

Appendix A

Comment Documents

EMAIL

From: DiMartino, Donald [DDiMartino@bellinghamma.org]
Sent: Tuesday, July 05, 2011 9:18 AM
To: Anne Kitchell
Cc: Richard Claytor; Niles, Rich; Cody.Ray@epamail.epa.gov; Tarja McGrail; Brutus Cantoreggi; msantora@townofmilford.com
Subject: RE: Sustainable Stormwater Funding Project: Cost of Future Services

Anne,
I briefly reviewed the table of costs estimated and do not see any glaring omissions or cost estimate busts. I will not really know the cost of implementation until we start doing some of this stuff, but for your report, I think you can use the Bellingham numbers.
I know Brutus and Mike have done a little more on analysis of costs than I. I would like to hear their input, it may help me look at the Bellingham numbers differently.

From: Anne Kitchell [<mailto:akitchell@horsleywitten.com>]
Sent: Thursday, June 30, 2011 4:13 PM
To: Brutus Cantoreggi; msantora@townofmilford.com; DiMartino, Donald
Cc: Richard Claytor; Niles, Rich; Cody.Ray@epamail.epa.gov; Tarja McGrail
Subject: RE: Sustainable Stormwater Funding Project: Cost of Future Services

All,
As discussed yesterday, attached are copies of the slideshow presentations and the future program cost spreadsheets for each of the three towns. Please let us know if you have any questions during your review of this material. Have a good holiday weekend.

Anne

Anne Kitchell, LEED AP
Sr. Environmental Planner

Horsley Witten Group

90 Route 6A, Sandwich, MA 02563

508-833-6600

843.263.0273 (cell)

www.horsleywitten.com

Sustainable Environmental Solutions



EMAIL (marked up spreadsheet available upon request)

From: DiMartino, Donald [<mailto:DDiMartino@bellinghamma.org>]
Sent: Tuesday, February 01, 2011 4:20 PM
To: Richard Claytor
Cc: Cody.Ray@epamail.epa.gov; Fraine, Denis; Anne Kitchell; Michelle West
Subject: RE: Sustainable Stormwater Funding Project: Cost of Existing Stormwater Services Assessment

Rich,

I have attached the marked up spreadsheet. You will see answers to the memo questions added into the table. I am having trouble printing this but my PC may just need a reboot.

<<110111_Bellingham_Draft Existing Program Cost.xls>>

From: Richard Claytor [<mailto:rclaytor@horsleywitten.com>]
Sent: Thursday, January 20, 2011 9:48 AM
To: DiMartino, Donald
Cc: Cody.Ray@epamail.epa.gov; Fraine, Denis; Anne Kitchell; Michelle West
Subject: Sustainable Stormwater Funding Project: Cost of Existing Stormwater Services Assessment

Don, as you know we've been working on evaluating the cost of Bellingham's existing stormwater program as a basis for estimating the potential future cost of a proposed program under the pending EPA General Permits for the Upper Charles River watershed. Based on our review of the information you have provided us to date, we have completed a draft cost estimate of existing stormwater services for the Town of Bellingham for your review. Attached to this email are:

1. A memo that outlines how this estimate was derived, explains how the budget spreadsheets are organized, and identifies a number of areas where we are looking for additional clarification.
2. The excel spreadsheet (and a PDF version) with cost breakdowns across several major cost categories
3. Notes from the November 4, 2010 meeting used to help generate our cost breakdowns (memo dated 1/20/11)

We appreciate you taking the time to help our team collect and refine this information. Please send us your written response, or if you prefer, we are available to discuss your comments and responses to these questions via conference call. As you also know, we have an upcoming meeting of the Steering Committee scheduled for February 9th from 1-3 PM in Franklin, we do not plan on having a specific agenda item for this topic, but could put aside a few minutes after

the meeting to discuss your assessment of this estimate. Thank you and we look forward to continuing to work with you on this project. Respectfully, Rich Claytor.

Richard A. Claytor, Jr., P.E.

Principal Engineer

Horsley Witten Group

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EMAIL

From: James Esterbrook [jesterbrook@franklin.ma.us]
Sent: Monday, August 01, 2011 4:03 PM
To: Richard Claytor
Cc: rcantoreggi@franklin.ma.us; Niles, Rich; jnutting@franklin.k12.ma.us; Anne Kitchell; <Cody.Ray@epamail.epa.gov>
Subject: Re: Sustainable Stormwater Funding Project

Hi Rich,

For the record, my hand was not raised for this. As we spoke about, our areas of concern and comments on the spreadsheet are as follows:

Administration

RDA Compliance - Projected costs may be lower than actual costs based upon the uncertainty of the final permit regulations. CMPP - Same issue as RDA Compliance, there are still a great deal of variables that could drastically increase this cost and we feel it may be underestimated.

Regulation/Enforcement

Illicit Discharge and Dumping Program - This cost could cover the expense of enforcement and administration but will also need to associate the other costs associated with the inspection and oversight of any physical infrastructure modifications within the town, despite the majority cost being borne by the property owner.

Engineering and Master Planning

Catch Basin Inventory Plan and Street Sweeping Optimization - Unionized employees are not currently mandated to perform record keeping in addition to their CB cleaning or sweeping activities. Enhanced record keeping duties would be subject to contract modification under collective bargaining. Anytime such a give and take is needed there is typically a cost associated (extra vacation, sick days, etc). The additional time required to track and compile the data would be expensive and we feel that it would exceed the number currently listed.

Waterfowl & Pest Waste Management Programs - We currently pay \$5,000 a year for addling and have averaged \$5-6,000 for beaver problems. The amount of money spent has also increased as beaver populations have increased in recent years.

Groundwater & Drinking Water Program - These costs can be removed because they are already associated with our standard drinking water program which bears the cost of these activities.

Operations and Implementation

CIP/Infrastructure Implementation - We have some concerns that capital improvements and the installation of physical BMPs could cost more than anticipated based upon site specific constraints.

Inlet, Catch Basin, and Manhole Cleaning - We want to make sure that this reflects the full cost of the service and does not omit things like cleanings disposal or the additional costs for a municipality to contract this work and pay prevailing wage.

Street Sweeping - We feel this number is low. Please review the cost of man hours, brushes, equipment replacement, etc.

Fall Leaf-pickup - There is a program in place, I will try and obtain the cost and provide it to you.

Emergency Drainage Repairs - As additional efforts are placed on inspection and monitoring of the drainage network, we anticipate that more repairs will be identified and a portion of these will be considered an emergency and may bear a price higher than currently anticipated.

Monitoring

Surface Water Quality Monitoring - There are no costs in the table at this time, however depending upon how comprehensive the monitoring program is, there could be significant associated costs.

In the personnel matrix, we feel it may be beneficial to place some of the burden upon the jobs that may need to be created as a result of the enhanced regulations. This would more accurately reflect the need for additional staff or funds to hire a consultant.

Thank you and let me know if you have any questions or need us to elaborate some of our concerns.

Jim Esterbrook
Town of Franklin DPW
(508) 553-5534
jesterbrook@franklin.ma.us

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EMAIL

From: Brutus Cantoreggi [rcantoreggi@franklin.ma.us]
Sent: Thursday, June 30, 2011 3:28 PM
To: Richard Claytor; Niles, Rich
Cc: jnutting@franklin.k12.ma.us; jesterbrook@franklin.MA.US; Anne Kitchell; Michelle West
Subject: Re: Sustainable Stormwater Funding Project: Cost of Existing Stormwater Services

Rich(s),

You guys did a good job on the presenting the "numbers" yesterday. I think they are about as realist as they can be for what EPA has proposed with the draft MS4 and RDA permits.

I believe that the "utility" monthly cost numbers will be a hard sell for EPA based upon the benefits of "phosphors reductions in the Charles River" particularly when only three Towns in the basin are identified in the RDA, but we shall see....

Anyways could you forward me a copy of your powerpoint presentation so I can share it with my boss (Jeff Nutting)?

Have a good fourth!

Robert A. Cantoreggi
Director
Department of Public Works
Town of Franklin

508-553-5500

Richard Claytor <rcclaytor@horsleywitten.com> writes:

Brutus, as you know we've been working on evaluating the cost of Franklin's existing stormwater program as a basis for estimating the potential future cost of a proposed program under the pending EPA General Permits for the Upper Charles River watershed. Based on our review of the information you have provided us to date, we have completed a draft cost estimate of existing stormwater services for the Town of Franklin for your review. Attached to this email are:

1. A memo that outlines how this estimate was derived, explains how the budget spreadsheets are organized, and identifies a number of areas where we are looking for additional clarification.
2. The excel spreadsheet with cost breakdowns across several major cost categories

We appreciate you taking the time to help our team collect and refine this information. Please send us your written response, or if you prefer, we are available to discuss your comments and responses to these questions via conference call. As you also know, we have an upcoming meeting of the Steering Committee scheduled for February 9th from 1-3 PM in Franklin, we do

not plan on having a specific agenda item for this topic, but could put aside a few minutes after the meeting to discuss your assessment of this estimate. Thank you and we look forward to continuing to work with you on this project. Respectfully, Rich Claytor.

Richard A. Claytor, Jr., P.E.

Principal Engineer

Horsley Witten Group

90 Route 6A, Sandwich, MA 02563

508-833-6600

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EMAIL

From: Brutus Cantoreggi [rcantoreggi@franklin.ma.us]
Sent: Tuesday, August 02, 2011 4:29 PM
To: Richard Claytor
Cc: Niles, Rich; jnutting@franklin.k12.ma.us; jesterbrook@franklin.MA.US; Anne Kitchell; <Cody.Ray@epamail.epa.gov>, Carlos Rebelo <crebelo@franklin.ma.us>, DiMartino; Donald <DDiMartino@bellinghamma.org>,
Subject: Re: Sustainable Stormwater Funding Project

Rich,

Nice talking with you yesterday. Here is a short email of my concerns with your info: (They go in order of your sheets)

1. CMPP, not much funds to the end. No requirement (permits) to base cost off of.
2. Illicit discharge and dumping program. Numbers do not make sense to Jim and I based on explanation.
3. Catch basin inv. plan...limited information, need for money
4. Waterfowl and Beavers. We already spend around \$12K. to protect drinking water and Town's swimming area, think with new permit more funds needed.
5. Groundwater Drinking. Already under water Mgt req. should be removed.
6. Operations and Maintenance. Maybe collective bargaining issues with union staff.
7. Street sweeping, too low, removal of materials collect? New machine costs?
8. Waterfowl, see above #4.
9. Nothing for surface water? Something should be included.

Finally as we discussed in length, the way the last tables show taskings and amount of time based on salary of position is un-realistic. Your totals show DPW director spending roughly 70% of my time on stormwater stuff, that only leaves me 30% of my time to manage a water, sewer, highway, engineering, solid waste, etc. Not realistic. GIS will need to spend 125% of his time on stormwater, a tasking that is not really even his job description. Highway Super only would have to spend 112% of his time on stormwater issues and nothing else. Hopefully, you understand what I am saying. I would suggest that you show percent of time that is realistic for each position and then show "new jobs/positions" that are needed to meet the requirements of proposed program.

Hope this helps.

Robert A. Cantoreggi
Director
Department of Public Works
Town of Franklin
508-553-5500

Richard Claytor <rclaytor@horsleywitten.com> writes:

Brutus, et. al. Do you have any comments on the spreadsheet and/or the data included in our presentation to the Steering Committee from June 29th? We're in the process of completing the draft report over the next 2 weeks and would still be able to incorporate your input if received in the next few days. Thanks. Rich.

Richard A. Claytor, Jr., P.E.

Principal Engineer

Horsley Witten Group

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MEMORANDUM

TO: Richard Claytor, P.E.,
HWG
FROM: Michael Santora, P.E.
Town Engineer
DATE: July 14, 2011
RE: Milford Comments for MS4 Program Costs

Rich, I reviewed Milford's program costs with Scott Crisafulli and Rosalie Starvish and have the following comments.

1. Existing program cost for NPDES MS4 Public education should be changed from \$1,000.00 to \$5,500.00.
2. Existing program cost for Grants Program is too high at \$3,690, the Town typically spends very little to acquire Chapter 90 grants. Should lower amount to \$500.00.
3. Existing program cost for Illicit Discharge & Elimination program carries \$6,000.00 for Sewer Department work but the Town's consultant's work. Should increase total to \$16,000.00.
4. We don't understand the line for existing program costs for Hazard Mitigation Planning and Flood Insurance Updates.
5. Existing program costs for Operations & Maintenance Management (\$50,400) need to be justified. Is this amount for the entire department or just the Highway Surveyor?
6. Existing program costs and future program costs for Street Sweeping and Sidewalk Sweeping and Catchbasin Cleaning needs to be re-visited as Highway Surveyor doubts these numbers. Contact the Highway Surveyor to discuss these line items.
7. Revisit cost numbers (existing and future) for Fall Leaf program (contact Highway Surveyor).
8. Existing program costs of \$80,000 for Stream Restoration is questionable since that was a one-time special project and not a typical cost for the town's stormwater program.
9. Is NPDES MS4 Public Involvement line item on page one counted again in the Hazardous/Toxic Material Collection program on page 3?
10. There is no guarantee of a phosphorus ban on fertilizer, in fact, it is probably more likely that it won't occur. The study should be re-calculated to not include the 10% credit for the phosphorus ban on fertilizers.
11. The cost analysis omits costs for land acquisition and legal costs. Since Milford does not control much land at the end of pipe for its many outlets, land acquisition costs could be very significant. We realize these costs are very difficult to estimate but carrying zero paints an unrealistic picture. We recommend carrying \$5,000,000 for this line item.

Transmittal (following initial Town Meetings in November)

From : Mike Santora, Town of Milford

To: Horsley Witten

Milford's Priorities for the Stormwater Utility Feasibility Evaluation

- The development of a Phosphorus Control Plan (PCP) and a Certified Municipal Phosphorus Program (CMPP) should be addressed in terms of both costs/rates and management.
- Guidance for implementation of the local and/or regional stormwater utility should be provided, particularly regarding legal, billing, and data requirements.
- Costs and staff needed to comply with the MS4 permit should be evaluated.
- The specific benefits to the Town and its residents of having a stormwater utility should be included.
- Public involvement and education should be an emphasis throughout the Feasibility Evaluation process.

EMAIL

From: Mike Santora [msantora@townofmilford.com]
Sent: Thursday, January 20, 2011 11:50 AM
To: Richard Claytor
Subject: RE: Sustainable Stormwater Funding Project: Cost of Existing Stormwater Services Assessment

Richard, I have reviewed the list of items in the memo and very few of the questions posed can be answered by me directly. To answer all of these questions, input is required from: Town Planner Larry Dunkin, Sewer superintendent John Mainini, Health Director Paul Mazzuchelli, Town consultant Rosalie Starvish and Highway Surveyor (most) Scott Crisafulli. Unfortunately, I am in the middle of trying to get a big project out to bid and also am under the gun on a fast tracked MassDot Intersection Improvement project so I cannot act as the town liaison for this info gathering.

Answers of questions for me that I can answer are as follows:

1. Town Administrator does not get involved with stormwater budget prep.
2. No coordination costs with anything related to the Milford Water Company that I am aware of.
3. My yearly salary is \$84,070.00

As for the other items, I think you could either do a round table in Milford with all of the above similar to the original meeting or alternatively telephone each and gather the info that way. Also, if you decide on the telephone survey route, if you have someone from your office call me, I can direct them to the proper person for each of the questions.

From: Richard Claytor [<mailto:rclaytor@horsleywitten.com>]
Sent: Thursday, January 20, 2011 10:19 AM
To: Mike Santora
Cc: Cody.Ray@epamail.epa.gov; rosalie.starvish@gza.com; Celozzi, Louis; Scott Crisafulli; Michelle West; Anne Kitchell
Subject: Sustainable Stormwater Funding Project: Cost of Existing Stormwater Services Assessment

Mike, as you know we've been working on evaluating the cost of Milford's existing stormwater program as a basis for estimating the potential future cost of a proposed program under the pending EPA General Permits for the Upper Charles River watershed. Based on our review of the information you have provided us to date, we have completed a draft cost estimate of existing stormwater services for the Town of Milford for your review. Attached to this email are:

1. A memo that outlines how this estimate was derived, explains how the budget spreadsheets are organized, and identifies a number of areas where we are looking for additional clarification.

2. The excel spreadsheet (and a PDF version) with cost breakdowns across several major cost categories
3. Notes from the November 4 meeting used to help generate our cost breakdowns (memo dated 1/20/11)
4. A copy of the Highway Department's recent cost estimates, also used to generate existing program costs (dated 1/10/11)

We appreciate you taking the time to help our team collect and refine this information. Please send us your written response, or if you prefer, we are available to discuss your comments and responses to these questions via conference call. As you also know, we have an upcoming meeting of the Steering Committee scheduled for February 9th from 1-3 PM in Franklin, we do not plan on having a specific agenda item for this topic, but could put aside a few minutes after the meeting to discuss your assessment of this estimate. Thank you and we look forward to continuing to work with you on this project. Respectfully, Rich Claytor.

Richard A. Claytor, Jr., P.E.

Principal Engineer

Horsley Witten Group

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November 12, 2010

Mr. Richard Claytor, Jr. P.E.
Horsley Witten Group
90 Route 6A
Sandwich, MA 02563

Mr. Rich Niles
AMEC
2 Robbins Road
Westford, MA 01886

Dear Mr. Claytor and Mr. Niles:

The 495/MetroWest Partnership, NAIOP Massachusetts - the Commercial Real Estate Development Association, and Associated Industries of Massachusetts (AIM), on behalf of our broad constituencies, have been actively following EPA's use of the Residual Designation Authority (RDA) in the Upper Charles. Our organizations have submitted extensive comments on the EPA's Draft Permit for Residually Designated Discharges in the towns of Bellingham, Franklin, and Milford. With the comment period closed and an EPA-funded Stormwater Utility Feasibility Evaluation now underway, we would like to offer our recommendations on how the study could provide the greatest value not only to the EPA, but also to the affected communities and landowners identified in the Draft Permit.

The 495/MetroWest Partnership, through a unique public-private collaboration with businesses, municipalities, and other stakeholders, is the regional leader for creating an environment that prepares for and cultivates sustainable growth. We accomplish this by coordinating, educating, and advocating for solutions to regional constraints and limited natural resources, and have conducted numerous initiatives to address workforce housing, transportation, and water resources.

NAIOP Massachusetts represents the interests of more than 1,200 members involved with the development, ownership, management, and financing of more than 175 million square feet of office, research & development, industrial, mixed-use, retail, and institutional space in the Commonwealth.

Associated Industries of Massachusetts (AIM) is an organization of Massachusetts companies representing more than six thousand employers in both the manufacturing and non-manufacturing sectors in the Commonwealth. AIM was founded in 1915 and has since sought to advocate positive public policy decisions to promote a vibrant and expanding economy, and retain and expand job opportunities in Massachusetts.

Our organizations assembled a group of our members with interest and expertise in the area of stormwater in June 2010, and again on November 2, 2010. The result of the two meetings was a recommendation to review the Work Assignment and Work Plan for the Stormwater Utility Feasibility Evaluation to ensure that certain items that are deemed necessary to accurately evaluate the feasibility of a stormwater utility are included.

Based on our review and discussions, we urge you to address the following issues (and how they will relate to the requirements of the RDA General Permit) in your final evaluation:

- **Funding for Stormwater Utility Implementation** - While the three communities are grateful for the \$300,000 for the feasibility evaluation, there is no question that the costs to implement any stormwater utility on a municipal or regional basis would be far greater than the feasibility evaluation costs. We request that the final evaluation include a cost estimate for the implementation of a stormwater utility (i.e., all costs associated with the creation and management

of the utility), as well as information on what funding support is or will be made available to these municipalities to implement stormwater utilities. Furthermore, if the EPA plans to expand the RDA Pilot Program into all communities within the Charles River Watershed, then adequate funding must be provided to all affected communities to evaluate and/or implement stormwater utilities. These costs must be understood as part of evaluating the impacts of the RDA General Permit and the role that stormwater utilities could play in that regulatory program.

- **Implementation Hurdles** - The Stormwater Utility Feasibility Evaluation should include a detailed plan with specific strategies on how to overcome the many hurdles associated with the creation and management of a stormwater utility including: Town Meeting approval process, education and outreach with multiple communities, creation of equitable and valid rate structures, regional billing and management issues, coordination with the phosphorous control plans, and a timeline for planning, development and implementation, including the legal easement acquisition process.
- **Credits and Abatements** - A recommendation for the method of assigning both structural and non-structural credits and abatements into the potential fee structure for the recommended utility(s) should be included. Will there be a standard that is adopted for calculating/awarding credits and abatements? Or will it be left to each entity as the individual utility is developed? This is critical as a municipal utility may not be able to provide direct benefits to private landowners. Unless being a utility ratepayer exempts a Designated Discharge Site from the permitting requirement, the primary benefit of the utility for private landowners would be the credits.
- **Recommendation for Local, Regional, or Watershed-based Stormwater Utilities** - A final recommendation on how to organize/develop either local (community by community), regional, or watershed-based stormwater utilities should be provided. We also suggest a public/private utility structure be considered (with an accompanying cost benefit analysis), such as the Long Creek Watershed Management District, in addition to a regional/municipal utility structure.
- **Coordination of Phosphorous Control Plans and Stormwater Utilities** - Additional information and guidance is needed on how the Municipal Phosphorous Control Plans will be coordinated with the Stormwater Utilities. Who will be responsible for completing the Municipal Phosphorous Control Plans? If there is a local, community-based utility, will the cost of the phosphorous control plans be covered by fees generated by the utility? What if it is a regional utility? How will individual Phosphorous Control Plans work with the goal of having a watershed-based Phosphorous Control Plans? Who will be reviewing and coordinating the watershed Phosphorous Control Plans? Clearly, there are many issues that need to be thought through.
- **Town Meeting Hurdles** - The hurdles associated with approving a Stormwater Utility under a Town Meeting system should be considered. The length of time required to receive the approvals individually on a town by town basis, and the reality that it may not be approved (or that multiple Town Meetings may be required before approval is obtained) must be addressed. Consideration should be given to whether a town would even undertake this option if it is not a requirement under an RDA or other regulatory mechanism. While cities may pass an ordinance with City Council's approval, towns must go through Town Meeting. This discrepancy must be addressed.
- **Industry/Business Representation** - Businesses, unlike residents, do not have the right to vote at Town Meeting, but they are required to pay utility fees. A recommended strategy is needed to ensure that businesses have a voice in the decision making process (especially related to the fee structure).
- **Implementation Cost Estimate** - A cost estimate should be prepared for establishing and administering the stormwater utility, including the education and outreach before actually voting on a utility, the managerial tasks that must take place before beginning to charge fees, as well as the follow up time and effort for settling abatements, credits and resolving billing issues.
- **Role of Stormwater Utilities in the RDA General Permit** - Perhaps most importantly, it is essential that the RDA General Permit acknowledge the role that stormwater utilities will play as a means of complying with the General Permit. It is our understanding that implementation of a municipal or regional utility would preclude the need to file an NOI for any Designated Discharge sites that are part of the utility rate base. Otherwise, those Designated Discharge site would be forced to pay

both the utility fees and the compliance costs associated with the General Permit, which is clearly unfair, and result in widespread opposition to the implementation of utilities.

- **Timetable** - The Feasibility Evaluation should provide a realistic timetable for implementing and operating a Stormwater Utility as well as creating and implementing a Phosphorous Control Plan and Certified Municipal Phosphorous Program.

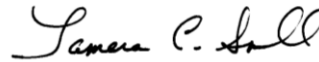
We recognize that some of these recommendations are mentioned in your Work Plan, however, we want to emphasize the importance of addressing *all* of the many significant challenges associated with the creation and management of a stormwater utility. We are concerned that the Work Plan does not seem to address the integration of a Designated Discharge site stormwater plan and a municipal phosphorous program, both of which are essential to each of the communities' compliance with the RDA pilot program and the new MS4 requirements. A resolution to the Certified Municipal Phosphorous Program (CMPP), as described in the Draft Permit, is an absolute necessity to a successful Feasibility Evaluation and we hold the opinion that it cannot be a choice of "a stormwater plan, a Phosphorous Control Plan (PCP) and/or a CMPP"; there needs to be a "both/and" mentality as opposed to an "and/or" option. Your final Evaluation is particularly significant, given the EPA's stated intent to broaden the Pilot Program beyond the three communities. It is essential that this Stormwater Utility Feasibility Evaluation establish the foundation for the possible implementation of future stormwater utility programs in the Charles River Watershed.

On behalf of our broad and varied constituencies, we appreciate your consideration of our recommendations. Please feel free to contact us with any questions. We look forward to working with you throughout the Stakeholder process to ensure an evaluation benefiting the targeted towns, owners of Designated Discharge sites, and the Charles River.

Sincerely,



Jessica Strunkin
Deputy Director of Public Policy & Public Affairs
495/MetroWest Partnership



Tamara C. Small
Director of Policy & Public Affairs
NAIOP Massachusetts



Robert A. Rio, Esq.
Senior Vice President and Counsel
Associated Industries of Massachusetts

Cc: Mr. Ray Cody, EPA
Mr. Ken Moraff, EPA
Mr. Dennis Fraine, Town of Bellingham
Mr. Don DiMartino, Town of Bellingham
Mr. Jeff Nutting, Town of Franklin
Mr. Brutus Cantoreggi, Town of Franklin
Mr. Louis Celozzi, Town of Milford
Mr. Mike Santora, Town of Milford

U.S. Senator John F. Kerry
U.S. Senator Scott P. Brown
Congressman James P. McGovern
Congressman Richard E. Neal
State Senator Richard T. Moore
State Senator Richard J. Ross
State Senator Karen E. Spilka
State Representative Jennifer Callahan
State Representative John Fernandes
State Representative James E. Vallee

This memorandum originally received from Milford on July 14, 2011, has been amended to include responses to the comments. Responses by HW can be found following each comment in italics.

MEMORANDUM

TO: Richard Claytor, P.E.,
HWG
FROM: Michael Santora, P.E.
Town Engineer
DATE: July 14, 2011
RE: Milford Comments for MS4 Program Costs

Rich, I reviewed Milford's program costs with Scott Crisafulli and Rosalie Starvish and have the following comments.

1. Existing program cost for NPDES MS4 Public education should be changed from \$1,000.00 to \$5,500.00.
HW- The existing program cost has been updated to reflect this change.
2. Existing program cost for Grants Program is too high at \$3,690, the Town typically spends very little to acquire Chapter 90 grants. Should lower amount to \$500.00.
HW- The existing program cost has been updated to reflect this change.
3. Existing program cost for Illicit Discharge & Elimination program carries \$6,000.00 for Sewer Department work but the Town's consultant's work. Should increase total to \$16,000.00.
HW- The existing program cost has been updated to reflect this change.
4. We don't understand the line for existing program costs for Hazard Mitigation Planning and Flood Insurance Updates.
HW- This line item is to account for planning expenditures resulting from future (expected) updates to the FEMA maps.
5. Existing program costs for Operations & Maintenance Management (\$50,400) need to be justified. Is this amount for the entire department or just the Highway Surveyor?
HW- Per the request of the Highway Surveyor on 8/2/11, the estimates for existing level of effort for operations and maintenance management have been changed to 7% for both the Highway Surveyor and the Assistant Highway Surveyor positions.
6. Existing program costs and future program costs for Street Sweeping and Sidewalk Sweeping and Catchbasin Cleaning needs to be re-visited as Highway

Surveyor doubts these numbers. Contact the Highway Surveyor to discuss these line items.

HW- These values are based on a letter received from the Highway Surveyor on January 10, 2011. The values reflect the annualized cost of equipment (based on provided purchase price), the cost for burdened employee labor, disposal, and fuel. Per the request of the Highway Surveyor on 8/2/11, interest has been removed from the annualized equipment cost.

7. Revisit cost numbers (existing and future) for Fall Leaf program (contact Highway Surveyor).

HW- This value is based on a letter received from the Highway Surveyor on January 10, 2011. The value includes the annualized cost of equipment (based on provided purchase price), cost for burdened employee labor, and disposal cost (cost of creating/ maintaining the compost facility). Per the request of the Highway Surveyor on 8/2/11, interest has been removed from the annualized equipment cost. The Highway Surveyor also noted that replacement cost of equipment in the future could be lower, as the collection equipment currently used is more expensive than some other collection options.

8. Existing program costs of \$80,000 for Stream Restoration is questionable since that was a one-time special project and not a typical cost for the town's stormwater program.

HW- The Existing program cost has been updated to remove this one-time cost.

9. Is NPDES MS4 Public Involvement line item on page one counted again in the Hazardous/Toxic Material Collection program on page 3?

HW- The Administration cost category on page one includes an assumption of the administrative cost for level of effort for personnel to oversee, coordinate, and provide public outreach for the materials collection event. Page three, Operations and Implementation category includes the cost of disposal for materials collected (provided by the town) and an assumption of level of effort for personnel to run the collection event.

10. There is no guarantee of a phosphorus ban on fertilizer, in fact, it is probably more likely that it won't occur. The study should be re-calculated to not include the 10% credit for the phosphorus ban on fertilizers.

HW has retained the assumption that 10% of the TP load can be reduced via a phosphorus ban.

11. The cost analysis omits costs for land acquisition and legal costs. Since Milford does not control much land at the end of pipe for it's many outlets, land acquisition costs could be very significant. We realize these costs are very difficult to estimate but carrying zero paints an unrealistic picture. We recommend carrying \$5,000,000 for this line item.

Land acquisition costs have been accounted for in the revised estimates for implementation of capital projects for structural control measures.



Memo

To **Town of Franklin**
Robert Cantoreggi, DPW Director
James Esterbrook, GIS Manager

Date **August 4, 2011**

Project # 780520004

From **AMEC Earth & Environmental, Inc.**
Rich Niles

cc **Horsley Witten Group**
Rich Claytor
Anne Kitchell
Tarja McGrail

**Subject Response to Comments for Stormwater Program Costs,
Sustainable Stormwater Funding Project for Upper Charles River**

The purpose of this memo is to provide a response to the Town of Franklin's August 1 & 2, 2011 e-mail comments regarding the stormwater program costs. The comments have been combined below (in italics) with a response and/or suggested change to address each comment.

Administration

RDA Compliance - Projected costs may be lower than actual costs based upon the uncertainty of the final permit regulations.

Response 1:

We will remove this item entirely since RDA compliance is not required by the municipality in the absence of a CMPP. See Response 2 below.

CMPP - Same issue as RDA Compliance, there are still a great deal of variables that could drastically increase this cost and we feel it may be underestimated.

Response 2: Suggest increasing the effort 100% to \$9,090 (0.10 FTE) annually. The original effort for this subtask was limited to "tracking of regulated entities"; however, it is not unreasonable to assume that a greater effort may be needed, depending on the final permit requirements and the Town's internal staffing needs to address this element of the program. Also note that we will add an item under Engineering and Master Planning for CMPP Planning and Development for the costs to the municipality to plan and set up a CMPP (we've recently worked out the details of how this might work with EPA). The values will be \$20K/year for years 2-4 (\$60K total).

Regulation/Enforcement

Illicit Discharge Detection and Elimination Program - This cost could cover the expense of enforcement and administration but will also need to associate the other costs associated with the inspection and oversight of any physical infrastructure modifications within the town, despite the majority cost being borne by the property owner.

Response 3: This brings up a valid point and we tried to address the cost for "Illicit Discharge Removal under "Operations and Implementation", which included staff labor for oversight (0.05

FTE) and minor modifications to infrastructure by a highway crew (0.15 FTE) for a value of \$19,725/year beginning in year 2 of the permit. **We feel these values are reasonable but perhaps our estimated efforts for oversight and/or the highway crew under “Operations and Implementation” need to change?**

Engineering and Master Planning

Catch Basin Inventory Plan and Street Sweeping Optimization - Unionized employees are not currently mandated to perform record keeping in addition to their CB cleaning or sweeping activities. Enhanced record keeping duties would be subject to contract modification under collective bargaining. Anytime such a give and take is needed there is typically a cost associated (extra vacation, sick days, etc). The additional time required to track and compile the data would be expensive and we feel that it would exceed the number currently listed.

Response 4: This brings up a good point about modification of job descriptions versus an increase in staff time or needs. **We suggest the addition of a paid intern or other staff position at an administrative level to accompany crews and collect data.** The FTE effort will be based on the proposed effort for the equipment operators for street sweeping (0.88 FTE) and catch basin cleaning (0.84 FTE).

Waterfowl & Pest Waste Management Programs - We currently pay \$5,000 a year for addling and have averaged \$5-6,000 for beaver problems. The amount of money spent has also increased as beaver populations have increased in recent years.

Response 5: **These costs will be updated** to \$12,000 in the spreadsheet tab under “Operations and Implementation” where we previously accounted for only \$6,000.

Groundwater & Drinking Water Program - These costs can be removed because they are already associated with our standard drinking water program which bears the cost of these activities.

Response 6: **This can be removed since it was a minor sub-task.** However, it should be noted that the Phase II MS4 permit requires the Town to address drinking water in the Stormwater Program and written plan. To be consistent with the other Towns, this will remain in the spreadsheet with a note about how Franklin addresses this requirement.

Operations and Implementation

CIP/Infrastructure Implementation - We have some concerns that capital improvements and the installation of physical BMPs could cost more than anticipated based upon site specific constraints.

Response 7: This item is not intended to address BMP installation or retrofits to meet phosphorous reduction goals. The Town maintains existing drainage infrastructure (i.e., replacement of old/damaged pipes) and incorporates minor modifications as part of other ongoing construction projects. **Since this was an existing program element, we decided to carry it in the future program with a 25% increase in effort; therefore, we suggest leaving this cost “as-is”.** The cost for implementation of projects to address phosphorous loads has been calculated separately.

