Phosphorous Reduction in the Mystic River Watershed 101

Virtual workshops for municipalities in the Mystic River Watershed

Summary

EPA Region 1, MassDEP, and local municipal leaders, hosted three free information and discussion sessions on how to make progress to meet the new alternative TMDL for the Mystic River. Sessions included high-level context from EPA and MassDEP, local case examples from within the Mystic Watershed, and time for participant discussion and exploration of the opportunities and challenges of enhancing water quality in the Mystic River Watershed. Municipal staff, community leaders, representatives of non-profits, and volunteers who work on water quality were invited to come and hear from their peers and take a deeper dive into EPA's recent Mystic watershed phosphorous study and its implications for local communities.

The topic and dates of each session were:

Session 1: Easy to Install and Maintain Green Infrastructure
November 2, 2020 | 10 AM-noon

Session 2: Effective Non-structural Practices
November 16, 2020 | 10 AM -noon

Session 3: Funding Your Program
November 30, 2020 | 9 – 11 AM

This document contains a high-level synthesis of the key discussion themes in each session, supplemented by comments participants shared in brief reflection surveys following engagements. Reference materials, including available slide decks, from all three sessions are available to view here.

The Planning Team included:

- Mel Cote, Environmental Protection Agency (EPA) Region 1
- Ona Ferguson, the Consensus Building Institute (CBI)
- Patrick Herron, Mystic River Watershed Association (MyRWA)
- Andrew Hrycyna, Mystic River Watershed Association (MyRWA)
- Darya Mattes, Mystic River Urban Waters Federal Partnership Ambassador
- Maggie Osthues, the Consensus Building Institute (CBI)
- Laura Schifman, Massachusetts Department of Environmental Protection (MassDEP)
- Toby Stover, Environmental Protection Agency (EPA) Region 1
- Newtown Tedder, Environmental Protection Agency (EPA) Region 1
- Mark Voorhees, Environmental Protection Agency (EPA) Region 1
- Caitlyn Whittle, Environmental Protection Agency (EPA) Region 1

Session 1: Easy to Install and Maintain Green Infrastructure

SESSION SUMMARY

This virtual session focused on how municipalities can start to implement affordable, simple to install green infrastructure and featured two presentations and a robust discussion period.

Jamie Houle from the University of New Hampshire (UNH) Stormwater Center provided an overview of qualities to look for in affordable and easy to install and maintain green infrastructure. Narrowing into Mystic municipal-specific contexts, Wayne Chouinard and Emily Sullivan from the Town of Arlington presented a case study of how their town has taken a flexible, iterative approach to stormwater management through design and installation of a template infiltration trench. They also shared the town bidding and installation process as well as early performance metrics.

Following presentations, session participants and presenters engaged in open, full-group discussion. Below is a synthesis of the key discussion themes, supplemented by comments participants shared in a brief reflection survey after the session.

KEY DISCUSSION THEMES

Green Infrastructure (GI) Maintenance

- **Promoting individual maintenance:** Municipalities cannot guarantee individual maintenance of rain gardens at the neighbor level. Arlington is working on providing annual GI maintenance support through pruning, mulching, and checking on rain gardens and porous pavement as well as designing an outreach campaign to show neighbors how to maintain a rain garden.

GI Design

- **Designing trenches:** Participants asked specific design questions focused on trench size and the monitor port for trenches. Presenters shared that catch basins with deep inverts (>4 feet from ground surface) limit the trench depth if you are aiming to keep the total depth of the trench no more than 5 feet from grade. Arlington recommends digging the trench greater than 5 feet deep and backfilling with stone to 5 feet in depth to complete trench construction in these situations to avoid trench boxes and keep costs low. Arlington is also currently customizing standard irrigation control boxes to serve as distribution boxes to aid inspections of trenches.
- **Describing the GI design process:** Arlington has established GI design standards to help roll out and design systems quickly, circumventing the need for a full watershed study and engineering report. Arlington has also brought on a new engineer to review and refine their standards and is working with Lexington to further clarify design procedures narratively and graphically. The design approach should help address combined sewer contexts, like those in Chelsea.

