



Charles River Watershed Association

March 11, 2011

Kate Renahan
U.S. EPA-Region 1
Office of the Regional Administrator
5 Post Office Square-Suite 100
Mail Code-ORA01-1, Boston, MA 02109-3912

RE: Draft Massachusetts Interstate, Merrimack and South Coastal Small Municipal Separate Storm Sewer System (MS4) General Permit (Draft MIMSC MS4 Permit)

Dear Ms. Renahan:

Charles River Watershed Association (CRWA) offers the following comments on the above-referenced draft permit. Although Charles River watershed municipalities will not be covered by these General Permits, we recognize that the Stormwater General Permits throughout Region 1 are critical components of water quality improvement efforts and they should all be consistent, and reflect the growing understanding of effective stormwater management programs. We are strongly supportive of EPA's efforts to improve stormwater management across the Region and urge swift finalization of the new permit. We provide a copy of our original comments from March, 2010 on the North Coastal Draft MS4 Permit as an attachment to this letter, as many of the comments we made at that time apply also to this Draft Permit.

CRWA applauds EPA's efforts to build upon the successes of the 2003 MS4 General Permit. We believe the draft MIMSC MS4 permit, like the draft North Coastal MS4 Permit issued in 2010, will make significant improvements in municipal stormwater management programs. We urge EPA to review the public comments on the draft permit quickly, and to issue a final permit as soon as possible so implementation can begin.

CRWA also recognizes and supports the significant level of effort and resources that EPA Region 1 staff continues to make to develop tools and training programs to support municipalities in their efforts to comply with stormwater permit programs. We believe these tools, support and training programs, in conjunction with program oversight, and enforcement efforts where necessary, are vital to a successful program and we urge EPA Region 1 to continue and even expand these efforts as stormwater programs continue to evolve.

We strongly support most elements of the Draft MIMSC MS4 Permit, especially the requirements for stronger IDDE programs, water quality monitoring, documentation and reporting requirements, support for green infrastructure, and strengthening of stormwater by-laws and ordinances. We support the requirements in section 2.4.6.9 that require the identification of and planning for reductions in Directly Connection Impervious Areas. We agree with the comments made in detail by others that exceedences of water quality standards should be reported to regulators (section 2.1.1.c).

However, we do not support the threshold levels in this draft permit for post-construction stormwater management for new and redevelopment. Section 2.4.6.4 requires the modification of municipal post-construction stormwater management bylaws or ordinances to require compliance with certain Massachusetts Stormwater Standards for projects that will create “two or more acres of impervious surfaces,” (Draft MIMSC MS4 Permit at pages 33 – 34). As we commented in 2010 on the draft North Coastal MS4 Permit, we believe this threshold is far too high, especially in urbanized areas where the majority of new and redevelopment projects will create less than even one acre of new impervious cover. We again recommend a threshold of 0.5 acres of impervious surface for compliance with the relevant Massachusetts Stormwater Standards. Municipalities need strategies to control stormwater on private property, and post-construction stormwater requirements can be a valuable tool, but they will not be effective if the thresholds are so high that most projects do not need to comply.

In conclusion, CRWA appreciates the significant time and resources that EPA Region 1 has put into this draft permit, and the opportunities provided for the public to provide input prior to its release. The new permit moves in a direction that is consistent with our experience and science on stormwater management, and will provide measurable improvements in the future. Please feel free to contact us should you have questions.

Sincerely,

Kate Bowditch
Director of Projects

Attached: CRWA Comment letter on Draft MS4 Permit for Massachusetts North Coastal Watersheds

ATTACHMENT:

CRWA Comment letter on Draft MS4 Permit for the Massachusetts North Coastal Watersheds,
March, 2010



Charles River Watershed Association

March 31, 2010

EPA-Region 1
Attn: Thelma Murphy
Office of Ecosystem Protection
5 Post Office Square – Suite 100
Mail Code: OEP06-4
Boston, MA 02109-3912

***RE: Small Municipal Separate Storm Sewer System (MS4) Draft General Permit for
Massachusetts North Coastal Watersheds***

Dear Ms. Murphy:

Charles River Watershed Association (CRWA) offers the following comments on the above-referenced draft permit. We are strongly supportive of EPA's efforts to improve stormwater management across the North Coastal watersheds and urge swift finalization of the new permit. We provide comments in order to assist EPA in clarifying and strengthening the permit.

Our comments are based on our reviews of the draft General Permit, its appendices, and the Fact Sheet, as well as information we have learned at the formal public hearing, numerous public informational meetings regarding the MS4 permit program, and our own work and experience with the municipalities in the Charles River Watershed.

In addition, in anticipation of the new MS4 permit, CRWA conducted research in January, 2010 of municipal stormwater management programs in Charles watershed communities under the existing MS4 permit to evaluate compliance and to provide input on the new permit. A report of this research accompanies this comment letter, and the results are discussed in our comments below.

General Comments

CRWA applauds EPA's efforts to build upon the successes of the 2003 MS4 General Permit, and to clarify and to strengthen areas of the permit in ways that reflect the water resource protection needs of the North Coastal region, as well as the capacities of the regulated municipalities. The draft permit is a detailed document that will help improve stormwater management and water quality. We urge EPA to review the public comments on the draft permit quickly, and to issue a final permit as soon as possible so implementation can begin.

As CRWA's recent research into several Charles River watershed municipal stormwater programs shows (see attached Report), those municipalities that have moved forward to develop robust stormwater management programs report fairly positive outcomes and experiences. Stormwater bylaws have helped municipalities improve management of their own systems by sharing the burden of stormwater management with private property owners, and have given municipalities the authority to establish standards to protect their own drainage systems. The successes of these programs are likely the result of both guidance from EPA and genuine commitments to the effort from municipal leadership. The draft permit has taken many of the lessons learned from these successful programs and incorporated them into detailed sections. We believe this level of detail is important, will increase compliance, and strengthen programs across the North Coastal watersheds.

Program Capacity at Region 1

CRWA urges EPA Region 1 to consider bolstering its own capacity to manage the program under the new permit. In our experience, successful stormwater regulation requires a combination of support, oversight and, when necessary, enforcement actions. Technical assistance and oversight will be especially important for those communities with an approved total maximum daily load (TMDL). EPA should consider strengthening the tools available to help municipalities develop successful programs that comply with regulations. Training and outreach programs for municipal officials, watershed associations and other stakeholders should be considered. Encouraging municipalities to meet regularly to share experiences and resources with one another as well as with regulators, as was done with the Clean Charles Initiative, may help streamline programs and reduce costs and failure rates.

As is made clear in our attached Report, there is a tremendous variability in MS4 program activities, even in the Charles watershed municipalities. For example, of the 34 Charles watershed communities regulated under the MS4 general permit, 11 appear not to have filed an annual stormwater report in 2009; 12 do not appear to have passed IDDE by-laws. At the public hearing for this draft permit, many municipalities expressed their need for program support as they work to implement MS4 requirements. EPA needs the resources to oversee municipal programs carefully, to be able to work with municipalities to ensure compliance, and, if necessary, to use enforcement.

Timetables and Milestones

CRWA believes many of the timetables in the draft permit are too long, and that more specific milestones should be established to ensure that municipalities are making meaningful progress in program development. This is especially important given the poor performance of some municipalities and non-traditional MS4s under the 2003 MS4 permit. In particular, we believe the four-year timetable for completion of a Phosphorus Control Plan (PCP), and ten years for implementation of the PCP, are too long. We think it is reasonable to require PCPs be complete within two years and implemented within five years, or during the life of this permit. Specific milestones should also be required each year to ensure progress is being made. Additional specific comments on timetables and milestones are provided in the detailed comments below.

Monitoring

CRWA supports expanding the water quality monitoring requirements under the new permit, and believes that more frequent monitoring than is proposed in the draft permit is necessary. Specifically, we believe wet weather analytical monitoring should be conducted at outfalls *at least* three times during the five-year permit period, with an expectation that this should evolve to a standard of at least one wet weather sampling event each year at most outfalls.