Inlet, Catch Basin, and Manhole Cleaning - We want to make sure that this reflects the full cost of the service and does not omit things like cleanings disposal or the additional costs for a municipality to contract this work and pay prevailing wage.

Response 8: The cost for disposal was not included since it was unknown. **We can include a reasonable disposal cost of \$30/ton for these materials if the Town can provide an estimate of the volume/tonnage of materials generated.**

Street Sweeping - We feel this number is low. Please review the cost of man hours, brushes, equipment replacement, etc.

Response 9: These costs were based on what was provided for the existing program effort, which is a rough estimate on our part. **We realized that we need to estimate the cost for sweeping all streets twice per year and now the town only does the down-town areas at that level. We suggest increasing the future program effort by 75%.**

Equipment replacement costs are included in the future program for street sweeping (\$52,500, increased 75% as discussed above) and catch basin cleaning (\$33,400). These are annual costs, so over a 5-year period of increased use, this allows for the replacement of each piece of equipment (vacuum street sweeper = ~\$185,000 and catch basin truck (~\$135,000). **We would need more justification/ data to support a higher equipment replacement cost.**

Emergency Drainage Repairs - As additional efforts are placed on inspection and monitoring of the drainage network, we anticipate that more repairs will be identified and a portion of these will be considered an emergency and may bear a price higher than currently anticipated.

Response 10: This is not an unrealistic outcome of additional drainage inspections. **We suggest increasing the future program effort by 50%.**

Monitoring

Surface Water Quality Monitoring - There are no costs in the table at this time, however depending upon how comprehensive the monitoring program is, there could be significant associated costs.

Response 11: The current Phase II MS4 permit does not require surface water monitoring; however, there are a number of benefits to collecting this data for watershed planning, prioritization, baseline data, measuring improvements, etc. The proposed “Stormwater Master Planning” effort under the “Engineering and Master Planning” tab includes ~\$330,000 for a variety of assessments. Although surface water quality monitoring is not explicitly outlined in this effort, it could be part of this rough planning effort (understanding that a detailed “master plan” was not scoped).

If the Town wishes to include a future program with a robust surface water quality monitoring effort, this can be called out as its own item. However, we will note that it is not actually required under the permit and the effort for master planning would be reduced slightly. **We estimate that a reasonable allowance for monitoring over a 2-year period is ~\$50,000.**

In the personnel matrix, we feel it may be beneficial to place some of the burden upon the jobs that may need to be created as a result of the enhanced regulations. This would more accurately reflect the need for additional staff or funds to hire a consultant.

Response 12: This is a valid concern and we do not want to give the impression that specific staff will be spending X% of their time in the future. Rather, the program requires additional stormwater staff at each of the staff levels or their equivalent. **This will be emphasized in the report and below are suggested illustrations to better address this issue in the tables.**

	Source	DPW Director	Town Engineer	Highway Superintendent
	Rate	\$157,500	\$142,500	\$112,500
Operations & Maintenance	# Units			
Operations and Maintenance Management	Existing	0.02		0.15
	Proposed (w/ add. Stormwater Staff)	0.03		0.23
CIP/Infrastructure Implementation	Existing	0.02	0.05	0.10
	Proposed (w/ add. Stormwater Staff)	0.03	0.06	0.13

Existing Program Effort (FTE)		Proposed Staff Effort (FTE, existing plus stormwater staff)						% Increase
		Year 1	Year 2	Year 3	Year 4	Year 5	6 Year Average	
Town Administrator	0.04	0.05	0.05	0.05	0.06	0.05	0.05	18%
Add. Staff Need	N/A	0.01	0.01	0.01	0.02	0.01	0.01	-
Town Attorney	0.01	0.05	0.07	0.05	0.05	0.07	0.05	480%
Add. Staff Need	N/A	0.04	0.03	0.04	0.04	0.06	0.05	-
DPW Director	0.29	0.44	0.44	0.42	0.43	0.48	0.44	51%
Add. Staff Need	N/A	0.15	0.15	0.13	0.14	0.19	0.15	-
Town Engineer	0.26	0.42	0.43	0.43	0.42	0.52	0.44	71%
Add. Staff Need	N/A	0.16	0.17	0.17	0.16	0.26	0.18	-

Next Steps for Franklin

1. We have attached the cost breakdown from Milford for their "Fall Leaf Pickup" program; this may be a good initial estimate but adjusted for the street miles of Franklin. Milford has ~240 curb miles, so a program cost of \$100,500 = \$419/curb mile. Adjusted for Franklin at ~400 curb miles X \$419/curb mile = \$167,500. Provide validate whether this is a good approach for Franklin or provide other cost information for the future "Fall Leaf Pickup" program.
2. Review this memo and indicate your concurrence or additional suggested changes.

Appendix B

Summary Tables of Draft MS4 and RDA General Permit Requirements

Table B.1: Summary of Draft MS4 General Permit Requirements

Requirement	Description	Time Line
<p>NOI (Section 1.7.2 & Appendix F)</p>	<p>NOI to include the following information.</p> <ul style="list-style-type: none"> • General Conditions- Address, Contact, 2003 Permit coverage status (yes/no), and EPA NPDES Permit # • Stormwater Management Program (see Part IV below for SWMP Requirements) • Endangered Species Act Eligibility • National Historic Preservation Act Eligibility • MS4 Infrastructure Information- Status of Outfall Map • Bylaw & Ordinance Development- (IDDE), ESC, and Post Construction. • Part II – Summary of Receiving Waters • Part III- Summary of 2003 Stormwater Management Program • Part IV- Summary of 2010 Stormwater Management Program) • Part V- BMP's for Meeting TMDL • Part VI- Certification 	<p>Within 90 Days of Effective Permit</p>
<p>Stormwater Management Program (SWMP)</p>	<p>Permittees authorized under MS4-2003 shall continue to implement their existing SWMP until the program has been updated. The permittee is encouraged to maintain adequate funding for the implementation of this program.</p> <ul style="list-style-type: none"> • Identification of names and titles of those responsible for program implementation • Listing of receiving waters with their classification under applicable state water quality standards, any impairments, & number of outfalls that discharge to each water. In addition permittee is encouraged to document in SWMP all public drinking water sources including both surface and groundwater that may be impacted by MS4 discharge. • Document compliance with Part 1.9.1- Endangered Species Act • Document compliance with Part 1.9.2- National Historic Preservation • Include Map of separate storm sewers required by Part 2.4.4.6 (system mapping) • Description of practices to achieve water quality requirements (parts 2.1-water quality based effluent limitations, 2.2-Discharges to impaired waters, 2.3-new/Increased discharges and antidegradation, as applicable) • Description of practices to achieve stormwater control/ requirements to reduce pollutants to the Maximum Extent Practicable (MEP) • BMP and Control measures – non-numeric effluent limitations by focusing on pollution prevention and source control in combination with structural controls and treatment. 	<p>Update SWMP following the receipt of authorization from EPA to discharge under the permit within 120 days</p>

Requirement	Description	Time Line
1. Public Education and Outreach	<p>Public Education and Outreach (see section 2.4.2) program should focus on pollutants of concern for impaired waters and priority waters in MS4</p> <ul style="list-style-type: none"> The educational and outreach program shall distribute a minimum of two educational messages over the permit term to the following four audiences: <ul style="list-style-type: none"> Residents Businesses, institutions, and commercial facilities, Developers (construction) Industrial facilities Identify methods that it will use to evaluate the effectiveness of the education program. Permittee shall change an ineffective program (2.4.2.3) Permittee shall report on messages for audiences and effectiveness annually. 	beginning the first year of the permit, report annual
2. Public Participation and Involvement	<ul style="list-style-type: none"> Provide opportunities to engage the public to participate in the review and implementation of the SWMP. SWMP and all annual reports shall be made available to public. Public involvement activities shall comply with state public notice requirements 	beginning the first year of the permit, report annually
3. IDDE- Inventory and Elimination of Illicit discharges	<ul style="list-style-type: none"> Permittee shall prohibit discharges from SSOs and other illicit discharges (2.4.4.1) Elimination of illicit discharges Permittee authorized by MS4-2003 shall continue to implement IDDE program required by MS4-2003 Evaluate and determine if non-stormwater discharges (e.g. basement sump pumps) are significant contributors of pollutants SSOs are prohibited and discharges will violate permit. Upon detection permittee shall eliminate or minimize pollutant discharge prior to elimination. Permittee shall have inventory of all known SSOs. Inventory shall be maintained as part of SWMP and updated annually in report. (2.4.4.5) 	Eliminate within 30 days of discovery, or establish schedule for elimination within 6 months, Inventory of SSO's within 60 days,
IDDE-Map	<p>System Mapping- (more stringent mapping requirements for phosphorus control see 2.4.4.6.d). Map shall include the following and be either a hard copy or GIS.</p> <ul style="list-style-type: none"> Infrastructure: Municipal Separate Storm Sewer (include inter-municipal and private connection where available); Municipal combined sewer, if applicable; Catchment delineations Infrastructure (recommended): Representation of sewer material, size, age; Sewersheds and alignments with inadequate LOS with indication of cause; Area where an MS4 could be influenced by septic system discharges Water Resources (Required): Waterbodies identified by name Water Resources (Recommended): Seasonal high water table elevations impacting sanitary alignments; Topography; Orthophotography Operations and Maintenance, Investigations, and remediation (recommended): Alignments, dates, representation of work for past illicit investigations; Location of suspected, confirmed, corrected connections 	Map MS4 within 2 years, report progress annually

Requirement	Description	Time Line
IDDE- outfall Inventory, Dry weather monitoring	<ul style="list-style-type: none"> • Outfall Inventory- Record location of each outfall and provide characterization of its condition • Inventory for each stream mile within its regulated jurisdiction that receives discharge from the MS4; Inventory shall begin at catchments identified as priority. (see 2.4.4.8) • Each outfall shall be labeled and document conditions. • Permittee shall complete outfall inventory for 25% of the outfalls each year of the permit, if outfall is inaccessible the observations shall be made upstream. (see part 2.4.4.8) • If flow is observed at time of inventory a sample shall be. The outfall sampling conducted as part of inventory may fulfill requirements for Dry weather outfall screening (part 3.0). 	beginning year 2 with completion of inventory by the end of the permit term
IDDE- Written Program	<p>IDDE Program-shall be a written document that includes:</p> <ul style="list-style-type: none"> • Legal Authority-consists of a currently effective ordinance • Protocol for IDDE program Responsibilities-must be written within one year of effective date of permit. • Assessment of Priority catchments and problem catchments; Delineate MS4 areas into catchments and evaluate each for potential illicit discharge; Work with neighboring MS4s as boundaries overlap • Rank each delineated catchment as high, medium, or low for its potential to have illicit discharges. The rankings shall be based on screening factors reflective of MS4 existing conditions. • Permittee shall retain the results of the catchment prioritization as part of the written IDDE program. • Permittee shall identify in the annual report the basis for the problem catchments' designation and the progress the permittee has made in detecting and eliminating illicit discharges. • Permittee shall include inventory of all problem catchments. • The permittee shall remove all illicit discharges in each identified problem catchment. • Develop a written systematic procedure for locating and removing illicit connections. Complete within one year from the effective date of the permit. Report on status annually. • Implement systematic procedure for locating and removing illicit connections. • Document in SWMP and the annual report the basis of any decisions not to implement protocol in any problem or priority catchments. • Illicit discharge prevention procedures • Indicators of IDDE program progress • Annually train employees about IDDE program-document in SWMP, report on frequency in annual report. 	<p>Written protocol within one year, report on written protocol in year 2 annual report</p> <p>Problem Catchment inventory, discharge potential assessment/ prioritization complete within 1 year- include in annual report</p> <p>Year 5 annual report document removals.</p>
4. Construction Site Stormwater Runoff Control (section 2.4.5)	<ul style="list-style-type: none"> • Ordinance or regulatory mechanism to require ESC at construction sites. This was a requirement of MS4-2003 • Construction site stormwater runoff control program shall include written procedures for site inspection and enforcement of sediment and erosion control measures at construction sites. If not completed these should be done within one year from the effective date of the permit. • Require construction site operators of land disturbances discharging to MS4 to implement ESC program including BMPs meeting at a minimum standards of Massachusetts Stormwater Handbook. • Construction site stormwater runoff control program shall require construction site operators within MS4 to 	Within 1 year, ESC ordinance

Requirement	Description	Time Line
	<p>control wastes, including but not limited to, discarded building materials, truck wash out, chemicals, litter, and sanitary wastes.</p> <ul style="list-style-type: none"> Construction site stormwater runoff control program shall have written procedures for site plan review. If not existing complete within one year of effective permit. Permittee shall track the number of site reviews, inspections, and enforcement actions in the SWMP. This information shall be included in annual report. 	
5. Stormwater Management post-construction	<ul style="list-style-type: none"> Stormwater Management post-construction in New Developments and Redevelopments of size 1+ acre or projects less than 1 acre that are a part of a larger common plan of development that disturbs greater than 1 acre. (see section 2.4.6) Continue to implement MS4-2003 program Ordinance or regulatory mechanism in place (part of MS4-2003) Ordinance or other regulatory mechanism shall be amended as appropriate within two years of permit to contain following provisions: <ul style="list-style-type: none"> Comply with Massachusetts stormwater management standards, standards 3,4,5, and 6 regardless of proximity to resources areas. Redevelopment must comply with Massachusetts stormwater management standard 7. Apply Massachusetts stormwater standards to maximum extent practicable for projects exempt from MassDEP stormwater standards. Permittees new development/ redevelopment program shall have procedures to minimize impacts to water quality. (2.4.6.5) Permittee shall require, at a minimum, the submission of as-built drawings within 90 days of construction completion. Permittee shall require adequate long term operations and maintenance of stormwater management practices. This may require setting up procedures for escrow, or maintenance contracts between owner of the BMP and the permittee. Maintenance contracts shall include verification of maintenance practices by the owner, allow municipality to inspect the maintenance practices and perform maintenance if inspections indicate neglect by owner. These requirements shall be included in the SWMP, and be reported annually. Assessment of Design standards and LID -Within two years of the effective date of this permit the permittee shall develop a report assessing current street design and parking lot guidelines and other local requirements that affect the creation of impervious cover. This assessment shall be used to determine if design standards for streets and parking lots can be modified to support LID. Assessment shall be part of SWMP. Status of assessment shall be included in Annual report. Green Infrastructure/LID practices – within 3 years from the effective date of the permit, the permittee shall develop report assessing existing local regulations to determine the feasibility of making at a minimum the following practices allowable: <ul style="list-style-type: none"> Green roofs 	<p>Within 2 years update stormwater management post-construction ordinance;</p> <p>Within 2 years report on assessment of design standards and LID; Within 3 years report on assessment of local regulations and green infrastructure/LID; Annually report progress</p> <p>Year 2 begin report DCIA reduction, report priority ranking properties;</p>

Requirement	Description	Time Line
	<ul style="list-style-type: none"> ○ Infiltration practices, rain gardens, curb extensions, planter gardens, porous and pervious pavements, and other designs to manage stormwater using landscaping and structured or augmented soils ○ Water harvesting devices ○ The permittee shall report in each annual report on its findings and progress towards making practices allowable • Directly connected impervious areas-permittee shall estimate changes in number of acres of impervious area tributary to MS4 from the initial base line from EPA or determined by permittee. Beginning in second year MS4 shall report additions or reductions to impervious area. Include additions or reductions resulting from development and redevelopment or retrofit projects undertaken directly by the permittee or by private developers or other parties. • Inventory of priority ranking MS4 owned property and infrastructure within two years of effective date. • Infrastructure retrofit inventory- beginning with the third year annual report and in each subsequent report permittee shall report on MS4 owned properties that have been retrofitted with BMPs. 	Year 3 report retrofit projects
6. Good House Keeping and Pollution Prevention in Municipal Operations	<ul style="list-style-type: none"> • Good House Keeping and Pollution Prevention in Municipal Operations (see section 2.4.7) • Written Operations and Maintenance program within 1 year of effective date of permit • Inventory of permittee owned facilities within 6 months of effective date of permit <ul style="list-style-type: none"> ○ Parks and open space ○ Address proper storage, use, and disposal of pesticides, herbicides, and fertilizers including minimization of use and only using in accordance with manufacturers label ○ Evaluate lawn maintenance and landscaping to ensure practices are protective of water quality ○ Trash management ○ Signage to encourage proper disposal of pet waste <p>Additional requirements for MS4 listed in Appendix G (see table below Requirements for MS4's with approved TMDL)</p> <ul style="list-style-type: none"> • Buildings and facilities <ul style="list-style-type: none"> ○ Evaluate use, storage, and disposal of petroleum and non-petroleum products ○ Employee training at facilities for handling of materials ○ Spill prevention plans ○ Waste management ○ Parking lot sweeping ○ Within 6 months inventory of floor drains to ensure they are not connected to MS4 • Vehicles and Equipment address the following: <ul style="list-style-type: none"> ○ Vehicle storage procedures ○ Fueling areas ○ Vehicle wash waters 	<p>Written O&M within Year 1, Facility Inventory within 6 months</p> <p>Annually report catch basin cleaning activity, and street sweeping</p>

Requirement	Description	Time Line
	<ul style="list-style-type: none"> Infrastructure operations and maintenance <ul style="list-style-type: none"> Within 6 months establish program to repair and rehabilitate MS4 infrastructure Street maintenance of permittee owned roads to minimize pollutant discharge Catch basin cleaning optimization to meet following conditions: Ensure sumps not more than 50% full (in catchment tributary to impaired water) Prioritize inspection and maintenance <ul style="list-style-type: none"> Set goals for frequency of routine cleaning Investigate catch basins with sumps more than 50% full during two consecutive cleanings Document in SWMP and annual report, include number CB's cleaned, inspected, and volume or mass of material removed. Street and Sidewalk Sweeping Establish sweeping procedure Areas shall be swept or cleaned a minimum of twice per year, spring (after snow melt) and fall (after leaf cleanup) Report annually number miles cleaned and volume/mass material removed For MS4 located in areas listed in appendix G see additional requirements (in table below) Stormwater pollution prevention plan (SWPPP) <ul style="list-style-type: none"> Develop and implement for permittee owned maintenance garages, public works facilities, transfer stations, waste handling facilities. Within 1 year of date of effective permit develop and implement program. (2.4.7.2) SWPPP must include comprehensive site inspections annually, routine quarterly inspections and report. Select, design, and install BMPs to reduce pollutants Minimum monthly sweeping Inspect, maintain, and repair all equipment & systems quarterly ESC – Structural & non-structural control measures to stabilize and control runoff from exposed areas Management of runoff – divert, infiltrate, reuse, contain, or reduce runoff. Or eliminate pollutants in discharges. Covered salt storage (only if discharging to MS4) Employee Training – annually 	<p>Within 1 year develop and implement SWPPP</p>
<p>Outfall Monitoring Program</p>	<ul style="list-style-type: none"> Outfall Monitoring Program- Documentation of Compliance with part 3.0 Implement outfall monitoring program- shall begin no later than beginning of the second year of permit. Program shall begin with the outfalls in the catchments with the highest priority ranking as designated pursuant to 2.4.4.8.c Conduct one dry weather screening and analytical monitoring and wet weather analytical monitoring of each outfall within 5 years of the effective permit date. (3.1.3) Perform wet weather outfall sampling at all outfalls , or develop within one year a permittee specific 	<p>Dry Weather Monitoring -Begin monitoring by year 2, complete within 5 years; Wet Weather Monitoring –</p>

Requirement	Description	Time Line
	<p>monitoring plan that reduces the number of outfalls monitored based on the following within 5 years of effective permit date:</p> <ul style="list-style-type: none"> ○ Permittee completed outfall monitoring under MS4-2003, consistent with 3.3.1 of permit, document. ○ Outfall associated with problem catchment designated as part of 2.4.4 ○ Impervious cover discharging through the outfall is less than 10% of catchment area, document ○ Catchment drains one acre or less of either low density residential or forest, document ○ Conduct permittee specific monitoring plan wet and dry weather in stream monitoring which is representative of discharges to water body, document and maintain monitoring results as part of SWMP 	optional complete monitoring plan by Year 1, Begin monitoring by year 2, complete within 5 years;
State Requirements	<ul style="list-style-type: none"> • Public drinking water requirements (4.1) <ul style="list-style-type: none"> ○ Consider waters priority that are public drinking water sources for implementation of SWMP ○ Discharges to public drinking water supply sources and their protection areas should provide pre-treatment and spill control capabilities to extent feasible ○ Avoid direct discharges to Class A waters to extent feasible • Groundwater recharge (4.2) <ul style="list-style-type: none"> ○ Evaluate physical conditions ○ Site design ○ BMP to promote groundwater recharge and infiltration where feasible ○ Permittee shall address recharge and infiltration for the control measures as well as reasons for not electing to implement recharge and infiltration. Loss of annual recharge to GW should be minimized through infiltration measures to MEP. 	
Program evaluation, recordkeeping and reporting	<ul style="list-style-type: none"> • Program evaluation, recordkeeping, and reporting • Program self evaluation-annually • Self assessment of review of compliance • Status of plans or activities • Progress toward achieving measurable goals • Public education evaluation • Activity descriptions-to promote public participation • Description of activities related to IDDE program • Evaluation of construction run-off management • Evaluation of stormwater management for new/ re development including ordinance development , status of street design assessment, impervious area reductions • Status of O&M programs and status of SWPPPs • state reporting requirements • Outfall monitoring data • Discharges to impaired waters- identification of specific BMPs used to address pollutant control • Description of activities for next reporting cycle • Description of any changes in identified BMP measurable goals • Description of activities by any entity contracted for achieving measurable goals or implementing control measure 	Report annually, maintain records for 5 years

Table B.2: Additional Requirements for MS4's with approved TMDL

Requirement	Description	Time Line
PCP Plan Development	<p>Permittee shall develop phosphorus control plan (PCP) that describes measures necessary to reduce the amount of phosphorus discharges from its MS4 to the Charles River and its tributaries to achieve consistency with the WLA for phosphorus loading published in the final TMDL.</p> <ul style="list-style-type: none"> • PCP development includes priority ranking of areas and infrastructure for implementation of phosphorus control practices. • Description of non-structural controls • Permittee shall complete an inventory and priority ranking of MS4 owned property and infrastructure that may have potential to be retrofitted with structural BMPs. • Establishment of an estimate of annual phosphorus loads for calendar year 2010 discharging into the Charles river basin or tributaries. 	Begin Year 1, complete plan development within 4 years
PCP-YR2 Annual Report	YR2 annual report includes additional info showing progress in development of the following: funding source assessment, legal analysis, identification of anticipated incentives and guidance, initial estimates of loads and reductions, potential measures for implementation in non-regulated areas, inventory and priority ranking, and offsite mitigation credit system.	Within 2 years
PCP Complete written document	<p>Complete PCP written document within 4 years and include as part of the SWMP and includes:</p> <ul style="list-style-type: none"> • legal analysis, Incentives/assistance, Mapping, Prioritization, Non-structural controls, Structural controls, Phosphorus loadings and reductions, Design and construction schedule, Funding sources, and Third party implementers. 	Within 4 years
Implement PCP	<p>Implementation of PCP Plan</p> <ul style="list-style-type: none"> • Beginning one year after implementation of PCP permittee shall estimate reduction in phosphorus loading 	Within 4 years, complete within 10 years
Additional Public Education	<ul style="list-style-type: none"> • Residential education program must address proper use of fertilizers, alternatives to fertilizers, and detergents etc. septic system maintenance • Distribute educational materials to dog owners with license or renewal about detrimental impact of pet waste and requirements for waste collection and disposal as well as penalties for non-compliance. • Business/commercial and industrial - include education on alternative fertilizers with lower nutrient compositions, proper use of, parking lot /street sweeping benefits, methods for recycling yard waste as fertilizer 	

Requirement	Description	Time Line
Additional IDDE Mapping Requirements	<ul style="list-style-type: none"> include sewer system infrastructure operation and maintenance, investigations, remediation, and capital projects including (sewer infrastructure cleaning/repair projects that have or will occur within 5 years of effective date of permit, alignments and I/I investigations and sanitary sewer remediation work, planned capital improvement projects relative to utility and roadway work, proposed phasing of future illicit discharge investigations, septic system info including locations and dates of title 5 inspections, upgrades and repairs) land use, impervious cover, soil types, locations with excessive nutrient loading public and private parking lots, yard waste storage or compost facilities, parks, fields, golf, and green space where turf is fertilized. street alignments w/ deciduous trees, areas with highly erodible soils, other areas w/ known or suspected significant sources of phosphorus structural controls public and private municipal owned vacant land suitable for structural practice 	
IDDE- Discovery	<p>IDDE- systematic illicit discharge discovery process</p> <ul style="list-style-type: none"> (1)Infrastructure, verification and preparation (2)Dry weather criteria (3)Junction manhole inspection methodology (4)field monitoring (5)isolations and confirmation of illicit discharges (6)removal of illicit discharges (7) work progression and schedule (8)reporting and evaluation (9)modifications 	
Public Green Space	Optimize the application of fertilizers	within 1 year
Leaf collection	Leaf collection Municipal leaf litter collection and disposal	
Pet waste	<ul style="list-style-type: none"> Identify locations within community where inappropriate pet waste management practices are apparent and pose threat to receiving waters. Implement targeted management efforts. Document effectiveness of program in annual report 	Identify within 1 year , Implement within 2 years
Waterfowl	<ul style="list-style-type: none"> Identify public lands where waterfowl congregate and feeding by the public occurs. Begin dissemination of educational materials Implement practices that discourage congregation of waterfowl. 	Identify within 1 year , Education within 2 years, implement within 3 years

Requirement	Description	Time Line
CBIP	Catch basin inventory program CBIP that utilizes a mapping element combined with record keeping to catalogue each catch basin inspection, maintenance, and management information. Use a GIS tracking system or well organized paper mapping system. Utilize information compiled through CBIP to optimize cleaning routines and frequencies. Investigate catch basin that are found to have sumps 50% full at the time of inspections two times in a row.	Within 1 year
SOP	<p>Sweep twice per calendar year all municipal roadways and open-air parking lots with directly connected impervious area (DCIA) discharging to the MS4.</p> <ul style="list-style-type: none"> • Implement a street sweeping optimization program (SOP) that utilizes mapping and recordkeeping elements to track street and parking lot cleaning statistics over time. • Record cleaning dates, frequencies, equipment, techniques, volume of material collected. • Permittee shall use information collected through its SOP to facilitate refinement of its sweeping program 	Within 1 year
Dry Weather Monitoring	If the discharge is included in the waste load allocation in an approved TMDL the permittee shall also monitor dry weather discharges for the pollutant identified as the cause of impairment.	
Wet Weather Monitoring	If the discharge is included in the waste load allocation in an approved TMDL the permittee shall also monitor wet weather discharges for the pollutant identified as the cause of impairment.	

Table B.3: Summary of requirements for DDs under the RDA General Permit

Requirement	Requirement Description	Time Line
NOI	<ul style="list-style-type: none"> Designated Discharge Sites that come into existence after the effective date of the permit within 180 days, Or within 60 days of commencement of creation of impervious surfaces, Alternatively, within 90 days of EPA request to site operator. 	Within 180, 60, or 90 days (see description)
National Historic Preservation Act	Permit requires compliance with NHPA Criteria A, B,C, or D	Prior to authorization to discharge
Stormwater Management Plan (SMP)	<p>The SMP is a written document, maintained on site, immediately available to EPA or member of the public upon request.</p> <ul style="list-style-type: none"> Identify responsible Stormwater Management Team, Sweeping must occur at least twice a year on paved surfaces, Management of snow and de-icing chemicals, Management of Solid Waste and Hazardous Materials , Permittee must provide proper disposal of waste and pet waste, weekly inspections of site for trash and debris, Stabilization of exposed soil areas, Proper management of landscaped areas, Permittee to reduce or eliminate the use of fertilizers containing phosphorus. Permit also requires a plan to remove organic waste from impervious surfaces, Proper management of landscaped areas within water supply areas, Additional pollution prevention and source control measures for portions of the designated discharge site devoted to non-residential uses. Permittee is required to take inventory of all structural stormwater BMPs, to assess their condition and to make repairs where necessary, Permittee to operate and maintain structural stormwater BMPs at the site, Integration of stormwater management activities under other NPDES stormwater permits, Maintain logbook documenting activities that have occurred, when, and responsible party for implementation. Permittee to implement an IDDE program to systematically find and eliminate sources of non-stormwater that may contribute to increased pollutant discharges from the site. 	Within 30 days of authorization to discharge
Preliminary Phosphorus Reduction Plan	<p>Site suitability analysis-potential of DD site to achieve on-site TP reductions. Permittee required to perform the following:</p> <ul style="list-style-type: none"> Develop detail map of DD site; Conduct inventory of the sites characteristics and regular activities; Site inventory report presenting details of information depicted on site map and details of activities, site uses, quantify impervious and pervious area for each sub-drainage area on map, detail stormwater infrastructure, and existing BMPs. 	On or before 2 nd anniversary of authorization to discharge date.

Requirement	Requirement Description	Time Line
	<ul style="list-style-type: none"> Non-structural stormwater phosphorus BMPs need to be identified along with reduction credit amount and supporting calculations (monthly or weekly sweeping, semi-annual catch basin cleaning, elimination of fertilizer containing Phosphorus, or organic/leaf litter collection program) Structural stormwater BMPs –evaluate site suitability of structural controls (highest practicable level of control 1-inch rainfall), and 65% reduction annual phosphorus load from developed impervious and pervious surfaces on site, Identify site constraints that prohibit the use of infiltration Assess retrofit potential of existing BMPs Phosphorus reduction estimates for structural BMPs identified in site suitability assessment Permittee may bypass the site suitability analysis and elect one-inch certification; this encourages permittees to build structural BMPs at earlier date than required by permit, Permittee must include in its site suitability analysis a statement indicating if the permittee intends to satisfy its phosphorus reduction requirement through enhanced non-structural BMPs, structural BMPs, or participation in CMPP or combination of all. Provide plan to municipality, or upstream municipality with CMPP that permittee wishes to join. 	
Final Phosphorus Reduction Plan	<ul style="list-style-type: none"> Negotiate involvement with CMPP, and finalize approach to satisfying the Phosphorus reduction requirement. Plan/report to assess the extent of phosphorus reduction that on-site BMPs will achieve to meet reduction, the shortfalls, and that which will be satisfied through participation in the CMPP. 	On or before 3 rd anniversary of authorization to discharge date.
Complete Plans and Permits or Certification of Participation in CMPP	<ul style="list-style-type: none"> Develop plans, secure all necessary permits for constructing BMPs on-site, Certify participation in the CMPP, if applicable. Implement enhanced non-structural BMPs Develop Operations and Maintenance plan (include monthly BMP inspections, periodic removal of accumulated sediment, routine maintenance, and repairs) Document adherence to O&M for existing BMPs to receive credit 	On or before 4th anniversary of authorization to discharge date.
Structural Stormwater BMPs constructed	<ul style="list-style-type: none"> Permittee must construct all BMPs proposed in Final Phosphorus reduction plan. Certify to EPA that they are constructed and operational 	On or before 5th anniversary of authorization to discharge date.
Annual compliance Certification	<ul style="list-style-type: none"> Certify satisfaction of ongoing obligations under permit, Certify that measures are being implemented to satisfy base line performance standards, Certify satisfactory participation in the CMPP, if applicable; and Report Operation and Maintenance 	On or before each (Feb. 15 th) anniversary of authorization to discharge date.

Requirement	Requirement Description	Time Line
Water Quality Based Effluent Limitations	<ul style="list-style-type: none"> • Protect water quality through the implementation of BMPs or participation in CMPP, • Compliance with water quality standards for discharges from DD site, • Identify impairments to the Charles River other than phosphorus or bacteria that the DD may be contributing, and incorporate into base line site management plan and Phosphorus reduction plan (PRP) • Assess whether discharge is contributing to an impairment, address in SMP and PRP, • When aware that a discharge causes or contributes to a violation of water quality, take corrective action within 60 days • Document corrective measures • Increased discharge not meeting PRP, report on measures to come into compliance in next annual report (e.g., additional BMP), and • New discharge is not authorized by current permit, must submit documentation to EPA before effective date of authorization that either there is sufficient remaining pollutant load allocation and existing discharges to waterbody are subject to compliance schedules 	Discharge corrective action within 60 days, report annually
Antidegradation	<ul style="list-style-type: none"> • Notify EPA and DEP, include description of the discharge and documentation demonstrating satisfaction of anti-degradation provisions of Massachusetts water quality standards (level of water quality to be maintained and protected). • Demonstrate that the discharge will not lower current water quality, stormwater controls designed for no discharge of the 1" storm event. 	60 days prior to commencement of new or increased discharge

Appendix C

Certified Municipal Phosphorus Program (CMPP) Assessment

Certified Municipal Phosphorus Program (CMPP) – Possible Approach¹ and A Potential Model for Developing a Phosphorus Credit Trading Program

Introduction and Background

The Final Total Maximum Daily Load for Nutrients in the Lower Charles River Basin, Massachusetts CN 301.0 (“Lower Charles River Phosphorus TMDL” or “TMDL”) was developed through a landuse analysis of the Charles River watershed. The land use analysis indicated that stormwater discharges from large impervious surfaces are notably contributing to this excessive phosphorus loading to the river. The TMDL sets wasteload reductions from phosphorus sources throughout the entire Charles River watershed.

In April 2010, EPA Region 1 issued a draft general permit to cover stormwater discharges from Designated Discharge (DD) properties subject to the “General Permit for Designated Discharges in the Charles River Watershed in the Municipalities of Milford, Bellingham, and Franklin, Massachusetts – Authorization to Discharge under the National Pollutant Discharge Elimination System” (RDA GP). The draft RDA GP specifies that control is necessary based upon wasteload allocations in the TMDL, and because they are contributing to water quality standards violations in Massachusetts. The RDA GP, if adopted, would establish requirements to assure that DD properties do not cause or contribute to violations of Massachusetts water quality standards.