GI Cost & Crediting

- **Unpacking implementation costs:** Arlington's implementation costs varied from year 1 to year 2, in part influenced by the contractor helping do the work. Arlington estimated that the cost per unit was roughly $3,000 and noted that there were instances of installations requiring adding in gutters and a granite sidewalk curve that were closer to $4,000 apiece.
- **Accounting for future EPA credits:** The University of New Hampshire Stormwater Center has done modeling to determine the effectiveness of infiltration for removing phosphorus based on curves in the MS4 Permit and performance data of different GI measures at the center. Returning hydrology to a normal state will also help remove phosphorus. Representatives from

EPA Region 1 noted that anything that municipalities are investing in now to remove phosphorus through improved infiltration and hydrology will be accounted for in any future permitting scenario.

- Participants recommended that UNH help determine the effectiveness of measures five years after they've been implemented and noted that there will need to be specific requirements for operations and maintenance in that time period to ensure that measures are functioning as intended.

Requests for More Information

- **MyRWA's CZM-funded work:** Participants requested more information, specifically the scope of work, for the CZM-funded analysis that MyRWA is conducting around rolling out Arlington's GI approach within the Mystic watershed. MyRWA noted that, in time, they will have a standard scope for analysis, design, and siting to help municipalities implement cost-effective GI (e.g., infiltration trenches), which they will share widely. (More information on MyRWA and Arlington's work to date is available here).
- **Base knowledge to inform BMP implementation:** Participants requested recommendations for reference work on roads, right of ways, sub-base materials, and utilities to help put BMPs into a larger context for non-engineers. One source recommendation was Bay State Roads.
- **Additional information/training requests:** Participants asked for additional information on construction and bidding experiences with constructing these types of BMPs; tying GI structures into combined sewer systems; linking efforts to reduce phosphorus loads with construction planning; different BMPs and their effectiveness; meeting performance standards of a permit; and case studies from other municipalities.

Session 2: Effective Non-structural Practices

SESSION SUMMARY

This virtual session focused on how municipalities can employ effective non-structural practices to help reduce phosphorus loads and featured three presentations and a robust discussion period.

Laura Schifman, Mass DEP, gave an overview of phosphorus reduction in the Mystic River Watershed and the Mystic Alternative TMDL, followed by a presentation from Mark Vorhees. EPA Region 1, on existing credits and approaches for non-structural practices as well as future plans to address questions around crediting. Catherine Woodbury, Cambridge, then provided a case study of how Cambridge has approached street sweeping, focusing in on lessons learned.

Following presentations, session participants and presenters engaged in open, full-group discussion. Below is a synthesis of the key discussion themes, supplemented by comments participants shared in a brief reflection survey after the session.

KEY DISCUSSION THEMES

Street Sweeping Implementation Guidance

- **Balancing mechanical and vacuum sweepers:** Cambridge has to alternate between different street sweepers (mechanical and regenerative) due to the heavier materials – leaves - in the fall, which cost the city more money to dispose of. In heavier debris months, the mechanical sweepers generally go first, picking up heavier debris, followed by the regenerative vacuum sweeper. In Watertown, catch basin cleaning is contracted out and mechanical sweepers are employed.
- **Comparing vacuum street sweepers:** Regenerative sweepers are less expensive than true vacuum sweepers; there their effectiveness is mixed on porous pavements. True vacuum sweepers may also have manifolds that are too small; coupling that inefficiency with their higher cost, they are not widely used.

Costs & Crediting

- **Accounting for Non-structural practices:** Municipalities are tracking and accounting for their non-structural practices in different ways. Some examples include:
    - Cambridge sees the benefit in tracking and has started by taking a preliminary look at a single catchment to determine the necessary sweeping and cleaning.
    - Chelsea's street sweeping contractor sends monthly reports on miles swept and amount of debris disposed; they are starting to track catch basin cleaning through GIS as well.
    - Watertown hopes to start tracking credits over the next year; they track in terms of requirements of the MS4 permit for the tons of sweeping and numbers cleaned but have not translated that tracking into accounting for credits.
    - Lexington is doing data collection with tablets for catch basin cleaning and will be getting automatic vehicle location (AVL) equipment on sweepers soon. They have also just started working with a composting facilitating in town to gather leaf collection data.
- **Calculating credits:** Non-structural credits are the most challenging to estimate because of the multiple variables at play. As the research becomes more refined, the credits for responsibly handling leaf litter and organic debris will become more worthwhile. Leaf litter and organic debris contribute nutrients to the Mystic, and while our goal is to reduce water quality impacts, those nutrients are valuable to lawns and gardens. It is hard to assign credits because existing,