The issue of monitoring has been discussed extensively over the past year once EPA announced it was considering additional water quality monitoring in the new permit. While we are well aware of the debates about the benefits of monitoring, particularly among water resource managers, CRWA's position on the value of water quality monitoring is based on our own experience in the Charles River, where water quality monitoring has been essential to all of the river's major successes. Stormwater water quality data is indeed variable, and difficult to collect and manage. However, without monitoring it is not possible to identify trends, prioritize problems, and ensure that everyone is being held to the same standards. Specific recommendations for monitoring are provided in the detailed comments section below.

MassDOT

CRWA believes the new Massachusetts Department of Transportation (MassDOT) should be required to obtain an individual permit for its stormwater discharges in accordance with Part 1.8 rather than seeking coverage under the General Permit. MassDOT has two major transportation divisions—Highway (Massachusetts Highway Department and Massachusetts Turnpike Authority and Transit (the Massachusetts Bay Transportation Authority and all Regional Transit Authorities)—with large stormwater runoff footprints and impacts. Responsibility for many of the Department of Recreation and Conservation's bridges and roadways has also been transferred to MassDOT.

MassDOT's stormwater program is premised on that of Massachusetts Highway Department (MHD), and as such fails to protect water quality. MassDOT stormwater discharges cause and contribute to water quality standards violations, and both MassDOT and MHD have made little meaningful progress in updating or improving the stormwater management program since MHD filed its Notice of Intent under the 2003 MS4 permit.

MassDOT has stated in public hearings that it does not believe the highways cause impacts and that it should not be held to the same standards as municipalities. These statements exemplify MassDOT and MHD's general recalcitrance to comply with stormwater regulatory obligations, or even to look for opportunities to make progress in their programs.

While many states' Transportation agencies have begun to test new stormwater management approaches, and have invested in stormwater projects using stimulus funds issued through the federal ARRA program, MassDOT has simply continued its "business as usual" approach. An individual permit is necessary because MassDOT is significant contributor of pollutants to waters of the United States and its discharges contribute to a violation of water quality standards. We believe that MassDOT's stormwater discharges should be regulated under an individual permit, with specific requirements and clear enforceable benchmarks and timetables.

Comments by Draft Permit Section

Section 1.10:

CRWA supports the detailed requirements of the Stormwater Management Plan (SWMP), including the provisions that it be made available to the public. Subsections (a) and (b): We suggest permittees authorized by the MS4-2003 should modify or update their SWMPs within 90 days of the date of authorization of the new permit.

In subsection (c) We suggest replacing the word “encouraged” so that it reads: “The permittee should maintain and adequate funding source...” Funding is essential to compliance.

Section 10.1.1

Rather than merely encouraging municipalities to post their SWMP on line, EPA should require permittees to make the SWMP publicly accessible via the MS4’s website and not contingent upon a request in writing and payment of a copying fee. Any permittee unable to post its SWMP on line should be required to explain why they cannot do so, and provide a reasonable alternative repository of free copies. We propose the same for Section 2.4.3.1.

Section 1.10.2

The SWMP should clarify the requirement that the permittee appoint a person with responsibility for the stormwater management program, and that this person should have a level of training and authority commensurate with the responsibilities of running the program. Experience with the MS4-2003 permit has shown that successful municipal programs depend on leadership from the stormwater manager. If a permittee does not have such a person appointed at the time of the filing of the SWMP, they should be required to name one and update the SWMP within 90 days.

Section 2.2

CRWA supports the clear, detailed requirements in this section. We believe this will provide clarity about the requirements to reduce impacts in impaired waters, both those with and without approved TMDLs. We also support requiring different standards for new and increased discharges. However, we do agree with several commentators who recommend clarifying that sewer separation projects, which may result in larger stormwater discharges, should not be consider new or increased discharges, and should therefore be required to meet the same standards as existing discharges.

Section 2.2.1: We suggest clarifying language be added that as new TMDLs are approved, the MS4 permits will be modified to comply with new WLAs or new requirements.

Section 2.2.1(c) and (d) and (d)iii and iv: To clarify the intent of these sections, and to avoid any ambiguity should enforcement action be necessary, we strongly suggest revising as follows: Replace the phrase “to achieve consistency with the WLA” with the phrase “to comply with the WLA.”

Section 2.2.1(d)(vi): We suggest that if Charles river municipalities propose to develop municipality-wide phosphorus reduction plans in lieu of a MS4-only plan, it should still be required to meet the minimum elements of the permit.

Section 2.2.1(d)(viii): We believe municipalities can and should complete PCPs in two years, not four.

Section 2.2.1(d)(xi): We suggest adding a new section here to clarify that municipalities must complete implementation of the PCP within five years; and that specific milestones must be achieved. We believe it is feasible for municipalities in the Charles to implement programs and practices to achieve at least half of their total phosphorus load reduction requirements within three years.

Section 2.3.3(b)(i): We believe this should be eliminated. Massachusetts does not appear to have defined “de minimis” via state policy. We do not believe that “insignificance” is tantamount to “de minimis.”

Section 2.4.2

CRWA supports the increased level of specificity provided in this section of the draft permit. We believe improved education can provide meaningful improvements in stormwater management. Municipal education programs developed under the MS4-2003 permit vary widely in their content and effectiveness. A more specific, detailed plan as proposed in the draft will help strengthen programs.

Section 2.4.2.1(b): In order to comply with the objective of Section 2.4.2, to “create a change in public behavior and knowledge so that pollutants in stormwater are reduced,” permittees should distribute educational materials at a minimum of once per year.

Section 2.4.2.1(c)(i): Given the potential for high impacts from improperly maintained septic systems, the educational program should include septic system maintenance if more than 25% of a municipality is served by septic systems.

Section 2.4.4

CRWA strongly supports the increased level of specificity provided in this section of the draft permit. IDDE programs are vital to protecting water and wetland resources, complying with water quality standards, and reducing pollution and public health threats caused by sewage entering storm drains. Our experiences with the varied IDDE programs across the Charles watershed leads us to support the approach to IDDE programs that is laid out in the draft permit.

Section 2.4.4.7: Permittees authorized by the MS4-2003, who should have already identified and mapped their outfalls, should be required to update their outfall inventories to comply with these new requirements within three years of authority to discharge. .

Section 2.4.6

CRWA believes the objective for redevelopment in this section should be strengthened. A goal to “improve the hydrology... and reduce the discharge of stormwater” from a redeveloped site is non-specific and does not support strong stormwater management goals. If EPA wishes to provide permittees with flexibility in developing redevelopment standards, the permittee should be required to develop its own specific standards and include these in its SWMP.

Section 2.4.6.1 and 2.4.6.2 and 2.4.6.4(a): We believe the one acre threshold is too large, especially in urbanized areas where most redevelopment projects are smaller than 1 acre. We suggest a 0.5 acre threshold is more appropriate to achieve the program goals.

Section 2.4.6.7: CRWA strongly supports this provision, as we believe this approach offers some of the best stormwater management strategies available to many communities. This assessment is likely to support the development of a strong municipal program as it requires interdepartmental coordination, and should support activities that are most appropriate to each unique municipality.

Section 2.4.7.1(d)(iv) and (vi): CRWA does not believe street sweeping twice per year is sufficient in many locations. We believe municipalities should prioritize areas of town where more frequent street sweeping is needed, and at a minimum, streets should be swept monthly during the non-winter months.

Section 3.0

As stated above, CRWA strongly supports monitoring requirements and believes they are necessary to achieve success in stormwater management.

Section 3.1.4.5: We oppose the inclusion of this section as one of the conditions that allow a permittee to be exempt from the requirements of 3.3.1 and 3.3.2. We do not believe that in-stream monitoring can be classified as representative of one or more discharges to that waterbody.

Section 3.2.2 and 3.3.3: We do not believe monitoring pH provides enough useful information to warrant its inclusion in wet or dry weather analyses.

Section 7.3: CRWA suggests adding language requiring the agency to develop standards for lease holders at their facilities (including but not limited to rest areas) to develop a stormwater management plan that meets state stormwater standards, including requirements for Operation and maintenance, and an IDDE inspection program.