The draft RDA GP also requires the development and implementation of a comprehensive stormwater management plan (SMP) and a Final Phosphorus Reduction Plan (PRP) as the mechanisms to achieve the required pollutant reductions. In the development and implementation of a site-specific PRP, a permittee may rely upon both structural and non-structural best management practices (BMPs) to meet its “Phosphorus Reduction Requirement,” and a permittee is required to identify these measures within its PRP. Specifically, each permittee is required to assure a phosphorus load reduction that equals 65% of the load from developed areas of the permittee’s DD Site (i.e., the Phosphorus Reduction Requirement). This can be achieved by any one or a combination of three methods:

- 1) Enhanced non-structural BMPs;
- 2) On-site structural BMPs; and/or
- 3) Participation in a Certified Municipal Phosphorus Program.

In the development of the draft RDA GP, EPA contemplated that many permittees will opt to participate in the CMPP, as it potentially offers a number of advantages to both a permittee and a municipality if the municipality’s overall phosphorus load reduction is accomplished under a coordinated and centralized management program. Some of the expected advantages from a CMPP include:

- Lower overall program costs for meeting phosphorus reduction objectives through optimized placement and sizing of the best performing BMPs;

¹ Based in part upon the Federal ILF Program for Aquatic Resource Mitigation

- Shared responsibility for installing, operating, and maintaining BMPs; and
- Efficiencies in the number of BMPs likely to be needed community-wide to achieve the phosphorus reductions.

Both the permittee and a municipality that has adopted a CMPP will also enjoy the benefit that each can apply the phosphorus reductions against its own phosphorus reduction obligations.

Development of a CMPP also allows for the creation of a trading system by which a permittee that is unable to meet its minimum Phosphorus Reduction Requirement, or who otherwise does not wish to engage in on-site construction projects, may still be able to meet its Phosphorus Reduction Requirement. EPA anticipates that many regulated permittees will also opt to participate within a CMPP for the potential financial benefits. In other words, certain participating permittees may find a monetary incentive to control their stormwater above and beyond the required 65% minimum phosphorus reduction if there is an ability to sell the excess phosphorus reduction “credits” to other permittees participating in the CMPP. At the same time, a DD site needing credits (as an alternative to constructing on-site measures) to meet its Phosphorus Reduction Requirement, would seek out credits from other participants within the CMPP. This system might also create a system of checks and balances that will allow the individual DD’s as well as the municipality to meet its obligations under the TMDL.

Establishing a trading mechanism, setting the pricing factors for phosphorus “credits,” and conducting multi-party negotiations to develop an agreement among all permittees that will assure compliance with the Permit, can conceivably be complex and time consuming. Thus, a model would need to be developed to allow this phosphorus credit trading to occur that is in compliance with the Permit.

Potential Model for CMPP Adoption

One potential model for pursuing phosphorus mitigation for the Upper Charles Watershed TMDL would be to model the establishment and operation of a CMPP after the federal In Lieu Fee (ILF) program for wetlands mitigation that has been established under Section 404 of the Clean Water Act.

Under the federally adopted rules and regulations for an ILF program, an ILF program sponsor, run by a government agency (or non-profit organization), must first develop a Site Protection Instrument, which is defined as the legal program document that establishes the various required elements of the ILF program that must be pre-approved by the appropriate federal agency (which in this case of this program is the Army Corps of Engineers, in conjunction with other federal, state, and or local agencies, or collectively referred to as the “Interagency Review Team” or IRT). Among other things, the “Instrument” defines the “service area” in which the ILF program will operate (where wetland mitigation projects must be located to compensate for wetland impacts that are permitted to occur, which is typically watershed-based), outlines the accounting procedures for documenting allowable mitigation credits and defines who will have the mitigation responsibility. The Instrument also establishes the compensation planning

framework, reporting protocols, the method for determining the fees, and a schedule by which credits can be sold.

Once this Instrument is approved, the ILF provider may sell advance mitigation credits to permittees that require mitigation for impacts to aquatic resources within the approved service area. When sufficient credits have been sold, the ILF provider then identifies suitable mitigation sites and implements one or more mitigation projects that provide suitable mitigation to off-set for permitted alterations to aquatic resources. Each mitigation site must have an individual Mitigation Plan that further outlines the site-specific elements that will ensure a long-term sustainable compensatory mitigation project. These include identifying the objectives of the program; a work plan and a maintenance plan; credit determination; site selection factors; an individual Site Protection Instrument to ensure the long-term viability of a mitigation site; establishing baseline data; identifying performance standards and a monitoring plan for ensuring the performance standards are met; and establishing a long-term management plan and an adaptive management plan to ensure the mitigation site continues to function in the way it is designed in perpetuity. Finally, the ILF program must provide financial assurances that the program will continue to have the funds available to continue operating into the future.

An ILF program essentially affords the opportunity for permittees to comply with a 404 Permit, allowing them to meet mitigation requirements through the purchase of mitigation credits, rather than requiring on-site mitigation for every wetland impact. In turn, the ILF program sponsor will then implement the required mitigation within the same service area. Since mitigation credits are often sold before a mitigation project is undertaken, a series of strict timelines is set into place to ensure that appropriate mitigation is implemented after a certain number of credits is sold.

With this type of "third-party" compensatory mitigation, the responsibility for compensatory mitigation implementation and success is assumed by governmental or non-profit entity and not by the permittee. In other words, permittees who participate in an ILF program by purchasing mitigation credits transfer the mitigation responsibility for the design, construction, monitoring, ecological success, and long-term protection of the mitigation site. These programs provide a high level of assurance that mitigation will be provided, and that the mitigation will be sustainable into the future, and are now officially sanctioned as one of the preferred methods for providing mitigation over on-site mitigation to compensate for unavoidable wetland impacts.

How a CMPP Parallels the ILF Program

Using the ILF program as a model, a CMPP would operate in a similar manner, establishing a sustainable working program through a governmental entity (i.e., a participating municipality), to collect fees from permittees (DD sites), which will then be used to identify, design, construct, and maintain suitable, and presumably more cost effective, sites within the watershed to meet part of total collective Phosphorus Reduction Requirements of those DD sites that require phosphorus “credits.” Through a CMPP, a DD would be allowed the flexibility to meet its individual Phosphorus Reduction Requirement in one of two ways:

- 1) either through individual on-site construction of stormwater BMP practices (whether or not the construction of which provides a “surplus” of phosphorus credits, which could then be used to off-set other DD sites’ Phosphorus Reduction Requirement(s)), or
- 2) through credits purchased through the CMPP.

The CMPP would then use the revenue from purchased credits, supplemented by annual fees collected from all participating DDs within the municipality, to construct and maintain a suite of the most cost effective stormwater facilities in appropriate locations within the watershed toward meeting the Phosphorus Reduction Requirements of the CMPP participants and the municipality. However, unlike the federal ILF program where a third party (ILF provider) assumes all responsibility for the mitigation, with the CMPP, the participating DD sites would still have to ensure that the CMPP is meeting their individual PRRs as required by the RDA GP.

Similar to an ILF program and the Instrument that governs its operations, in order to ensure that a CMPP is sustainable, the CMPP must first establish the authority and purpose of its mission, as well as an assessment of the contributing watershed to the Charles River within the municipality, the funding mechanism and credit schedule, and an open communication and cooperation with the CMPP participants.

Once the CMPP is established, suitable sites for construction of stormwater facilities must be identified, and each site must also have a Phosphorus Reduction Plan or PRP (similar to a Mitigation Plan under the ILF program), that outlines the objectives and procedures for each site. A description of the various elements of a CMPP is described below, including the overall CMPP structure, the possible process for setting up a CMPP, and the minimum elements of a site-specific PRP for each site.

Possible CMPP Structure

1) Authority of the CMPP

The federal authority for establishing the CMPP is the Federal Clean Water Act under Sections 401 and 402 as it relates to upholding Massachusetts’ Water Quality Standards. The purpose of the CMPP would be to operate at the local level to ensure that these laws are upheld and that the municipality is fulfilling its obligations under the General Permit for Designated Discharges in the Charles River Watershed in the Municipalities of Milford, Bellingham, and Franklin, Massachusetts. The Massachusetts Constitution created a limited

home rule mechanism² granting certain powers to cities and towns, including the ability for municipalities to exercise a power or function through the approval of its legislative body (town meeting, city council, or town council) and its voters, such as the adoption of an ordinance or by-law.

The CMPP would be granted these powers under a Memorandum of Agreement (MOA) between the participating parties (i.e., municipal sponsor of program, the property owners of DD sites, and the EPA). The MOA would constitute a binding contract among all parties and thus an enforceable agreement between the permittees and the municipality for ensuring compliance with permit obligations.

It may also be necessary for the CMPP to be formally adopted under a local bylaw (such as a stormwater bylaw). As such, the CMPP will likely require adoption at a town meeting or through Town Council action. It is possible that this may also be done through a modification of existing regulations under planning and zoning bylaws, which would be simpler, and not require town-wide action.

2) Organizational Structure Within A Municipal Department

It is anticipated that the CMPP would identify municipal staff (most likely DPW) responsible for CMPP implementation and oversight. Program implementation will likely require a minimum staff commitment, which would need to be established and approved by local government. This Program Administrator would be responsible for ensuring that the necessary services of the CMPP are conducted (e.g., watershed planning, site identification, design and construction procurement of phosphorus reduction controls), and for associated administrative duties, including fee collections, record-keeping, and annual reporting.

To maintain a system that provides effective services to both the municipality and the DD permittee, there should also be an governing board or separate committee (“CMPP Governing Board”) authorized by the Selectmen or Town Council, and made up of members from other municipal boards and committees (similar to a Community Preservation Committee or CMP), as well as representatives from the participating DD permittees. Participation from the DDs is a critical component of the governing board, as DD participants will have a vested interest in the CMPP success and viability, as they are individually responsible for their own Phosphorus Reduction Requirement. The CMPP Governing Board would need to establish a regular meeting schedule. There may need to be some participation/ oversight from the state (Massachusetts Department of Environmental Protection (DEP), the state agency responsible for upholding the state’s Water Quality Standards), and/or the EPA.

² The Home Rule Amendment, Amendment Article 89 to the Massachusetts Constitution, and M.G.L. Ch. 43B (1966).

3) Powers

Under the bylaws and/or regulations, the program sponsor (CMPP Governing Board) should be granted the powers to establish and collect fees, borrow money, enter into contracts with DD permittees, provide enforcement, and establish easements.

4) Budget

The municipality must formally develop and maintain a budget for the CMPP. Budget costs include program administrative costs, watershed planning, planning and development costs for identifying appropriate sites, site inspections and long-term maintenance of individual sites, and enforcement of agreements between the CMPP and participating DDs (e.g., drainage and/or right of entry easements on private properties).

The budget must be to be established in consideration of the actual costs for development and operation of the CMPP (see below). The budget must also have procedures in place for re-evaluating the CMPP fee structure on a regular basis, to ensure the long-term sustainability of the program, taking into account inflation costs.

Possible Procedures for Establishing and Maintaining a CMPP

The following procedures are suggested as a possible approach to establish and maintain a CMPP at the municipal level.

- 1) **Baseline Documentation.** Within each municipality, identify the number of DD parcels, the contributing phosphorus (P) load from each, and total required P load reduction to meet cumulative P reduction requirements of all the DDs within each municipality. This will provide the framework for maximum participation of the DDs in the CMPP.
- 2) **Solicit the Level of Participation Interest from DDs.** This will help gauge the number of potential participating DDs and help inform initial revenue levels. This can be accomplished by holding public forum(s) in each municipality and providing outreach materials, fact sheets, and direct mailings to each DD.
- 3) **Develop a Stakeholder Group.** The stakeholder group may be equivalent to the CMPP Governing Board, and would include DPW staff (or other appointed staff), other representatives from municipal boards, potentially a representative from MA DEP and/or EPA, and a cross-section of representatives from DD property owners within the municipality.
- 4) **Conduct a Preliminary Watershed Management Plan.** This preliminary watershed plan will identify the initial target phosphorus reduction estimate and the best locations for construction of structural BMPs. The initial watershed plan will provide an initial estimate of a potential Fee Structure (see below), and the Preliminary Watershed Management Plan should identify opportunities for offering non-structural credits such as enhanced street sweeping or impervious cover removal (with a permanent Conservation Easement).

- 5) **Establish Memorandum of Agreement between DDs and Municipality.** The MOA will constitute a legally-binding document identifying the authority of the CMPP, the organization and powers of the CMPP, and will become the instrument upon which the program is structured (e.g., an outline for participation, maintenance responsibilities, limits of liability, etc.).
- 6) **Fee Structure.** Establish procedures to develop initial annual fee per acre of impervious cover to be collected from each DD participant. Fees will be applied toward the planning, design, construction, inspection/maintenance, and reporting at each management site, as well as maintenance of non-structural controls (e.g., street sweeping), based on cost estimates identified in the Preliminary Watershed Management Plan. The Fee Structure should be a simple fee structure based upon a flat rate for P-load reduction or impervious area. Credits should be granted for those DDs willing and able to provide greater P-load reductions through on-site implementation of stormwater BMPs that may generate credits for other DD participants. A separate fee structure should also be established for those DDs opting to participate through alternative means, whereby credits are provided/generated for removal of impervious cover or tree planting without construction of BMPs. The Fee Structure should be reevaluated by the CMPP Committee during the development of the CMPP, and at regular intervals thereafter.
- 7) **Conduct Refined Watershed Plan.** The Final Watershed Plan will identify specific sites and a tentative schedule for implementation. It should include a design level (e.g., 25% design plans) for each site identified, with detailed cost estimates for the design, permitting, establishment of easements (including any legal fees), construction, and maintenance of each “shared” site. The fee structure should also be revisited at this time to ensure costs are commensurate with the initial fee structure developed under Step 6.
- 8) **Establish a Timeline for Control Practice Installation.** Establish a timeline for identification and initiation of program with a goal of achieving a certain percentage of P reduction within the watershed each year until full compliance (65% P reduction for all DDs) is realized. As with the fee schedule, the implementation timeline should be reevaluated on a regular basis to ensure the program is on track.
- 9) **As-Built Assurance Program.** Establish a system of reporting and follow up site inspections to ensure that the required BMPs have been implemented, and that the P reduction goals are being met. Rather than relying upon costly water quality monitoring data, this Assurance Program may be based upon established P reduction rate of the various practices used for compliance. The CMPP Governing Board should determine content of these as-built assessment reports (a simple table or data sheet with a narrative backup), and the minimum frequency (annual) for reporting requirements by both the DD sites that opt to provide on-site mitigation to meet their Phosphorus Reduction Requirement, and by the municipal agent responsible for the oversight of town-wide BMPs. The CMPP Committee should also establish a minimum timeline for the duration of the as-built assurance program

(e.g., inspections to ensure maintenance is being performed). This As-Built Assurance Program should also include contingencies for follow up should remedial measures be needed, and a timeline for implementation of remedial measures.

- 10) Reporting Program.** The CMPP should establish a program for reporting to the state and federal authorities regarding the progress and relative success of the CMPP in meeting the Phosphorus Reduction Requirement. The reporting program should involve reporting of annual inspection results (as outlined under the As-Built Assurance Program) above, as well as the overall success of the program on the watershed scale. The municipal agent would be responsible for preparing the watershed scale report that identifies the goals and objectives met, milestones achieved, remedial actions necessary, and next steps.
- 11) Cycle for CMPP Update.** The CMPP Governing Board or an appointed advisory group for the program, and made up of representatives of the municipality, the DD stakeholders, DEP and EPA, would meet at regular intervals once the program is underway. Procedures should be established to assess the overall program, and a report should be generated to determine program progress and success in alleviating P loading into the watershed. A system should also be established for assessing program issues and providing remedial actions. This flexibility would be built into the MOA.

Minimum Elements of a Site-Specific Phosphorus Reduction Plan

Each management site would be required to have in place a Phosphorus Reduction Plan addressing the following minimum elements.

The draft RDA GP contemplates that DD permittees will develop and submit a Site Suitability Analysis for their properties to the municipality in which they are located. This is to include the following:

- A site map with location of impervious surfaces, infrastructure, and outfall pipes, among other information;
- A site inventory report including uses and activities on the subject DD site;
- An analysis of potential enhanced non-structural control measures that might be feasible on the subject DD site;
- An initial analysis of potential structural BMPs that are capable, in conjunction with non-structural control measures of achieving the required 65% phosphorus reduction;
- An estimate of the phosphorus load reduction achievable based on the above information;
- Submission of the Site Suitability Analysis to the municipality or any upstream municipality in which a CMPP may be established.

The above information is then incorporated into a Final Phosphorus Reduction Plan and Report that would document the methods of phosphorus load reduction as well as both non-structural

and structural controls where applicable, and include design plans, construction specifications, as-built certifications, operation and maintenance plans, and annual certification of compliance, among other elements.

It seems reasonable that the sites that participate in a CMPP program would require the same data and information at the municipal scale, as at the individual DD site scale, as well as the following to ensure long-term phosphorus controls:

- a. **Phosphorus Control Objectives**—How much phosphorus reduction is targeted at each location and does this meet the requirements to cumulative reduce 65% from all DD site;
- b. **Additional Baseline Information**;
 - Site Section Factors (determine the characteristics of the most appropriate site of implementation of phosphorus control measures);
 - Define existing conditions and whether non-structural controls are targeted at particular sites, identify physical and operational constraints (e.g., wetlands, open space, existing utilities, etc.), confirm P load reduction capabilities;
- c. **Provide a Work Plan for Implementation**—Include a schedule for project siting, addressing legal issues (establishing easements, right of entry, etc.), design, permitting, and construction);
- d. **Site Protection Designation**—Conservation Easements; right of entry on private property; or outright Fee Simple purchase);
- e. **Operation and Maintenance Plan**—Provide inspection and maintenance requirements and frequency for each phosphorus reduction site);
- f. **Performance Standards**—Level of P removal required for each site based upon existing P load and target removals and methods to ensure P removal levels are achieved);
- g. **Site As-Built Assurance Requirements**—Parameters measured; methods; frequency of inspection; party responsible; and content of report);
- h. **Financial Assurances**—Provide adequate funding (non-wasting) for all aspects of program, from construction to long-term maintenance);
- i. **Adaptive Management Plan**—Create a plan for corrective actions (as necessary) and site flexibility if BMP is under-performing or over-performing (may allow for additional credits in the future, or require less P load reduction elsewhere).

Should there be other means for opting into the CMPP and gaining credits (i.e., through the sale of a property or establishment of a permanent Conservation Easement on a property such that impervious surfaces could be removed and/or the land subsequently converted to a stormwater practice), then only certain elements would be necessary. For instance, only elements a, b, d, h, and i would be necessary for a property that was donated to the CMPP or otherwise not slated for the construction of a stormwater practice.

Consideration for a Potential Model for Developing a Phosphorus Credit Trading Program

Based upon this model, development of a “Phosphorus Credit Trading Program” within the context of a CMPP would be a useful tool to allow for the production and sale of phosphorus reduction “credits” to other permittees participating in the CMPP.

Key components of the development of a Phosphorus Credit Trading Program would be to ensure that baseline conditions were established for all DD Sites – both those providing the credits and those needing them – as well as a means of establishing performance standards for those DD Sites providing credits, either quantitative or qualitative, and establishing standard monitoring protocols to ensure compliance with the CMPP.

Establishing a Phosphorus Credit Trading Program will require advanced planning by each municipality, and necessitate the imposition of certain checks and balances on the credit program. Some considerations in the development of a Phosphorus Credit Trading Program include:

- Determining who should sponsor the Phosphorus Credit Trading Program. This would likely be the municipality, but would there be a particular department in the municipality, and whether there would be any outside oversight from EPA and/or DEP;
- Developing a means of establishing phosphorus credit trading values – possibly basing this upon the cost of implementing certain BMP practices, based upon the type of stormwater practice(s) implemented and the amount of P removal reported using the Stormwater BMP Performance Analysis curves (per Tetra Tech, 2008; revised March 2010);
- Determining whether it is necessary to limit “service areas” for Phosphorus Credit Trading Programs, for instance, establishing this on a sub-watershed basis;
- Determining whether the overall goal of the CMPP is to have all DD Sites be required to provide some phosphorus reduction to the “extent practicable” (i.e., whether DD Sites would only be considered eligible to purchase phosphorus credits after demonstrating that they cannot feasibly come into compliance with the 65% reduction in phosphorus vs. achieving compliance by any means). This aspect of the Phosphorus Credit Trading Program may also be self-regulating depending on the cost per credit;
- Determining the value of each phosphorus credit, and when and how phosphorus credits should be released;
- Determining how the monies generated by the phosphorus credits would be utilized in the municipality. For instance, if private DD sites are allowed to provide credits, this might result in an enterprising endeavor, and there would need to be checks and balances in place (e.g., similar to those found within an Instrument for an ILF program), or whether this Phosphorus Credit Trading Program may be more or less self-regulated

by the local economy. Ideally, the monies generated through any Phosphorus Credit Trading Program would be used to further the interests of the TMDL;

- Establishing a stringent as-built assurance program and requiring all compliance inspections to be conducted by an independent individual. The inspection program should include, at a minimum, the parameters to be inspected, the party responsible for assuring compliance, the content of the inspection reports, and the length of the required inspection period;
- Establishing a means of assuring that properties providing the phosphorus credits do not fall below the stringent standards established in the CMPP minimum requirements of the Phosphorus Reduction Requirement, for instance, through a stringent inspection program with pre-established protocols. It may be important to also establish a means of putting phosphorous credit providers on “probation” should a performance standard not be met (i.e., not allowing them to provide credits through the program). If the Phosphorus Credit Trading Program is developed in a manner similar to an ILF Program, failure on behalf of a phosphorus credit provider, should not result in penalties rendered against those DD Site properties relying upon the Phosphorus Credit Trading Program, without some recourse;
- Establishing a long-term management plan of the Phosphorus Credit Trading Program that is tied to an overall stormwater BMP maintenance plan for each site that is providing credits within the CMPP; and finally,
- Determining a measure of success of the Phosphorus Credit Trading Program, that focuses on measurable outcomes (quantitative or qualitative) that are enforceable.

Appendix D

Existing and Future Program Cost Spreadsheets

D-1 Town of Bellingham

D-13 Town of Franklin

D-24 Town of Milford

Sustainable Stormwater Funding in the Upper Charles
Town of Bellingham, Stormwater Cost of Service
Cost of Service Analysis; Burdened Personnel Costs, Summary by Cost Subcategory

Major Cost Category	Existing	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Description (existing)	Description (future)
Cost Subcategory									
Administration									
General Stormwater Program Administration	\$ 2,760	\$ 4,140	\$ 4,140	\$ 4,140	\$ 4,140	\$ 4,140	\$ 4,684	Periodic review and tracking of tasks & subcontractors	Periodic review and tracking of tasks & subcontractors (50% workload increase due to enhanced program)
Legal Support Services	N/A		\$ 5,000			\$ 5,000	\$ 5,657	N/A	Legal review of regulatory changes in Years 2, & 5
Inter-Agency Coordination (MA hwy, CRWA, EPA)	\$ 1,275	\$ 1,913	\$ 1,913	\$ 1,913	\$ 1,913	\$ 1,913	\$ 2,164	Share information, attend workshops & seminars, utilize CRWA fact sheets for public education	50% increase to existing efforts
Inter-Municipal Coordination (adj. Towns)	N/A	\$ 1,275	\$ 1,275	\$ 1,275	\$ 1,275	\$ 1,275	\$ 1,443	N/A	Meet twice a year to review and coordinate programs
Emergency/Disaster Management Coordination	\$ -	\$ 1,275	\$ 1,275	\$ 1,275	\$ 1,275	\$ 1,275	\$ 1,443	N/A	Meet twice a year to review and coordinate programs
NPDES NOI and SWMP	N/A	\$ 36,040	\$ -	\$ -	\$ 16,275		\$ -	N/A	Prepare NOI and SWMP in Year 1, assume prepared by consultant, Year 4 incorporate PCP plan into SWMP,
NPDES Annual Reporting	\$ 3,660	\$ -	\$ 7,320	\$ 7,320	\$ 7,320	\$ 7,320	\$ 8,282	Completed by DPW Director, input & review by Town staff	100% increase from existing, completed by program director and reviewed by town staff,
NPDES MS4 Public Education Programs	\$ 3,000	\$ 10,170	\$ 10,842	\$ 4,860	\$ 8,940	\$ 10,307	\$ 11,661	Distribution of fact sheets for stormwater & water resource and Illicit Discharge, CBTV Posting on Runoff/Re-use/recharge and photos of Illicit Discharge.	Workload increase from existing; distribute at least 2 messages to each of 4 audiences (residents, commercial, industrial, construction), measure & report message effectiveness
NPDES MS4 Public Involvement Programs	\$ 4,275	\$ 9,560	\$ 9,560	\$ 8,560	\$ 8,560	\$ 8,560	\$ 9,685	Water Resource Comm. (WRC) 2 televised public meetings per yr. & Youth summer water awareness program	2x WRC Public meetings, update website w/ annual report&events,river clean-up day, storm drain stencil, rain barrel workshop or similar presentation
NPDES MS4 & SPCC Training	\$ 1,591	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,657	SPCC & pollution prevention/good housekeeping for DPW, DPW staff training on IDDE with written memo and photos	SWPPP training for Transfer Station, DPW Facility & pollution prevention/good housekeeping and IDDE for all DPW; SPCC training at DPW Facility; all training done by a consultant; programs developed and training in Year 1, refresher training each year thereafter
Certified Municipal Phosphorous Program (CMPP)	N/A	\$ -	\$ -	\$ -	\$ -	\$ 9,995	\$ 11,308	N/A	Recordkeeping, data tracking (GIS mapping updates)and correspondence with regulated entities for updating program progress under "Water Quality"
Grants Program (s319, 604b, CZM)	\$ 1,860	\$ -	\$ 1,860	\$ -	\$ 1,860	\$ -	\$ -	604b pilot study grant, chapter 90 grant (for exist. Transp. Infrastructure improvements)	Staff efforts to apply for and administer grants received for stormwater programs; assumes one permit every two years
Subtotal:	\$ 18,421	\$ 69,373	\$ 48,185	\$ 34,343	\$ 56,558	\$ 54,785	\$ 61,984		
Regulation/Enforcement									
MS4 Stormwater Permit Administration	\$ -	\$ 1,275	\$ 1,275	\$ 1,275	\$ 1,275	\$ 1,275	\$ 1,443	1 new permit for construction site 1+ Acre (review by consultant paid for by developer)	Anticipated administration of 3 permits annually- review by consultant paid for by developer, cost of program coordination
RDA/CMPP Compliance	N/A	\$ -	\$ -	\$ -	\$ -	\$ 10,875	\$ 12,304	N/A	Inspection of facilities to verify accuracy of information submitted under the CMPP
Stormwater/Drainage System Inspections	\$ 900	\$ 1,125	\$ 1,125	\$ 1,125	\$ 1,125	\$ 1,125	\$ 1,273	DPW inspects Town projects; private projects are inspected at the cost to the developer or permittee, town inspector inspects some	25% increase in workload due to various programs
Illicit Discharge Detection and Elimination	\$ -	\$ -	\$ 9,750	\$ 9,750	\$ 9,750	\$ 9,750	\$ 11,031	N/A- no issues reported, Issues are reported through hotline or BOH, very few (1 pursued in 8yrs)	Includes identification of IDDE sources- assume 10% of outfalls (sampled in dry-weather monitoring program) have illicit discharge (24 hits over permit cycle-start YR2), estimate cost to identify source \$1200 per hit. Removal costs are borne by owner of source/discharge, staff time for coordination and enforcement
Erosion/sediment Control Inspections	\$ 900	\$ 1,350	\$ 1,350	\$ 1,350	\$ 1,350	\$ 1,350	\$ 1,527	DPW inspects Town projects; private projects are inspected at the cost to the developer or permittee, town inspector inspects some	50% increase in workload due to additional maintenance and construction work
Subtotal:	\$ 1,800	\$ 3,750	\$ 13,500	\$ 13,500	\$ 13,500	\$ 24,375	\$ 27,578		

Engineering and Master Planning									
Stormwater Master Planning	N/A	\$ 92,600	\$ 88,100	\$ 75,100	\$ 75,100	\$ 19,980	\$ 22,606	Master Plan on Hold, CIP on Hold , planning for infrastructure -currently no money	Develop a CIP based on the Phosphorous Control Plan and infrastructure needs, develop PCP by year 4, yr-5 GIS update of new BMPs , resulting TP reductions, CIP planning based on infrastructure needs
Illicit Discharge Detection and Elimination plan	N/A	\$ 17,035	\$ 5,000	\$ -	\$ -	\$ 6,275	\$ 7,100	N/A	Update IDDE Plan in Year 1 to meet new permit requirements, Year 1 - Director time for coordination SSO, including delineation of and prioritization of catchments YR1, and coordination with Sewer/Health Dept for mapping requirements, YR 2 update mapping, performed under data collection and mapping task. yr5 detailed report of removals
Catchbasin Inventory Plan (CBIP) Plan and Street sweeping optimization	N/A	\$ 6,170	\$ 80,170	\$ 80,170	\$ 6,170	\$ 6,170	\$ 6,981	GIS map complete of known infrastructure, pipes&outfalls, cont. updates , currently sweep some streets and catch basins are cleaned infrequently, only as needed	Year 1- develop CBIP and standard operating procedure (SOP) to sweep areas with DCIA twice/ year, Years 2-5-implement CBIP recordkeeping of CB cleaning and status of CB, intern(s) accompany field crews to collect cleaning and sweeping data Yr 2&3, investigate CB w/ >50% full sump at 2 consecutive cleanings, record sweeping miles and materials generated.
Waterfowl & Pet Waste Management Programs	N/A	\$ 11,275	\$ 2,175	\$ 2,175	\$ 2,175	\$ 2,175	\$ 2,461	N/A	Develop programs by end of Year 1, assume cost management plan, annual coordination and reporting
Septic, Inflow, and Infiltration Program	N/A	\$ 1,020	\$ 1,020	\$ 1,020	\$ 1,020	\$ 1,020	\$ 1,154	Sanitary sewer (I/I) investigations and improvements tracked to document condition and status of system,	Cost of coordination between board of health and stormwater program director to evaluate potential impacts from septic systems (assume impacts identified as part of IDDE plan-prioritization mapping task),
Pesticide, Herbicide, and Fertilizer Program	N/A	\$ 2,550	\$ 2,550	\$ 2,550	\$ 2,550	\$ 2,550	\$ 2,885	Applications follow the principles of an Integrated Pest Management (IPM) Program to reduce chemical applications for pest and turf management,	Continue IPM & Implement fertilizer optimization program Year 1, assume requires coordination with multiple depts.
Spill Response and Cleanup Program	N/A	\$ -	\$ 7,945	\$ 3,445	\$ 3,445	\$ 9,220	\$ 10,432	No formal program related to stormwater	Year 2 - Develop a priority response program based on high accident areas, significant pollutant potential and proximity to receiving waters; Years 3 & 4 - track program results and coordinate with Town departments; Year 5 - update priority response program and track program results and coordinate with Town departments
Groundwater and Drinking Water Program	N/A	\$ 7,250	\$ 2,550	\$ 2,550	\$ 2,550	\$ 2,550	\$ 2,885	No formal evaluation of priorities & results with respect to water supply	Year 1 - technical review memo of drinking water quantity and quality priority areas; Years 2 through 5 - incorporate program results into planning activities for BMPs to address water quality; review status annually
DPW Project Design Engineering and permitting assistance	N/A	\$ 6,275	\$ 6,275	\$ 6,275	\$ 6,275	\$ 16,375	\$ 18,527	Design of roadway projects that incorporate stormwater improvements; retrofits designs for existing drainage systems (problem areas)	Increase in workload from existing, 2 projects per year, additional increase in projects for year 5 increased inspection, aging infrastructure
SWPPPs for Transfer Station & DPW Facility	\$ -	\$ 17,500	\$ 1,275	\$ 1,275	\$ 1,275	\$ 18,775	\$ 21,242	Municipal facility inventory completed (previous to 2010) to evaluate pollution prevention and good housekeeping at municipal facilities	Develop SWPPPs by end of Year 1; implement recommendations by end of Year 2; update every 5 years
Maintenance and Field Engineering Support	\$ 10,000	\$ 12,500	\$ 12,500	\$ 12,500	\$ 12,500	\$ 15,000	\$ 16,971	Engineers assist DPW on an on-call basis	25% increase in workload from existing, 50% increase YR 5
Drainage -Data Collection,Database Management, Mapping	\$ 7,000	\$ 127,472	\$ 127,472	\$ 33,050	\$ 33,050	\$ 33,050	\$ 37,393	Field Data collected for existing infrastructure and new projects (GIS update) - consultant	complete system mapping Year 2 cost includes mapping of entire drainage network (schematic only); continue data collection, field verification and update mapping annually, YR5 tracking and update mapping for IC reduction (PCP implementation)
<u>Sewer</u> -Data Collection,Database Management, Mapping	\$ -	\$ -	\$ 43,500	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,657	Field Data collected for existing infrastructure and new projects (GIS update) - consultant	sewer infrastructure mapping, (assume that this update includes time to collect plans, schematics, and info from Sewer/Health Dept. ,incorporate existing attribute data into GIS, address data gaps), continue field verification and update mapping annually,
Technical Services/Public Assistance (hotlines)	\$ -	\$ 1,860	\$ 1,860	\$ 1,860	\$ 1,860	\$ 1,860	\$ 2,104	Handle calls for Illicit Discharge	increase in workload, handle calls related to illicit discharge and flooding
Code Development and Zoning Support Services	N/A	\$ 7,500	\$ 17,500	\$ 12,500	\$ 6,275	\$ 6,275	\$ 7,100	N/A-bylaws for illicit discharge , stormwater mgmt and ESC are in place (2007)	Review and update ESC, SW, IDDE as needed by YR2, Report on local regulations affecting impervious areas in Year 2, report on feasibility of green practices and other green techniques in Year 3, Year 4 & 5 ongoing compliance support
Hazard Mitigation Planning and Flood Insurance Updates	N/A	\$ -	\$ -	\$ -	\$ -	\$ 25,000	\$ 28,285	N/A	Allowance for H&H analysis (consultant) in Year 5 for specific areas of concern identified during the permit term
CMPP Planning and Development	N/A	\$ -	\$ 20,000	\$ 20,000	\$ 20,000	\$ -	\$ -	N/A	Years 2 through 4 - planning and set up for a Certified Municipal Phosphorous Program; data collection and review of regulated sites for phosphorous reduction, review of credits, etc.
Subtotal:	\$ 17,000	\$ 311,007	\$ 419,892	\$ 259,470	\$ 179,245	\$ 171,275	\$ 193,782		

