baltimore*, is to petition EPA under 40 C.F.R. § 122.26(f)(2) to designate certain discharges originating from privately-owned CII sources if scientific data can be provided that those discharges are currently unregulated and are contributing to water quality impairment. The Maine State Economist has predicted that Maine's population will increase to 1,340,462 in 2026, a 0.8% increase from 2016, the base year used for this

175. *Id.* at *6.
176. *Id.*
177. *Id*.
178. *Id.*
179. *Id.*
180. *Id.* at *7 (quoting Massachusetts v. EPA, 549 U.S. 497, 534). EPA appealed the decision to the Fourth Circuit, but on its own motion voluntary dismissed the case pursuant to Rule 42(b) of the Federal Rules of Appellate Procedure. Blue Water Baltimore, Inc., v. Wheeler, 2019 WL 6173493 (4th Cir. 2019).

projection.[181] An increase in population size will inevitably be accompanied by an increase in development, and as such, an accompanying increase in impervious surface. Private development is not subject to NPDES, and while it is true that any new development over one acre is subject to Chapter 500 regulations, development may nonetheless result in a specific development's contribution to degraded water quality, especially because it does not contain any provisions for chloride management. The rulings from *Los Angeles Waterkeeper* and *Blue Water Baltimore* clarify EPA's role in requiring stormwater permitting for certain properties that have not been traditionally regulated under the NPDES program.

If a plaintiff was able to scientifically document that a discharge composed entirely of stormwater was contributing to a violation of water quality criteria, a petition could be submitted to EPA Region 1 to make its own determination that the discharge does in fact contribute to a violation, as was the case in the Long Creek Watershed. When such a determination is made, a MEPDES permit would then be issued to that entity, even if it is a privately owned CII site.[182] Maine has recognized and attempted to remedy chloride impairment by including an urban impaired stream standard that addresses chloride in the MS4 permit. However, as argued in Part IV, stricter standards can and should be included at the state level. Such an update would serve to better control chloride pollution statewide and possibly avoid a petition to EPA.

B. Petitioning Maine

The second possibility is that the state of Maine, as a NPDES permitting authority, may be petitioned to designate a small MS4 that is not located within an urbanized area.[183] There are currently thirty automatically designated MS4s in Maine,[184] yet, Maine has nearly 500

181. ME. STATE ECONOMIST, MAINE POPULATION OUTLOOK 2016 TO 2026 1 (2018).

182. 40 C.F.R. § 122.34(a). The strength of a permit is that it must contain clear, specific, and measurable terms, as required by the Remand Rule, as opposed to unenforceable guidelines of a Management Plan. EPA Region 1 has most recently exercised its residual designation authority in Massachusetts, where it has designated certain properties in the Charles River, Mystic River, and Neponset River Watersheds as requiring NPDES permits. *Watershed-Based Residual Designation Actions in New England*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/npdes-permits/watershed-based-residual-designation-actions-new-england#EPAsRDADetermination [https://perma.cc/R3XE-KWLV] (last visited April 26, 2023).

183. 40 C.F.R. § 122.32(b).

184. *NPDES Phase II Stormwater Program, Automatically Designated MS4 Area Maps and Notice of Intent*, ME. DEP'T OF ENV'T PROT.,

municipalities.[185] As previously mentioned, municipalities are only automatically designated as requiring a NPDES permit if they are located within an urbanized area. However, this does not also automatically mean municipalities located outside of urbanized areas do not have stormwater discharges that are contributing to water quality impairment. In recognition of this, the Clean Water Act requires the NPDES permitting authority to "develop a process, as well as criteria, to designate small MS4s other than those described in § 122.32(a)(1)."[186] In making designations of small MS4s, the NPDES permitting authority must take several actions.