In conclusion, CRWA appreciates the significant time and resources that EAP Region 1 has put into the new draft permit, and the opportunities provided for the public to provide input prior to its release. The new permit moves in a direction that is consistent with our experience and science on the Charles, and will provide measurable improvements in the future. Please feel free to contact us should you have questions.

Sincerely,

Kate Bowditch
Director of Projects

Attached: Report on Phase II MS4 Permit Implementation in the Charles River Watershed

Report on Implementation of Selected Components of the Phase II MS4 Permit in the
Charles River Watershed

Meridith Richmond
Julie Wood
Charles River Watershed Association
190 Park Road
Weston, MA 02493
January 2010

Table of Contents

Section 1. Introduction.....	3
Section 2. Methodology.....	3
Section 3: Results	4
Section 3.1: Stage 1 Results: Filing of Annual Stormwater Reports.....	4
Section 3.2: Stage 1 Results: Municipal Compliance with Bylaw Requirements.....	4
Section 3.3: Stage 2 Results: Post-construction Stormwater Management Bylaw Compliance	7
Section 3.4: Stage 3 Results: MCM #5 Compliance Case Studies.....	14
Section 4: Conclusion.....	15
Appendix A. Stage 1 Results Matrix	
Appendix B. Stage 2 Results Matrix	
Appendix C. Stage 3 Interview Question List	

List of Tables

Table 1. Bylaws Adopted under MS4 Permit Compliance in Charles River Watershed Communities	4
Table 2. Post-Construction Bylaw Operations and Maintenance Requirements among "Stage 2" Municipalities.....	12

List of Figures

Figure 1. Percentage of MS4 Phase II Municipalities in the Charles River Watershed with Illicit Discharge Bylaw.....	5
Figure 2. Percentage of MS4 Phase II Municipalities in Charles River Watershed Reporting Passing a Bylaw to Comply with MCM 2 Erosion and Sediment Control	5
Figure 3. Percentage of MS4 Phase II Municipalities in Charles River Watershed Reporting Passing a Bylaw to Comply with MCM #5 Post-Construction Stormwater Management	6
Figure 4. Post Construction Bylaw Thresholds of Stage 2 Municipalities	8
Figure 5. Post Construction Bylaw Performance Criteria in "Stage 2" Municipalities	9
Figure 6. Post-Construction Bylaw Reviewing Authority among "Stage 2" Municipalities	10
Figure 7. Post-Construction Bylaw Stormwater Management Plan Requirements among "Stage 2" Municipalities	11
Figure 8. Status of Post-Construction Bylaw Requirements Among Municipalities in the Charles River Watershed Reporting Not Having Passed a Bylaw to Comply with MCM #5	13

Section 1: Introduction

This report summarizes the implementation of certain aspects of the Phase II Municipal Separate Storm Sewer System (MS4) Permit within the Charles River watershed. There are thirty-five municipalities in the watershed, thirty-four of which have Phase II MS4 permits. Boston was excluded from this research since it is covered under a Phase I NPDES Permit. The focus of this report is the implementation of the requirements to adopt bylaws as part of three of the six minimum control measures (MCM) of the Permit. Three MCMs require municipalities with a Phase II MS4 Permit to have bylaws to address these measures. These three MCMs are:

- MCM #2 - Construction Site Stormwater Runoff/Erosion and Sediment (E&S) Control,
- MCM #3 - Illicit Discharge Detection and Elimination (IDDE), and
- MCM #5 - Post-Construction Stormwater Management in New Development and Redevelopment.

The first section of this report documents the extent to which the three kinds of bylaws have been adopted in the thirty-four MS4 communities of the Charles River watershed. The second section further evaluates post-construction bylaws (MCM#5) in the communities that have reported passing a bylaw to comply with this MCM. A sample of the post-construction stormwater management bylaws were reviewed to determine what they require and three municipalities with post-construction bylaws were interviewed to gain a perspective on their experience meeting the post-construction bylaw requirement.

Section 2: Methodology

This investigation is divided into three parts: stage 1, stage 2, and stage 3. The objective of stage 1 was to determine which of the thirty-four municipalities have passed IDDE, erosion and sediment control, and post construction stormwater management bylaws¹. The objective of stage 2 was to investigate a selected subset of municipalities that had passed a post-construction bylaw and document the specific requirements of these bylaws. Stage 2 also examined municipalities that had not passed a new post-construction stormwater bylaw to determine if they have any plans to do so in the future. Lastly, stage 3 presents short case studies on three municipalities that have passed bylaws to meet the requirements of MCM #5. These case studies examine their experiences in implementing these bylaws.

Information was obtained through each municipality's most recent Annual Report to the EPA on their MS4 permit compliance and, when necessary, follow-up interviews with municipal personnel who are involved with MS4 permit compliance. For bylaws considered during stage 2, copies of the relevant stormwater bylaws dealing with post-construction were assessed for their requirements in the following categories: thresholds, performance criteria, implementation and

¹ The different types of bylaws we examined were often combined within one "stormwater bylaw," for the purpose of this report, however, we will often refer to a municipality having passed an "Erosion and Sediment Control bylaw" and a "Post Construction bylaw" when in reality municipalities often did not pass two separate bylaws, but passed one "stormwater" bylaw that addressed multiple minimum control areas.

enforcement, and operations and maintenance (O&M). Information for the three case studies presented in stage 3 was obtained through telephone interviews.

Review of individual bylaws was conducted simply to determine the types of issues and areas current bylaws are addressing. Bylaws were *not* assessed or judged with respect to how well or how thoroughly they address stormwater pollution or any other environmental issue. Any interpretation of the various bylaws is simply intended as an interpretation for this report and should not be considered legal analysis or advice.

Section 3: Results

Section 3.1: Stage 1 Results: Filing of Annual Stormwater Reports

CRWA reviewed the EPA’s website for municipal Annual Stormwater Reports in an effort to obtain the most up to date information from each municipality. Of the thirty-four towns in the Charles, eleven had not filed a 2009 report as of January 2010; four of these last filed in 2008; six of these last filed in 2007; and one last filed in 2006 (See Appendix A)².

Section 3.2: Stage 1 Results: Municipal Compliance with Bylaw Requirements

Municipal compliance with the bylaw requirements fell into three categories:

- Passed – reported having passed the bylaw
- Not passed – reported not yet passing the bylaw
- Existing – reported having existing codes or bylaws that meet the permit requirements

Table 1. Bylaws Adopted under MS4 Permit Compliance in Charles River Watershed Communities

	<i>IDDE</i>		<i>Erosion & Sediment</i>		<i>Post Construction</i>	
	<i>#</i>	<i>%</i>	<i>#</i>	<i>%</i>	<i>#</i>	<i>%</i>
<i>Passed</i>	<i>18</i>	<i>53</i>	<i>18</i>	<i>53</i>	<i>19</i>	<i>56</i>
<i>Not Passed</i>	<i>12</i>	<i>35</i>	<i>9</i>	<i>26</i>	<i>10</i>	<i>29</i>
<i>Existing</i>	<i>4</i>	<i>12</i>	<i>7</i>	<i>21</i>	<i>5</i>	<i>15</i>

Table 1 and Figures 1-3 summarizes the results of stage 1 research. Of the three bylaws, erosion and sedimentation control has been reported as passed or as already being met by the most communities, while IDDE has been reported as passed or already being met by the fewest. Nineteen communities, 56% of the MS4 watershed communities, have passed the post-construction bylaw. The results of our stage 1 research are presented in Appendix A.

² The annual permit period is from April 1 to March 31 with annual reports due by May 1; therefore 2009 reports report on the period from April 1, 2008 to March 31, 2009 and were due by May 1, 2009.