Operations and Implementation									
<i>Operations and Maintenance Management</i>	\$ 14,250	\$ 26,375	\$ 21,375	\$ 21,375	\$ 21,375	\$ 22,800	\$ 25,796	DPW coordinates work schedules, equipment and product needs, oversees progress and completion of work (2% DPW Director time + Asst DPW + Foreman)-Labor is fully burdened	Year 1 Develop detailed O&M program for municipal facilities, parks, buildings, streets, vehicle storage, infrastructure, and SWPPP, 50% increase in effort from existing due to new projects and tracking of results (measurable goals) for each activity, Year 5 increase due to implementation & const. of BMP's for PCP
<i>CIP/Infrastructure Implementation</i>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	No formal program; infrastructure needs incorporated into Highway Budget for operations, CIP funded through grants or CHP 90	Annual needs evaluation, incorporate capital projects for infrastructure improvements
<i>IDDE-Removal</i>	N/A	\$ 14,070	\$ 14,070	\$ 14,070	\$ 14,070	\$ 14,070	\$ 15,919	IDDE's not detected, cost of private IDDE source elimination to be re-imbursed to town, if applicable per bylaw	Assume cost of removal is borne by owner or sewer dept.,cost of illicit discharge removal infrastructure improvements
<i>Storm Sewer and Culvert Maintenance/Repair</i>	\$ 1,000	\$ 7,850	\$ 7,850	\$ 7,850	\$ 7,850	\$ 7,850	\$ 8,882	500 LF of storm drain cleaned	increase due to degraded infrastructure, address and maintain infrastructure
<i>Inlet, Catch Basin, and Manhole Cleaning</i>	\$ 25,070	\$ 115,300	\$ 115,300	\$ 115,300	\$ 115,300	\$ 115,300	\$ 130,451	Clean some of the 158 catch basins and manholes, disposed of 183 tons material- hwy budget	Clean/ inspect all catch basins (approx. 2025) and manholes each year, assume cost to address all catch basins \$55 per catch basin
<i>Stormwater BMP Facility Maintenance</i>	\$ 13,838	\$ 13,583	\$ 13,583	\$ 13,583	\$ 13,583	\$ 14,566	\$ 16,480	BMPs - 24 cleaned regularly, others as issues arise. Seven in-line bmp structures inspected quarterly and cleaned as needed	Continue cleaning and maintenance of all BMP locations in first 4 years;5% increase year 5 maintenance increase due to aging infrastructure identified from inspection programs ,
<i>Street Sweeping</i>	\$ 128,900	\$ 257,800	\$ 257,800	\$ 257,800	\$ 257,800	\$ 257,800	\$ 291,677	continuous sweeping as weather permits ~8mos/yr average once/yr	Increase effort, fuel, supplies,& disposal to Sweep streets 2x and directly connected municipal parking areas 2x per year, 96 centerline miles roadway per MassDOT
<i>Fall Leaf-pickup</i>	N/A	\$ -	\$ -	\$ -	\$ -	\$ 76,800	\$ 86,892	N/A - leaf pickup program not in place	Begin leaf collection in Year 5, assume \$400/curb mile, 96 center line miles roadway per MassDOT
<i>Maintenance/Repair/Installation of ESC practices</i>	\$ -	\$ 7,850	\$ 7,850	\$ 7,850	\$ 7,850	\$ 7,850	\$ 8,882	Repair of areas in spring damaged by snow plowing; repair of other eroded areas due to major rain events, (road repairs - budgeted amount)	Allowance for repair activities
<i>Stream Restoration/Stabilization</i>	N/A	\$ -	\$ -	\$ 19,785	\$ -	\$ -	\$ -	N/A	Complete one stream restoration project every 3 years;
<i>Ditch and Channel Maintenance</i>	N/A	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	N/A	N/A
<i>Waterfowl & Pet Waste Management Programs</i>	N/A	\$ -	\$ 4,000	\$ 8,500	\$ 6,500	\$ 6,500	\$ 7,354	N/A	Install waterfowl education signs at congregation areas by Year 2; install pet waste stations at key areas of concern by Year 2; implement waterfowl deterrents by Year 3; maintain programs annually
<i>Public Assistance Program</i>	N/A	\$ 3,720	\$ 3,720	\$ 3,720	\$ 3,720	\$ 3,720	\$ 4,209	public awareness but No incentive program in place to encourage Relocation of roof leaders into catch basins; disconnection of identified illicit discharges	continue creating public awareness & encourage disconnection of impervious areas
<i>Hazardous / Toxic Materials Collection Program</i>	\$ 11,860	\$ 11,860	\$ 11,860	\$ 11,860	\$ 11,860	\$ 11,860	\$ 13,419	Annual household hazardous waste collection, 25% participation, includes cost of staff coordination for program.	Continue existing practices
<i>Emergency Drainage Repairs</i>	\$ -	\$ 11,620	\$ 11,620	\$ 11,620	\$ 11,620	\$ 11,620	\$ 13,147	Annual allowance for unexpected repair of failed drainage structures	Allowance for repair activities identified through inspection programs
Subtotal:	\$ 194,918	\$ 470,028	\$ 469,028	\$ 493,313	\$ 471,528	\$ 550,736	\$ 623,107		
Monitoring									
<i>Catchment Assessment & Inventory /Outfall Monitoring (dry weather)</i>	\$ -	\$ 1,275	\$ 37,600	\$ 37,600	\$ 37,600	\$ 37,600	\$ 42,541	Inventory completed 2003-permit, 240 outfalls	Assess 50% of catchments by Year 3, monitor 50% of outfalls by Year 4 and 100% of catchments and outfalls by Year 5; 240 outfalls and sampling of 20%; catchment assessments include key junction manhole inspections (i.e., damming of inlet pipes),
<i>Stormwater Outfall Monitoring (wet weather)</i>	N/A	\$ 16,375	\$ 40,375	\$ 40,375	\$ 40,375	\$ 40,375	\$ 45,681	N/A	Develop Permittee Specific Monitoring Plan in Year 1; sample 25% of outfalls each year beginning in Year 2
Subtotal:	\$ -	\$ 17,650	\$ 77,975	\$ 77,975	\$ 77,975	\$ 77,975	\$ 88,222		
TOTAL:	\$ 232,139	\$ 871,807	\$ 1,028,579	\$ 878,601	\$ 798,806	\$ 879,145	\$ 994,672		Cost in 2011 Dollars
Future Total Including 2.5% Annual Inflation:	\$ 232,139	\$ 893,603	\$ 1,080,651	\$ 946,157	\$ 881,732	\$ 994,672	\$ 1,273,265		Annual inflation of 2.5% is an average of historic inflation values reported for the last 10 years based on Consumer Price Index

Note:Year 10 cost based on year 5 estimated cost (2011 dollars) projected out 5 years at 2.5% inflation

Sustainable Stormwater Funding in the Upper Charles
Town of Bellingham, Stormwater Cost of Service
Program Administration: Existing & Future Cost Supporting Data

		Subcontractors (units = fee)				Burdened Personnel (rate = salary + 50%, units = FTE)			Expenses						Description
	Source	Consulting Engineer	GIS Technician-Consultant	IT Tech. or Consultant	Legal Counsel	DPW Director	DPW Office Manager	Assistant DPW Director	Mileage	Postage	Disposal	Other	Total Cost	Total FTE	
	Rate	1	1	1	1	\$127,500	\$58,500	\$90,000	\$0.51	\$0.44	1	1			
Administration	# Units														
General Stormwater Program Administration	Existing					0.010		0.010					\$ 2,175	0.02	Periodic review and tracking of tasks & subcontractors
	Proposed*					0.015		0.015					\$ 3,263	0.03	Periodic review and tracking of tasks & subcontractors (50% workload increase due to enhanced program)
Legal Support Services	Existing	-				-	-	-	-	-		-	\$ -	0.00	N/A
	Proposed*				\$5,000								\$ 5,000	0.00	Legal review of regulatory changes in Years 2&5
Administrative Support Services	Existing						0.010						\$ 585	0.01	Assist in mailings, preparation of budgets, etc.
	Proposed*						0.015						\$ 878	0.02	50% workload increase from existing
Inter-Agency Coordination (CRWA, MA-HWY, EPA)	Existing					0.010							\$ 1,275	0.01	Share information, attend workshops & seminars, utilize CRWA fact sheets for public education
	Proposed*					0.015							\$ 1,913	0.02	Continue existing efforts
Inter-Municipal Coordination (adj. Towns)	Existing	-			-	-	-	-	-	-		-	\$ -	0.00	N/A
	Proposed*					0.010							\$ 1,275	0.01	Meet twice a year to review and coordinate programs
Emergency/Disaster Management Coordination	Existing													0.00	N/A
	Proposed*					0.010							\$ 1,275	0.01	Meet twice a year to review and coordinate programs
NPDES NOI and SWMP	Existing	-			-	-	-	-	-	-		-	\$ -	0.00	N/A
	Proposed*-YR1	\$36,040											\$ 36,040	0.00	Prepare NOI and SWMP in Year 1,
	Proposed*- YR 4	\$15,000				0.01							\$ 16,275	0.01	Year 4 incorporate PCP into SWMP
NPDES Annual Reporting	Existing					0.01	0.01	0.02					\$ 3,660	0.04	Completed byDPW director, input & review by Town staff
	Proposed*-YR 1-5					0.02	0.02	0.04					\$ 7,320	0.08	100% increase from existing, completed by consultant, input & review by Town staff
	Proposed*-Average/Year												\$ 7,320	0.00	100% increase from existing, completed by consultant, input & review by Town staff
NPDES MS4 Public Education Programs	Existing											3,000.00	\$ 3,000	0.00	Distribution of fact sheets for stormwater & water resource and Illicit Discharge, CBTV Posting on Runoff/Re-use/recharge and photos of Illicit Discharge.
	Proposed*-YR 1	\$4,200				0.03	0.03					1,320.00	\$ 10,170	0.05	2 educational messages one to target residents (radio ad) and one to developers audience (brochures w/ permit application), program measure of effectiveness to meet program goals
	Proposed*-YR 2	\$4,200				0.03	0.03			925		1,585.00	\$ 10,842	0.05	2 educational messages one to target commercial (mailed brochure) and one to industrial audience (mailed brochures)
	Proposed*-YR 3	\$3,000				0.01	0.01						\$ 4,860	0.02	Consultant-Survey of educational program effectiveness (1000 telephone surveys)
	Proposed*-YR 4	\$3,600				0.03	0.03					690.00	\$ 8,940	0.05	2 educational messages to target residents (newspaper ad) and developer audience (brochures w/ permit application)
	Proposed*-YR 5	\$3,600				0.03	0.03			925		1,650.00	\$ 10,307	0.05	2 educational messages one to target commercial (mailing &presentation at local business assoc. meeting) and one to industrial audience (mailed brochures)
	Proposed*-Average/Year												\$ 9,024	0.00	Workload increase from existing; distribute at least 2 messages to each of 4 audiences (residents, commercial, industrial, construction), measure & report message effectiveness

		Subcontractors (units = fee)				Burdened Personnel (rate = salary + 50%, units = FTE)			Expenses						Description
	Source	Consulting Engineer	GIS Technician-Consultant	IT Tech. or Consultant	Legal Counsel	DPW Director	DPW Office Manager	Assistant DPW Director	Mileage	Postage	Disposal	Other	Total	Total	
	Rate	1	1	1	1	\$127,500	\$58,500	\$90,000	\$0.51	\$0.44	1	1	Cost	FTE	
Administration	# Units														
NPDES MS4 Public Involvement Programs	Existing					0.010						3,000.00	\$ 4,275	0.01	Water Resource Comm. (WRC) 2 televised public meetings per yr. & Youth summer water awareness program
	Proposed*-YR 1			\$800		0.010	0.010	0.010			1,000.00	5,000.00	\$ 9,560	0.04	2x water resource comm. Public meetings, update website w/ annual report and events,river clean-up day, and storm drain stencil &supplies
	Proposed*-YR 2			\$800		0.010	0.010	0.010			1,000.00	5,000.00	\$ 9,560	0.04	2x WRC Public meetings, update website w/ annual report&events,river clean-up day, storm drain stencil, rain barrel workshop or similar presentation
	Proposed*-YR 3-5			\$800		0.010	0.010	0.010			1,000.00	4,000.00	\$ 8,560	0.04	2x WRC Public meetings, update website w/ annual report&events,river clean-up day, storm drain stencil, rain barrel workshop or similar presentation
	Proposed*-Averaged/Year												\$ 8,960	0.00	2x WRC Public meetings, update website w/ annual report&events,river clean-up day, storm drain stencil, rain barrel workshop or similar presentation
NPDES MS4 & SPCC Training	Existing						0.010	0.010				106.00	\$ 1,591	0.02	SPCC & pollution prevention/good housekeeping for DPW, DPW staff training on IDDE with written memo and photos
	Proposed*	\$5,000											\$ 5,000	0.00	Annual SWPPP training for Transfer Station, DPW Facility & pollution prevention/good housekeeping and IDDE for all DPW; SPCC training at DPW Facility; all training done by a consultant; programs developed and training in Year 1, refresher training each year thereafter
Certified Municipal Phosphorous Program (CMPP)	Existing	-			-	-	-	-	-	-		-	\$ -	0.00	N/A
	Proposed* YR5	\$5,000				0.03	0.02						\$ 9,995	0.05	Recordkeeping, data tracking and correspondence with regulated entities for updating program progress under "Water Quality"
Grants Program (s319, 604b, CZM)	Existing					0.010	0.010						\$ 1,860	0.02	604b pilot study grant, chapter 90 grant (for exist. Transp. Infrastructure improvements)
	Proposed*					0.010	0.010						\$ 1,860	0.02	Staff efforts to apply for and administer grants received for stormwater programs; assumes one permit every two years-same level of effort
Stormwater Advisory Committee Support	Existing	-			-	-	-	-	-	-		-	\$ -	0.00	N/A
	Proposed*												\$ -	0.00	Incorporated into general stormwater program administration
Unspecified Overhead	Existing												\$ -	0.00	Copies, postage, consumables
	Proposed*												\$ -	0.00	50% increase from existing
Emergency/Disaster Management	Existing	-			-	-	-	-	-	-		-	\$ -	0.00	N/A
	Proposed*												\$ -	0.00	Coordinate stormwater program with LEPC, meet twice a year
Total:	Existing	\$0			0	0.050	0.040	0.040	0.000	0.000	0.000	6,106	\$18,421	0.13	
	Proposed*-YR 1	\$50,240	\$0	\$800	\$5,000	0.09	0.05	0.03	0.00	\$0	\$1,000	\$6,320	\$69,373	0.17	
	Proposed*-YR 2	\$14,200	\$0	\$800	\$5,000	0.12	0.08	0.07	0.00	\$925	\$1,000	\$6,585	\$48,185	0.27	
	Proposed*-YR 3	\$13,000	\$0	\$800	\$5,000	0.09	0.06	0.07	0.00	\$0	\$1,000	\$4,000	\$34,343	0.22	
	Proposed*-YR 4	\$28,600	\$0	\$800	\$5,000	0.13	0.08	0.07	0.00	\$0	\$1,000	\$4,690	\$56,558	0.28	
	Proposed*-YR 5	\$13,600	\$0	\$800	\$5,000	0.14	0.09	0.07	0.00	\$925	\$1,000	\$5,650	\$54,785	0.30	

*Proposed Includes Additional Stormwater Staff Support

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Town of Bellingham, Stormwater Cost of Service
Regulation/Enforcement: Existing & Future Cost Supporting Data

		Subcontractors (units = fee)			Burdened Personnel (rate = salary +50%, units = FTE)			Expenses					Description
	Source	Consulting Engineer	GIS Technician-Consultant	Legal Counsel	DPW Director	Asst. DPW Director	DPW Office Manager	Mileage	Postage	Other	Total Cost	Total FTE	
	Rate	1	1	1	\$127,500	\$90,000	\$58,500	\$0.51	\$0.44	1			
Regulation/Enforcement	# Units												
MS4 Stormwater Permit Administration	Existing										\$ -	0.00	No new permits
	Proposed*				0.01	0.01					\$ 1,275	0.02	Anticipated administration of 3 project permits annually, cost borne by developer
RDA/CMPP Compliance	Existing										\$ -	0.00	N/A
	Proposed*		\$5,000		0.05	0.05					\$ 10,875	0.10	Inspection of facilities to verify accuracy of information submitted under the CMPP
Stormwater/Drainage System Inspections	Existing					0.010					\$ 900	0.01	Currently conducted by Engineering Department to review compliance of post-construction BMPs or connections with the MS4, \$500 estimate provided by DPW
	Proposed*					0.013					\$ 1,125	0.01	25% increase in workload due to various programs
Illicit Discharge and Dumping Program	Existing										\$ -	0.00	Issues are reported through the stormwater hotline or the Board of Health, mostly related to dumping, very few each year
	Proposed*				0.02					\$7,200	\$ 9,750	0.02	Includes identification of IDDE sources- assume 50% of dry-weather sampled outfalls have illicit discharge (24 hits over permit cycle), estimate cost to identify source \$1200 per hit. assume removal costs are borne by property owner or sewer authority - annual cost begin YR2, director effort for oversight/coordination of enforcement, Source-IDDE Manual-cost per hit
Erosion/sediment Control Inspections	Existing					0.010					\$ 900	0.01	Engineering inspects Town projects; private projects are inspected at the cost of the developer or permittee
	Proposed*					0.015					\$ 1,350	0.02	50% increase in workload due to additional maintenance and construction work
Total:	Existing	\$0	\$0	\$0	0.00	0.02	0.00	\$0	\$0	\$0	\$1,800	0.02	
	Proposed*-YR1	\$0	\$0	\$0	0.01	0.04	0.00	\$0	\$0	\$0	\$3,750	0.05	
	Proposed*-YR2	\$0	\$0	\$0	0.03	0.04	0.00	\$0	\$0	\$7,200	\$13,500	0.07	
	Proposed*-YR3	\$0	\$0	\$0	0.03	0.04	0.00	\$0	\$0	\$7,200	\$13,500	0.07	
	Proposed*-YR4	\$0	\$0	\$0	0.03	0.04	0.00	\$0	\$0	\$7,200	\$13,500	0.07	
	Proposed*-YR5	\$0	\$5,000	\$0	0.08	0.10	0.00	\$0	\$0	\$7,200	\$24,375	0.17	

*Proposed Includes Additional Stormwater Staff Support

Sustainable Stormwater Funding in the Upper Charles
Town of Bellingham, Stormwater Cost of Service
Engineering & Master Planning: Existing & Future Cost Supporting Data

		Subcontractors (units = fee)			Burdened Personnel (rate = salary+50%, units = FTE)					Expenses					
	Source Rate	Consulting Engineer 1	GIS Technician-Consultant 1	Legal Counsel 1	Town Administrator \$187,500	DPW Director \$127,500	Asst. DPW Director \$90,000	DPW Office Manager \$58,500	SW program Intern \$45,000	Mileage \$0.51	Postage \$0.44	Other 1	Total Cost	Total FTE	Description
Engineering & Master Planning	# Units														
Stormwater Master Planning, includes PCP/CIP planning, link with comp plan; planning for infrastructure needs, includes facility inventory for SW retrofit	Existing												\$ -	0.00	
	Proposed*-YR 1	\$82,500	\$5,000			0.04							\$ 92,600	0.04	PCP Development and Adjust IC loads and % removal from 2000-2009, facility retrofit
	Proposed*-YR 2	\$58,000	\$25,000			0.04							\$ 88,100	0.04	PCP development and YR 2 Progress Report, facility retrofit inventory (1/2 yr2)
	Proposed*-YR 3	\$70,000				0.04							\$ 75,100	0.04	PCP development
	Proposed*-YR 4	\$60,000		10,000		0.04							\$ 75,100	0.04	PCP development
	Proposed*-YR 5	\$15,000	\$1,500		0.01	0.01		0.01					\$ 19,980	0.03	Annual tracking and update GIS with BMPs installed &TP reductions, annual reporting of new BMPs and resulting TP reduction, CIP plan by consultant review by staff
Illicit Discharge Detection and Elimination Plan	Existing												\$ -	0.00	IDDE Plan developed during 2003 permit
	Proposed*-YR 1	\$10,000	\$5,760			0.010							\$ 17,035	0.01	Update IDDE Plan in Year 1 to meet new permit requirements, Delineation of and prioritization of catchments ,
	Proposed*-YR 2		\$5,000										\$ 5,000	0.00	Update catchment delineation based on mapping changes/updates
	Proposed*-YR 5	\$5,000				0.010							\$ 6,275	0.01	detailed report of illicit connection/discharge removals, YR5
Catch Basin Inventory Plan (CBIP) Plan and Street Sweeping Optimization	Existing												\$ -	0.00	N/A
	Proposed*-YR 1,4,5		\$5,000					0.02	0.00				\$ 6,170	0.02	Upfront cost to develop/set up tracking system and route planning, YR1
	Proposed*-2&3		\$2,500					0.02	1.70				\$ 80,170	1.72	Year 1- develop CBIP and standard operating procedure (SOP) to sweep areas with DCIA twice/ year, Years 2-5-implement CBIP recordkeeping of CB cleaning and status of CB, intern(s) accompany field crews to collect cleaning and sweeping data, investigate CB w/ >50% full sump at 2 consecutive cleanings, record sweeping miles and materials generated.
Waterfowl & Pet Waste Management Programs	Existing												\$ -	0.00	N/A
	Proposed* Annual					0.01	0.01						\$ 2,175	0.02	Annual coordination
	Proposed* YR-1	\$10,000				0.01							\$ 11,275	0.01	assume pet & waterfowl locations identified in retrofit inventory, Cost of consultant producing written managemnet plan
Septic, Inflow, and Infiltration Program	Existing												\$ -	0.00	Sanitary sewer (I/I) investigations and improvements tracked to document condition and status of system,
	Proposed*					0.01							\$ 1,020	0.01	Continue existing program; evaluate potential impacts from septic systems; 60% of Town has sewer service
Pesticide, Herbicide, and Fertilizer Program	Existing												\$ -	0.00	Applications follow the principles of an Integrated Pest Management (IPM) Program to reduce chemical applications for pest and turf management
	Proposed*					0.02							\$ 2,550	0.02	Continue IPM & Implement fertilizer optimization program Year 1, assume requires coordination with multiple depts.
Toxic and Hazardous Materials Control Program	Existing												\$ -	0.00	Annual household hazardous waste collection-accounted for in operations and implementation
	Proposed*												\$ -	0.00	Continue existing program
Spill Response and Cleanup Program	Existing												\$ -	0.00	No formal program related to stormwater
	Proposed* YR2	\$4,500	\$1,000			0.01		0.02					\$ 7,945	0.03	Develop a priority response program based on high accident areas, significant pollutant potential and proximity to receiving waters
	Proposed* YR 3-4		\$1,000			0.01		0.02					\$ 3,445	0.03	Track program results and coordinate with Town departments
	Proposed* YR 5	\$4,500	\$1,000			0.02		0.02					\$ 9,220	0.04	Update priority response program and track program results and coordinate with Town departments
Groundwater and Drinking Water Program	Existing												\$ -	0.00	No formal evaluation of priorities & results with respect to water supply
	Proposed*- YR1	\$4,700				0.02							\$ 7,250	0.02	Technical review memo of drinking water quantity and quality priority areas , includes consultant GIS map exercise
	Proposed* YR- 2-5					0.02							\$ 2,550	0.02	Incorporate program results into planning activities for BMPs to address water quality; review status annually
DPW Project Design Engineering and Permitting Assistance	Existing												\$ -	0.00	design of town roadway projects that incorporate stormwater improvements
	Proposed* YR- 1-3	\$5,000				0.01							\$ 6,275	0.01	increase in workload from existing to 2 projects,
	Proposed* YR 5+	\$10,000				0.05							\$ 16,375	0.05	double effort -additional increase in projects for year 4 implementation of PCP
SWPPPs for Transfer Station & DPW Facility	Existing												\$ -	0.00	Municipal facility inventory completed to evaluate pollution prevention and good housekeeping at municipal facilities
	Proposed* -YR1	\$17,500											\$ 17,500	0.00	Assume cost \$2500 per site for swppp and 1/4 of town owned bldgs (7) need swppp
	Proposed* -YR5	\$17,500				0.01							\$ 18,775	0.01	Assume cost \$2500 per site for swppp and 1/4 of town owned bldgs (7) need swppp, site inspection and report
	Proposed*-YR 2-4					0.01							\$ 1,275	0.01	Develop SWPPPs by end of Year 1; implement recommendations by end of Year 2; update every 5 years- includes annual site inspection by facility managers & reporting by SWMP director
Maintenance and Field Engineering Support	Existing	\$10,000											\$ 10,000	0.00	Engineers assist DPW on an on-call basis
	Proposed*	\$12,500											\$ 12,500	0.00	25% increase in workload from existing,
	Proposed* YR5+	\$15,000											\$ 15,000	0.00	50% increase year 5,

		Subcontractors (units = fee)			Burdened Personnel (rate = salary+50%, units = FTE)					Expenses			Total Cost	Total FTE	Description
	Source	Consulting Engineer	GIS Technician- Consultant	Legal Counsel	Town Administrator	DPW Director	Asst. DPW Director	DPW Office Manager	SW program Intern	Mileage	Postage	Other			
	Rate	1	1	1	\$187,500	\$127,500	\$90,000	\$58,500	\$45,000	\$0.51	\$0.44	1			
Engineering & Master Planning	# Units														
Data Collection, Database Management, Mapping	Existing	\$7,000											\$ 7,000	0.00	Field data collected for existing infrastructure and new projects (GIS update)
	Proposed*-YR 1		\$124,922			0.02							\$ 127,472	0.02	1/2 of stormwater infrastructure system mapping
	Proposed*-YR 2- Drainage		\$124,922			0.02							\$ 127,472	0.02	complete system mapping Year 2 cost includes mapping of entire drainage network (schematic only); and
	Proposed*-YR 2-Sewer		\$43,500										\$ 43,500	0.00	add sewer infrastructure, (assume that this update includes time to collect plans, schematics, and info from Sewer/Health Dept. ,incorporate existing attribute data into GIS), time included for consultant field time to address data gaps
	Proposed*-YR 3-5 Sewer		\$5,000										\$ 5,000	0.00	Years 3-5 update septic/ sewer attributes
	Proposed*-YR 3		\$30,500			0.02							\$ 33,050	0.02	Years 3 include field mapping and verification of drainage attributes
	Proposed*-YR 4		\$30,500			0.02							\$ 33,050	0.02	Years 4 include field mapping and verification of drainage attributes, update with new BMPs and retrofits, IC reduction tracking ,update gis with layers from developer,
	Proposed*-YR5		\$30,500			0.02							\$ 33,050	0.02	Years 5 include field mapping and verification of drainage attributes, update of new BMPs & retrofits, IC reduction tracking,update gis with layers from developer,
Technical Services/Public Assistance (hotlines)	Existing												\$ -	0.00	Handle calls related to flooding and illicit discharges
	Proposed*					0.01		0.01					\$ 1,860	0.02	increase in workload from existing
Code Development and Zoning Support Services	Existing												\$ -	0.00	Updates completed to comply with 2003 NPDES MS4 Permit
	Proposed*-YR 1	\$7,500											\$ 7,500	0.00	Consultant Review ESC, SW, and IDDE codes, develop or update written procedures for plan review, inspection, and ESC enforcement
	Proposed*-YR 2	\$17,500											\$ 17,500	0.00	Consultant complete Review of ESC, SW, and IDDE codes, review Impervious Cover requirements in codes
	Proposed*-YR 3	\$12,500											\$ 12,500	0.00	Report on feasibility of green practices and other green techniques in Year 3
	Proposed*-YR4 &5	\$5,000				0.01							\$ 6,275	0.01	Year 4 & 5 code compliance support
Hazard Mitigation Planning and Flood Insurance Updates	Existing												\$ -	0.00	N/A
	Proposed* YR5	\$25,000											\$ 25,000	0.00	Allowance for H&H analysis (consultant) in Year 5 for specific areas of concern identified throughout the permit term; review results of FEMA mapping updates for Norfolk County, anticipated within 5 years
CMPP Planning and Development	Existing														
	Proposed* YR2-4	\$20,000											\$ 20,000	0.00	Planning and development of CMPP program in Years 2, 3, and 4
Total:	Existing	\$17,000	\$0	0.00	0.00	0.00	0.00	0.00	0.00	\$0	\$0	\$0	\$ 17,000	0.00	
	Proposed*-YR 1	\$149,700	\$140,682	\$0	0.00	0.15	0.00	0.03	0.00	\$0	\$0	\$0	\$311,007	0.18	
	Proposed*-YR 2	\$117,500	\$201,922	\$0	0.00	0.16	0.01	0.05	1.70	\$0	\$0	\$0	\$419,892	1.92	
	Proposed*-YR 3	\$120,000	\$39,000	\$0	0.00	0.16	0.01	0.05	1.70	\$0	\$0	\$0	\$259,470	1.92	
	Proposed*-YR 4	\$90,000	\$39,000	\$10,000	0.00	0.17	0.01	0.05	0.00	\$0	\$0	\$0	\$179,245	0.23	
	Proposed*-YR 5	\$97,000	\$40,500	\$0	0.01	0.20	0.01	0.06	0.00	\$0	\$0	\$0	\$171,275	0.28	

*Proposed Includes Additional Stormwater Staff Support

Sustainable Stormwater Funding in the Upper Charles
Town of Bellingham, Stormwater Cost of Service
Operations & Implementation: Existing & Future Cost Supporting Data

		Subcontractors (units = fee)			Burdened Personnel (rate = salary+50%, units = FTE)					Expenses								Description
	Source	Consulting Engineer/ Subcontractor	GIS Technician Consultant	Legal Counsel	DPW Director	Asst. DPW Director	DPW Office Manager	Working Foreman/ Labor	Seasonal Labor	Equipment Budget/ replacement budget	Disposal	Vehicle Parts	Materials & Supplies	Fuel	Other	Total Cost	Total FTE	
	Rate	1	1	1	\$127,500	\$90,000	\$58,500	\$67,500	\$18,000	1	1	1	1	1	1			
Operations & Maintenance	# Units																	
Operations and Maintenance Management	Existing				0.05	0.05		0.05								\$ 14,250	0.15	Highway Foreman coordinates work schedules, equipment and product needs, oversees progress and completion of work
	Proposed* YR1	\$5,000			0.08	0.08		0.08								\$ 26,375	0.23	Develop detailed O&M program for municipal facilities, parks, buildings, streets, vehicle storage, infrastructure, and SWPPP
	Proposed* YR2-4				0.08	0.08		0.08								\$ 21,375	0.23	Highway Foreman coordinates work schedules, equipment and product needs, oversees progress and completion of work
	Proposed* YR5+				0.08	0.08		0.08								\$ 22,800	0.24	50% increase in effort from existing due to new projects and tracking of results (measurable goals) for each activity, Year 5 increase due to pcip implementation & const. of BMP's maintenance oversight
CIP/Infrastructure Implementation	Existing																0.00	No formal program; infrastructure needs incorporated into Highway Budget for operations, CIP funded through grants or CHP 90 or s319; stormwater improvements completed as part of Highway and Water Department Projects, including decreases to roadway width and removal of cul-de-sacs
	Proposed*																0.00	Annual needs evaluation, incorporate capital projects, evaluate stormwater improvement opportunities
PCP Implementation	Existing	\$0															0.00	N/A
	Proposed* YR-4+																0.00	Year 4 - implementation & construction of BMPs
Voluntary CMPP/RDA Implementation	Existing	\$0															0.00	N/A
	Proposed*																0.00	Year 5 - implementation of CMPP or construction of BMP
Illicit Discharge Removal	Existing	\$0															0.00	No formal program; no cross connections to MS4 identified thus far; illegal dumping removed by Highway Department and disposal coordinated with Board of Health
	Proposed*				0.02	0.04	0.02	0.10								\$ 14,070	0.18	Year 1 - address illicit discharge & Year 5 report on removals, cost of removal borne by discharger, include cost for infrastructure improvements required as part of removal
Storm Sewer and Culvert Maintenance/Repair	Existing	\$1,000														\$ 1,000	0.00	500 LF of storm drain cleaned
	Proposed*	\$2,000			0.01	0.01		0.01		3,000						\$ 7,850	0.03	increase due to degraded infrastructure, address and maintain infrastructure
Inlet, Catch Basin, and Manhole Cleaning	Existing							0.23		2,000	7,320					\$ 25,070	0.23	Clean approximately 158 catch basins and manholes per year
	Proposed*				0.02	0.02									\$112,750	\$ 115,300	0.04	Clean all catch basins and manholes each year (~2050 structures) \$55/basin -subcontract
Stormwater BMP Facility Maintenance	Existing							0.11							\$6,158	\$ 13,838	0.11	BMPs - 24 cleaned regularly, others as issues arise. Seven in-line bmp structures inspected quarterly and cleaned as needed
	Proposed* YR 1-4							0.11							\$6,158	\$ 13,583	0.11	Major cleaning and maintenance of all BMP locations in first 4 years;
	Proposed* YR 5							0.12							\$6,466	\$ 14,566	0.12	5% increase in activities due to imp. Of PCP plan