The NPDES permitting authority—in this case, Maine—must "develop criteria to evaluate whether a storm water discharge results in or has the potential to result in exceedances of water quality standards, including impairment of designated uses, or other significant water quality impacts, including habitat and biological impact."[187] In determining other significant water quality impacts, EPA recommends consideration of several factors, including "discharge to sensitive waters, high growth or growth potential, high population density, contiguity to an urbanized area, significant contributor of pollutants to waters of the United States, and ineffective protection of water quality by other programs."[188] These criteria, which can be applied at any time, must be applied to any small MS4 located outside of an urbanized area but with a population density of at least 1,000 people per square mile and a population of at least 10,000.[189] Additionally, Maine can designate any small MS4 that contributes substantially to the pollutant loadings of a physically interconnected municipal separate storm sewer that is regulated by the NPDES storm water program.[190] The MS4s currently listed pursuant to the MEPDES Phase II Stormwater Program are titled

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https://www.maine.gov/dep/water/wd/ms4/documents.html [https://perma.cc/CUG5-B4Y6] (last visited Mar. 21, 2023) (also listing other entities falling within the scope of the NPDES Stormwater Program: eight state or federally owned separate storm sewer systems, the Maine Department of Transportation municipal separate storm sewer system, and the Maine Turnpike Authority municipal separate storm sewer system pursuant to 40 C.F.R. § 122.26(b)(16) and 40 C.F.R. § 122.32(a)).

185. *Local Government*, MAINE.GOV, https://www.maine.gov/local [https://perma.cc/PYY4-VXXQ] (last visited Mar. 21, 2023).

186. 40 C.F.R. § 123.35(b). The MS4s described in Section 122.32 are MS4s designated by urbanized area.

187. *Id.* § 123.35(b)(1)(i).

188. *Id*. § 123.35(b)(1)(ii).

189. *Id*. § 123.35(b)(2)-(3).

190. 40 C.F.R. § 122.35(b)(4).

as automatically designated,[191] giving rise to the presumption that DEP has not designated any MS4s that were not automatically designated. Both 122.32(b) and 122.26(f)(2) remain as options to bring additional municipalities and private CII sites within the purview of the MPDES program.[192]

IV. UPDATING MAINE'S CHAPTER 500 REGULATIONS

Maine's Department of Environmental Protection has begun to heed the call to update Chapter 500.[193] This is encouraging news, because

191. *Id.* § 122.32(b).

192. Maine DEP notes designations apply to small MS4s located in an urbanized area pursuant to 40 C.F.R. § 122.32(a)(1) *and* to small MS4s determined to need a permit pursuant to 40 C.F.R. § 122.32(a)(2).
ME. DEP'T OF ENV'T PROT., MAINE POLLUTANT DISCHARGE ELIMINATION SYSTEM (MPDES) PERMIT, MAINE WASTE DISCHARGE LICENSE, FACT SHEET 2 (2013) (emphasis added). 40 C.F.R. § 122.32(a)(2) includes designation pursuant to § 123.35(b)(3) and (b)(4), and designation by petition under § 122.26(f). Section 123.35(b)(3) and (b)(4) are the provisions containing the criteria that can be applied to any small MS4 located outside of an urbanized area but with a population density of at least 1,000 people per square mile and a population of at least 10,000 and any small MS4 that contributes substantially to the pollutant loadings of a physically interconnected municipal separate storm sewer that is regulated by the NPDES storm water program. Section 122.26(f) is the provision under which *Los Angeles Waterkeepe*r and *Blue Water Baltimor*e were brought. For example, the municipality of Brunswick is not regulated under the MS4 Permit. It has a population of approximately 21,800 people, but 465 people per square mile. *QuickFacts*, U.S. CENSUS BUREAU, https://www.census.gov/quickfacts/fact/table/brunswicktowncumberlandcountymaine/PST045222#PST045222 [https://perma.cc/C6UE-72ZC] (last visited Mar. 21, 2023). Thus, it could not be designated pursuant to § 123.35(b)(2)-(3). If it was determined, however, that Brunswick contributed substantially to the pollutant loadings of a physically interconnected MS4, it may be able to be designated under § 122.35(b)(4). Or, alternatively, the entities within Brunswick could be petitioned for designation under § 122.26(f).