Figure 1. Percentage of MS4 Phase II Municipalities in the Charles River Watershed with Illicit Discharge Bylaw

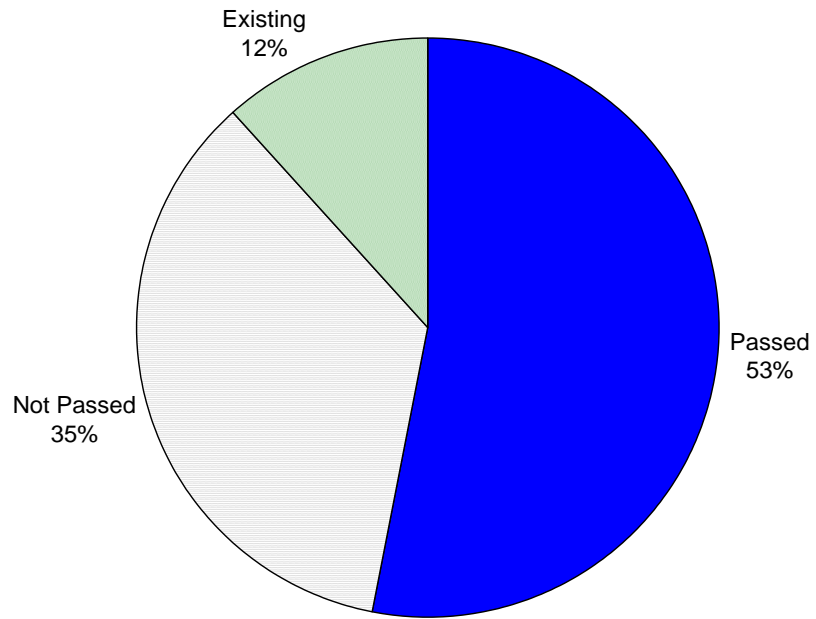


Figure 2. Percentage of MS4 Phase II Municipalities in Charles River Watershed Reporting Passing a Bylaw to Comply with MCM 2 Erosion and Sediment Control

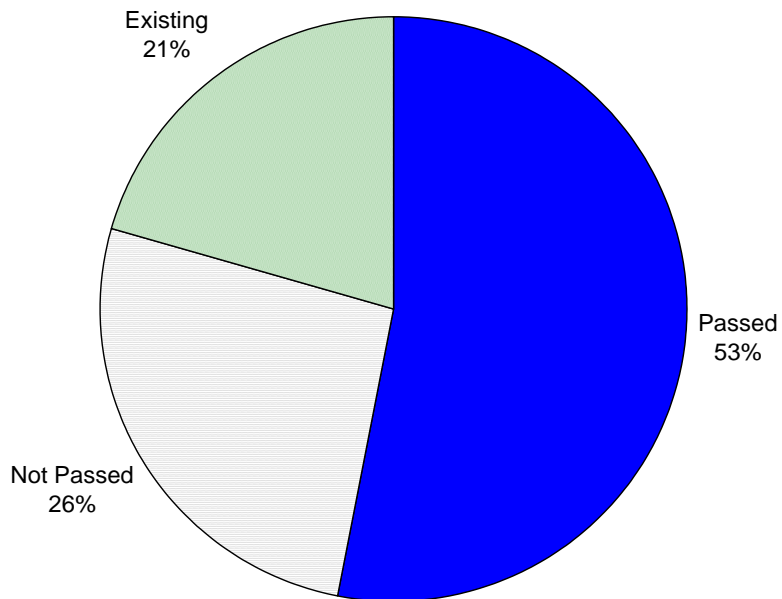
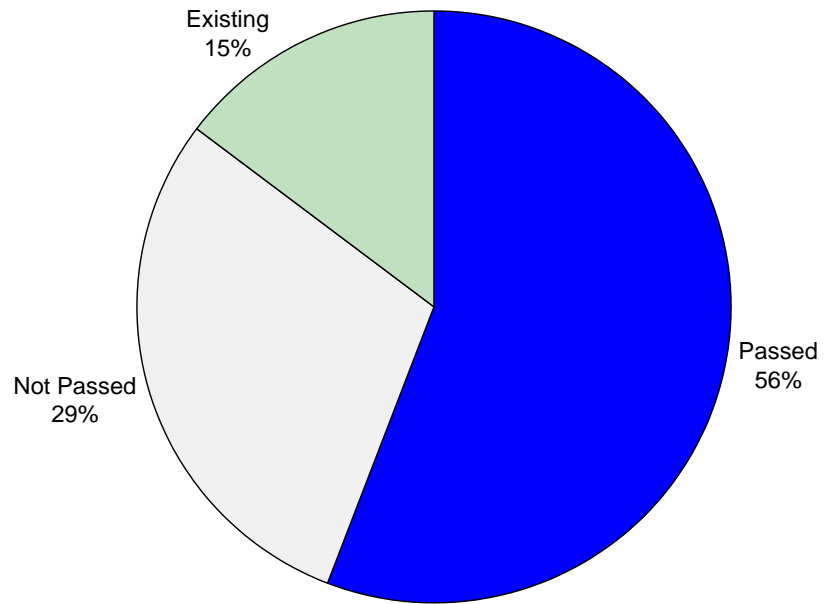


Figure 3. Percentage of MS4 Phase II Municipalities in Charles River Watershed Reporting Passing a Bylaw to Comply with MCM #5 Post-Construction Stormwater Management



Section 3.3: Stage 2 Results: Post-construction Stormwater Management Bylaw Compliance

3.3.1. Study of Select Municipalities Reporting Adopting a Bylaw to Comply with MCM #5

From the nineteen municipalities that reported having passed a bylaw that met MCM #5, a subset of eleven municipalities were selected for further review of their post-construction stormwater management bylaw (See Table 2). Selection of these eleven communities was based on the following criteria:

- a. Reported having passed a bylaw to comply with MCM#5 post-construction stormwater management in new development and redevelopment following the issuance of the MS4 Phase II permit
- b. Majority of municipality is located within the watershed
- c. Contributed to having a range of municipalities from throughout the geographic extent of the watershed
- d. Contributed to having a range of municipalities with different land use/development patterns

Bylaw requirements in the following categories were investigated: thresholds, performance criteria, implementation and enforcement, and operations and maintenance.

Threshold

Bylaws varied with respect to the projects that were subject to them; threshold defines the minimum requirements for projects subject to the bylaw. The thresholds for the 11 post-construction bylaws reviewed fell into four major categories:

1. Standard – bylaw applies to projects that have 1 acre or more of land disturbance for redevelopment or development, including smaller parts of a larger common plan of development that would ultimately disturb an acre or more. (One bylaw with a 40,000 square foot or greater threshold was incorporated into this category);
2. Lower threshold – bylaw applies to projects with smaller land disturbances than an acre;
3. Tiered – bylaw has two sets of requirements, with general requirements applying to sites with lower thresholds and stronger or more specific requirements applying to site with greater than 1 acre of land disturbance;
4. Other – bylaw applies to a range of projects, based on various project measures, including size but also zoning, number of parking spaces, amount impervious area created, etc.

Most bylaw thresholds fell in the standard category (See Figure 4).