		Subcontractors (units = fee)			Burdened Personnel (rate = salary+50%, units = FTE)					Expenses								Description
	Source	Consulting Engineer/ Subcontractor	GIS Technician Consultant	Legal Counsel	DPW Director	Asst. DPW Director	DPW Office Manager	Working Foreman/ Labor	Seasonal Labor	Equipment Budget/ replacement budget	Disposal	Vehicle Parts	Materials & Supplies	Fuel	Other	Total Cost	Total FTE	
	Rate	1	1	1	\$127,500	\$90,000	\$58,500	\$67,500	\$18,000	1	1	1	1	1	1			
Operations & Maintenance	# Units																	
Street Sweeping	Existing							1.40		19,700	9,700	2,500		2,500		\$ 128,900	1.40	All streets are swept at least once a year, assume equipment replacement budget of \$19,700- based on sweeper replacement with regenerative air (\$197,000 purchase price,10yr life), equip cost of \$5000 provided by town covers annual maintenance and fuel
	Proposed*							2.80		39,400	19,400	5,000		5,000	\$8,000	\$ 257,800	2.80	double LOE and sweep directly connected municipal parking lots (assume 80% municipal bldgs have parking cost to sweep each 2x per year is \$400)- need to sweep all 2 times per year
Fall Leaf-pickup	Existing																0.00	N/A - leaf pickup program not in place, 96 miles town roads per MassDOT
	Proposed*														\$76,800	\$ 76,800	0.00	Begin leaf collection in Year 4
Maintenance/Repair/Installation of ESC practices	Existing														\$0		0.00	Repair of areas in spring damaged by snow plowing; repair of other eroded areas due to major rain events (road repairs - budgeted amount)
	Proposed*				0.01	0.01		0.01					5,000			\$ 7,850	0.03	Allowance for repair activities
Stream Restoration/Stabilization	Existing																0.00	N/A
	Proposed* YR 3				0.01	0.02		0.02	0.02				15,000			\$ 19,785	0.07	allowance to adress 1 stream project every 3 years, YR 3
Ditch and Channel Maintenance	Existing															\$ -	0.00	N/A
	Proposed*															\$ -	0.00	Continue existing maintenance activities
Waterfowl & Pet Waste Management Programs	Existing																0.00	N/A
	Proposed* YR-2												\$4,000			\$ 4,000	0.00	install pet waste collection bag stations, stock bags annually
	Proposed* YR-3	\$6,000											\$2,500			\$ 8,500	0.00	implement waterfowl controls (goose egg addling) and pet bags stock
	Proposed* YR 4-5	\$6,000											\$500			\$ 6,500	0.00	continue implementation of measures, stock supplies
Public Assistance Program	Existing																0.00	
	Proposed*				0.02		0.02									\$ 3,720	0.04	Create public awareness & incentive program to encourage disconnection of impervious areas to the storm sewer system
Hazardous / Toxic Materials Collection Program	Existing				0.01		0.01				10,000					\$ 11,860	0.02	collection program, administration time accounted for in Administration category
	Proposed*				0.01		0.01				10,000					\$ 11,860	0.02	continue existing activity
Emergency Drainage Repairs	Existing															\$ -	0.00	Annual allowance for unexpected repair of failed drainage structures
	Proposed* YR 1-5						0.01	0.01	0.02				10,000			\$ 11,620	0.04	allowance for improvements identified through inspection program
Total:	Existing	\$1,000		\$0	0.06	0.05	0.00	1.80	0.00	\$21,700	\$17,020	\$2,500	\$0	\$2,500	\$6,158	\$194,918	1.92	
	Proposed*-YR 1	\$7,000	\$0	\$0	0.17	0.16	0.06	3.12	0.02	\$42,400	\$29,400	\$5,000	\$15,000	\$5,000	\$126,908	\$470,028	3.52	
	Proposed*-YR 2	\$2,000	\$0	\$0	0.17	0.16	0.06	3.12	0.02	\$42,400	\$29,400	\$5,000	\$19,000	\$5,000	\$126,908	\$469,028	3.52	
	Proposed*-YR 3	\$8,000	\$0	\$0	0.18	0.18	0.06	3.14	0.04	\$42,400	\$29,400	\$5,000	\$30,500	\$5,000	\$126,908	\$493,313	3.59	
	Proposed*-YR 4	\$2,000	\$0	\$0	0.17	0.16	0.06	3.12	0.02	\$42,400	\$29,400	\$5,000	\$15,000	\$5,000	\$126,908	\$471,528	3.52	
	Proposed*-YR 5	\$8,000	\$0	\$0	0.17	0.16	0.06	3.13	0.02	\$42,400	\$29,400	\$5,000	\$15,500	\$5,000	\$204,016	\$550,736	3.54	

*Proposed Includes Additional Stormwater Staff Support

Sustainable Stormwater Funding in the Upper Charles
Town of Bellingham, Stormwater Cost of Service
Monitoring: Existing & Future Cost Supporting Data

		Subcontractors (units = fee)			Burdened Personnel (rate = salary+50%, units = FTE)						Expenses			Total Cost	Total FTE	Description
	Source Rate	Consulting Engineer	GIS Technician-Consultant	Legal Counsel	Town Administrator	DPW Director	Asst. DPW Director	Working Foreman/Labor	Seasonal Labor	DPW Office Manager	Mileage	Postage	Other			
		1	1	1	\$187,500	\$127,500	\$90,000	\$67,500	\$18,000	\$58,500	\$0.51	\$0.44	1			
Monitoring	# Units															
Catchment Assessment & Outfall Inventory/Monitoring (dry weather)	Existing													\$ -	0	All outfalls inspected once during dry weather conditions during the 2003 permit term-not required
	Proposed* YR1					0.01								\$ 1,275	0.01	SWMP director coordination and planning
	Proposed* YR2-5	\$22,900				0.040	0.02	0.08					\$2,400	\$ 37,600	0.14	Inventory 25% of outfalls each year beginning in Year 2 assume 20% of total 240 outfalls have dry flow and require sampling , coordination effort by program director, Assess Key Junction Manholes for dry
Stormwater Outfall Monitoring (wet weather)	Existing													\$ -	0	N/A
	Proposed* YR1	\$10,000				0.050								\$ 16,375	0.05	annual monitoring program coordination by program director, Develop Permittee Specific Monitoring Plan in Year 1
	Proposed* YR2-5	\$34,000	\$2,500			0.050								\$ 40,375	0.05	Sample 25% of outfalls each year beginning in Year 2- assume 80% of 240 outfalls are monitored, complete year 5
Surface Water Quality Monitoring	Existing													\$ -	0	N/A
	Proposed* YR 3&4	\$0				0.00	0.00							\$ -	0	
Total:	Existing	\$0	\$0	\$0	0.00	0.00	0.00	0.00	0.00	0.00	\$0	\$0	\$0	\$ -	0	
	Proposed* YR1	\$10,000	\$0	\$0	0.00	0.06	0.00	0.00	0.00	0.00	\$0	\$0	\$0	\$ 17,650	0.06	
	Proposed* YR2	\$56,900	\$2,500	\$0	0.00	0.09	0.02	0.08	0.00	0.00	\$0	\$0	\$2,400	\$ 77,975	0.19	
	Proposed* YR3	\$56,900	\$2,500	\$0	0.00	0.09	0.02	0.08	0.00	0.00	\$0	\$0	\$2,400	\$ 77,975	0.19	
	Proposed* YR4	\$56,900	\$2,500	\$0	0.00	0.09	0.02	0.08	0.00	0.00	\$0	\$0	\$2,400	\$ 77,975	0.19	
	Proposed* YR5	\$56,900	\$2,500	\$0	0.00	0.09	0.02	0.08	0.00	0.00	\$0	\$0	\$2,400	\$ 77,975	0.19	

*Proposed Includes Additional Stormwater Staff Support

Sustainable Stormwater Funding in the Upper Charles

Town of Franklin, Stormwater Cost of Service

Annual Cost of Service Analysis; Burdened Personnel Costs, Summary by Cost Subcategory by Year

Major Cost Category	Existing	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10*	Description (existing)	Description (future)
Cost Subcategory									
Administration									
General Stormwater Program Administration	\$ 12,510	\$ 18,765	\$ 18,765	\$ 18,765	\$ 18,765	\$ 18,765	\$ 21,111	Periodic review and tracking of tasks & subcontractors	Periodic review and tracking of tasks & subcontractors (50% workload increase due to enhanced program)
Legal Support Services	\$ 1,442	\$ -	\$ 2,885	\$ -	\$ -	\$ 2,885	\$ 3,245	Periodic review of regulatory changes (avg. over 5 years)	Legal review of regulatory changes in Years 2 & 5
Inter-Agency Coordination (MA Hwy, CRWA, EPA)	\$ 8,017	\$ 8,017	\$ 8,017	\$ 8,017	\$ 8,017	\$ 8,017	\$ 9,020	Share information, attend workshops & seminars, utilize CRWA & EPA fact sheets for public education	Continue existing efforts
Inter-Municipal Coordination (adj. Towns)	N/A	\$ 2,501	\$ 2,501	\$ 2,501	\$ 2,501	\$ 2,501	\$ 2,813	N/A	Meet twice a year to review and coordinate programs
Emergency/Disaster Management Coordination	\$ -	\$ 2,475	\$ 2,475	\$ 2,475	\$ 2,475	\$ 2,475	\$ 2,784	N/A	Coordinate stormwater program with LEPC, meet twice a year
NPDES MS4 NOI and SWMP	N/A	\$ 54,855	\$ -	\$ -	\$ 23,365	\$ -	\$ -	N/A	Year 1 - Prepare NOI and SWMP; Year 4 - ; update SWMP (incorporate PCP);
NPDES MS4 Annual Reporting	\$ 8,575	\$ 17,150	\$ 17,150	\$ 17,150	\$ 17,150	\$ 17,150	\$ 19,294	Completed by consultant, input & review by Town staff	100% increase from existing, completed by consultant, input & review by Town staff
NPDES MS4 Public Education Programs	\$ 6,200	\$ 13,675	\$ 12,725	\$ 12,725	\$ 12,725	\$ 12,725	\$ 14,316	Poster display circulated, articles in DPW newsletter and Milford Daily news, coordination with High School "Green Team", DPW stormwater presentations at Town Council meetings, Middle School stormwater presentations	50% workload increase from existing; purchase new materials in Year 1; distribute at least 2 messages to each of 4 audiences (residents, commercial, industrial, construction); report annually
NPDES MS4 Public Involvement Programs	\$ 9,715	\$ 12,144	\$ 12,144	\$ 12,144	\$ 12,144	\$ 12,144	\$ 13,662	Earth Day cleanup event, stormwater hotline, storm drain marking	Continue existing efforts, provide opportunity for public input on SWMP annually (25% increase in effort)
NPDES MS4 & SPCC Training	\$ 3,000	\$ 7,125	\$ 4,725	\$ 4,725	\$ 4,725	\$ 4,725	\$ 5,316	SPCC & pollution prevention/good housekeeping for DPW (consultant)	SWPPP training for Transfer Station, DPW Facility & pollution prevention/good housekeeping and IDDE for all DPW; SPCC training at DPW Facility; all training done by a consultant; programs developed and training in Year 1, refresher training each year thereafter
Certified Municipal Phosphorous Program (CMPP)	N/A	\$ -	\$ -	\$ -	\$ -	\$ 9,090	\$ 10,226	N/A	Recordkeeping, data tracking and correspondence with regulated entities for updating program progress under "Water Quality"
Grants Program (s319, 604b, CZM)	\$ 9,210	\$ -	\$ 9,210	\$ -	\$ -	\$ 9,210	\$ 10,361	None current, but some in the past	Staff efforts to apply for and administer grants received for stormwater programs; assumes one grant in Permit Years 2 & 5
Subtotal:	\$ 58,670	\$ 136,707	\$ 90,596	\$ 78,502	\$ 101,867	\$ 99,686	\$ 112,147		
Regulation/Enforcement									
MS4 Stormwater Permit Administration	\$ -	\$ 8,520	\$ 8,520	\$ 8,520	\$ 8,520	\$ 8,520	\$ 9,585	No new permits	Anticipated administration of 3 project permits annually
RDA/CMPP Compliance	N/A	\$ -	\$ -	\$ -	\$ -	\$ 13,125	\$ 14,766	N/A	Inspection of facilities to verify accuracy of information submitted under the CMPP
Stormwater/Drainage System Inspections	\$ 27,663	\$ 34,579	\$ 34,579	\$ 34,579	\$ 34,579	\$ 34,579	\$ 38,901	Currently conducted by Engineering Department to review compliance of post-construction BMPs or connections with the MS4	25% increase in workload due to various programs
Illicit Discharge Detection and Elimination Program	\$ 2,730	\$ 2,730	\$ 22,920	\$ 22,920	\$ 22,920	\$ 22,920	\$ 25,785	Issues are reported through the stormwater hotline or the Board of Health, mostly related to dumping, very few each year	Continue existing practices in Year 1; beginning in Year 2: 50% increase in staff workload due to new issues discovered through additional investigations and increased reporting; outside resources required for source identification, assumes 50% of dry-weather sampled outfalls have illicit discharge (50 hits over permit cycle), estimated cost to identify source = \$1,200 per hit, assumes removal costs are borne by property owner or sewer authority
Erosion/sediment Control Inspections	\$ 21,003	\$ 31,505	\$ 31,505	\$ 31,505	\$ 31,505	\$ 31,505	\$ 35,443	Engineering inspects Town projects; private projects are inspected at the cost of the developer or permittee	50% increase in workload due to additional maintenance and construction work
Subtotal:	\$ 51,396	\$ 77,333	\$ 97,523	\$ 97,523	\$ 97,523	\$ 110,648	\$ 124,479		

Engineering and Master Planning									
<i>Stormwater Master Planning, Includes PCP/CIP Planning; Link with SWMP; Planning for Infrastructure Needs, Includes Facility Inventory for SW Retrofit</i>	\$ 14,866	\$ 115,286	\$ 78,906	\$ 75,666	\$ 40,026	\$ 50,240	\$ 56,520	No formal planning evaluation for stormwater; 1997 Town Master Plan; Stormwater Management Plan for Spruce Pond Brook Subwatershed (CRWA, 2010); Optimal Stormwater Management Plan Alternatives: A Demonstration Study in Three Upper Charles River Communities (TETRA TECH, December 2009); Town staff participate in planning efforts by others	Develop a CIP based on the Phosphorous Control Plan and infrastructure needs, develop PCP by year 4, yr-5 GIS update of new BMPs , resulting TP reductions, CIP planning based on infrastructure needs
<i>Illicit Discharge Detection and Elimination Plan</i>	\$ 1,800	\$ 34,250	\$ 15,320	\$ -	\$ -	\$ 18,890	\$ 21,251	IDDE Plan developed in 2006, periodic inspection of outfalls to update GIS database	Year 1 - update IDDE Plan to meet new permit requirements, including delineation of and prioritization of catchments; Year 2 - update catchment delineation based on mapping changes/updates; Year 5 - detailed report for illicit discharges removed during the permit period
<i>Catch Basin Inventory Plan (CBIP) Plan and Street Sweeping Optimization</i>	\$ -	\$ 10,625	\$ 81,000	\$ 81,000	\$ 11,025	\$ 11,025	\$ 12,403	N/A	Year 1 - develop CBIP and a Standard Operating Procedure (SOP) to sweep areas with DCIA twice/year; Years 2 & 3 - implement CBIP recordkeeping of CB cleaning and status of CB, intern(s) accompany field crews to collect cleaning and sweeping data; Years 4 & 5 - investigate CB w/ >50% full sump at 2 consecutive cleanings
<i>Waterfowl & Pet Waste Management Programs</i>	\$ -	\$ 11,638	\$ 8,028	\$ 8,028	\$ 8,028	\$ 10,528	\$ 11,843	Completed as part of "Operations & Implementation": Goose egg adding & beaver control by contractor, DPW oversight & management	Year 1 - develop written programs for waterfowl and pet waste management; Year 2 - Oversight of pet waste management program implementation and public awareness activities for waterfowl management; Year 3 - Oversight of pet waste and waterfowl management program implementation, continue public awareness activities for waterfowl management; Year 4 - Continue oversight of pet waste and waterfowl management programs and public awareness activities; Year 5 - Continue oversight of pet waste and waterfowl management programs and public awareness activities; update management programs
<i>Septic, Inflow, and Infiltration Program</i>	\$ -	\$ 2,550	\$ 2,550	\$ 2,550	\$ 2,550	\$ 2,550	\$ 2,869	Sanitary sewer (I/I) investigations and improvements tracked to document condition and status of system, approximately 0.6 MGD removed over last 5 years through I/I activities	Cost of coordination between sewer department, board of health, and stormwater program director to evaluate potential impacts from septic systems (assume impacts identified as part of IDDE plan-prioritization mapping task),
<i>Pesticide, Herbicide, and Fertilizer Program</i>	\$ 4,710	\$ 7,448	\$ 4,710	\$ 4,710	\$ 4,710	\$ 4,710	\$ 5,299	Applications follow the principles of an Integrated Pest Management (IPM) Program to reduce chemical applications for pest and turf management	Year 1 - continue IPM & develop/implement fertilizer optimization program; Years 2 through 5 - continue IPM & fertilizer optimization program
<i>Spill Response and Cleanup Program</i>	\$ -	\$ -	\$ 10,125	\$ 4,050	\$ 4,050	\$ 14,175	\$ 15,947	No formal program related to stormwater	Year 2 - Develop a priority response program based on high accident areas, significant pollutant potential and proximity to receiving waters; Years 3 & 4 - track program results and coordinate with Town departments; Year 5 - update priority response program and track program results and coordinate with Town departments
<i>Groundwater and Drinking Water Program</i>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Drinking water quantity and quality priority areas are reviewed annually as part of the Town's current drinking water program.	No additional costs are Proposed* under the stormwater program.
<i>DPW Project Design Engineering and Permitting Assistance</i>	\$ 63,780	\$ 79,725	\$ 79,725	\$ 79,725	\$ 79,725	\$ 79,725	\$ 89,691	~5 projects/year; design of roadway projects that incorporate stormwater improvements (e.g., reduced pavement width, removal of cul-de-sacs); retrofit designs for existing drainage systems (problem areas)	25% increase in workload from existing (2 additional projects per year, 7 total)
<i>SWPPPs for Transfer Station & DPW Facility</i>	\$ 5,625	\$ 11,625	\$ 2,250	\$ 2,250	\$ 2,250	\$ 13,875	\$ 15,609	Municipal facility inventory completed to evaluate pollution prevention and good housekeeping at municipal facilities	Year 1 - develop SWPPPs for Transfer Station & DPW Facility; Years 2 through 4 - implement SWPPP recommendations, manage SWPPP activities, conduct site inspections and track results; Year 5 - manage SWPPP activities, conduct site inspections, track results and update SWPPPs
<i>Maintenance and Field Engineering Support</i>	\$ 25,350	\$ 31,688	\$ 31,688	\$ 31,688	\$ 31,688	\$ 38,025	\$ 42,778	Engineers assist DPW on an on-call basis	Years 1 through 4 - 25% increase in workload from existing increase; Year 5 - 50% increase in workload from existing following Year 4 implementation of PCP;
Storm Drain System : <i>Data Collection, Database Management, Mapping</i>	\$ 20,625	\$ 45,430	\$ 233,370	\$ 36,160	\$ 36,160	\$ 36,160	\$ 40,680	Field data collected for existing infrastructure and new projects (GIS update)	Year 1 - mapping of entire drainage network (schematic only) ; Year 2 - field mapping and verification of drainage attributes; Years 3 through 5 - field data collected for new projects (GIS update)
Sanitary Sewer System : <i>Data Collection, Database Management, Mapping</i>	\$ -	\$ -	\$ 82,830	\$ 64,540	\$ 7,250	\$ 7,250	\$ 8,156	N/A, updated/managed with I/I investigations as part of the sanitary sewer program	Year 2 - update sewer schematic with attribute data from as-built plans and I/I studies; Year 3 - Field data collection to address data gaps; incorporate groundwater elevation data from various sources & overlay to identify zones of separation/saturation; Years 4 & 5 - update mapping based on new projects, repairs, modifications
<i>Technical Services/Public Assistance (hotlines)</i>	\$ 2,940	\$ 4,410	\$ 4,410	\$ 4,410	\$ 4,410	\$ 4,410	\$ 4,961	Handle calls related to flooding and illicit discharges	50% increase in workload from existing
<i>Code Development and Zoning Support Services</i>	\$ 12,975	\$ 12,975	\$ 32,320	\$ 32,320	\$ 12,975	\$ 12,975	\$ 14,597	Updates completed to comply with 2003 NPDES MS4 Permit; ongoing compliance support for stormwater requirements	Year 1 - ongoing compliance support for stormwater requirements; Year 2 - report on local regulations affecting impervious areas; ongoing compliance support for stormwater requirements; Year 3 - report on feasibility of green practices and other green techniques; ongoing compliance support for stormwater requirements; Years 4 and 5 - ongoing compliance support for stormwater requirements
<i>Hazard Mitigation Planning and Flood Insurance Updates</i>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 30,145	\$ 33,913	N/A	Year 5 - allowance for H&H analysis (consultant) for specific areas of concern identified throughout the permit term; review results of FEMA mapping updates for Norfolk County, anticipated within 5 years
<i>CMPP Planning & Development</i>	\$ -	\$ -	\$ 20,150	\$ 20,150	\$ 20,150	\$ -	\$ -	N/A	Years 2 through 4 - planning and set up for a Certified Municipal Phosphorous Program; data collection and review of regulated sites for phosphorous reduction, review of credits, etc.
Subtotal:	\$ 152,671	\$ 367,649	\$ 687,381	\$ 447,246	\$ 264,996	\$ 334,683	\$ 376,518		

Operations and Implementation									
<i>Operations and Maintenance Management</i>	\$ 32,460	\$ 48,690	\$ 48,690	\$ 48,690	\$ 48,690	\$ 48,690	\$ 54,776	Highway Foreman coordinates work schedules, equipment and product needs, oversees progress and completion of work	50% increase in effort from existing due to new projects and tracking of results (measurable goals) for each activity
<i>CIP/Infrastructure Implementation</i>	\$ 249,250	\$ 311,563	\$ 311,563	\$ 311,563	\$ 311,563	\$ 311,563	\$ 350,508	No formal program; infrastructure needs incorporated into Highway Budget for operations, CIP funded through grants or CHP 90 or s319; stormwater improvements completed as part of Highway and Water Department Projects, including decreases to roadway width and removal of cul-de-sacs	Annual needs evaluation, incorporate capital projects, evaluate stormwater improvement opportunities (25% increase overall)
<i>Illicit Discharge Removal</i>	N/A	\$ 19,725	\$ 19,725	\$ 19,725	\$ 19,725	\$ 19,725	\$ 22,191	No formal program; no cross connections to MS4 identified thus far; illegal dumping removed by Highway Department and disposal coordinated with Board of Health	Address illicit discharges within 6 months (1 identified annually)
<i>Storm Sewer and Culvert Maintenance/Repair</i>	\$ 76,983	\$ 96,228	\$ 96,228	\$ 96,228	\$ 96,228	\$ 96,228	\$ 108,257	Repair/re-setting of catch basin grates, damaged headwalls, collapsed culverts and structures, rebuilding of manholes and catch basins	25% increase due to degraded infrastructure
<i>Inlet, Catch Basin, and Manhole Cleaning</i>	\$ 101,263	\$ 169,108	\$ 169,108	\$ 169,108	\$ 169,108	\$ 169,108	\$ 190,247	Clean approximately 1,800 catch basins and manholes per year	Clean all catch basins and manholes each year (~3,000 structures, 67% increase in effort)
<i>Stormwater BMP Facility Maintenance</i>	\$ 47,288	\$ 47,288	\$ 47,288	\$ 47,288	\$ 47,288	\$ 49,371	\$ 55,542	Cleaned as issues arise; inventory completed for 185 locations; have not accepted many roads in Town (~56 miles), so access to BMPs is limited	Continue routine maintenance in Years 1-4 and address major rehabilitation as part of the capital improvements/retrofits as part of PCP implementation. Increased maintenance effort in Year 5 (5%)
<i>Street Sweeping</i>	\$ 91,888	\$ 160,803	\$ 160,803	\$ 160,803	\$ 160,803	\$ 160,803	\$ 180,904	All streets are swept once a year; downtown streets are swept twice a year	Sweep all streets at least twice a year (75% increase overall)
<i>Spring & Fall Leaf-pickup</i>	\$ 56,850	\$ 56,850	\$ 56,850	\$ 56,850	\$ 56,850	\$ 63,750	\$ 71,719	Leaf pickups are completed in the spring and fall (3 each) and one christmas tree pickup is completed in the winter; each pickup costs \$7,800	Continue existing practices; evaluate leaf collection program based on PCP recommendations in Year 5
<i>Maintenance/Repair/Installation of ESC practices</i>	\$ 14,013	\$ 14,013	\$ 14,013	\$ 14,013	\$ 14,013	\$ 14,013	\$ 15,764	Repair of areas in spring damaged by snow plowing; repair of other eroded areas due to major rain events (road repairs - budgeted amount)	Continue existing activities
<i>Stream Restoration/Stabilization</i>	N/A	\$ -	\$ -	\$ 34,065	\$ -	\$ -	\$ -	N/A	Complete one stream restoration project every 3 years;
<i>Ditch and Channel Maintenance</i>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	N/A	N/A
<i>Waterfowl & Pet Waste Management Programs</i>	\$ 14,700	\$ 15,825	\$ 19,280	\$ 20,280	\$ 20,325	\$ 23,780	\$ 26,753	Goose egg addling & beaver control by contractor (average cost), DPW oversight & management	Install waterfowl education signs at congregation areas by Year 2; install pet waste stations at key areas of concern by Year 3; implement waterfowl deterrents by Year 4; maintain programs after Year 4
<i>Public Assistance Program</i>	\$ -	\$ 7,470	\$ 7,470	\$ 7,470	\$ 7,470	\$ 7,470	\$ 8,404	No program for the storm sewer system; Town requires inflows to the sanitary sewer system to be disconnected. Town caps improper connections in the street, paid through the sewer enterprise fund.	Continue existing program for inputs to the sanitary sewer system. Create public awareness & incentive program to encourage disconnection of impervious areas to the storm sewer system; respond to and evaluate specific incidents
<i>Toxic and Hazardous Materials Control Program</i>	\$ 33,485	\$ 33,485	\$ 33,485	\$ 33,485	\$ 33,485	\$ 33,485	\$ 37,671	Annual household hazardous waste collection	Continue existing program
<i>Emergency Drainage Repairs</i>	\$ 41,800	\$ 62,700	\$ 62,700	\$ 62,700	\$ 62,700	\$ 62,700	\$ 70,538	Annual allowance for unexpected repair of failed drainage structures	50% increase from existng due to the identification of additional issues through enhanced inspections
Subtotal:	\$ 759,978	\$ 1,043,747	\$ 1,047,202	\$ 1,082,267	\$ 1,048,247	\$ 1,060,685	\$ 1,193,271		
Monitoring									
<i>Catchment Assessment & Outfall Monitoring (dry weather)</i>	\$ -	\$ -	\$ 75,180	\$ 75,180	\$ 75,180	\$ 75,180	\$ 84,578	All outfalls inspected once during dry weather conditions during the 2003 permit term	Assess 50% of catchments by Year 3, monitor 50% of outfalls by Year 4 and 100% of catchments and outfalls by Year 5; 501 outfalls and sampling of 10%; catchment assessments include key junction manhole inspections (i.e., damming of inlet pipes);
<i>Stormwater Outfall Monitoring (wet weather)</i>	N/A	\$ 26,398	\$ 81,720	\$ 81,720	\$ 81,720	\$ 81,720	\$ 91,935	N/A	Develop Permittee Specific Monitoring Plan in Year 1; sample 25% of outfalls each year beginning in Year 2
<i>Surface Water Quality Monitoring</i>	\$ -	\$ -	\$ -	\$ 25,428	\$ 25,428	\$ -	\$ -	N/A	Monitoring of key streams and water bodies based on Permittee Specific Monitoring Plan (7 key locations, 4 rounds of data); incorporate results into Stormwater Master Planning activities
Subtotal:	\$ -	\$ 26,398	\$ 156,900	\$ 182,328	\$ 182,328	\$ 156,900	\$ 176,513		
TOTAL:	\$ 1,022,715	\$ 1,651,833	\$ 2,079,603	\$ 1,887,866	\$ 1,694,961	\$ 1,762,602	\$ 1,982,928	Cost in 2011 Dollars	
TOTAL (w/inflation):	\$ 1,022,715	\$ 1,693,129	\$ 2,183,583	\$ 2,029,456	\$ 1,864,457	\$ 1,982,928	\$ 2,478,660	2.5% Annual Inflation Starting in Year 1	

Note:Year 10 cost based on year 5 estimated cost (2011 dollars) projected out 5 years at 2.5% inflation

Sustainable Stormwater Funding in the Upper Charles
Town of Franklin, Stormwater Cost of Service
Program Administration: Existing & Future Cost Supporting Data

		Subcontractors (units = fee)		Burdened Personnel (rate = salary + 50%, units = FTE)							Expenses			Total (\$) Total (FTE) Description		
	Source	Consulting Engineer	Legal Counsel	Town Attorney	Town Administrator	DPW Director	Highway Superintendent	GIS Technician	DPW Office Manager	DPW Clerk	Mileage	Postage	Other			
	Rate	1	1	\$144,237	\$213,000	\$157,500	\$112,500	\$90,000	\$78,000	\$58,500	\$0.51	\$0.44	1			
Administration	# Units															
General Stormwater Program Administration	Existing				0.01	0.02		0.05	0.02	0.02				\$ 12,510	0.12	Periodic review and tracking of tasks & subcontractors
	Proposed*				0.02	0.03		0.08	0.03	0.03				\$ 18,765	0.18	Periodic review and tracking of tasks & subcontractors (50% workload increase due to enhanced program)
Legal Support Services	Existing			0.01										\$ 1,442	0.01	Periodic review of regulatory changes (avg. over 5 years)
	Proposed* (Year 2)			0.02										\$ 2,885	0.02	Legal review of regulatory changes in Year 2 (50% increase over existing)
	Proposed* (Year 5)			0.02										\$ 2,885	0.02	Legal review of regulatory changes in Year 5 (50% increase over existing)
	Proposed* (Year 10)			0.02										\$ 2,885	0.02	Legal review of regulatory changes in Year 10 (50% increase over existing)
Inter-Agency Coordination (MA Hwy, CRWA, EPA)	Existing				0.01	0.02		0.02	0.01		300	10		\$ 8,017	0.06	Share information, attend workshops & seminars, utilize CRWA & EPA fact sheets for public education
	Proposed*				0.01	0.02		0.02	0.01		300	10		\$ 8,017	0.06	Continue existing efforts
Inter-Municipal Coordination (adj. Towns)	Existing													\$ -	0.00	N/A
	Proposed*					0.01		0.01			50			\$ 2,501	0.02	Meet twice a year to review and coordinate programs
Emergency/Disaster Management Coordination	Existing													\$ -	0.00	N/A
	Proposed*					0.01		0.01						\$ 2,475	0.02	Coordinate stormwater program with LEPC, meet twice a year
NPDES MS4 NOI and SWMP	Existing													\$ -	0.00	N/A
	Proposed* (Year 1)	\$46,080				0.02	0.01	0.05						\$ 54,855	0.08	Prepare NOI and SWMP in Year 1
	Proposed* (Year 4)	\$14,590				0.02	0.01	0.05						\$ 23,365	0.08	Update SWMP Year 4 (incorporate PCP)
NPDES MS4 Annual Reporting	Existing	\$2,500				0.01		0.05						\$ 8,575	0.06	Completed by consultant, input & review by Town staff
	Proposed*	\$5,000				0.02		0.10						\$ 17,150	0.12	100% increase from existing, completed by consultant, input & review by Town staff
NPDES MS4 Public Education Programs	Existing					0.02		0.03					\$350	\$ 6,200	0.05	Poster display circulated, articles in DPW newsletter and Milford Daily news, coordination with High School "Green Team", DPW stormwater presentations at Town Council meetings, Middle School stormwater presentations
	Proposed* (Year 1)	\$4,200				0.03		0.05					\$700	\$ 13,675	0.08	50% workload increase from existing; purchase new materials; distribute at least 2 messages to one of 4 audiences (residents, commercial, industrial, construction); report annually
	Proposed* (Years 2-5)	\$3,600				0.03		0.05					\$350	\$ 12,725	0.08	50% workload increase from existing; distribute at least 2 messages to one of 4 audiences (residents, commercial, industrial, construction); report annually
NPDES MS4 Public Involvement Programs	Existing					0.01	0.02	0.05		0.02		500		\$ 9,715	0.10	Earth Day cleanup event, stormwater hotline, storm drain marking
	Proposed*					0.01	0.03	0.06		0.03		625		\$ 12,144	0.13	Continue existing efforts, provide opportunity for public input on SWMP annually (25% increase in effort)