193. E-mail from Kerem Gungor, Stormwater Engineering Team Leader, Maine DEP, to Ivy Frignoca, Casco Baykeeper, Friends of Casco Bay (Dec. 8, 2022, 04:37 EST) (on file with the author).The Community Resilience Planning, Emergency Management and Public Health Working Group recommended to the Climate Council that Maine's Stormwater Management Act (Title 38, Chapter 3, § 420D) and associated rules (Chapter 500) undergo a comprehensive review and revision to support adaptation and resilience. DEPT. OF AGRIC., CONSERVATION & FORESTRY, COMMUNITY RESILIENCE PLANNING, EMERGENCY MANAGEMENT AND PUBLIC HEALTH WORKING GROUP, COMMUNITY RESILIENCE PLANNING SUB-GROUP RECOMMENDATIONS A6 (2020). Moreover, the Coastal and Marine Working Group likewise recommended to the Climate Council that Maine's stormwater management tools be strengthened, including revisions to 38 MRS § 420(D) as well as Chapter 500. A REPORT FROM THE COASTAL & MARINE WORKING GROUP OF

Chapter 500 could serve as the mechanism that addresses the gaps identified in Maine's current stormwater regulations. Further, municipalities should not shoulder the burden of correcting urban impaired streams without a correlating update to state stormwater regulations that captures all the development that occurs in the municipalities' respective watersheds. As Chapter 500 is currently written, there are no terms or requirements for addressing chloride impairment.[194] This section proposes provisions designed specifically to reduce the amount of de-icer applied to impervious surfaces, which is the only avenue that will effectively address chloride impairment. Lastly, this section proposes that Chapter 500 applies to a wider set of permittees. Reduction of chloride-based de-icer by a wide range of Chapter 500 permittees would propel Maine down the road to achieving restoration and protection of Maine waters.

A. Chloride Provision

First, a provision should be developed that includes specific mandates designed to achieve salt reduction. For example, commercial permittees, or others with large parking lots, should be required to identify impervious cover that must be out of service for the winter, essentially creating no-salt and no-plow areas.[195] Certain permittees, perhaps depending on the location of the development, should be required to identify pervious surfaces onto which snow may not be plowed, which prevents groundwater infiltration.[196] In the same regard, infiltration should not occur for salty water at all, but should instead, be captured and directed to the stormwater system.[197] The regulations should also necessitate anti-icing treatments such as brining in chloride vulnerable areas—a proactive strategy applied in advance of a snow or

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THE MAINE CLIMATE COUNCIL A37 (2020). The suggestions made by this working group mirror those made by the Community Resilience working group but take their recommendations a step further regarding green infrastructure, water quality and nutrient loading. *Id*. at A49-A50.

194. *See generally* 06-096-500 Me. Code R. Maine DEP does maintain a three volume Stormwater Best Practices Manual which includes detailed guidelines, but guidelines provide no enforceable mechanism by which to ensure winter salt is being responsibly applied. *See generally id.*

195. *See* FINAL MS4 GENERAL PERMIT, *supra* note 100, at Appendix D.

196. *Id.* Infiltration is discouraged when chloride impact to a small stream is the biggest current or future concern.

197. *Id.* Keeping in mind, however, that even structural stormwater systems are not able to remove chloride from stormwater unless they are equipped with a reverse osmosis feature.

ice event—consisting of the application of liquid brine before a storm to prevent ice from bonding to the pavement allowing for less chemical use.[198] In addition, the regulations should adopt application rates of de-icer used for roads and parking lots.[199]

Second, a monitoring provision should be implemented to ensure application rates are being adhered to. The most efficient and effective tool for reducing chloride levels without decreasing the level of service is selecting the appropriate time and method of snow and ice removal for each storm. The provision should require documentation by applicators of storm events and winter maintenance activities as well as documentation that salt application equipment has been calibrated before each winter season.[200] The rules should also impose obligations to report annual salt usage,[201] and to inspect parking lots and sidewalks for over application of de-icer.[202]