Exemptions

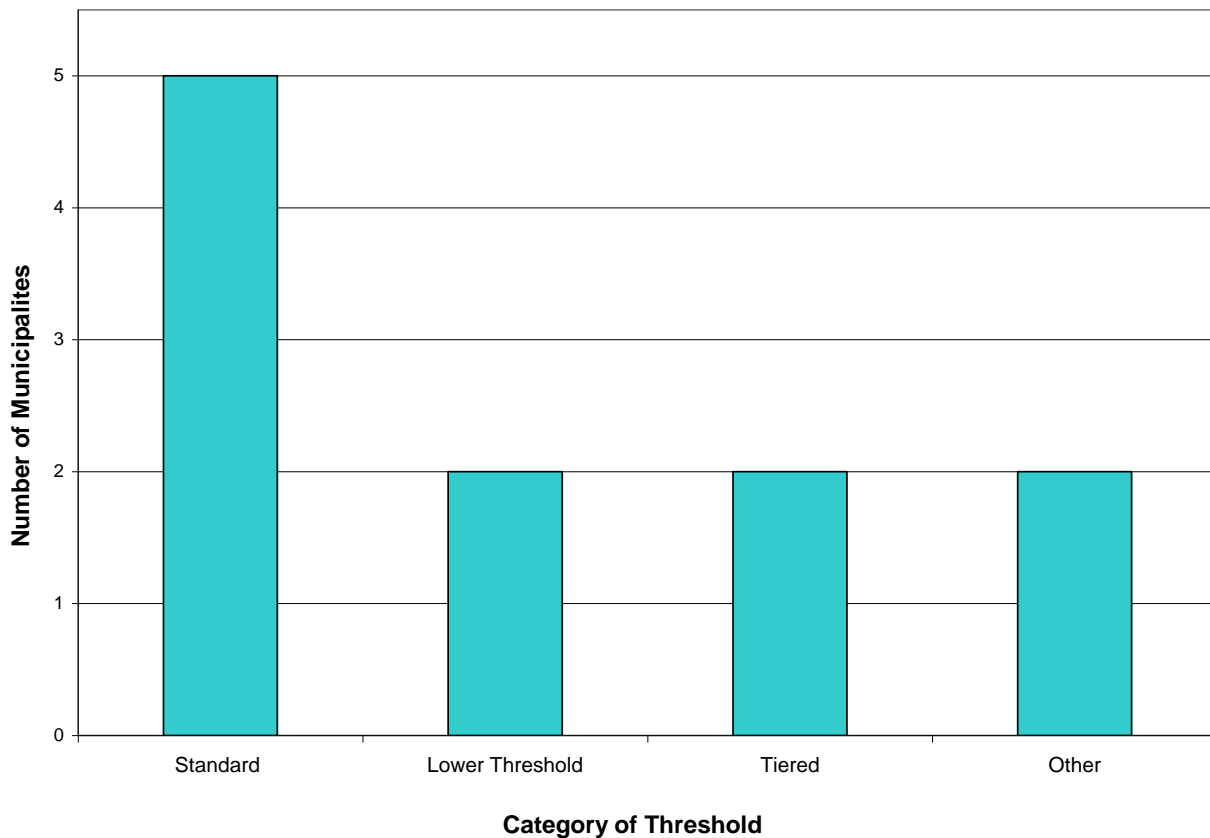
Many bylaws also included certain exemptions to the thresholds. Examples of typical exemptions include:

- Activities that are already regulated or that do not alter drainage;
- Normal maintenance and improvement of land in agricultural use as defined by the Wetlands Protection Act;
- Maintenance of existing landscaping, especially when drainage patterns are not altered;
- Construction of utilities other than drainage that would not alter terrain or drainage patterns; and
- Emergency repairs.

Certain bylaws also included atypical exemptions which were unique to the specific community, these included:

- Projects reviewed under other permitting or development mechanisms, specifically the Special Permit, Site Plan Review, Definitive Subdivision approval, Conservation Commission Order of Conditions, Board of Health approval of a septic system upgrade processes (Holliston)
- Modifications or additions to single family homes (Milford)

Figure 4. Post Construction Bylaw Thresholds of Stage 2 Municipalities

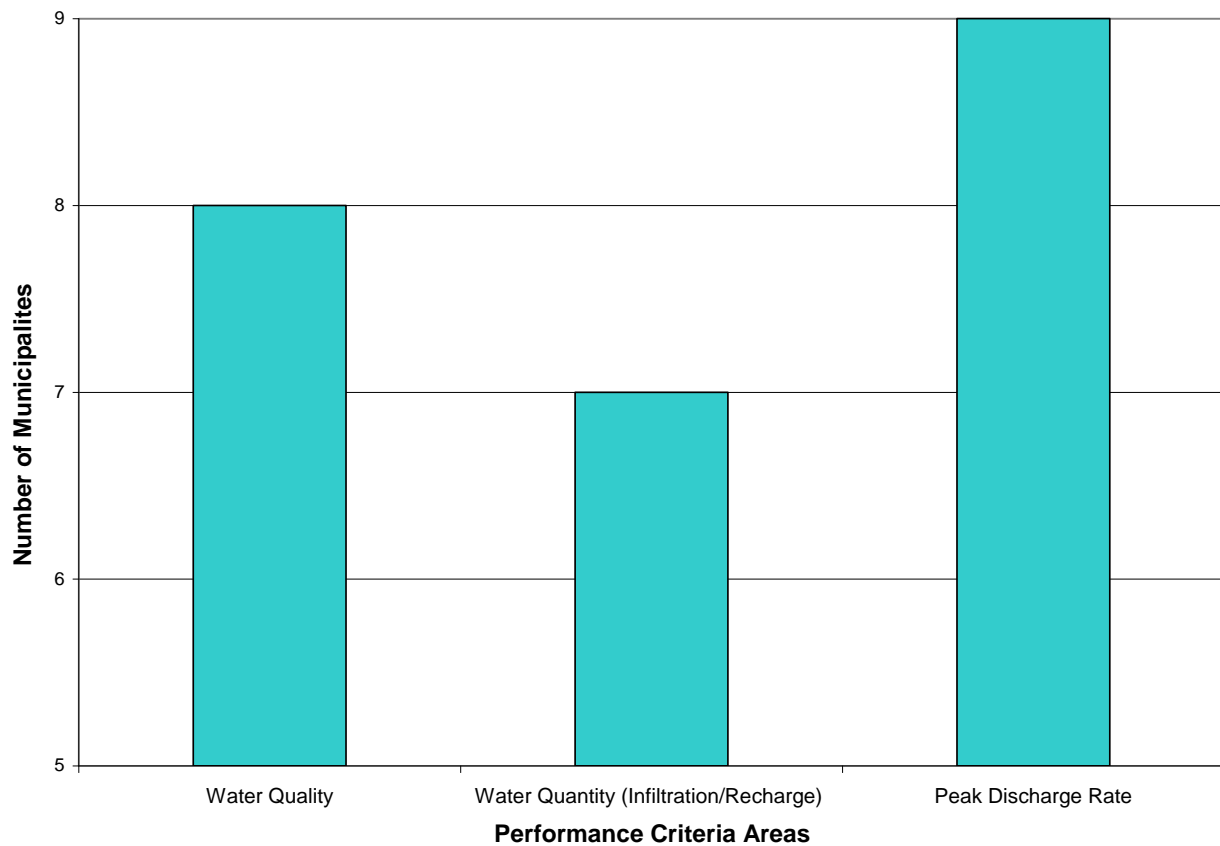


Performance Criteria

Performance criteria are standards that projects subject to this bylaw are expected to meet. Performance criteria were reviewed to determine whether or not the bylaw included performance criteria in three categories: water quality, peak discharge rate, and water quantity (infiltration/recharge). Many bylaws based performance criteria in part or in entirety on these Massachusetts Stormwater Handbook which addresses all three of the performance criteria areas. The bylaws of two municipalities did not include performance criteria information.

Each performance area was addressed by more than half of the bylaws investigated (See Figure 5). Peak discharge rate is addressed in all nine bylaws, water quality is covered by eight bylaws, and water quantity is covered by seven of the nine bylaws with performance criteria. Bylaws varied in their actual performance criteria within each category and while many were based on state standards some were in fact much stricter than state standards.