		Subcontractors (units = fee)		Burdened Personnel (rate = salary + 50%, units = FTE)							Expenses			Total (\$) Total (FTE) Description		
	Source	Consulting Engineer	Legal Counsel	Town Attorney	Town Administrator	DPW Director	Highway Superintendent	GIS Technician	DPW Office Manager	DPW Clerk	Mileage	Postage	Other			
	Rate	1	1	\$144,237	\$213,000	\$157,500	\$112,500	\$90,000	\$78,000	\$58,500	\$0.51	\$0.44	1			
Administration	# Units															
NPDES MS4 & SPCC Training	Existing	\$3,000												\$ 3,000	0.00	SPCC & pollution prevention/good housekeeping for DPW (consultant)
	Proposed* (Year 1)	\$6,000					0.01							\$ 7,125	0.01	SWPPP training for Transfer Station, DPW Facility & pollution prevention/good housekeeping and IDDE for all DPW; SPCC training at DPW Facility; all training done by a consultant; programs developed and training in Year 1
	Proposed* (Years 2-5)	\$3,600					0.01							\$ 4,725	0.01	Refresher training: SWPPP training for Transfer Station, DPW Facility & pollution prevention/good housekeeping and IDDE for all DPW; SPCC training at DPW Facility; all training done by a consultant
Certified Municipal Phosphorous Program (CMPP)	Existing													\$ -	0.00	N/A
	Proposed* (Year 5)					0.02		0.04		0.04				\$ 9,090	0.10	Recordkeeping, data tracking and correspondence with regulated entities for updating program progress under "Water Quality"
Grants Program (s319, 604b, CZM)	Existing					0.02		0.05	0.02					\$ 9,210	0.09	None current, but some in the past
	Proposed* (Year 2)					0.02		0.05	0.02					\$ 9,210	0.09	Staff efforts to apply for and administer 1 grant for stormwater programs
	Proposed* (Year 5)					0.02		0.05	0.02					\$ 9,210	0.09	Staff efforts to apply for and administer 1 grant for stormwater programs
Total:	Existing	\$5,500	\$0	0.01	0.02	0.10	0.02	0.25	0.05	0.04	\$300	\$510	\$350	\$58,670	0.49	
	Proposed* Year 1	\$61,280	\$0	0.00	0.03	0.15	0.05	0.37	0.04	0.06	\$350	\$635	\$700	\$136,707	0.69	
	Proposed* Year 2	\$12,200	\$0	0.02	0.03	0.15	0.04	0.37	0.06	0.06	\$350	\$635	\$350	\$90,596	0.72	
	Proposed* Year 3	\$12,200	\$0	0.00	0.03	0.13	0.04	0.32	0.04	0.06	\$350	\$635	\$350	\$78,502	0.61	
	Proposed* Year 4	\$26,790	\$0	0.00	0.03	0.15	0.05	0.37	0.04	0.06	\$350	\$635	\$350	\$101,867	0.69	
	Proposed* Year 5	\$12,200	\$0	0.02	0.03	0.17	0.04	0.41	0.06	0.10	\$350	\$635	\$350	\$99,686	0.82	
*Proposed includes additional stormwater staff support																

Sustainable Stormwater Funding in the Upper Charles
Town of Franklin, Stormwater Cost of Service
Regulation/Enforcement: Existing & Future Cost Supporting Data

		Subcontractors (units = fee)		Burdened Personnel (rate = salary + 50%, units = FTE)								Expenses			Total (\$) Total (FTE) Description		
	Source	Consulting Engineer	Legal Counsel	Town Administrator	DPW Director	Town Engineer	Highway Superintendent	Staff Engineer/ Inspector	GIS Technician	DPW Office Manager	DPW Clerk	Mileage	Postage	Other			
	Rate	1	1	\$213,000	\$157,500	\$142,500	\$112,500	\$72,000	\$90,000	\$78,000	\$58,500	\$0.51	\$0.44	1			
Regulation/Enforcement	# Units																
MS4 Stormwater Permit Administration	Existing														\$ -	0.00	No new permits
	Proposed*					0.02		0.05	0.01		0.02				\$ 8,520	0.10	Anticipated administration of 3 permits annually
RDA/CMPP Compliance	Existing														\$ -	0.00	N/A
	Proposed* (Year 5)					0.01		0.10	0.05						\$ 13,125	0.16	Inspection of facilities to verify accuracy of information submitted under the CMPP
Stormwater/Drainage System Inspections	Existing					0.05	0.05	0.18	0.02			300			\$ 27,663	0.30	Currently conducted by Engineering Department to review compliance of post-construction BMPs or connections with the MS4
	Proposed*					0.06	0.06	0.23	0.03			375			\$ 34,579	0.38	25% increase in workload due to various programs
Illicit Discharge and Detection Program	Existing									0.02	0.02				\$ 2,730	0.04	Issues are reported through the stormwater hotline or the Board of Health, mostly related to dumping, very few each year
	Proposed* (Year 1)									0.02	0.02				\$ 2,730	0.04	Continue existing practices
	Proposed* (Year 2-5)					0.01	0.02			0.03	0.03			\$15,000	\$ 22,920	0.09	50% increase in staff workload due to new issues discovered through additional investigations and increased reporting; outside resources required for source identification, assumes 50% of dry-weather sampled outfalls (20% of total have flow) have illicit discharge (50 hits over permit cycle), estimated cost to identify source = \$1,200 per hit (1 day for TV inspection), assumes removal costs are borne by property owner or sewer authority, annual cost begins in Year 2
Erosion/sediment Control Inspections	Existing					0.02		0.25				300			\$ 21,003	0.27	Engineering inspects Town projects; private projects are inspected at the cost of the developer or permittee
	Proposed*					0.03		0.38				450			\$ 31,505	0.41	50% increase in workload due to additional maintenance and construction work
Total:	Existing	\$0	\$0	0.00	0.00	0.07	0.05	0.43	0.02	0.02	0.02	\$600	\$0	\$0	\$51,396	0.61	
	Proposed* Year 1	\$0	\$0	0.00	0.00	0.11	0.06	0.65	0.04	0.02	0.04	\$825	\$0	\$0	\$77,333	0.92	
	Proposed* Year 2	\$0	\$0	0.00	0.01	0.11	0.08	0.65	0.04	0.03	0.05	\$825	\$0	\$15,000	\$97,523	0.97	
	Proposed* Year 3	\$0	\$0	0.00	0.01	0.11	0.08	0.65	0.04	0.03	0.05	\$825	\$0	\$15,000	\$97,523	0.97	
	Proposed* Year 4	\$0	\$0	0.00	0.01	0.11	0.08	0.65	0.04	0.03	0.05	\$825	\$0	\$15,000	\$97,523	0.97	
	Proposed* Year 5	\$0	\$0	0.00	0.01	0.12	0.08	0.75	0.09	0.03	0.05	\$825	\$0	\$15,000	\$110,648	1.13	
*Proposed includes additional stormwater staff support																	

Sustainable Stormwater Funding in the Upper Charles
Town of Franklin, Stormwater Cost of Service
Engineering & Master Planning: Existing & Future Cost Supporting Data

		Subcontractors (units = fee)	Burdened Personnel (rate = salary + 50%, units = FTE)											Expenses		Total (\$) Total (FTE)		Description
	Source Rate	Consulting Engineer	Town Administrator	DPW Director	Town Engineer	Highway Superintendent	Sewer Superintendent	Staff Engineer/ Inspector	GIS Technician	DPW Office Manager	Conservation Agent	DPW Clerk	Paid Intern	Mileage	Postage			
Engineering & Master Planning	# Units	1	\$213,000	\$157,500	\$142,500	\$112,500	\$112,500	\$72,000	\$90,000	\$78,000	\$65,250	\$58,500	\$45,000	\$0.51	\$0.44			
Stormwater Master Planning, Includes PCP/CIP Planning; Link with SWMP; Planning for Infrastructure Needs, Includes Facility Inventory for SW Retrofit	Existing		0.02	0.02	0.02				0.05					200	10	\$ 14,866	0.11	No formal planning evaluation for stormwater; 1997 Town Master Plan; Stormwater Management Plan for Spruce Pond Brook Subwatershed (CRWA, 2010); Optimal Stormwater Management Plan Alternatives: A Demonstration Study in Three Upper Charles River Communities (TETRA TECH, December 2009); Town staff participate in planning efforts by others
	Proposed* (Year 1)	\$100,420	0.02	0.02	0.02				0.05					200	10	\$ 115,286	0.11	PCP Development and adjust IC loads and % removal from 2000-2009, update (2006) facility retrofit inventory
	Proposed* (Year 2)	\$64,040	0.02	0.02	0.02				0.05					200	10	\$ 78,906	0.11	Town staff participate in planning efforts by others; PCP development and Year 2 progress report
	Proposed* (Year 3)	\$60,800	0.02	0.02	0.02				0.05					200	10	\$ 75,666	0.11	Town staff participate in planning efforts by others; PCP development
	Proposed* (Year 4)	\$25,160	0.02	0.02	0.02				0.05					200	10	\$ 40,026	0.11	Town staff participate in planning efforts by others; PCP development
	Proposed* (Year 5)	\$23,420	0.03	0.03	0.03	0.02	0.01		0.08		0.02					\$ 50,240	0.22	Incorporate existing studies; develop a CIP based on the PCP and infrastructure needs; annual tracking of PCP progress; annual reporting of new BMPs & resulting TP reduction
Illicit Discharge Detection and Elimination Plan	Existing								0.02							\$ 1,800	0.02	IDDE Plan developed in 2006, periodic inspection of outfalls to update GIS database
	Proposed* (Year 1)	\$26,900		0.01	0.02		0.01		0.02							\$ 34,250	0.06	Update IDDE Plan to meet new permit requirements, including delineation of and prioritization of catchments
	Proposed* (Year 2)	\$13,520							0.02							\$ 15,320	0.02	Update catchment delineation based on mapping changes/updates
	Proposed* (Year 5)	\$11,540		0.01	0.02		0.01		0.02							\$ 18,890	0.06	Detailed report for illicit discharges removed during the permit period
Catch Basin Inventory Plan (CBIP) Plan and Street Sweeping Optimization	Existing															\$ -	0.00	N/A
	Proposed* (Year 1)	\$5,000		0.01		0.02			0.02							\$ 10,625	0.05	Develop CBIP and a Standard Operating Procedure (SOP) to sweep areas with DCIA twice/year
	Proposed* (Years 2 & 3)					0.02			0.02				1.71			\$ 81,000	1.75	Implement CBIP recordkeeping of CB cleaning and status of CB, intern(s) accompany field crews to collect cleaning and sweeping data
	Proposed* (Years 4 & 5)					0.05		0.05	0.02							\$ 11,025	0.12	Investigate CB w/ >50% full sump at 2 consecutive cleanings
Waterfowl & Pet Waste Management Programs	Existing															\$ -	0.00	Completed as part of "Operations & Implementation": Goose egg addling & beaver control by contractor, DPW oversight & management
	Proposed* (Year 1)	\$5,000		0.01					0.02		0.05					\$ 11,638	0.08	Develop written programs for waterfowl and pet waste management
	Proposed* (Year 2)			0.01					0.02		0.05	0.02			500	\$ 8,028	0.10	Oversight of pet waste management program implementation and public awareness activities for waterfowl management
	Proposed* (Year 3)			0.01					0.02		0.05	0.02			500	\$ 8,028	0.10	Oversight of pet waste and waterfowl management program implementation, continue public awareness activities for waterfowl management
	Proposed* (Year 4)			0.01					0.02		0.05	0.02			500	\$ 8,028	0.10	Continue oversight of pet waste and waterfowl management programs and public awareness activities
	Proposed* (Year 5)	\$2,500		0.01					0.02		0.05	0.02			500	\$ 10,528	0.10	Continue oversight of pet waste and waterfowl management programs and public awareness activities; update management programs
Septic, Inflow, and Infiltration Program	Existing															\$ -	0.00	Sanitary sewer (I/I) investigations and improvements tracked to document condition and status of system, approximately 0.6 MGD removed over last 5 years through I/I activities
	Proposed*				0.01		0.01									\$ 2,550	0.02	Continue existing program; evaluate and track potential impacts from septic systems; 60% of Town has sewer service
Pesticide, Herbicide, and Fertilizer Program	Existing			0.02						0.02						\$ 4,710	0.04	Applications follow the principles of an Integrated Pest Management (IPM) Program to reduce chemical applications for pest and turf management
	Proposed* (Year 1)			0.02						0.03	0.03					\$ 7,448	0.08	Continue IPM & develop/implement fertilizer optimization program
	Proposed* (Years 2-5)			0.02						0.02						\$ 4,710	0.04	Continue IPM & fertilizer optimization program
Spill Response and Cleanup Program	Existing															\$ -	0.00	No formal program related to stormwater
	Proposed* (Year 2)	\$4,500		0.01		0.02			0.02							\$ 10,125	0.05	Develop a priority response program based on high accident areas, significant pollutant potential and proximity to receiving waters
	Proposed* (Years 3-4)					0.02			0.02							\$ 4,050	0.04	Track program results and coordinate with Town departments
	Proposed* (Year 5)	\$4,500		0.01		0.04			0.04							\$ 14,175	0.09	Update priority response program and track program results and coordinate with Town departments

		Subcontractors (units = fee)	Burdened Personnel (rate = salary + 50%, units = FTE)												Expenses		Total (\$)	Total (FTE)	Description
	Source Rate	Consulting Engineer 1	Town Administrator \$213,000	DPW Director \$157,500	Town Engineer \$142,500	Highway Superintendent \$112,500	Sewer Superintendent \$112,500	Staff Engineer/ Inspector \$72,000	GIS Technician \$90,000	DPW Office Manager \$78,000	Conservation Agent \$65,250	DPW Clerk \$58,500	Paid Intern \$45,000	Mileage \$0.51	Postage \$0.44				
Engineering & Master Planning	# Units																		
Groundwater and Drinking Water Program	Existing															\$ -	0.00	Drinking water quantity and quality priority areas are reviewed annually as part of the Town's current drinking water program.	
	Proposed*															\$ -	0.00	No additional costs are Proposed* under the stormwater program.	
DPW Project Design Engineering and Permitting Assistance	Existing			0.05	0.10	0.05		0.40	0.05	0.02		0.02				\$ 63,780	0.69	~5 projects/year; design of roadway projects that incorporate stormwater improvements (e.g., reduced pavement width, removal of cul-de-sacs); retrofit designs for existing drainage systems (problem areas)	
	Proposed*			0.06	0.13	0.06		0.50	0.06	0.03		0.03				\$ 79,725	0.86	25% increase in workload from existing (2 additional projects per year, 7 total)	
SWPPPs for Transfer Station & DPW Facility	Existing			0.01		0.02			0.02							\$ 5,625	0.05	Municipal facility inventory completed to evaluate pollution prevention and good housekeeping at municipal facilities; ongoing BMP oversight and implementation.	
	Proposed* (Year 1)	\$6,000		0.01		0.02			0.02							\$ 11,625	0.05	Develop SWPPPs for Transfer Station & DPW Facility	
	Proposed* (Years 2-4)					0.02										\$ 2,250	0.02	Implement SWPPP recommendations, manage SWPPP activities, conduct site inspections and track results	
	Proposed* (Year 5)	\$6,000		0.01		0.04			0.02							\$ 13,875	0.07	Manage SWPPP activities, conduct site inspections, track results and update SWPPPs	
Maintenance and Field Engineering Support	Existing				0.05	0.05		0.15	0.02							\$ 25,350	0.27	Engineers assist DPW on an on-call basis	
	Proposed* (Years 1-4)				0.06	0.06		0.19	0.03							\$ 31,688	0.34	25% increase in workload from existing increase	
	Proposed* (Year 5)				0.08	0.08		0.23	0.03							\$ 38,025	0.41	50% increase in workload from existing following Year 4 implementation of PCP	
Storm Drain System: Data Collection, Database Management, Mapping	Existing			0.01	0.02			0.10	0.10							\$ 20,625	0.23	Field data collected for existing infrastructure and new projects (GIS update)	
	Proposed* (Year 1)	\$26,380			0.02			0.10	0.10							\$ 45,430	0.22	Mapping of entire drainage network (schematic only)	
	Proposed* (Year 2)	\$198,120			0.02			0.20	0.20							\$ 233,370	0.42	Field mapping and verification of drainage attributes	
	Proposed* (Years 3-5)	\$17,110			0.02			0.10	0.10							\$ 36,160	0.22	Field data collected for new projects (GIS update)	
Sanitary Sewer System: Data Collection, Database Management, Mapping	Existing															\$ -	0.00	N/A, updated/managed with I/I investigations as part of the sanitary sewer program	
	Proposed* (Year 2)	\$80,580					0.02									\$ 82,830	0.02	Update sewer schematic with attribute data from as-built plans and I/I studies	
	Proposed* (Year 3)	\$60,040					0.04									\$ 64,540	0.04	Field data collection to address data gaps; incorporate groundwater elevation data from various sources & overlay to identify zones of separation/saturation	
	Proposed* (Years 4 & 5)	\$5,000					0.02									\$ 7,250	0.02	Update mapping based on new projects, repairs, modifications	
Technical Services/Public Assistance (hotlines)	Existing			0.01						0.01		0.01				\$ 2,940	0.03	Handle calls related to flooding and illicit discharges	
	Proposed*			0.02						0.02		0.02				\$ 4,410	0.05	50% increase in workload from existing	
Code Development and Zoning Support Services	Existing				0.02			0.05			0.10					\$ 12,975	0.17	Updates completed to comply with 2003 NPDES MS4 Permit; ongoing compliance support for stormwater requirements	
	Proposed* (Year 1)				0.02			0.05			0.10					\$ 12,975	0.17	Ongoing compliance support for stormwater requirements	
	Proposed* (Year 2)	\$13,120		0.01	0.04			0.05	0.02		0.10					\$ 32,320	0.22	Report on local regulations affecting impervious areas; ongoing compliance support for stormwater requirements	
	Proposed* (Year 3)	\$13,120		0.01	0.04			0.05	0.02		0.10					\$ 32,320	0.22	Report on feasibility of green practices and other green techniques; ongoing compliance support for stormwater requirements	
	Proposed* (Years 4 & 5)				0.02			0.05			0.10					\$ 12,975	0.17	Ongoing compliance support for stormwater requirements	
Hazard Mitigation Planning and Flood Insurance Updates	Existing															\$ -	0.00	N/A	
	Proposed* (Year 5)	\$13,120		0.02	0.05	0.02			0.05							\$ 30,145	0.14	Allowance for H&H analysis (consultant) for specific areas of concern identified throughout the permit term; review results of FEMA mapping updates for Norfolk County, anticipated within 5 years	
CMPP Planning & Development	Existing															\$ -	0.00	N/A	
	Proposed* (Years 2, 3 & 4)	\$15,500			0.02				0.02							\$ 20,150	0.04	Planning and set up for a Certified Municipal Phosphorous Program; data collection and review of regulated sites for phosphorous reduction, review of credits, etc.	
Total:	Existing	\$0	0.02	0.12	0.21	0.12	0.00	0.70	0.26	0.05	0.10	0.03	0.00	\$200	\$10	\$152,671	1.61		
	Proposed* Year 1	\$169,700	0.02	0.16	0.28	0.17	0.02	0.84	0.32	0.07	0.18	0.04	0.00	\$200	\$10	\$367,649	2.09		
	Proposed* Year 2	\$389,380	0.02	0.15	0.30	0.19	0.03	0.94	0.46	0.06	0.15	0.06	1.71	\$200	\$510	\$687,381	4.06		
	Proposed* Year 3	\$166,570	0.02	0.14	0.30	0.19	0.05	0.84	0.34	0.06	0.15	0.06	1.71	\$200	\$510	\$447,246	3.85		
	Proposed* Year 4	\$62,770	0.02	0.13	0.28	0.22	0.03	0.89	0.32	0.06	0.15	0.06	0.00	\$200	\$510	\$264,996	2.15		
	Proposed* Year 5	\$83,190	0.03	0.19	0.35	0.31	0.05	0.93	0.44	0.06	0.17	0.06	0.00	\$0	\$500	\$334,683	2.58		
*Proposed includes stormwater staff support																			

Sustainable Stormwater Funding in the Upper Charles
Town of Franklin, Stormwater Cost of Service
Operations & Implementation: Existing & Future Cost Supporting Data

	Source Rate	Subcontractors (units = fee)	Burdened Personnel (rate = salary + 50%, units = FTE)													Expenses						Total (\$)	Total (FTE)	Description
		Consulting Engineer/ Subcontractor	DPW Director	Town Engineer	Highway Superintendent	Sewer Superintendent	GIS Technician	Staff Engineer/ Inspector	DPW Office Manager	DPW Clerk	Mechanic	Working Foreman	Heavy Equip. Operator	Highway Maintenance Craftsman	Seasonal Labor	Equipment Replacement Budget	Disposal	Vehicle Parts	Materials & Supplies	Fuel	Other			
		1	\$157,500	\$142,500	\$112,500	\$112,500	\$90,000	\$72,000	\$78,000	\$58,500	\$80,250	\$79,500	\$68,250	\$68,250	\$18,000	1	1	1	1	1	1			
Operations & Maintenance	# Units																							
Operations and Maintenance Management	Existing		0.02		0.15				0.02	0.05		0.10										\$ 32,460	0.34	Highway Foreman coordinates work schedules, equipment and product needs, oversees progress and completion of work
	Proposed*		0.03		0.23				0.03	0.08		0.15										\$ 48,690	0.51	50% increase in effort from existing due to new projects and tracking of results (measurable goals) for each activity
CIP/Infrastructure Implementation	Existing		0.02	0.05	0.10			0.20	0.05	0.05		0.25	0.25	0.25					150,000	2,500		\$ 249,250	1.22	No formal program; infrastructure needs incorporated into Highway Budget for operations, CIP funded through grants or CHP 90 or s319; stormwater improvements completed as part of Highway and Water Department Projects, including decreases to roadway width and removal of cul-de-sacs
	Proposed*		0.03	0.06	0.13			0.25	0.06	0.06		0.31	0.31	0.31					187,500	3,125		\$ 311,563	1.53	Annual needs evaluation, incorporate capital projects, evaluate stormwater improvement opportunities (25% increase overall)
Illicit Discharge Removal	Existing																					\$ -	0.00	No formal program; no cross connections to MS4 identified thus far; illegal dumping removed by Highway Department and disposal coordinated with Board of Health
	Proposed*			0.01	0.02	0.02						0.05	0.05	0.05					2,500	500		\$ 19,725	0.20	Address illicit discharges within 6 months (1 identified annually)
Storm Sewer and Culvert Maintenance/Repair	Existing				0.05					0.02	0.05	0.25	0.20	0.20			2,500	5,000	10,000	1,500		\$ 76,983	0.77	Repair/re-setting of catch basin grates, damaged headwalls, collapsed culverts and structures, rebuilding of manholes and catch basins
	Proposed*				0.06					0.03	0.06	0.31	0.25	0.25			3,125	6,250	12,500	1,875		\$ 96,228	0.96	25% increase due to degraded infrastructure
Inlet, Catch Basin, and Manhole Cleaning	Existing				0.05						0.05		0.50			20,000	30,000	4,000	1,000	2,500		\$ 101,263	0.60	Clean approximately 1,800 catch basins and manholes per year
	Proposed*				0.08						0.08		0.84			33,400	50,100	6,680	1,670	4,175		\$ 169,108	1.00	Clean all catch basins and manholes each year (~3,000 structures, 67% increase in effort)
Stormwater BMP Facility Maintenance	Existing				0.05							0.15	0.15		0.50		2,000	2,000	5,000	1,500		\$ 47,288	0.85	Cleaned as issues arise; inventory completed for 185 locations; have not accepted many roads in Town (~56 miles), so access to BMPs is limited
	Proposed* (Years 1-4)				0.05							0.15	0.15		0.50		2,000	2,000	5,000	1,500		\$ 47,288	0.85	Continue routine maintenance in Years 1-4 and address major rehabilitation as part of the capital improvements/retrofits as part of PCP implementation.
	Proposed* (Year 5)				0.05							0.16	0.16		0.53		2,100	2,100	5,250	1,575		\$ 49,371	0.89	Increased maintenance effort in Year 5 (5%)
Street Sweeping	Existing				0.02						0.05		0.50			30,000	15,000	4,000		2,500		\$ 91,888	0.57	All streets are swept once a year; downtown streets are swept twice a year
	Proposed*				0.04						0.09		0.88			52,500	26,250	7,000		4,375		\$ 160,803	1.00	Sweep all streets at least twice a year (75% increase overall)
Spring & Fall Leaf-pickup	Existing	\$54,600			0.02																	\$ 56,850	0.02	Leaf pickups are completed in the spring and fall (3 each) and one christmas tree pickup is completed in the winter; each pickup costs \$7,800
	Proposed* (Years 1-4)	\$54,600			0.02																	\$ 56,850	0.02	Continue existing practices
	Proposed* Year 5	\$54,600		0.02	0.04		0.02															\$ 63,750	0.08	Continue existing practices; evaluate leaf collection program based on PCP recommendations in Years 5
Maintenance/Repair/Installation of ESC practices	Existing				0.01							0.05	0.05						5,000	500		\$ 14,013	0.11	Repair of areas in spring damaged by snow plowing; repair of other eroded areas due to major rain events (road repairs - budgeted amount)
	Proposed*				0.01							0.05	0.05						5,000	500		\$ 14,013	0.11	Continue existing activities
Stream Restoration/Stabilization	Existing																					\$ -	0.00	N/A
	Proposed* (Year 3)	\$5,000	0.01		0.02			0.02				0.05	0.05	0.05			2,500		10,000	500		\$ 34,065	0.20	Complete one stream restoration project every 3 years; project in Yr3
Ditch and Channel Maintenance	Existing																					\$ -	0.00	N/A
	Proposed*																					\$ -	0.00	N/A
Waterfowl & Pet Waste Management Programs	Existing	\$12,000	0.01		0.01																	\$ 14,700	0.02	Goose egg addling & beaver control by contractor (average cost), DPW oversight & management
	Proposed* (Year 1)	\$12,000	0.01		0.02																	\$ 15,825	0.03	Continue goose egg addling & beaver control by contractor, DPW oversight & management
	Proposed* (Year 2)	\$12,000	0.01		0.02							0.02		0.02					500			\$ 19,280	0.07	Continue goose egg addling & beaver control by contractor, DPW oversight & management; install waterfowl education signs at congregation areas
	Proposed* (Year 3)	\$12,000	0.01		0.02							0.02		0.02					1,500			\$ 20,280	0.07	Continue goose egg addling & beaver control by contractor, DPW oversight & management; install pet waste stations at key areas of concern
	Proposed* (Year 4)	\$14,000	0.01		0.02														2,500			\$ 20,325	0.03	Continue goose egg addling & beaver control by contractor, DPW oversight & management; maintain pet waste stations at key areas of concern; implement waterfowl deterrents
	Proposed* (Year 5)	\$14,000	0.01		0.02							0.02		0.02					3,000			\$ 23,780	0.07	Maintain and manage all programs
Public Assistance Program	Existing																					\$ -	0.00	No program for the storm sewer system; Town requires inflows to the sanitary sewer system to be disconnected. Town caps improper connections in the street, paid through the sewer enterprise fund.
	Proposed*				0.04		0.02			0.02												\$ 7,470	0.08	Continue existing program for inputs to the sanitary sewer system. Create public awareness & incentive program to encourage disconnection of impervious areas to the storm sewer system; respond to and evaluate specific incidents
Toxic and Hazardous Materials Control Program	Existing		0.01				0.05		0.02	0.10											\$20,000	\$ 33,485	0.18	Annual household hazardous waste collection
	Proposed*		0.01				0.05		0.02	0.10											\$20,000	\$ 33,485	0.18	Continue existing program
Emergency Drainage Repairs	Existing		0.01		0.05							0.10	0.10	0.10			2,000		10,000	1,000		\$ 41,800	0.36	Annual allowance for unexpected repair of failed drainage structures
	Proposed*		0.02		0.08							0.15	0.15	0.15			3,000		15,000	1,500		\$ 62,700	0.54	50% increase from existing due to the identification of additional issues through enhanced inspections
Total:	Existing	\$66,600	0.07	0.05	0.51	0.00	0.05	0.20	0.09	0.22	0.15	0.90	1.75	0.55	0.50	\$50,000	\$51,500	\$15,000	\$181,000	\$12,000	\$20,000	\$759,978	5.04	
	Proposed* Year 1	\$66,600	0.09	0.07	0.77	0.02	0.07	0.25	0.11	0.28	0.23	1.18	2.67	0.76	0.50	\$85,900	\$84,475	\$21,930	\$229,170	\$17,550	\$20,000	\$1,043,747	7.01	
	Proposed* Year 2	\$66,600	0.09	0.07	0.77	0.02	0.07	0.25	0.11	0.28	0.23	1.20	2.67	0.78	0.50	\$85,900	\$84,475	\$21,930	\$229,670	\$17,550	\$20,000	\$1,047,202	7.05	
	Proposed* Year 3	\$71,600	0.10	0.07	0.79	0.02	0.07	0.27	0.11	0.28	0.23	1.25	2.72	0.83	0.50	\$85,900	\$86,975	\$21,930	\$240,670	\$18,050	\$20,000	\$1,082,267	7.25	
	Proposed* Year 4	\$68,600	0.09	0.07	0.77	0.02	0.07	0.25	0.11	0.28	0.23	1.18	2.67	0.76	0.50	\$85,900	\$84,475	\$21,930	\$231,670	\$17,550	\$20,000	\$1,048,247	7.01	
	Proposed* Year 5	\$68,600	0.09	0.09	0.79	0.02	0.09	0.25	0.11	0.28	0.23	1.20	2.68	0.78	0.53	\$85,900	\$84,575	\$22,030	\$232,420	\$17,625	\$20,000	\$1,060,685	7.15	

*Proposed includes additional stormwater staff support

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Town of Franklin, Stormwater Cost of Service
Monitoring: Existing & Future Cost Supporting Data

		Subcontractors (units = fee)			Burdened Personnel (rate = salary + 50%, units = FTE)												Expenses		Total (\$) Total (FTE) Description		
	Source	Consulting Engineer	Legal Counsel	Town Administrator	DPW Director	Town Engineer	Highway Superintendent	Sewer Superintendent	Staff Engineer/ Inspector	GIS Technician	DPW Office Manager	Conservation Agent	DPW Clerk	Working Foreman	Highway Maintenance Craftsman	Mileage					
	Rate	1	1	\$213,000	\$157,500	\$142,500	\$112,500	\$112,500	\$72,000	\$90,000	\$78,000	\$65,250	\$58,500	\$79,500	\$68,250	\$0.51					
Monitoring	# Units																				
Catchment Assessment & Outfall Monitoring (dry weather)	Existing																\$ -	0.00	All outfalls inspected once during dry weather conditions during the 2003 permit term		
	Proposed* (Year 2)	\$49,830				0.01	0.02	0.05	0.02		0.05				0.05	0.10	\$ 75,180	0.30	Assess 25% of catchments (investigations) and monitor 25% of outfalls; sampling of 10% of outfalls; catchment assessments include key junction manhole inspections (i.e., damming of inlet pipes); report of results & next steps		
	Proposed* (Year 3)	\$49,830				0.01	0.02	0.05	0.02		0.05				0.05	0.10	\$ 75,180	0.30	Assess additional 25% of catchments (investigations) and monitor additional 25% of outfalls (50% total by end of Year 3); sampling of 10% of outfalls; catchment assessments include key junction manhole inspections (i.e., damming of inlet pipes); report of results & next steps		
	Proposed* (Year 4)	\$49,830				0.01	0.02	0.05	0.02		0.05				0.05	0.10	\$ 75,180	0.30	Assess additional 25% of catchments (investigations) and monitor additional 25% of outfalls; sampling of 10% of outfalls; catchment assessments include key junction manhole inspections (i.e., damming of inlet pipes); report of results & next steps		
	Proposed* (Year 5)	\$49,830				0.01	0.02	0.05	0.02		0.05				0.05	0.10	\$ 75,180	0.30	Assess remaining 25% of catchments (investigations) and monitor additional 25% of outfalls (100% total by end of Year 5); sampling of 10% of outfalls; catchment assessments include key junction manhole inspections (i.e., damming of inlet pipes); report of results & next steps		
Stormwater Outfall Monitoring (wet weather)	Existing																\$ -	0.00	N/A		
	Proposed* (Year 1)	\$17,060				0.01				0.05		0.05					\$ 26,398	0.11	Develop Permittee Specific Monitoring Plan (501 outfalls reduced to 400)		
	Proposed* (Years 2-5)	\$70,020				0.01		0.05		0.05							\$ 81,720	0.11	Sample 25% of outfalls each year beginning in Year 2		
Surface Water Quality Monitoring	Existing																\$ -	0.00	N/A		
	Proposed* (Years 3 & 4)	\$16,750					0.02			0.02		0.05			0.02		\$ 25,428	0.11	Monitoring of key streams and water bodies (7 key locations, 4 rounds of data); incorporate results into Stormwater Master Planning activities		
Total:	Existing	\$0	\$0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	\$0	\$0	0.00			
	Proposed* Year 1	\$17,060	\$0	0.00	0.01	0.00	0.00	0.00	0.00	0.05	0.00	0.05	0.00	0.00	0.00	\$0	\$26,398	0.11			
	Proposed* Year 2	\$119,850	\$0	0.00	0.02	0.02	0.10	0.02	0.00	0.10	0.00	0.00	0.00	0.05	0.10	\$0	\$156,900	0.41			
	Proposed* Year 3	\$136,600	\$0	0.00	0.02	0.02	0.12	0.02	0.00	0.12	0.00	0.05	0.00	0.05	0.12	\$0	\$182,328	0.52			
	Proposed* Year 4	\$136,600	\$0	0.00	0.02	0.02	0.12	0.02	0.00	0.12	0.00	0.05	0.00	0.05	0.12	\$0	\$182,328	0.52			
	Proposed* Year 5	\$119,850	\$0	0.00	0.02	0.02	0.10	0.02	0.00	0.10	0.00	0.00	0.00	0.05	0.10	\$0	\$156,900	0.41			