Combined, these techniques could form a larger salt management plan,[203] thus reducing the amount of salt used, resulting in less chloride contamination of a watershed. The provisions could also be coupled with the requirement for salt application training for public and private entities and limited liability legislation,[204] which would enhance the effectiveness of each. Such a plan could have wide ranging effects given those who currently fall under the authority of Chapter 500,[205] and even more so if Chapter 500 were to incorporate alternative design standards and apply

198. *See* CENT. MASS. REG'L STORMWATER COAL., STANDARD OPERATING PROCEDURE 18: WINTER ROAD MAINTENANCE 1-2 (2019). A study conducted in Minnesota verified that stormwater runoff from cities that used brine contains less chloride per unit of road area than stormwater from cities that did not utilize brine as best management practice. Danelle M. Haake & Jason H. Knouft, *Comparison of Contributions to Chloride in Urban Stormwater from Winter Brine and Rock Salt Application*, 53 ENV'T SCI. & TECH. 11888, 11892 (2019).

199. *See* Strifling, *supra* note 46, at 201.

200. *See* U.S. ENV'T PROT. AGENCY, GENERAL PERMIT FOR STORMWATER DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS IN NEW HAMPSHIRE APPENDIX H PART IV.

201. *Id*.

202. The rules could even require pavement temperature monitoring and prohibit the use of salt when the pavement temperature is below 15 degrees Fahrenheit. *See* CENT. MASS. REG'L STORMWATER COAL., *supra* note 198, at 2.

203. For example, New Hampshire law requires a salt management plan in certain instances. NH Env-Wq 1503.11(g) ("For any project that might result in a discharge of stormwater to a surface water impaired for chloride, the applicant shall: (1) Submit a chloride management plan to minimize the discharge of chloride to the surface water; and (2) Implement the plan if a permit is issued for the project.").

204. *See* Strifling, *supra* note 46, at 184-90.

205. *See supra* notes 116-21 and accompanying text.

to a greater number of permittees, suggestions which are addressed in the following section.

B. Alternative Design and Development Standards

Both low impact development and alternative urban design should be incorporated as requirements into Chapter 500. Alternative urban design that addresses salt use specifically includes practices such as alternative pavements and covered areas. Various types of alternative pavements exist that can be kept clear with less salt or with no salt at all. Such alternatives include heated pavement, porous asphalt, and surfaces with improved traction. Holland, Michigan currently has the largest publicly owned snowmelt system in North America.[206] Underneath 10.5 acres of sidewalks and streets is a system of tubing that circulates water heated by waste heat from power generation.[207] The system is capable of melting one inch of snow per hour at twenty degrees Fahrenheit with winds of ten miles per hour.[208] This effectively makes for 10.5 acres where no salt is needed and is a viable option for urban sidewalks and downtown areas. Porous asphalt is another strategy that can mitigate chloride impairment. A study conducted by the University of New Hampshire Stormwater Center concluded that "up to 72% less salt was needed for porous asphalt to maintain equivalent or better surface conditions as impermeable asphalt."[209] This asphalt type is a second option that could be required of permittees where reduced salt use is necessary, perhaps in areas already impaired for chloride or areas where there is high potential to become impaired for chloride. Still another design standard that could be implemented is covered parking areas and walkways. Covered areas provide protection of the impervious surface; thus, they reduce the need

206. *Snowmelt System*, HOLLAND, MICHIGAN, https://www.cityofholland.com/879/Snowmelt-System [https://perma.cc/8BMQ-CT2C] (last visited Mar. 21, 2023).

207. *Id.*

208. *Id.* Other types of heated pavement technologies are being tested for use on a larger scale. See generally Eyal Levenberg & Quentin Felix Adam, *Construction of an Electrically Heated Asphalt Road Based on Ribbon Technology*, 2675(9) TRANSPORTATION RESEARCH RECORD 652 (2021).