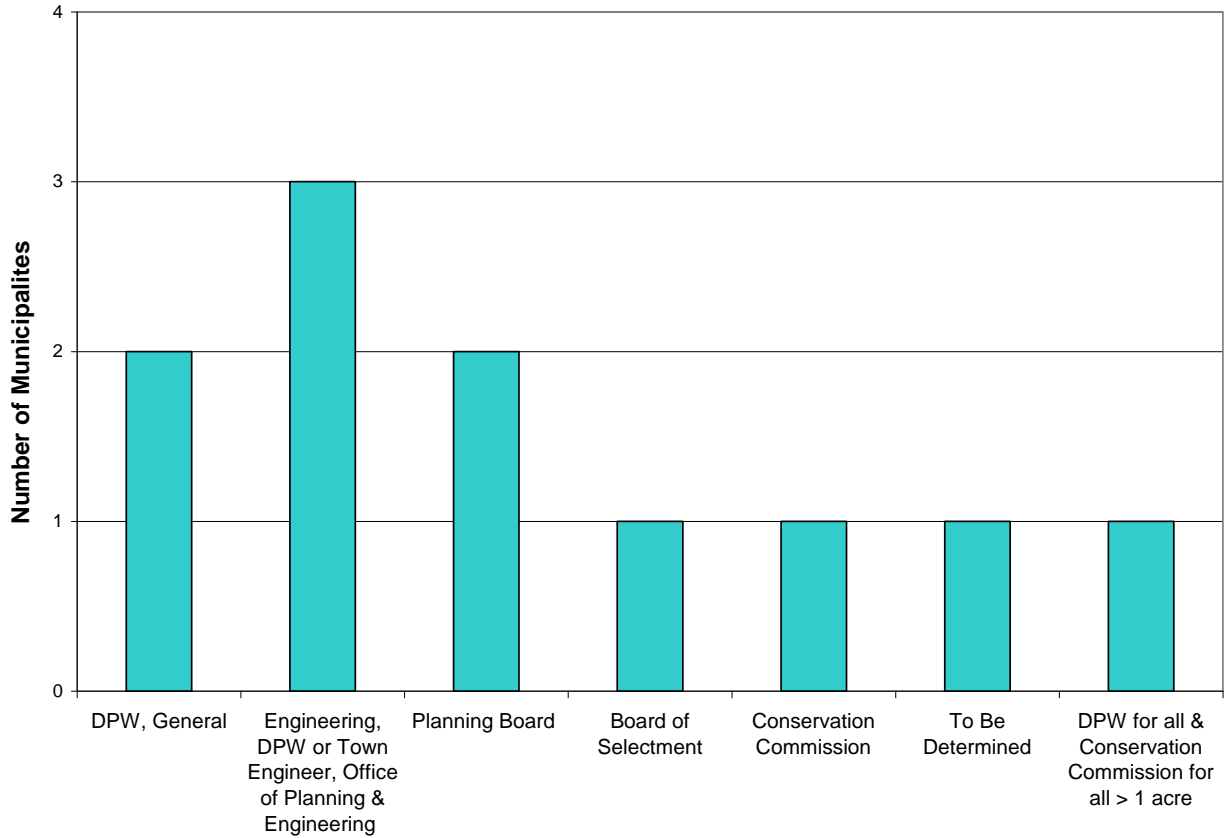
Figure 5. Post Construction Bylaw Performance Criteria in “Stage 2” Municipalities



Reviewing Authority

Bylaws also typically identified who was responsible for reviewing projects to ensure compliance. The municipal engineer was the most common reviewing authority, but overall there was a wide variety of reviewing authorities designated by the bylaws (See Figure 6).

Figure 6. Post-Construction Bylaw Reviewing Authority among Stage 2 Municipalities

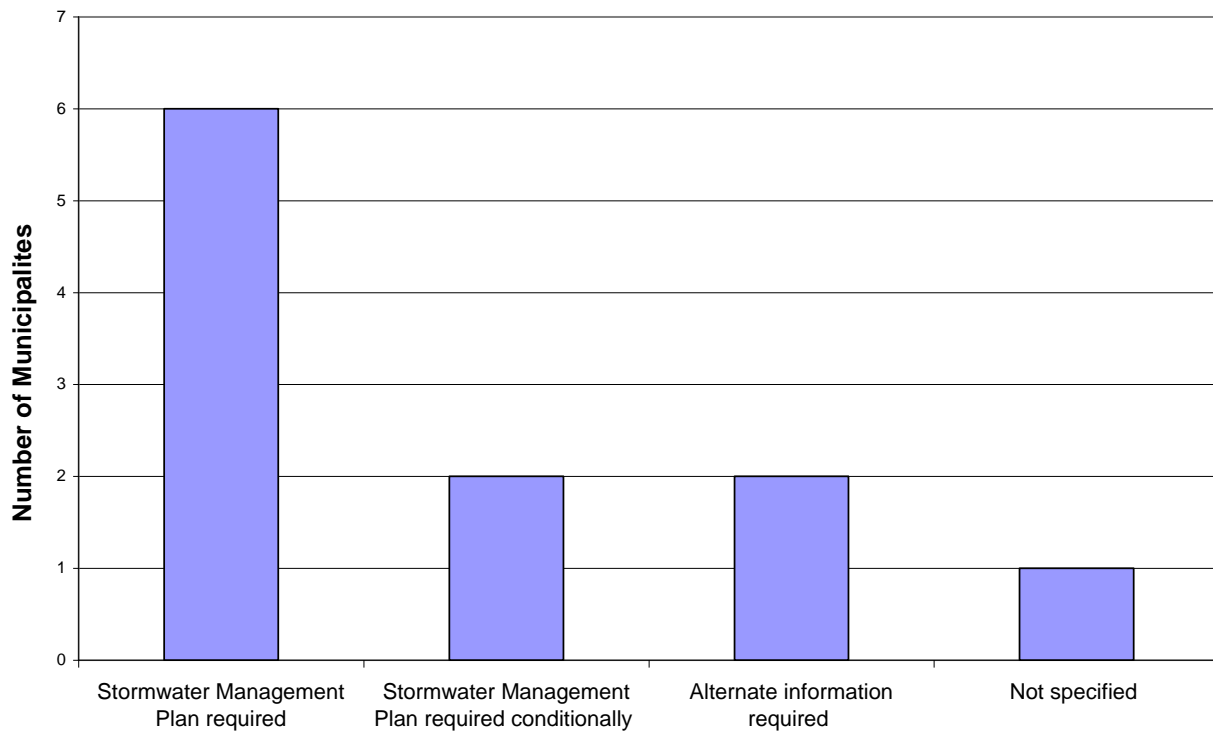


Implementation and Enforcement

CRWA investigated how project proponents were required to comply with the bylaws. A common mechanism of compliance was a requirement to submit information about the project, usually in the form of a Stormwater Management Plan for review by the relevant reviewing authority (See Figure 7).

Another common requirement was that the site be inspected at certain times, and two of the bylaws had the unique requirement that the stormwater management system be evaluated during a storm. It was also common for “as-built” plans to need to be submitted with ten of the eleven bylaws specifying this, and for the municipality to require for all projects or at its discretion some sort of performance guarantee, bond or surety, with seven of the eleven bylaws addressing this in some way.

Figure 7. Post-Construction Bylaw Stormwater Management Plan Requirements among Stage 2 Municipalities



Operations and Maintenance

Certain bylaws dictated operations and maintenance requirements for projects. O&M typically refers to practices intended to reduce stormwater pollution (i.e. parking lot sweeping) and upkeep of structural stormwater best management practices.

The most common O&M mechanisms specified by the bylaws were required O&M Plans and Maintenance Schedules (See Table 2). It was also common for municipalities to require a plan, maintenance agreement, *and* a maintenance schedule, five out of the eleven sampled bylaws required these three pieces of documentation. In some cases plans and schedules were required conditionally based on the type of stormwater management techniques and practices incorporated in the project or the type of project, residential, commercial, etc.