*Proposed includes additional stormwater staff support

Sustainable Stormwater Funding in the Upper Charles

Town of Milford, Stormwater Cost of Service

Cost of Service Analysis; Burdened Personnel Costs, Summary by Cost Subcategory

Major Cost Category	Existing	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Description (existing)	Description (future)
Cost Subcategory									
Administration									
General Stormwater Program Administration	\$ 2,645	\$ 3,968	\$ 3,968	\$ 3,968	\$ 3,968	\$ 3,968	\$ 4,489	Periodic review and tracking of tasks & subcontractors	Periodic review and tracking of tasks & subcontractors (50% workload increase due to enhanced program)
Legal Support Services	N/A	\$ -	\$ 5,000	\$ -	\$ -	\$ 5,000	\$ 5,657	N/A	Legal review of regulatory changes in Years 2, & 5
Inter-Agency Coordination (MA hwy, CRWA, EPA)	\$ 1,260	\$ 1,890	\$ 1,890	\$ 1,890	\$ 1,890	\$ 1,890	\$ 2,138	Share information, attend workshops & seminars	50% increase in existing efforts
Inter-Municipal Coordination (adj. Towns)	N/A	\$ 1,260	\$ 1,260	\$ 1,260	\$ 1,260	\$ 1,260	\$ 1,426	N/A	Meet twice a year to review and coordinate programs
Emergency/Disaster Management Coordination	N/A	\$ 1,260	\$ 1,260	\$ 1,260	\$ 1,260	\$ 1,260	\$ 1,426	N/A	Meet twice a year to review and coordinate programs
NPDES NOI and SWMP	N/A	\$ 41,260	\$ -	\$ -	\$ 16,260	\$ -	\$ -	N/A	Prepare NOI and SWMP in Year 1, Year 4 incorporate PCP plan into SWMP,
NPDES Annual Reporting	\$ 4,035	\$ -	\$ 8,070	\$ 8,070	\$ 8,070	\$ 8,070	\$ 9,130	Completed by consultant, input & review by Town staff	100% increase from existing, completed by consultant, input & review by Town staff
NPDES MS4 Public Education Programs	\$ 5,500	\$ 10,335	\$ 13,423	\$ 4,845	\$ 9,465	\$ 12,123	\$ 13,716	Presentations (presentation to middle school students by consultant), add stormwater edu. Materials to library, schools, & town hall, postings on Town website & posters.	Workload increase from existing; distribute at least 2 messages to each of 4 audiences (residents, commercial, industrial, construction), measure & report message effectiveness
NPDES MS4 Public Involvement Programs	\$ 3,030	\$ 10,205	\$ 10,205	\$ 9,205	\$ 9,205	\$ 9,205	\$ 10,415	Annual clean-up programs for scrap metal (615 tons scrap metal/white goods)& oil recycling (1,200 gal. waste oil), semi-annual hazardous waste pick up, and Community Clean up days.	2xPublic meetings, update website w/ annual report&events,river clean-up day, storm drain stencil, rain barrel workshop or similar consultant presentation
NPDES MS4 & SPCC Training	\$ 1,280	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,657	Consultant provided 2-hr training class to Hgwy Dept employees on good housekeeping measures, and practices of equipment fueling, waste ban regs, waste water, drink water, stormwater, & emerg. preparedness	SWPPP training for Transfer Station, Hgwy dept Facility & pollution prevention/good housekeeping and IDDE for all DPW; SPCC training at hgwy dept Facility; all training done by a consultant; programs developed and training in Year 1, refresher training each year thereafter
Certified Municipal phosphorus Program (CMPP)	N/A	\$ -	\$ -	\$ -	\$ -	\$ 9,950	\$ 11,258	N/A	Recordkeeping, data tracking (GIS mapping update) and correspondence with regulated entities for updating program progress under "Water Quality"
Grants Program (s319, 604b, CZM)	\$ 585	\$ -	\$ 585	\$ -	\$ 585	\$ -	\$ -	chapter 90 grant (for exist. Transp. Infrastructure improvements)	Staff efforts to apply for and administer grants received for stormwater programs; assumes one grant every two years
Subtotal:	\$ 18,335	\$ 75,178	\$ 50,661	\$ 35,498	\$ 56,963	\$ 57,726	\$ 65,311		
Regulation/Enforcement									
MS4 Stormwater Permit Administration	\$ 2,700	\$ 8,100	\$ 8,100	\$ 8,100	\$ 8,100	\$ 8,100	\$ 9,164	13 filings w/ Conservation Commission of which 1 was a new permit for a 1+ Acre construction site subject to the Town stormwater management and O&M bylaw for developm't regulations	Anticipated administration of 3 permits annually- review by consultant paid for by developer, coordination and oversight cost
RDA/CMPP Compliance	N/A	\$ -	\$ -	\$ -	\$ -	\$ 11,300	\$ 12,785	N/A	Inspection of facilities to verify accuracy of information submitted under the CMPP
Stormwater/Drainage System Inspections	\$ 13,500	\$ 16,875	\$ 16,875	\$ 16,875	\$ 16,875	\$ 16,875	\$ 19,093	Currently conducted by Town Engineer to review compliance of post-construction BMPs or connections with the MS4	25% increase in workload due to various programs
Illicit Discharge Detection and Elimination Program	\$ 6,000	\$ 6,000	\$ 11,520	\$ 11,520	\$ 11,520	\$ 11,520	\$ 13,034	Sewer Department currently tracks down discharges when receives a call, the cost is passed on to owner of illicit discharge	Includes identification of IDDE sources- assume 10% of outfalls (sampled as part of dy-weather monitoring program) have illicit discharge (30 hits over permit cycle-start YR2), estimate cost to identify source \$1200 per hit . Assume removal costs are borne by property owner or sewer authority, assume cost for coordination/oversight of enforcement
Erosion/sediment Control Inspections	\$ 4,050	\$ 6,075	\$ 6,075	\$ 6,075	\$ 6,075	\$ 6,075	\$ 6,873	Engineer inspects Town projects; private projects are inspected at the cost to the developer or permittee, town inspector inspects some	50% increase in workload due to additional maintenance and construction work
Subtotal:	\$ 26,250	\$ 37,050	\$ 42,570	\$ 42,570	\$ 42,570	\$ 53,870	\$ 60,949		

Engineering and Master Planning									
Stormwater Master Planning	N/A	\$ 105,040	\$ 100,540	\$ 75,040	\$ 75,040	\$ 20,280	\$ 22,945	N/A	Develop a CIP based on the Phosphorous Control Plan and infrastructure needs, develop PCP by year 4, yr-5 GIS update of new BMPs , resulting TP reductions, CIP planning based on infrastructure needs
IDDE plan		\$ 18,060	\$ 5,000	\$ -	\$ -	\$ 6,260	\$ 7,083		Update IDDE Plan in Year 1 to meet new permit requirements , Year 1 - Director time for coordination SSO, including delineation of and prioritization of catchments YR1, and coordination with Sewer/Health Dept for mapping requirements performed under data collection and mapping task. YR 2 update catchment mapping based on mapping changes, YR5 detailed report of removals
Catch basin Inventory Plan (CBIP) Plan and Street sweeping optimization	N/A	\$ 6,170	\$ 76,570	\$ 76,570	\$ 6,170	\$ 6,170	\$ 6,981	Location of some of the infrastructure is complete, Currently trying to contract with Surveyor to complete inventory.	Year 1- develop CBIP and standard operating procedure (SOP) to sweep areas with DCIA twice/ year, Years 2&3-implement CBIP recordkeeping of CB cleaning and status of CB &intern(s) accompany field crews to collect cleaning and sweeping data, investigate CB w/ >50% full sump at 2 consecutive cleanings, record sweeping miles and materials generated. Year 4&5 optimize program
Waterfowl & Pet Waste Management Programs	N/A	\$ 11,260	\$ 2,520	\$ 2,520	\$ 2,520	\$ 2,520	\$ 2,851	N/A	Develop programs by end of Year, 1 assume cost for management plan, annual program planning and management
Septic, Inflow, and Infiltration Program	\$ -	\$ 1,260	\$ 1,260	\$ 1,260	\$ 1,260	\$ 1,260	\$ 1,426	Sanitary sewer (I/I) investigations and improvements, performed as part of sewer program	Cost of coordination between sewer department, board of health, and stormwater program director to evaluate potential impacts from septic systems (assume impacts identified as part of IDDE plan-prioritization mapping task),
Pesticide, Herbicide, and Fertilizer Program	N/A	\$ 2,520	\$ 2,520	\$ 2,520	\$ 2,520	\$ 2,520	\$ 2,851	Applications follow the principles of an Integrated Pest Management (IPM) Program to reduce chemical applications for pest and turf management,	
Spill Response and Cleanup Program	\$ -	\$ -	\$ 8,320	\$ 4,300	\$ 4,300	\$ 9,580	\$ 10,839	No formal program related to stormwater	IPM & fertilizer optimization program YR-1 Develop a priority response program based on high accident areas, significant pollutant potential and proximity to receiving waters in YR 2; update every 3 years, YR 5 update priority response program and track results, Coordinate with Town Departments
Groundwater and Drinking Water Program		\$ 6,020	\$ 1,260	\$ 1,260	\$ 1,260	\$ 1,260	\$ 1,426	No formal evaluation of priorities & results with respect to water supply provided by town?	Review drinking water quantity and quality priority areas in Year 1 and incorporate results into planning activities for BMPs to address water quality; review status annually
Highway Department Project Design Engineering and permitting assistance	\$ 4,050	\$ 5,400	\$ 5,400	\$ 5,400	\$ 5,400	\$ 8,370	\$ 9,470	Town Engineer Review of Drainage Plans for Town	Increase in workload from existing, 2 projects per year, additional increase in projects for year 5 increased inspection, aging infrastructure
SWPPPs for Transfer Station &Highway Department Facility	N/A	\$ 15,110	\$ 2,610	\$ 2,610	\$ 2,610	\$ 16,460	\$ 18,623	N/A	Develop SWPPPs by end of Year 1; implement recommendations by end of Year 2; update every 5 years
Maintenance and Field Engineering Support	\$ 4,050	\$ 5,063	\$ 5,063	\$ 5,063	\$ 5,063	\$ 6,075	\$ 6,873	Engineers assist Hgwy Dept on an on-call basis	25% increase in workload from existing, 50% increase in YR 5
Drainage -Data Collection, Database Management, Mapping	N/A	\$ 242,144	\$ 242,144	\$ 33,200	\$ 33,200	\$ 33,200	\$ 37,563	N/A - System mapping to be completed by surveyor, and updated as needed	complete system mapping Year 2 cost includes mapping of entire drainage network (schematic only); continue data collection, field verification and update mapping annually, YR5 tracking and update mapping for IC reduction (PCP implementation)
Sewer -Data Collection,Database Management, Mapping		\$ -	\$ 53,910	\$ 7,700	\$ 7,700	\$ 7,700	\$ 8,712	Field Data collected for existing infrastructure and new projects (GIS update) - consultant	sewer infrastructure mapping, (assume that this update includes time to collect plans, schematics, and info from Sewer/Health Dept. ,incorporate existing attribute data into GIS, address data gaps), continue field verification and update mapping annually,
Technical Services/Public Assistance (hotlines)	N/A	\$ 1,935	\$ 1,935	\$ 1,935	\$ 1,935	\$ 1,935	\$ 2,189	N/A	handle calls related to illicit discharge and flood complaints
Code Development and Zoning Support Services	N/A	\$ 7,500	\$ 17,500	\$ 12,500	\$ 6,350	\$ 6,350	\$ 7,184	N/A-bylaws for stormwater mgmt and ESC are in place	Review and update ESC, SW, IDDE as needed by YR2, Report on local regulations affecting impervious areas in Year 2, report on feasibility of green practices and other green techniques in Year 3
Hazard Mitigation Planning and Flood Insurance Updates	\$ 5,000	\$ -	\$ -	\$ -	\$ -	\$ 25,000	\$ 28,285	O'Brien Brook repair study (noted in meeting notes)	Allowance in Year 5 for specific areas of concern identified throughout the permit term
CMPP Planning and Development	\$ -	\$ -	\$ 20,000	\$ 20,000	\$ 20,000	\$ -	\$ -	N/A	Years 2 through 4 - planning and set up for a Certified Municipal Phosphorous Program; data collection and review of regulated sites for phosphorous reduction, review of credits, etc.
Subtotal:	\$ 13,100	\$ 427,481	\$ 546,551	\$ 251,878	\$ 175,328	\$ 154,940	\$ 175,300		

Operations and Implementation									
<i>Operations and Maintenance Management</i>	\$ 13,650	\$ 26,450	\$ 20,820	\$ 20,820	\$ 20,820	\$ 21,450	\$ 24,269	Highway Surveyor coordinates work schedules, equipment and product needs, oversees progress and completion of work	Year 1 Develop detailed O&M program for municipal facilities, parks, buildings, streets, vehicle storage, infrastructure, and SWPPP, 50% increase in effort from existing due to new projects and tracking of results (measurable goals) for each activity, Year 5 increase due to implementation & const. of BMP's for PCP
<i>CIP/Infrastructure Implementation</i>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	No formal program; infrastructure needs incorporated into Highway Budget for operations, CIP funded through grants or CHP 90	Annual needs evaluation, incorporate capital projects for infrastructure improvements
<i>IDDE-Removal</i>	\$ 10,000	\$ 19,220	\$ 19,220	\$ 19,220	\$ 19,220	\$ 19,220	\$ 21,746	Illicit discharge removal and infrastructure improvements	Implementation of infrastructure improvements resulting from IDDE removal, inter-department oversight and coordination of removal
<i>Storm Sewer and Culvert Maintenance/Repair</i>	\$ 54,683	\$ 68,354	\$ 68,354	\$ 68,354	\$ 68,354	\$ 68,354	\$ 77,336	Repair Culverts & walls, 466 ft drainpipe installed & 90 ft replaced, 57 catch basins repaired/replaced & 2 new installed, clean inlet grates	25% increase due to degraded infrastructure
<i>Inlet, Catch Basin, and Manhole Cleaning</i>	\$ 63,993	\$ 63,993	\$ 63,993	\$ 63,993	\$ 63,993	\$ 63,993	\$ 72,402	3,368 catch basins cleaned by subcontractor, 1,600 CUY (sweep & catch basin material removed), Includes costs for emergency cleaning and cleaning of basins as needed in addition to subcontractor cleaning service	inspect all 3368 catch basins and manholes each year and clean as needed, clean basins when sump 50% full, document infrastructure status
<i>Stormwater BMP Facility Maintenance</i>	\$ 18,000	\$ 18,000	\$ 18,000	\$ 18,000	\$ 18,000	\$ 18,900	\$ 21,384	Brush cutting and trash clean up at various detention basins and culverts, some performed through inmate programs (approx. 70 basins for town to maintain)	Continue existing effort cleaning and maintenance of BMP locations in first 4 years; YR 5- 5% increased maint. due to PCP implementation
<i>SWPPPs for Transfer Station & Highway Department Facility</i>	\$ 11,357	\$ 11,357	\$ 11,357	\$ 11,357	\$ 11,357	\$ 11,357	\$ 12,849	Facility clean up- remove 975 gal. oil/water & 5 drums of oily sand & sludge from separator at garage	Continue existing activities
<i>Street Sweeping & Sidewalk Sweeping</i>	\$ 201,079	\$ 201,079	\$ 201,079	\$ 201,079	\$ 201,079	\$ 201,079	\$ 227,502	sweep all streets & municipal parking areas 2 times per year, sidewalks once a year, cost includes equipment, maintenance, fully burdened labor, & disposal for street and sidewalk sweeping.	continue existing sweeping program,roads, sidewalks, and municipal directly connected parking 2x per year, 123 centerline miles roads per MassDOT
<i>Fall Leaf-pickup and Composting Program</i>	\$ 95,419	\$ 95,419	\$ 95,419	\$ 95,419	\$ 95,419	\$ 95,419	\$ 107,958	Leaf Collection on 120 miles of Town streets, collected 9,198 CUY lawn waste & 405 Christmas trees, includes cost of equip., fuel, fully burdened labor, and maintenance. Cost also includes composting program for collected yard waste.	Continue leaf collection program, year 5 review/ adjust & optimize program to meet permit, assume no additional cost
<i>Maintenance/Repair/Installation of ESC practices</i>	\$ -	\$ 7,130	\$ 7,130	\$ 7,130	\$ 7,130	\$ 7,130	\$ 8,067	no reported repairs	allowance to address erosion repairs
<i>Stream Restoration/Stabilization</i>	\$ -	\$ -	\$ -	\$ 28,360	\$ -	\$ -	\$ -	N/A	allowance to adress 1 stream project every 3 years, YR 3
<i>Ditch and Channel Maintenance</i>	N/A	\$ -	\$ -		\$ -	\$ -	\$ -	N/A	N/A
<i>Waterfowl & Pet Waste Management Programs</i>	N/A	\$ -	\$ 4,000	\$ 8,500	\$ 6,500	\$ 6,500	\$ 7,354	N/A no current operations, Educational posters are in Town buildings informing people not to feed waterfowl.	Install waterfowl education signs at congregation areas by Year 2; install pet waste stations at key areas of concern by Year 3; implement waterfowl deterrents by Year 4; maintain programs after Year 4
<i>Public Assistance Program</i>	N/A	\$ 3,690	\$ 3,690	\$ 3,690	\$ 3,690	\$ 3,690	\$ 4,175	public awareness but No incentive program in place to encourage Relocation of roof leaders into catch basins; disconnection of identified illicit discharges	continue creating public awareness & encourage disconnection of impervious areas, and illicit discharges
<i>Hazardous/Toxic Materials Collection Program</i>	\$ 7,785	\$ 7,785	\$ 7,785	\$ 7,785	\$ 7,785	\$ 7,785	\$ 8,808	Annual clean-up programs for scrap metal (615 tons scrap metal/white goods)& oil recycling (1,200 gal. waste oil), semi-annual hazardous waste pick up. Includes cost of staff coordination/ implementation of program, and disposal.	Continue existing activity and report annually
<i>Emergency Drainage Repairs</i>	\$ 12,000	\$ 18,000	\$ 18,000	\$ 18,000	\$ 18,000	\$ 18,000	\$ 20,365	Annual allowance for unexpected repair of failed drainage structures	50% increase of existing practices due to aged structures and increased inspection frequencies
Subtotal:	\$ 487,966	\$ 540,477	\$ 538,847	\$ 571,707	\$ 541,347	\$ 542,877	\$ 614,216		
Monitoring									
<i>Catchment Assessment & Outfall Monitoring (dry weather)</i>	N/A	\$ -	\$ 44,930	\$ 44,930	\$ 44,930	\$ 44,930	\$ 50,834	All outfalls inspected once during dry weather conditions (303 outfalls 100% inspected during dry weather) completed by consultant 2005	Assess 50% of catchments by Year 3, monitor 50% of outfalls by Year 4 and 100% of catchments and outfalls by Year 5; 303 outfalls and sampling of 20%; catchment assessments include key junction manhole inspections (i.e., damming of inlet pipes).
<i>Stormwater Outfall Monitoring (wet weather)</i>	N/A	\$ 17,740	\$ 50,871	\$ 50,871	\$ 50,871	\$ 50,871	\$ 57,556	N/A	Develop Permittee Specific Monitoring Plan in Year 1; sample 25% of outfalls each year beginning in Year 2, assume 20% of outfalls excluded
Subtotal:	\$ -	\$ 17,740	\$ 95,801	\$ 95,801	\$ 95,801	\$ 95,801	\$ 108,390		
TOTAL:	\$ 545,651	\$ 1,097,926	\$ 1,274,430	\$ 997,453	\$ 912,008	\$ 905,214	\$ 1,024,166		Cost in 2011 Dollars
Future Total Including 2.5% Annual Inflation:	\$ 545,651	\$ 1,125,374	\$ 1,338,948	\$ 1,074,148	\$ 1,006,686	\$ 1,024,166	\$ 1,311,019		Annual inflation of 2.5% is an average of historic inflation values reported for the last 10 years based on Consumer Price Index

Note:Year 10 cost based on year 5 estimated cost (2011 dollars) projected out 5 years at 2.5% inflator

Sustainable Stormwater Funding in the Upper Charles
Town of Milford, Stormwater Cost of Service
Program Administration: Existing & Future Cost Supporting Data

		Subcontractors (units = fee)			Burdened Personnel (rate = salary+50%, units = FTE)				Expenses				Total Cost	Total FTE	Description
	Source	Consulting Engineer	GIS Technician- Consultant	Legal Counsel	Town Engineer	Highway Surveyor	Asst. Highway Surveyor	Admin.	Mileage	Postage	Disposal	Other			
	Rate	1	1	1	\$135,000	\$126,000	\$69,000	\$58,500	\$0.51	\$0.44		1			
Administration	# Units														
General Stormwater Program Administration	Existing					0.01	0.01						\$ 1,950	0.02	Periodic review and tracking of tasks & subcontractors
	Proposed*					0.02	0.02						\$ 2,925	0.03	Periodic review and tracking of tasks & subcontractors (50% workload increase due to enhanced program)
Legal Support Services	Existing	-		-		-	-	-	-	-		-	\$ -	0.00	N/A
	Proposed*-YR2			\$5,000									\$ 5,000	0.00	Legal review of regulatory changes in Year 2
	Proposed*-YR5			\$5,000									\$ 5,000	0.00	Legal review of regulatory changes in Year 5
	Proposed*-YR10			\$5,000									\$ 5,000	0.00	Legal review of regulatory changes in Year 10
Administrative Support Services	Existing							0.01				110.00	\$ 695	0.01	Assist in mailings, preparation of budgets, etc.
	Proposed*							0.02				165.00	\$ 1,043	0.02	50% workload increase from existing
Inter-Agency Coordination (CRWA, EPA, Mass-Hgwy)	Existing					0.010	0.000						\$ 1,260	0.01	Share information, attend workshops & seminars
	Proposed*					0.015	0.000						\$ 1,890	0.02	50% increase of existing efforts
Inter-Municipal Coordination (adj. Towns)	Existing	-		-		-	-	-	-	-		-	\$ -	0.00	N/A
	Proposed*					0.010							\$ 1,260	0.01	Meet twice a year to review and coordinate programs
NPDES NOI and SWMP	Existing	-		-		-	-	-	-	-		-	\$ -	0.00	N/A
	Proposed* YR-4	\$15,000				0.01							\$ 16,260	0.01	Incorporate PCP plan into SWMP
	Proposed* YR-1 & 10	\$40,000				0.01							\$ 41,260	0.01	Prepare NOI and SWMP in Year 1,
NPDES Annual Reporting	Existing	\$1,500				0.010	0.01	0.010					\$ 4,035	0.03	Completed by consultant, input & review by Town staff
	Proposed*	\$3,000				0.02	0.02	0.02					\$ 8,070	0.06	100% increase from existing, completed by consultant, input & review by Town staff
NPDES MS4 Public Education Programs	Existing	\$5,500											\$ 5,500	\$ -	Presentations (presentation to middle school students by consultant), add stormwater edu. Materials to library, schools, & town hall, postings on Town website & posters.
	Proposed*-YR 1	\$3,000				0.030		0.030				1,800	10,335	0.06	2 educational messages one to target residents (radio ad) and one to developers audience (brochures w/ permit application), Consultant-Survey of educational program effectiveness
	Proposed*-YR 2	\$3,000				0.030		0.030		1,700		4,140	13,423	0.06	2 educational messages one to target commercial (mailed brochure) and one to industrial audience (mailed brochures), Consultant-Survey of educational program effectiveness
	Proposed*-YR 3	\$3,000				0.010		0.010					4,845	0.02	Consultant-Survey of educational program effectiveness
	Proposed*-YR 4	\$3,000				0.030		0.030				930	9,465	0.06	2 educational messages to target residents (newspaper ad) and developer audience (brochures w/ permit application), Consultant-Survey of educational program effectiveness
	Proposed*-YR 5	\$3,000				0.030		0.030		1,700		2,840	12,123	0.06	2 educational messages one to target commercial (mailing &presenation at local business assoc. meeting) and one to industrial audience (mailed brochures), Consultant-Survey of educational program effectiveness
	Proposed*-Averaged/YR-10												10,038	0.00	Workload increase from existing; distribute at least 2 messages to each of 4 audiences (residents, commercial, industrial, construction), measure & report message effectiveness

		Subcontractors (units = fee)			Burdened Personnel (rate = salary+50%, units = FTE)				Expenses				Total Cost	Total FTE	Description
	Source	Consulting Engineer	GIS Technician-Consultant	Legal Counsel	Town Engineer	Highway Surveyor	Asst. Highway Surveyor	Admin.	Mileage	Postage	Disposal	Other			
	Rate	1	1	1	\$135,000	\$126,000	\$69,000	\$58,500	\$0.51	\$0.44		1			
Administration	# Units														
NPDES MS4 Public Involvement Programs	Existing						0.01	0.04					\$ 3,030	0.05	Annual clean-up programs for scrap metal (615 tons scrap metal/white goods)& oil recycling (1,200 gal. waste oil), semi-annual hazardous waste pick up, and Community Clean up days.
	Proposed*-YR 1& YR 2	\$2,360				0.010		0.010			1000	5000	\$ 10,205	0.02	2x Public meetings, update website w/ annual report&events,river clean-up day, storm drain stencil,presentation by consultant
	Proposed*-YR 3-5	\$2,360				0.010		0.010			1000	4000	\$ 9,205	0.02	2x Public meetings, update website w/ annual report&events,river clean-up day, storm drain stencil, rain barrel workshop or similar consultant presentation
NPDES MS4 & SPCC Training	Existing	\$800										480.00	\$ 1,280	0.00	Consultant provided 2-hr training class to DPW employees on good housekeeping measures, and practices of equipment fueling, waste ban regs, waste water, drink water, stormwater, & emerg. Preparedness
	Proposed* Annual	\$5,000											\$ 5,000	0.00	SWPPP training for Transfer Station, DPW Facility & pollution prevention/good housekeeping and IDDE for all DPW; SPCC training at DPW Facility; all training done by a consultant; programs developed and training in Year 1, refresher training each year thereafter
Certified Municipal Phosphorous Program (CMPP)	Existing	-		-			-	-	-	-		-		0.00	N/A
	Proposed* YR-5+		\$5,000			0.03		0.02					\$ 9,950	0.05	Recordkeeping, data tracking and correspondence with regulated entities for updating program progress under "Water Quality"
Grants Program (s319, 604b, CZM)	Existing					0.00		0.01					\$ 585	0.01	some state grants for repairs
	Proposed* YR-2&4					0.00		0.01					\$ 585	0.01	Staff efforts to apply for and administer grants received for stormwater programs; assumes one permit every two years
Stormwater Advisory Committee Support	Existing	-		-		-	-	-	-	-		-		0.00	N/A
	Proposed*												\$ -	0.00	Incorporated into general stormwater program administration
Unspecified Overhead	Existing												\$ -	0.00	Copies, postage, consumables
	Proposed*												\$ -	0.00	50% increase from existing
Emergency/Disaster Management	Existing	\$0	\$0	\$0	\$0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	N/A
	Proposed*					0.010							\$ 1,260	0.01	Coordinate stormwater program with EPC, meet twice a year
Total:	Existing	\$7,800		0.00	0.00	0.03	0.03	0.07	0.00	0.00		\$590	\$18,335	0.13	
	Proposed* YR-1	\$50,360	\$0	\$0	0.00	0.13	0.02	0.08	0.00	\$0	\$1,000	\$6,965	\$75,178	0.17	
	Proposed* YR-2	\$13,360	\$0	\$5,000	0.00	0.11	0.04	0.09	0.00	\$1,700	\$1,000	\$9,305	\$50,661	0.23	
	Proposed* YR-3	\$13,360	\$0	\$0	0.00	0.09	0.04	0.06	0.00	\$0	\$1,000	\$4,165	\$35,498	0.18	
	Proposed* YR-4	\$28,360	\$5,000	\$0	0.00	0.15	0.04	0.11	0.00	\$0	\$1,000	\$5,095	\$56,963	0.24	
	Proposed* YR-5	\$13,360	\$5,000	\$5,000	0.00	0.14	0.04	0.10	0.00	\$1,700	\$1,000	\$7,005	\$57,726	0.27	

*Proposed Includes Additional Stormwater Staff Support

Sustainable Stormwater Funding in the Upper Charles
Town of Milford, Stormwater Cost of Service
Regulation/Enforcement: Existing & Future Cost Supporting Data

		Subcontractors (units = fee)		Burdened Personnel (rate = salary+50%, units = FTE)				Expenses			Total Cost	Total FTE	Description
	Source	Consulting Engineer	Legal Counsel	Town Engineer	Highway Surveyor	Asst. Highway Surveyor	Admin.	Mileage	Postage	Other			
	Rate	1	1	\$135,000	\$126,000	\$78,000	\$58,500	\$0.51	\$0.44	1			
Regulation/Enforcement	# Units												
MS4 Stormwater Permit Administration	Existing			0.02							\$ 2,700	0.02	13 filings w/ Conservation Commission of which 1 was a new permit for a 1+ Acre construction site subject to the Town stormwater management and O&M bylaw for developm't regulations
	Proposed*			0.06							\$ 8,100	0.06	Anticipated administration of 3 permits annually
RDA/CMPP Compliance	Existing										\$ -	0.00	N/A
	Proposed*	\$5,000		0.05	0.05						\$ 11,300	0.10	Inspection of facilities to verify accuracy of information submitted under the CMPP
Stormwater/Drainage System Inspections	Existing			0.10							\$ 13,500	0.10	Currently conducted by Town Engineer to review compliance of post-construction BMPs or connections with the MS4
	Proposed*			0.13							\$ 16,875	0.13	25% increase in workload due to various programs
Illicit Discharge and Dumping Program	Existing	\$6,000									\$ 6,000	0.00	Sewer Department currently tracks down discharges when receives a call, the cost is passed on to owner of illicit discharge, consultant cost
	Proposed Yr 1	\$6,000									\$ 6,000	0.00	continue existing program
	Proposed* YR 2-5	\$9,000			0.02						\$ 11,520	0.02	Includes identification of IDDE sources- assume 150% of outfalls have illicit discharge (30 hits over permit cycle-start YR2), estimate cost to identify source \$1200 per hit (CWP IDDE 2004 manual =\$900 per site, dye test) assume removal costs are borne by owner or sewer authority, include \$2500 for coordination/oversight of enforcement
Erosion/sediment Control Inspections	Existing			0.03							\$ 4,050	0.03	Engineer inspects Town projects; private projects are inspected at the cost to the developer or permittee, town inspector inspects some
	Proposed*			0.05							\$ 6,075	0.05	50% increase in workload due to additional maintenance and construction work
Total:	Existing	\$6,000	\$0	0.15	0.00	0.00	0.00	\$0	\$0	\$0	\$26,250	0.15	
	Proposed* YR1	\$5,000	\$0	0.28	0.00	0.00	0.00	\$0	\$0	\$0	\$37,050	0.23	
	Proposed* YR 2	\$9,000	\$0	0.23	0.02	0.00	0.00	\$0	\$0	\$0	\$42,570	0.25	
	Proposed* YR 3	\$9,000	\$0	0.23	0.02	0.00	0.00	\$0	\$0	\$0	\$42,570	0.25	
	Proposed* YR 4	\$9,000	\$0	0.28	0.02	0.00	0.00	\$0	\$0	\$0	\$42,570	0.25	
	Proposed* YR 5	\$14,000	\$0	0.28	0.07	0.00	0.00	\$0	\$0	\$0	\$53,870	0.35	

*Proposed Includes Additional Stormwater Staff Support

Sustainable Stormwater Funding in the Upper Charles
Town of Milford, Stormwater Cost of Service
Engineering & Master Planning: Existing & Future Cost Supporting Data