detailed studies are site-specific. Effectively counting credits should not be a burden for municipalities, and there could be some benefit to collectively defining how to count. It would be a missed opportunity if there wasn't an effort to work on a consistent process and have a more open dialogue about accounting for credits. Minnesota completed a lot of work on this topic, and it has been shown to be more effective if all municipalities are calculating reductions in a similar fashion. Cost information could potentially be brought into the upcoming expert panel conversation to help advance this conversation.
    - Highway departments could be a useful partner for helping to understand costs, particular maintenance costs, and implementing different approaches.
- **Calculating phosphorus load reduction:** The street sweeping load reduction numbers in the current permit are from the Chesapeake Bay Area, supplemented by some of the work done in Cambridge for high efficiency, regenerative vacuum. The numbers are a combination of modelling and performance metrics, based on the efficiency of the sweeper and frequency of sweeping. The 67% reduction requirement comes from an analysis of the freshwater portions of the Mystic River, looking at watershed loading estimates, modelling, and receiving water monitoring to predict what level of load reduction needed to lower phosphorus levels in line with water quality standards. If the reduction requirement were to be adjusted per municipality, that would be addressed in permitting. This requirement is for the whole watershed and takes into account routing through the whole watershed.
    - Link to summary of Alternative TMDL, with further links to full report: https://www.epa.gov/sites/production/files/2020-06/documents/mystic-r-phosphorus-alt-tmdl-release-joint-ltr.pdf; https://www.epa.gov/sites/production/files/2020-05/documents/mystic-phosphorus-tmdl-development.pdf

Waste Streams & Disposal

- **Cleaning catch basins:** All catch basin cleanings are disposed of in the same location; the basins catch debris prior to them entering the sewer system, so combined sewer and separated drain catch basin debris is treated the same.
- **Considering disposal:** As municipalities work harder on catch basin cleaning, there will be big benefits, and there will be new considerations for how to best dispose of, or compost, debris. It will be important for those dealing with catch basins and stormwater to work closely with partners in solid waste to find flexible and affordable solutions.
- **Regulating different waste streams:** A big, open question is how to best handle disposal of debris from catch basins, street sweeping, and yard waste. To address leaf litter in Madison, Wisconsin, they are doing aggressive collection programs and disseminating information about how to use leaf litter in composting and other things. There may be a need to look at the MA DEP solid waste regulations, which address street sweeping and catch basin cleaning debris differently.

Requests for More Information

- **Additional information/training requests:** People would like additional information on potential funding sources; costs and regulations around waste streams; how different municipalities conduct their operations (specifically for fall clean up); sharing costs of equipment vs. contracting, what type of maintenance is required on equipment, and how to calculate credits.

Session 3: Funding Your Program

SESSION SUMMARY

This virtual session focused on how municipalities can approach funding their stormwater programs and featured three presentations and a robust discussion period.

Anne Leiby, EPA Region 1, presented on public engagement strategies to support the development of stormwater funding strategies, highlighting: lessons learned, successful case studies and tools that were developed as a result of pilot roundtables held in MA, and also posing a question about the potential interest in continued collaboration with other interested municipalities. Providing a state-wide context, Laura Schifman, Mass DEP, then presented on stormwater enterprise funds in Massachusetts, sharing data on which municipalities have implemented stormwater enterprise funds, costs per resident, revenue per community, tie-ins to MS4 permits, and possible approaches to setting fee structures. Alex Rozycki, Reading, then shared a case study from his Town of Reading on funding a stormwater utility, detailing the approach the town took, their fee structure decisions, and how the utility is used, especially in relation to the MS4 permit.

Following presentations, session participants and presenters engaged in open, full-group discussion. Below is a synthesis of the key discussion themes, supplemented by comments participants shared in a brief reflection survey after the session.