Table 2. Post-Construction Bylaw Operations and Maintenance Requirements among Stage 2 Municipalities

Municipality	O&M Plan Required	Maintenance Agreement Required	Maintenance Schedule of Tasks Required	Maintenance Documentation Required
Arlington				
Bellingham	X	X	X	
Brookline			X, conditionally	
Cambridge	X		X	X
Franklin	X	X	X	X
Holliston	X, conditionally			X
Milford			X	X
Millis	X	X	X	
Natick	X	X	X	
Waltham				
Wellesley	X, conditionally			X
Totals:	7	4	7	5

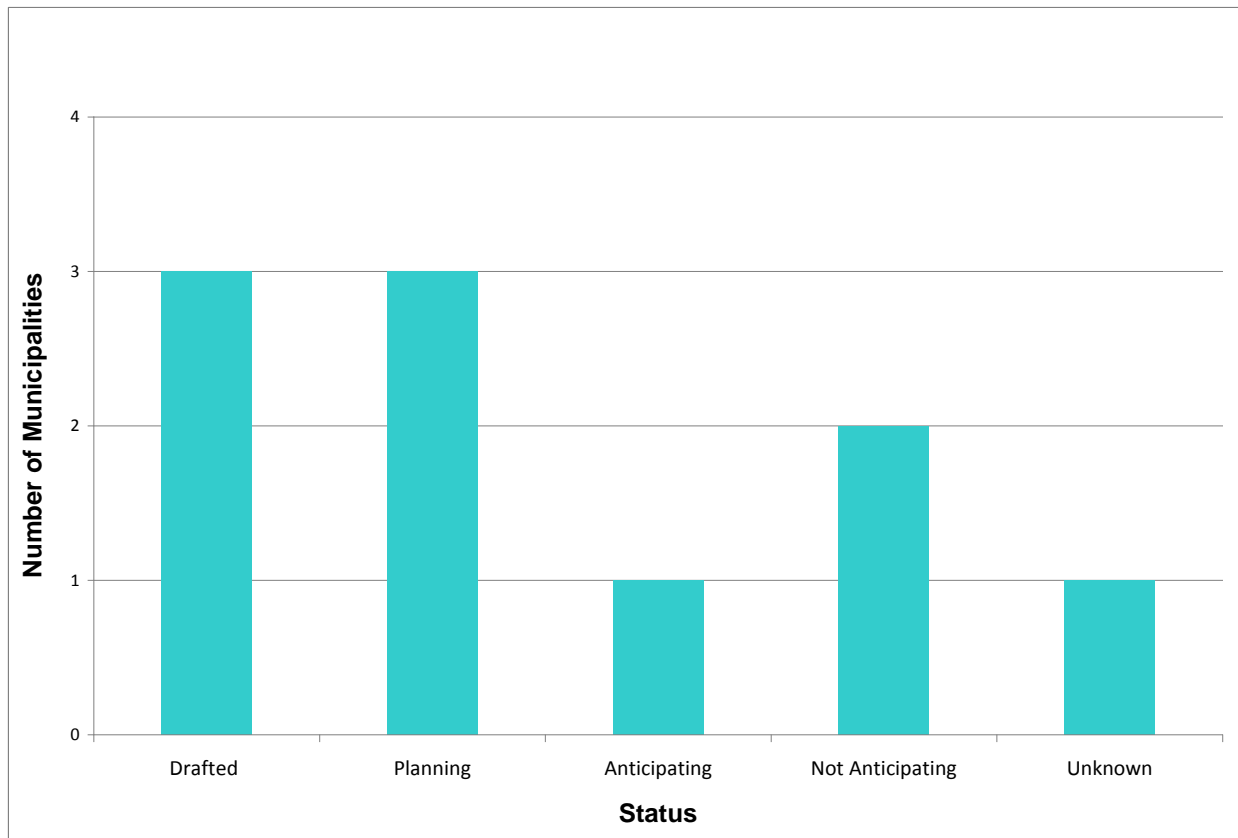
3.3.2. Municipalities Reporting *Not* Having Adopted a Bylaw to Comply with MCM #5

The ten communities that reported not having passed a bylaw to meet MCM #5 under their MS4 permit were investigated to determine the status of a potential bylaw. The status of these municipalities fell into five major categories:

1. Drafted – municipality reports having drafted bylaw
2. Planning – municipality reports planning or preparing to draft bylaw
3. Anticipating – municipality reports that they anticipate needing to draft a bylaw in the future, and is currently relying on existing bylaws
4. Not anticipating – municipality reports that they do not anticipate passing a bylaw in the near future (some are relying on existing bylaws or permits to manage stormwater although they did not report “existing” on their most-recent Annual Report)
5. Unknown – municipality did not report on the status of its bylaw

The most common status of municipalities is “drafted” or “planning”; with three municipalities reporting having drafted a bylaw and three municipalities reporting planning to draft a bylaw. Two municipalities do not anticipate passing a bylaw in the near future and the status of one municipality is unknown (See Figure 8).

Figure 8. Status of Post-Construction Bylaw Requirements Among Municipalities in the Charles River Watershed Reporting Not Having Passed a Bylaw to Comply with MCM #5



Section 3.4: Stage 3 Results: MCM #5 Compliance Case Studies

In stage 3, CRWA contacted individuals who are involved with MS4 permit compliance in the communities of Brookline, Cambridge, and Franklin. These individuals provided first-hand information on the city or town's experience in adopting and enforcing bylaws passed in compliance with MCM #5. Information was obtained through informal telephone interviews and is reported below in brief narrative summaries. Interview questions are included in Appendix C.

3.4.1. Brookline

Brookline reported that in the past year seventeen projects have come under the jurisdiction of their post-construction stormwater bylaw. All but one of these was a minor project (under an acre) and reviewed to get the best onsite runoff treatment that is feasible at the site, with a flexible guideline of handling a 25-year storm. For projects over an acre there are no formal calculations, but rather Brookline usually has a conversation with the engineer about its standards. The most common BMPs that Brookline reports seeing are infiltration systems.

Overall, Brookline reported that the response to their stormwater requirements has been generally positive, especially as engineers have become familiar with Brookline's bylaws. The contact reported that there is usually some give and take to revise the stormwater management of the project plans that they review but most engineers and their plans first come to the town trying to address stormwater in some way. Brookline reports that the TMDL for the Charles has had a relatively small impact on their practices and procedures of reviewing stormwater management plans.

3.4.2. Cambridge

Cambridge reported that six projects have required the land disturbance permit used to regulate post-construction stormwater runoff since it has been in place. These projects commonly have infiltration galleys, if soils are adequate, or swales, and if low impact BMPs aren't used then they see underground stormceptor systems. Cambridge reported that it has been hard to judge the effect of their O&M requirement since it has only been in place for two years.

Cambridge also reported that there was more of a back and forth with projects on stormwater requirements rather than initial compliance, but that project applicants are generally fine with meeting them because the stormwater requirements are a small part of large projects. They also reported that they've had great successes in enforcement though their stormwater management compliance officer working with individual contractors.

Lastly, Cambridge reported that the TMDL for the Charles has had an enormous impact on their stormwater management practices, specifically regarding their sewer separation since they have many combined sewers.

3.4.3. Franklin

Franklin reported that post-construction stormwater runoff is primarily regulated through the Town's subdivision regulations which have been around for a while and cover commercial developments over an acre, although smaller sites can be regulated for stormwater through the Conservation Commission. It was estimated that over the past ten years, about ten projects a year have come under the subdivision regulations. Applicants must complete formal calculations to show how much recharge, pollutant removal, and overall control they are providing. Project proponents employ a broad range of BMPs to meet requirements. In recent years the town has seen different kinds of BMPs such as bioretention cells, rain gardens, and sediment forebays, in contrast to detention and retention basins which were more common ten years ago. Franklin reported that maintenance is a challenge and difficult to enforce.

As with Brookline and Cambridge, Franklin reported that projects generally comply after some back and forth between the Town and the applicant, and that redevelopment sites can be more challenging than new development sites, although generally things have worked out pretty well. Finally, Franklin reported that project applicants are sometimes unhappy because of the increased cost of a project, but that there has not been an overwhelmingly negative response and complaints are rare.

Lastly, Franklin noted that the TMDL has had an impact on how Franklin has approached stormwater and the types of management/facilities and approaches they employ, with a shift towards infiltration.

Section 4: Conclusion

Overall, more than half of the communities in the Charles River watershed have passed bylaws specifically to comply with minimum control measures 2, 3 and 5. Most bylaws passed to comply with MCM#5 have the following components in common:

1. Laid out a threshold, most commonly based on land area disturbance, to determine which projects were subject to the bylaw; stated exceptions to projects subject to the bylaw.
2. Established performance criteria in one or more of the following categories: water quality, water quantity and peak discharge rate, that projects subject to the bylaw were expected to meet.
3. Established required documentation of operations and maintenance for a site.
4. Named the individual(s) within the municipality responsible for ensuring project compliance under the bylaw.
5. Detailed requirements for documenting bylaw compliance.