209. Kristopher Houle, *Winter Performance Assessment of Permeable Pavements: A Comparative Study of Porous Asphalt, Pervious Concrete, and Conventional Asphalt*, UNIV. OF N.H. SCHOLARS' REPOSITORY 32 (2008).

for salt application. Canopies that incorporate solar panels double as energy producers.[210]

Low impact development (LID) should also be incorporated as a requirement of Chapter 500 standards. For example, Rhode Island stormwater management regulations require low impact development to be considered. Minimum Standard 1 of the regulations state that LID must be used to the maximum extent practicable for both new and redevelopment projects.[211] Applicants must document that the full list of LID methods were explored and must supply a specific rationale when LID strategies are rejected as infeasible.[212] The regulations include ten LID measures that must be included and documented in the site planning process.[213]

C. Expanding the Number of Permittees

Including a greater number of permittees within the scope of Chapter 500 would have far-reaching effects. This can be done quite simply by reducing the footprint threshold and limiting exceptions for both new development and redevelopment. For example, Maryland stormwater prohibits anyone from developing land without first acquiring an approved stormwater management plan, unless the development qualifies for an exemption.[214] The three exemptions are (1) additions or modifications to an existing single family detached residence; (2) any development that does not disturb over 5,000 square feet of land area; and (3) land development activities which the Administration determines will be regulated under specific state laws which provide for managing stormwater runoff.[215] Additionally, redevelopment is required to address stormwater management.[216] All redevelopment projects are required to do one of the following: (1) reduce existing impervious area within the limit of disturbance by at least 50 percent according to the state managed design manual; (2) implement environmental site design to the maximum extent practicable to provide water quality treatment for at least 50 percent of the existing impervious area within the limit of disturbance; or

210. Randy Billings, *Old Port Parking Garage Does Double Duty as Solar Farm*, PORTLAND PRESS HERALD (May 30, 2017), https://www.pressherald.com/2017/05/30/old-port-garage-collects-rays-on-the-roof [https://perma.cc/VR6W-HRZ3].

211. 250-150 R.I. CODE R. § 8.7(A) (LexisNexis 2023).

212. *Id.* § 8.7(B).

213. *Id.*

214. MD. CODE REGS. 26.17.02.05(A).

215. *Id.* at 26.17.02.05(B).

216. *Id.* at 26.17.02.05(D)(1).

(3) use a combination of the first two for at least 50 percent of the existing site impervious area.[217]

Similarly, Vermont requires a stormwater permit to be issued for any impervious surface that is a half-acre or more in size.[218] Any earth disturbance of one acre or more is required to obtain a permit, and any expansion of existing impervious surface by more than 5,000 square feet, such that the total resulting impervious area is greater than one acre, is also required to obtain a permit.[219] Further, in recognition that certain properties were not permitted prior to adoption of the stormwater regulations, general permits must be issued for discharges of stormwater from impervious surface of three or more acres when the discharge previously was not permitted or was permitted under an individual or general permit that did not incorporate the requirements of the most recent stormwater management manual.[220] Capturing a greater number of permittees subject to Chapter 500 can be accomplished simply by revising the square footage thresholds for both new and redevelopment.

CONCLUSION

The Clean Water Act was an important step in restoring and maintaining the integrity of U.S. waters. Unfortunately, water quality impairment remains, and the issues associated with stormwater persist. As the U.S. continues to grow and develop as a nation, regulations must grow and develop as well. In the stormwater context, states can take active steps by tailoring their stormwater rules to suit their unique water quality needs. De-icing practices are used statewide by both public and private entities, meaning the potential for chloride contamination is widespread. The governmental units addressing these issues should not be limited to municipalities. Rather, the burden should be borne by all who employ the practice. If left unregulated, the possibility remains to document any water quality violations and either prohibit the discharges contributing to such violation or issue a MEPDES permit to control the discharge. Chloride contamination is a difficult issue to address, but Maine has several dedicated water quality stakeholders who are willing and capable to take on the duty.

217. *Id.* at 26.17.02.05(D)(1)(a)-(c).
218. VT. STAT. ANN. tit. 10, § 1264(c)(1) (West 2023)
219. *Id.* § 1264(c)(4)-(5).
220. *Id.* § 1264(g)(3).