KEY DISCUSSION THEMES

Conducting outreach during pandemic: Agencies and governments at all levels are facing the challenge of how to engage the public during the COVID-19 pandemic. Some ideas shared for how to engage more effectively included: shortening the length of sessions to better accommodate the virtual setting; leveraging opportunities to speak in other scheduled town engagements instead of holding virtual meetings solely dedicated to stormwater management; and investing in facilitation training for staff to help advance conversations.

Envisioning a Stormwater Enterprise Fund in your municipality: When asked what challenges and opportunities municipalities are seeing for implementation and what municipalities would do if they had a stormwater enterprise fund in place, responses included:

- One challenge is having strong information to inform planning. It would be helpful to better understand how much time and how many basins are involved with daily catch basin cleaning and how other municipalities are investing labor or subcontracting for similar efforts.
- One municipality suggested that they would use a stormwater enterprise fund to offset budget constraints, especially in a time of COVID-19. They are currently looking at what fee structures could be presented to the public to help facilitate a future vote.
- Another municipality is talking about an enterprise fund in anticipation of sewer separation. They have a combined sewer system and are trying to look at ways to offset the costs of dealing with permits, cleaning systems and stormwater.
    - In Portland, Maine, a compelling element for communities with combined sewers was the appeal to property owners who had a smaller footprint but higher vertically and paying a significantly higher sewer fee than they would be under a separated sewer system. Appealing to those whose costs would be lowered by separating sewers could help offset the payment for a combined sewer system to accommodate new stormwater fees.

- **Implementation challenges:** Having a clear and manageable fee structure that can be explained in enough detail for all to understand; getting municipal leadership to agree, then the normal consensus-building with stakeholders, residents, etc.

Approaching Public Engagement Regionally: Education to build public support could be done with a more regional approach rather than town-by-town to increase efficiency and lighten the burden on municipalities. New England lacks county-level coordination, which makes regional collaboration difficult compared with some parts of the country. A watershed-wide effort could be effective for these efforts; MyRWA could be well-positioned to help coordinate efforts. Regional collaboration could extend beyond public engagement efforts into sharing equipment, creating a shared funding initiative, etc. A regional watershed campaign could be tied into public education around MS4 permits and could bring in nonprofit entities.

- Participants asked for further discussion of and collaboration on non-structural approaches, funding, and structural green infrastructure.

Attendees

Name	Affiliation
Matt Barrett	Woburn Engineering
James Barsanti	MassDEP
Elizabeth Buschert	UNHSC
Shavaun Callahan	Chelsea
Ahmet Caus	Arlington
Meghan Cavalier	Town of Burlington
Wayne Chouinard	Town of Arlington
Eileen Coleman	Town of Burlington
William Copithorne	Town of Arlington
Jay Corey	City of Woburn
Randell Drane	Drane Engineering
Kevin Duffy	Watertown DPW
David Elmer	Weston & Sampson
Ona Ferguson	Consensus Building Institute
Shauna Gillies-Smith	Ground Inc.
Thomas Hayes	Burlington
Zach Henderson	Woodard & Curran
Patrick Herron	MyRWA
Lucica Hiller	Somerville
James Houle	UNHSC
Andy Hrycyna	MyRWA
John Keeley	Burlington Conservation
John Kilborn	Winchester
Anne Leiby	EPA
Cynthia Lopez	HUD
Daniel Macadam	UNH
Darya Mattes	Groundwork Somerville
Timothy McGivern	City of Medford
Anna Meyer	unaffiliated water resource professional
Marian Miller	MyRWA
John Mosley	Northeastern University School of Law
David Mussina	MyRWA
John Nader	UNHSC
Maggie Osthues	CBI
Catherine Pedemonti	MyRWA
Alex Rozycki	Town of Reading
Laura Schifman	MassDEP
Jaurice Schwartz	Weston & Samson

Josh Secunda	EPA
Matthew Shuman	Watertown
Michael Sprague	Lexington
Toby Stover	EPA
Emily Sullivan	Arlington
Newton Tedder	EPA
Mark Voorhees	EPA Region 1
Brian White	Town of Burlington
Caitlyn Whittle	EPA Region 1
Andrew Wojciak	Weston & Samson
Catherine Woodbury	Cambridge DPW