There were also broad commonalities among various bylaws within each of these components.

The three communities with whom CRWA conducted personal interviews indicated that their experience with passing and implementing bylaws to meet MCM #5 has been positive. Finally, of the communities that have not passed a bylaw to meet MCM #5, the majority are in the process of doing so or anticipating starting the process shortly.

Appendix A. Stage 1 Results Matrix

<i>Municipality</i>	<i>Year of last annual report (a)</i>	<i>Bylaw passed to meet:</i>		
		<i>MCM#3 IDDE (b)</i>	<i>MCM #2 E&S (c)</i>	<i>MCM#5 Post-Construction</i>
<i>Arlington</i>	<i>2009</i>	<i>N</i>	<i>E</i>	<i>Y</i>
<i>Ashland</i>	<i>2008</i>	<i>Y</i>	<i>Y</i>	<i>Y</i>
<i>Bellingham</i>	<i>2008</i>	<i>Y</i>	<i>Y</i>	<i>Y</i>
<i>Belmont</i>	<i>2007</i>	<i>N</i>	<i>N</i>	<i>N</i>
<i>Boston*</i>	<i>2008</i>	<i>-</i>	<i>-</i>	<i>-</i>
<i>Brookline</i>	<i>2009</i>	<i>Y</i>	<i>Y</i>	<i>Y</i>
<i>Cambridge</i>	<i>2009</i>	<i>Y</i>	<i>Y</i>	<i>Y</i>
<i>Dedham</i>	<i>2009</i>	<i>Y</i>	<i>Y</i>	<i>N</i>
<i>Dover</i>	<i>2009</i>	<i>N</i>	<i>Y</i>	<i>Y</i>
<i>Foxborough</i>	<i>2009</i>	<i>Y</i>	<i>E</i>	<i>E</i>
<i>Franklin</i>	<i>2009</i>	<i>N</i>	<i>Y</i>	<i>Y</i>
<i>Holliston</i>	<i>2007</i>	<i>E</i>	<i>Y</i>	<i>Y</i>
<i>Hopedale</i>	<i>2006</i>	<i>N</i>	<i>N</i>	<i>N</i>
<i>Hopkinton</i>	<i>2009</i>	<i>N</i>	<i>Y</i>	<i>Y</i>
<i>Lexington</i>	<i>2009</i>	<i>Y</i>	<i>N</i>	<i>Y</i>
<i>Lincoln</i>	<i>2008</i>	<i>E</i>	<i>E</i>	<i>E</i>
<i>Medfield</i>	<i>2009</i>	<i>Y</i>	<i>Y</i>	<i>Y</i>
<i>Medway</i>	<i>2007</i>	<i>N</i>	<i>Y</i>	<i>N</i>
<i>Mendon</i>	<i>2009</i>	<i>Y</i>	<i>N</i>	<i>N</i>
<i>Milford</i>	<i>2009</i>	<i>Y</i>	<i>Y</i>	<i>Y</i>
<i>Millis</i>	<i>2009</i>	<i>Y</i>	<i>Y</i>	<i>Y</i>

<i>Municipality</i>	<i>Year of last annual report (a)</i>	<i>Bylaw passed to meet:</i>		
		<i>MCM#3 IDDE (b)</i>	<i>MCM #2 E&S (c)</i>	<i>MCM#5 Post-Construction</i>
<i>Natick</i>	<i>2009</i>	<i>Y</i>	<i>Y</i>	<i>Y</i>
<i>Needham</i>	<i>2007</i>	<i>N</i>	<i>E</i>	<i>E</i>
<i>Newton</i>	<i>2009</i>	<i>N</i>	<i>E</i>	<i>E</i>
<i>Norfolk</i>	<i>2009</i>	<i>Y</i>	<i>Y</i>	<i>Y</i>
<i>Sherborn</i>	<i>2008</i>	<i>N</i>	<i>N</i>	<i>N</i>
<i>Somerville</i>	<i>2007</i>	<i>E</i>	<i>E</i>	<i>E</i>
<i>Walpole</i>	<i>2009</i>	<i>Y</i>	<i>Y</i>	<i>Y</i>
<i>Waltham</i>	<i>2009</i>	<i>Y</i>	<i>Y</i>	<i>Y</i>
<i>Watertown</i>	<i>2009</i>	<i>E</i>	<i>N</i>	<i>N</i>
<i>Wayland</i>	<i>2007</i>	<i>N</i>	<i>N</i>	<i>N</i>
<i>Wellesley</i>	<i>2009</i>	<i>Y</i>	<i>E</i>	<i>Y</i>
<i>Weston</i>	<i>2009</i>	<i>N</i>	<i>N</i>	<i>N</i>
<i>Westwood</i>	<i>2009</i>	<i>Y</i>	<i>N</i>	<i>N</i>
<i>Wrentham</i>	<i>2009</i>	<i>Y</i>	<i>Y</i>	<i>Y</i>
<i>Yes (Y)</i>		<i>18</i>	<i>18</i>	<i>19</i>
<i>No (N)</i>		<i>12</i>	<i>9</i>	<i>10</i>
<i>Existing (E)</i>		<i>4</i>	<i>7</i>	<i>5</i>

(a) Year of last annual report: references year the municipality submitted their most recent Annual Report on the Phase II MS4 Permit, as of January 2010. Reports were obtained through EPA's website.

(b) IDDE: Illicit Discharge Detection and Elimination

(c) E&S: –Erosion and Sediment Control

Appendix B. Stage 2 Results Matrix

Municipality	Thresholds/Applicability	Performance Criteria Area Addressed			Reviewing Authority	Implementation Requirement	O&M Plan Required?	Maintenance Agreement Required?	Maintenance Schedule of Tasks Required?	Maintenance Documentation Required?
		Water Quality	Water Quantity (Infiltration)	Peak Discharge Rate						
Arlington	Lower Threshold (350 - 500 square feet)			X	Engineering	Grading and drainage plan required				
Bellingham	Standard Threshold (≥1 acre)	Not specified in bylaw			Planning Board	Stormwater management plan required	X	X	X	
Brookline	Tiered Standard (Tier 1: >2500 square feet. Tier 2: >1 acre)	X	X	X	DPW for all projects, ConCom for projects >1 acre	Stormwater management plan required			X, conditionally	
Cambridge	Other (threshold based on project size and added parking)	X		X	DPW	Stormwater management plan required	X		X	X
Franklin	Standard Threshold (≥1 acre)	X	X	X	DPW	Stormwater management plan required	X	X	X	X
Holliston	Lower Threshold (250 - 10,000 sq. ft.)	X	X	X	Planning Board	Stormwater management plan required conditionally (required for intensive projects as determined by town)	X, conditionally			X
Milford	Tiered Standard	X	X	X	Engineering	Stormwater management plan required conditionally (required for sites ≥1 acre)			X	X
Millis	Standard Threshold (≥1 acre)	X	X	X	Board of Selectmen	Stormwater management plan required	X	X	X	
Natick	Standard Threshold (≥40,000 sq. ft.)	X	X	X	Conservation Commission	Stormwater management plan required	X	X	X	
Waltham	Standard Threshold (≥1 acre)	Not specified in bylaw			To Be Determined	Not specified in bylaw				
Wellesley	Other (threshold based on project size, land use and impervious area creation)	X	X	X	Engineering	Site plan and runoff calculations required, additional information may be required as needed	X, conditionally			X

Appendix C. Stage 3 Interview Question List

How many projects have required a permit or tripped the threshold?

What has the general response of project applicants to the requirements been?

How frequently do initial plans comply? Or is there more of a back and forth communication with the town and the applicant to achieve compliance?

Is there some sort of worksheet or calculations that have to be submitted to meet the standard?

What kinds of BMPs are more common or do you see the most?

Has the TMDL for the Charles impacted how you do things?

How effective have your O&M requirements been? Is there anyway to ensure they have been maintained?