		Subcontractors (units = fee)			Burdened Personnel (rate = salary+50%, units = FTE)					Expenses				
	Source Rate	Consulting Engineer 1	GIS consultant 1	Legal Counsel 1	Town Engineer \$135,000	Highway Surveyor \$126,000	Asst. Highway Surveyor \$78,000	Admin. \$58,500	SW Program Intern \$45,000	Mileage \$0.51	Postage \$0.44	Total Cost	Total FTE	Description
Engineering & Master Planning	# Units													
Stormwater Master Planning, includes PCP/CIP planning, link with Comp. Plan; planning for infrastructure needs, includes facility inventory for SW retrofit, tracking BMPs and resulting TP reduction, and updating GIS and annual report	Existing											\$ -	0.00	
	Proposed* YR-1	\$95,000	\$5,000			0.04						\$ 105,040	0.04	PCP Development and Adjust IC loads and % removal from 2000-2009, facility retrofit inventory (1/2 yr 1)
	Proposed* YR-2	\$70,500	\$25,000			0.04						\$ 100,540	0.04	PCP development, PCP GIS supportive mapping and YR 2 Progress Report, facility retrofit inventory (1/2 yr2)
	Proposed* YR-3	\$70,000				0.04						\$ 75,040	0.04	PCP development
	Proposed* YR-4	\$60,000		10,000		0.04						\$ 75,040	0.04	PCP development
	Proposed* YR-5	\$15,000	\$1,500		0.01	0.01		0.02				\$ 20,280	0.04	Annual tracking and update GIS with BMPs installed &TP reductions, annual reporting of new BMPs and resulting TP reduction- CIP planning based on PCP by consultant with staff review
Illicit Discharge Detection and Elimination Plan	Existing											\$ -	0.00	IDDE Plan developed during 2003 permit
	Proposed* YR-1	\$10,000	\$6,800			0.010						\$ 18,060	0.01	Update IDDE Plan in Year 1 to meet new permit requirements , director coord., delineation of and prioritization of catchments (80% of 303 outfalls/20 per day *8hr/dy*\$70/hr) YR2, director Coord.
	Proposed* YR-2		\$5,000									\$ 5,000	0.00	Update catchment delineation based on mapping changes/updates
	Proposed* YR-5	\$5,000				0.010						\$ 6,260	0.01	detailed report of illicit connection/discharge removals, YR5, director coord.
Catch Basin Inventory Plan (CBIP) Plan and Street Sweeping Optimization	Existing											\$ -	0.00	N/A
	Proposed* YR-1, 4,5		\$5,000					0.02				\$ 6,170	0.02	Upfront cost to set up tracking system and route planning, YR1
	Proposed*-Yr 2-3		\$2,500					0.02	1.62			\$ 76,570	1.64	Update & Review previous year CBIP recordkeeping of CB cleaning and status of CB, investigate CB w/ >50% full sump at 2 consecutive cleanings, SOP year 1 to sweep areas DCIA 2x-record miles, optimize programs
Waterfowl & Pet Waste Management Programs	Existing											\$ -	0.00	N/A
	Annual					0.02						\$ 2,520	0.02	Annual coordination and management
	Proposed* YR 1	\$10,000				0.01						\$ 11,260	0.01	Develop programs by end of Year 1, pet waste & waterfowl locations identified in mapping, no additional cost for plan
Septic, Inflow, and Infiltration Program	Existing											\$ -	0.00	Sanitary sewer (I/I) investigations and improvements tracked to document condition and status of system
	Proposed*					0.010						\$ 1,260	0.01	coordination w/ sewer dept.
Pesticide, Herbicide, and Fertilizer Program	Existing											\$ -	0.00	Applications follow the principles of an Integrated Pest Management (IPM) Program to reduce chemical applications for pest and turf management
	Proposed*					0.02						\$ 2,520	0.02	Continue IPM & Implement fertilizer optimization program Year 1, assume requires coordination w/ parks dept. etc.
Spill Response and Cleanup Program	Existing											\$ -	0.00	No formal program related to stormwater
	Proposed* YR2	\$4,500	\$1,000			0.01	0.02					\$ 8,320	0.03	Develop a priority response program based on high accident areas, significant pollutant potential and
	Proposed* YR 3-4		\$1,000			0.02	0.01					\$ 4,300	0.03	Track program results and coordinate with Town departments
	Proposed* YR 5	\$4,500	\$1,000			0.02	0.02					\$ 9,580	0.04	Update priority response program and track program results and coordinate with Town departments
Groundwater and Drinking Water Program	Existing											\$ -	0.00	No formal evaluation of priorities & results with respect to water supply
	Proposed* YR-1	\$3,500				0.02						\$ 6,020	0.02	Technical review memo of drinking water quantity and quality priority areas , includes consultant GIS map exercise
	Proposed* YR 2-5					0.01						\$ 1,260	0.01	Incorporate program results into planning activities for BMPs to address water quality; review status
DPW Project Design Engineering and Permitting Assistance	Existing				0.030							\$ 4,050	0.03	Town Engineer Review of Drainage Plans for Town
	Proposed* YR 1-4				0.040							\$ 5,400	0.04	25% increase in workload from existing, 2 projects per year
	Proposed* YR 5+				0.06							\$ 8,370	0.06	50% increase in projects resulting from increased inspection, aging infrastructure

		Subcontractors (units = fee)			Burdened Personnel (rate = salary+50%, units = FTE)					Expenses				
	Source	Consulting Engineer	GIS consultant	Legal Counsel	Town Engineer	Highway Surveyor	Asst. Highway Surveyor	Admin.	SW Program Intern	Mileage	Postage	Total Cost	Total FTE	Description
	Rate	1	1	1	\$135,000	\$126,000	\$78,000	\$58,500	\$45,000	\$0.51	\$0.44			
Engineering & Master Planning	# Units													
SWPPPs for Transfer Station & DPW Facility	Existing											\$ -	0.00	Municipal facility inventory completed to evaluate pollution prevention and good housekeeping at municipal facilities
	Proposed* YR 1	\$12,500			0.01	0.01						\$ 15,110	0.02	Develop SWPPPs by end of Year 1; assume \$2500 per site 1/4 town bldgs need swppp (5 of 22 sites), SWPPP for Highway Garage complete include annual inspection at the garage
	Proposed* YR 5	\$12,500			0.02	0.01						\$ 16,460	0.03	Year 5 update SWPPPs, and annual inspection,
	Proposed* YR 2-4				0.01	0.01						\$ 2,610	0.02	implement recommendations by end of Year 2; update every 5 years, assume annual evaluation performed by town engineer or facility manager, coordinate w/ SWMP director
Maintenance and Field Engineering Support	Existing				0.030							\$ 4,050	0.03	Engineers assist DPW on an on-call basis
	Proposed* YR 1-4				0.038							\$ 5,063	0.04	25% increase in workload from existing, 2 projects per year,
	Proposed* YR 5+				0.05							\$ 6,075	0.05	100% increase in projects as maintenance needs increase
Data Collection, Database Management, Mapping	Existing											\$ -	0.00	Field data collected for existing infrastructure and new projects (GIS update)
	Proposed*-YR 1		\$239,444		0.02							\$ 242,144	0.02	1/2 of stormwater infrastructure system mapping
	Proposed*-YR 2-Drainage		\$239,444		0.02							\$ 242,144	0.02	complete system mapping Year 2 cost includes mapping of entire drainage network (schematic only);
	Proposed*-YR 2-Sewer		\$51,210		0.02							\$ 53,910	0.02	sewer mapping-60 miles of Sewer serves 80% of town, assume takes a GIS consultant (\$70/hr) 8 hr to update GIS with 1 mile of sewer data provided by Sewer Dept. additional consultant field time to address data gaps,
	Proposed*-YR 3-5 Sewer		\$5,000		0.02						\$ -	\$ 7,700	0.02	Years 3-5 update septic/ sewer attributes
	Proposed*-YR 3		\$30,500		0.02							\$ 33,200	0.02	Years 3 include field mapping and verification of drainage attributes , IC reduction tracking & GIS update
	Proposed*-YR 4		\$30,500		0.02							\$ 33,200	0.02	Years 4 include field mapping and verification of drainage attributes , update with new BMPs and retrofits, IC reduction tracking update gis with layers from developer,
	Proposed*-YR5		\$30,500		0.02							\$ 33,200	0.02	Years 5 include cont. field mapping and verification of drainage attributes , update of new BMPs & retrofits, IC reduction tracking update gis with layers from developer,
Technical Services/Public Assistance (hotlines)	Existing											\$ -	0.00	Handle calls related to flooding and illicit discharges
	Proposed*				0.01			0.01				\$ 1,935	0.02	50% increase in workload from existing
Code Development and Zoning Support Services	Existing											\$ -	0.00	Updates completed to comply with 2003 NPDES MS4 Permit
	Proposed*-YR 1	\$7,500										\$ 7,500	0.00	Consultant Review ESC, SW, and IDDE codes, develop or update written procedures for plan review, inspection, and ESC enforcement
	Proposed*-YR 2	\$17,500										\$ 17,500	0.00	Consultant complete Review of ESC, SW, and IDDE codes, review Impervious Cover requirements in codes
	Proposed*-YR 3	\$12,500										\$ 12,500	0.00	Report on feasibility of green practices and other green techniques in Year 3
Hazard Mitigation Planning and Flood Insurance Updates	Proposed*-YR 4&5	\$5,000			0.01							\$ 6,350	0.01	Year 4 & 5 code compliance support
	Existing	\$5,000										\$ 5,000	0.00	N/A
CMPP Planning and Development	Proposed* YR-5	\$25,000										\$ 25,000	0.00	Allowance for H&H analysis (consultant) in Year 5 for specific areas of concern identified throughout the permit term; review results of FEMA mapping updates for Worcester County, anticipated within 5 years
	Existing													N/A
Total:	Proposed* YR 2-4	\$20,000										\$ 20,000	0.00	Planning and development of CMPP program in Years 2, 3, and 4
	Existing	\$5,000	\$0	\$0	0.06	0.00	0.00	0.00	0.00	0.00	\$0	\$13,100	0.06	
	Proposed* YR1	\$138,500	\$256,244	\$0	0.12	0.12	0.00	0.03	0.00	0.00	\$0	\$427,481	0.27	
	Proposed* YR2	\$112,500	\$324,154	\$0	0.13	0.12	0.02	0.02	1.62	\$0	\$0	\$546,551	1.93	
	Proposed* YR3	\$102,500	\$57,210	\$0	0.21	0.08	0.01	0.00	1.62	\$0	\$0	\$251,878	1.93	
	Proposed* YR4	\$85,000	\$37,500	\$10,000	0.21	0.11	0.04	0.00	0.00	\$0	\$0	\$175,328	0.32	
	Proposed* YR5	\$67,000	\$40,500	\$0	0.19	0.11	0.02	0.04	0.00	0.00	\$0	\$154,940	0.38	

*Proposed Includes Additional Stormwater Staff Support

Sustainable Stormwater Funding in the Upper Charles
Town of Milford, Stormwater Cost of Service
Operations & Implementation: Existing & Future Cost Supporting Data

		Subcontractors (units = fee)		Burdened Personnel (rate = salary+50%, units = FTE)							Expenses						Total Cost	Total FTE	Description
	Source	Consulting Engineer	Legal Counsel	Town Engineer	Sewer Director	Highway Surveyor	Asst. Highway Surveyor	Admin.	Foreman/ Labor	Seasonal Labor	Equipment Budget	Disposal	Vehicle Parts	Materials & Supplies	Fuel	Other			
	Rate	1	1	\$135,000	\$126,000	\$126,000	\$69,000	\$58,500	\$53,000	\$18,000	1	1	1	1	1	1			
Operations & Implementation	# Units																		
Operations and Maintenance Management	Existing					0.07	0.07										\$ 13,650	0.14	Highway Surveyor & Asst. coordinate work schedules, equipment and product needs, oversees progress and completion of work
	Proposed YR1	\$5,000				0.11	0.11										\$ 26,450	0.22	Develop detailed O&M program for municipal facilities, parks, buildings, streets, vehicle storage, infrastructure, and SWPPP
	Proposed YR-5					0.11	0.11										\$ 21,450	0.22	Increase in BMP mgmt & oversight due to PCP implementation
	Proposed YR2 -4					0.11	0.11										\$ 20,820	0.22	50% increase in effort from existing due to new projects and tracking of results (measurable goals) for each activity,
CIP/Infrastructure Implementation	Existing																\$ -	0.00	No formal program; infrastructure needs incorporated into Highway Budget for operations, CIP funded through grants or CHP 90 or s319;
	Proposed																\$ -	0.00	Annual needs evaluation, incorporate capital projects, evaluate stormwater improvement opportunities
PCP Implementation	Existing																\$ -	0.00	N/A
	Proposed																\$ -	0.00	Year 4 - implementation & construction of BMPs
Voluntary CMPP/RDA Implementation	Existing																\$ -	0.00	N/A
	Proposed																\$ -	0.00	Year 5 - implementation of CMPP or construction of BMP
Illicit Discharge Removal	Existing	\$10,000															\$ 10,000	0.00	No formal program; no cross connections to MS4 identified thus far; illegal dumping removed by Highway Department and disposal coordinated with Board of Health
	Proposed			0.02	0.02	0.02	0.02		0.10	0.10				2,500	500		\$ 19,220	0.28	implementation of infrastructure improvements resulting from IDDE removal, inter-department oversight and coordination
Storm Sewer and Culvert Maintenance/Repair	Existing															\$ 54,683	\$ 54,683	0.00	Repair/re-setting of catch basin grates, damaged headwalls, collapsed culverts and structures, rebuilding of manholes and catch basins
	Proposed															\$68,354	\$ 68,354	0.00	25% increase due to degraded infrastructure
Inlet, Catch Basin, and Manhole Cleaning	Existing								0.080		6,475	11,212				\$42,066	\$ 63,993	0.08	Clean approximately 3,368 catch basins and manholes per year
	Proposed								0.080		6,475	11,212				\$42,066	\$ 63,993	0.08	Continue program -Clean all catch basins and manholes each year (~3,368 structures)
Stormwater BMP Facility Maintenance	Existing															\$ 18,000	\$ 18,000	0.00	Brush cutting and trash clean up at various detention basins and culverts, some performed through inmate programs (approx. 70 basins for town to maintain) estimate based on seasonal employees (\$2,000* 9 weeks)
	Proposed Yr 1-4															\$ 18,000	\$ 18,000	0.00	continue existing existing effort;
	Proposed Yr 5															\$ 18,900	\$ 18,900	0.00	5% increase in cleaning and maintenance Year 5 due to implementation of PCP plan/retrofits
SWPPP- Facility Maintenance	Existing											\$ 11,357					\$ 11,357	0.00	Facility clean up- remove 975 gal. oil/water & 5 drums of oily sand & sludge from separator at garage
	Proposed*											\$ 11,357					\$ 11,357	0.00	continue existing activities

		Subcontractors (units = fee)		Burdened Personnel (rate = salary+50%, units = FTE)							Expenses						Total Cost	Total FTE	Description
	Source	Consulting Engineer	Legal Counsel	Town Engineer	Sewer Director	Highway Surveyor	Asst. Highway Surveyor	Admin.	Foreman/ Labor	Seasonal Labor	Equipment Budget	Disposal	Vehicle Parts	Materials & Supplies	Fuel	Other			
	Rate	1	1	\$135,000	\$126,000	\$126,000	\$69,000	\$58,500	\$53,000	\$18,000	1	1	1	1	1	1			
Operations & Implementation	# Units																		
Street Sweeping	Existing								2.16		24,700	21,200	28,000		12,699		\$ 201,079	2.16	All streets & parking are swept twice a year and sidewalks once a year
	Proposed*								2.16		24,700	21,200	28,000		12,699		\$ 201,079	2.16	continue existing activities
Fall Leaf-pickup	Existing								0.87		35,600	4,678	3,500		5,330		\$ 95,419	0.87	Leaf pickup program in place
	Proposed*								0.87		35,600	4,678	3,500		5,330		\$ 95,419	0.87	Continue existing leaf collection program
Maintenance/Repair/Installation of ESC practices	Existing																\$ -	0.00	Repair of areas in spring damaged by snow plowing; repair of other eroded areas due to major rain events (road repairs - budgeted amount)
	Proposed*					0.01	0.01		0.02	0.01				5,000			\$ 7,130	0.05	Allowance for repair of areas in spring damaged by snow plowing; repair of other eroded areas due to major rain events (road repairs - budgeted amount)
Stream Restoration/Stabilization	Existing																\$ -	0.00	stream restoration project
	Proposed *YR-3					0.01	0.02		0.02	0.04				25,000			\$ 28,360	0.09	allowance to adress 1 stream project every 3 years, YR 3
Ditch and Channel Maintenance	Existing																\$ -	0.00	
	Proposed*																\$ -	0.00	Continue existing maintenance activities
Waterfowl & Pet Waste Management Programs	Existing																\$ -	0.00	N/A
	Proposed* YR-2															\$4,000	\$ 4,000	0.00	install pet waste collection bag stations, stock bags annually
	Proposed* YR-3	\$6,000														\$2,500	\$ 8,500	0.00	implement waterfowl controls (Goose egg addling) & public education signage, continue waterfowl controls and pet bags stock annually
	Proposed* YR 4-5	\$6,000														\$500	\$ 6,500	0.00	Develop programs by end of Year 1, implement pet management year 2, water fowl year 2 public aware year 3 implement measures; update every 5 years
Public Assistance Program	Existing																\$ -	0.00	No program for the storm sewer system; Town requires inflows to the sanitary sewer system to be disconnected
	Proposed*					0.02		0.02									\$ 3,690	0.04	Create public awareness & incentive program to encourage disconnection of impervious areas to the storm sewer system
Hazardous/Toxic Materials Collection Program	Existing							0.01								\$7,200	\$ 7,785	0.01	Existing hazardous collection program
	Proposed*							0.01								\$7,200	\$ 7,785	0.01	continue existing program
Emergency Drainage Repairs	Existing															\$12,000	\$ 12,000	0.00	Annual allowance for unexpected repair of failed drainage structures
	Proposed* YR1-5															\$18,000	\$ 18,000		50% increase in existing practices due to increased inspection programs
Total:	Existing	\$10,000	\$0	0.00	0.00	0.07	0.07	0.01	3.11	0.00	\$66,775	\$48,447	\$31,500	\$0	\$18,029	\$133,949	\$487,966	3.26	
	Proposed YR1*	\$5,000	\$0	0.02	0.02	0.16	0.14	0.03	3.23	0.11	\$66,775	\$48,447	\$31,500	\$7,500	\$18,529	\$153,620	\$540,477	3.71	
	Proposed YR2*	\$0	\$0	0.02	0.02	0.16	0.14	0.03	3.23	0.11	\$66,775	\$48,447	\$31,500	\$7,500	\$18,529	\$157,620	\$538,847	3.71	
	Proposed YR3*	\$6,000	\$0	0.02	0.02	0.17	0.16	0.03	3.25	0.15	\$66,775	\$48,447	\$31,500	\$32,500	\$18,529	\$156,120	\$571,707	3.80	
	Proposed YR4*	\$6,000	\$0	0.02	0.02	0.16	0.14	0.03	3.15	0.11	\$60,300	\$37,235	\$31,500	\$7,500	\$18,529	\$112,054	\$541,347	3.71	
	Proposed YR5*	\$6,000	\$0	0.02	0.02	0.16	0.14	0.03	3.23	0.11	\$66,775	\$48,447	\$31,500	\$7,500	\$18,529	\$155,020	\$542,877	3.71	

*Proposed Includes Additional Stormwater Staff Support

Sustainable Stormwater Funding in the Upper Charles
Town of Milford, Stormwater Cost of Service
Monitoring: Existing & Future Cost Supporting Data

		Subcontractors (units = fee)			Burdened Personnel (rate = salary+50%, units = FTE)							Expenses		Total Cost	Total FTE	Description
	Source	Consulting Engineer	Consulting GIS Technician	Legal Counsel	Town Engineer	Highway Surveyor	Sewer Director	Asst. Highway Surveyor	Foreman/Labor	Seasonal Labor	Admin.	Other				
	Rate	1		1	\$135,000	\$126,000	\$126,000	\$78,000	\$53,000	\$18,000	\$58,500	1				
Monitoring	# Units															
Catchment Assessment & Outfall Monitoring (dry weather)	Existing												\$ -	0.00	All outfalls inspected once during dry weather conditions during the 2003 permit term	
	Proposed* YR 1													0.00		
	Proposed* YR 2-5	\$29,950			0.01	0.02	0.02	0.02	0.15			\$1,600	\$ 44,930	0.22	Assess 50% of catchments by Year 3, monitor 50% of outfalls by Year 4 and 100% of catchments and outfalls by Year 5; 303 outfalls and sampling of 20%; catchment assessments include key junction manhole inspections (i.e., damming of inlet pipes)by staff; 76 catchment & outfall assessments per year; 10 catchments per day = 8 days; 15 samples @ \$250/sample; 2 person field crew,damming of inlet pipes by DPW, inspection by Asst. HGWY surveyor, key junction manholes @ 8 per day x2 (inspection 48 hrs later) = 4 days (assume 61 KJMH inspected each year 2-5; allowance of 4 samples for key junction manhole flows; expenses at \$250/day; police detail at \$400/day for 4 days, \$4000 consultant review of sample results	
Stormwater Outfall Monitoring (wet weather)	Existing												\$ -	0.00	N/A	
	Proposed* YR 1	\$10,000			0.02	0.04	0.01						\$ 17,740	0.07	Develop Permittee Specific Monitoring Plan in Year 1	
	Proposed* YR 2-5	\$42,650	\$3,000		0.02	0.02	0.00						\$ 50,871	0.04	sample 25% of outfalls each year beginning in Year 2, assume 80% outfalls are sampled, sampling requires 12 days by consultant, 5 outfalls sampled per day, 25% labor contingency for false starts, \$250 per sample, \$250 per day expenses, \$5000 consultant review sample results, additional staff expenses for oversight and coordination	
Surface Water Quality Monitoring	Existing												\$ -	0.00	N/A	
	Proposed* YR 3&4	\$0			0.00	0.00							\$ -	0.00	Monitoring of key streams and water bodies based on Permittee Specific Monitoring Plan- not included as requirement optional program for overall monitoring plan	
Total:	Existing	\$0		\$0	0.00	0.00		0.00			0.00	\$0	\$ -	0.00		
	Proposed* YR1	\$10,000	\$0	\$0	0.02	0.04		0.00	0.00	0.00	0.00	\$0	\$ 17,740	0.07		
	Proposed* YR2	\$72,600	\$3,000	\$0	0.03	0.04	0.02	0.02	0.15	0.00	0.00	\$1,600	\$ 95,801	0.26		
	Proposed*YR3	\$72,600	\$3,000	\$0	0.03	0.04	0.02	0.02	0.15	0.00	0.00	\$1,600	\$ 95,801	0.26		
	Proposed* YR4	\$72,600	\$3,000	\$0	0.03	0.04	0.02	0.02	0.15	0.00	0.00	\$1,600	\$ 95,801	0.26		
	Proposed* YR5	\$72,600	\$3,000	\$0	0.03	0.04	0.02	0.02	0.15	0.00	0.00	\$1,600	\$ 95,801	0.26		

* Proposed Includes Additional Stormwater Staff Support

Appendix E

EPA Memorandum on the Methodology for Estimating Costs for Structural Controls

MEMORANDUM

DATE: DRAFT - August 9, 2011

TO: Project File

cc: Richard Claytor - Horsley Witten Group

FROM: Mark Voorhees, 617 918-1537, voorhees.mark@epa.gov

SUBJECT: Methodology for developing cost estimates for structural storm water controls for preliminary Residual Designation sites and for Charles River watershed areas in the communities of Milford, Bellingham and Franklin, Massachusetts.

Introduction

In coordination with Horsley Witten Group (HW), EPA has developed construction cost estimates for implementing storm water controls in the communities of Milford, Bellingham and Franklin, Massachusetts to reduce storm water phosphorus loadings to the Charles River. The EPA cost estimates were developed for structural storm water controls that would reduce storm water phosphorus loading to levels that are consistent with proposed requirements in the draft NPDES storm water permits for Small MS4s and potential Residual Designation Authority (RDA) discharges in the Charles River watershed. These reductions specified in the draft permits were derived from the Final Lower Charles River Phosphorus TMDL approved by EPA in October 2007. This document describes the approach used to develop storm water construction cost estimates for the Charles River watershed within the three communities.

The approach described herein refines and updates the cost estimates developed by Tetra Tech, Inc in their December 2009 study: *Optimal Storm Water Management Plan Alternatives: A Demonstration Project for the Three Upper Charles River Communities*. EPA has determined that the unit cost factors used in the Tetra Tech study do not adequately reflect anticipated costs associated with storm water retrofit projects in eastern Massachusetts based on a review of more recent storm water control retrofit work in Massachusetts and the Long Creek watershed in Maine. However, EPA has relied on much of the underlying GIS data layers and storm water management analyses from the Tetra Tech study to refine the cost estimates. The final report for the Tetra Tech study, which includes a detailed discussion of the approach used to evaluate storm water management plan options can be found at:

www.epa.gov/region1/topics/water/pdfs/OptimalSWMngtPlanAlternativesUpperCharlesPilotStudy.pdf

Background

The communities of Milford, Bellingham and Franklin MA are located in part in the upper Charles River watershed. The Charles River is non-attainment with Massachusetts Surface Water Quality Standards (MASWQS) because of excessive phosphorus loading from the contributing watershed. Known sources

of phosphorus to the Charles River include storm water discharges, treated wastewater, combined sewer overflows, illicit sanitary sources, and natural sources.

In October 2007, EPA Region 1 approved a Total Maximum Daily Load (TMDL) for phosphorus for the Lower Charles River. The Lower Charles phosphorus TMDL established the total allowable loading of phosphorus to the River and allocated allowable phosphorus loadings to the contributing phosphorus sources. Allocations were set for watershed areas, wastewater treatment facilities, combined sewer overflows and illicit discharges. The majority of the phosphorus load to the river comes from the contributing watershed areas and includes storm water runoff.

The TMDL analysis also included a land-use based phosphorus loading assessment to assist in the interpretation of the allocations assigned to watershed areas. The results of this analysis helps to define the levels of control needed in the watershed. Moreover, phosphorus load reductions were estimated for each municipality in the watershed using the GIS analysis. Details of the final TMDL including phosphorus sources, the loading capacity, allocations to sources, and the land-use based loading assessment can be found in the Final TMDL report at this link:

<http://www.mass.gov/dep/water/resources/charlesp.pdf>

In 2009 and 2010 EPA prepared draft NPDES permits to address storm water discharges to the Charles River: (1) Draft General Permit for Storm Water Discharges from Small Separate Municipal Storm Sewer Systems (MS4) in Massachusetts North Coastal Watersheds, which includes the Charles River watershed and; (2) the Draft General Permit for Designated Discharges in the Charles River Watershed within the municipalities of Milford, Bellingham and Franklin, Massachusetts. These two draft permits proposed requirements to achieve storm water phosphorus loading reductions that are consistent with the wasteload allocations and reductions established in the TMDL. Essentially, the draft permits for the MS4s propose overall phosphorus load reduction requirements of 57%, 52% and 52% for MS4 discharges in Charles River watershed areas of Milford, Bellingham and Franklin, respectively. The draft Designated Discharge permit proposes that Residual Designation sites (RD sites) achieve a 65% reduction in phosphorus load from the developed portion of the site.

In September 2010, EPA contracted with HW to conduct an evaluation of sustainable storm water funding options for the Upper Charles River communities of Milford, Bellingham and Franklin, Massachusetts. The objective of the sustainable funding project is to develop recommendations on integrated funding options for implementing and managing the proposed requirements set forth in the draft MS4 and residual designation general permits. In order to evaluate funding options for the three communities, it is necessary to forecast the potential costs associated with implementing the permit requirements. EPA volunteered to update and refine the cost estimates developed from the Tetra Tech study to support the HW effort. HW also developed cost estimates using different methodologies and information.

Overview of Scope and Approach

The approach described in this document was used to estimate construction costs associated with structural storm water controls for two levels of phosphorus control: 1) the proposed **full** phosphorus

load reduction requirements in the draft permits (e.g., 57.0% for Milford MS4, and 65% for RD sites); and 2) the proposed full phosphorus load reduction requirements in the draft permits **less 15%** (e.g., e.g., 42% for Milford MS4 and 50% for RD sites). The second level of phosphorus control, **less 15%**, was developed to assess the magnitude of potential cost-savings that could be associated with no-cost or low-cost non-structural and phosphorus source control practices (e.g., statewide phosphorus fertilizer ban).

More specifically, construction cost estimates have been developed for the RD sites; the entire watershed area for each municipality and for the three municipalities combined under one management program. Table 1 summarizes the scenarios for which individual construction cost estimates have been developed using the approach described herein. As indicated, cost estimates have been developed for the following three implementation approaches – two for the Residual Designation Sites and one for the entire watershed area in the specified municipality:

1. **Independent compliance at each proposed Residual Designation site.** Each site would achieve the specified level of phosphorus control through structural controls (65% and 50% reduction levels).
2. **Optimized – collective compliance by all Residual Designation sites.** A scenario where all sites work together as a group to most cost-effectively achieve the total combined reduction needed by all sites. This approach would be similar to the concept of a Certified Municipal Phosphorus Program as proposed in the Draft Residual Designation permit.
3. **Optimized compliance across watershed area for varying amounts of impervious area treated.** The municipality would implement a storm water management program to most cost effectively achieve a specified level of phosphorus control (e.g., draft MS4 requirement of 57.0% for Milford). Under this approach, cost estimates were developed for each municipality and for the three municipalities together as one entity for several scenarios by varying the amount of watershed impervious area treated (e.g., 60%, 65%, 70%, 80%, 85%, 90% & 100%)

Table 1: Scenarios for estimating construction costs for structural storm water controls in the Charles River watershed and proposed Residual Designation Sites of Milford, Bellingham and Franklin, MA.

Municipality	Area for Phosphorus Control	Implementation Approach	Full P Load Reduction, %	Full P Load Reduction less 15%, %
Milford	Residual Designation Sites	Independent compliance at each site	65	50
Milford	Residual Designation Sites	Optimized – collective compliance by all sites	65	50
Milford	Charles River Watershed	Optimized compliance in watershed for varying amounts of impervious area treated	57.0	42.0
Bellingham	Residual Designation Sites	Independent compliance at each site	65	50
Bellingham	Residual Designation Sites	Optimized – collective compliance by all sites	65	50
Bellingham	Charles River Watershed	Optimized compliance in watershed for varying amounts of impervious area treated	51.8	36.8
Franklin	Residual Designation Sites	Independent compliance at each site	65	50

Municipality	Area for Phosphorus Control	Implementation Approach	Full P Load Reduction, %	Full P Load Reduction less 15%, %
Franklin	Residual Designation Sites	Optimized – collective compliance by all sites	65	50
Franklin	Charles River Watershed	Optimized compliance in watershed for varying amounts of impervious area treated	52.1	37.1
Milford, Bellingham & Franklin	Residual Designation Sites	Optimized – collective compliance by all sites	65	50
Milford, Bellingham & Franklin	Charles River Watershed	Optimized compliance in watershed for varying amounts of impervious area treated	53.7	38.7

To develop the cost estimates the following steps were performed:

1. **Geographic Information System (GIS) Spatial Data Analysis:** Using GIS the following spatial data layers were compiled and analyzed for the Charles River watershed areas in Milford, Bellingham and Franklin:
 - a. Watershed delineations to determine drainage area to Charles River;
 - b. 37 Mass GIS (2005) land-use categories aggregated into 9 land-use categories for the purpose of calculating annual phosphorus loading to the Charles River (Table A-1 at the end of this document) illustrates how land use categories have been aggregated);
 - c. Impervious surface coverage (MassGIS, 2005) to determine impervious areas for annual phosphorus loading calculations and applicable storm water management categories;
 - d. Topography for surface slopes to assess suitability for storm water management practices;
 - e. Hydrologic soil types and depth to ground water and bedrock to assess suitability for storm water management practices; and
 - f. Property parcel boundaries for proposed residual designation sites.
2. **Phosphorus Load Calculations:** Using the results of the GIS analysis, annual phosphorus loads (pounds per year (lbs/yr)) to the Charles River were calculated for each municipality and RD site. Annual phosphorus loads were calculated for both impervious and pervious areas separately for each of the 9 aggregated land-use categories by multiplying the amount of area in each land-use category by the corresponding land-use specific phosphorus load export rate (PLER) (lbs/acre/yr). Table A-2 at the end of this document presents the phosphorus load export rates for impervious and pervious surfaces used to calculate annual phosphorus loads to the Charles River from each municipality and RD site. For example, the GIS analysis determined that Bellingham has 166.56 acres of commercial impervious area (IA) and 71.50 acres of commercial pervious area (PA) (for a total 238.16 acres) within the Charles River watershed. Using the appropriate PLERs from Table A-2, the annual phosphorus load (P) to the Charles River from commercial areas in Bellingham is calculated as follow:

$$P_{\text{Bell.-commercial}} = (IA) \times (PLER_{\text{commercial-Impervious}}) + (PA) \times (PLER_{\text{commercial-Pervious}})$$

$$P_{\text{Bell.-commercial}} = (71.50 \text{ acres}) \times (2.229 \text{ lbs/acre/yr}) + (71.50 \text{ acres}) \times (0.267 \text{ lbs/acre/yr})$$

$$P_{\text{Bell.-commercial}} = 371.44 \text{ lbs/yr} + 19.30 \text{ lbs/yr}$$

$$P_{\text{Bell.-commercial}} = 390.74 \text{ lbs/yr}$$

- 3. Phosphorus Load Reduction Calculations:** Phosphorus load reductions were calculated to determine the extent and capacity of structural controls needed for each municipality and each RD site to estimate construction costs. Load reductions were determined by multiplying the annual phosphorus load by a reduction factor (e.g., 0.518 for 51.8% for Bellingham). The reduction factors are consistent with the draft permit requirements and an assumption of a reasonable level of control that could be achieved through no-cost or low cost non-structural practices. For example, based on the GIS analysis and the phosphorus load calculations, the total annual phosphorus load to the Charles River from Bellingham (the sum of IA and PA loads from all of the 9 land-use categories) is 2,131.93 lbs/yr. The draft MS4 permit requires Bellingham to achieve a 51.8% reduction. Therefore, the net phosphorus load reduction needed for the Charles River watershed area in Bellingham is:

$$P\text{-Reduction}_{\text{Bellingham-51.8\%}} = P_{\text{Bellingham}} \times \text{Reduction Factor}$$

$$P\text{-Reduction}_{\text{Bellingham-51.8\%}} = 2,131.93 \text{ lbs/yr} \times 0.518$$

$$P\text{-Reduction}_{\text{Bellingham-51.8\%}} = 1,104.34 \text{ lbs/yr}$$

For the scenario assuming a 15% phosphorus load reduction could be achieved through non-structural practices (e.g., phosphorus fertilizer ban, leaf litter management, etc.), the net phosphorus load reduction needed by structural controls in Bellingham is:

$$P\text{-Reduction}_{\text{Bellingham-36.8\%}} = P_{\text{Bellingham}} \times (\text{Reduction Factor}-0.15)$$

$$P\text{-Reduction}_{\text{Bellingham}} = 2,131.93 \text{ lbs/yr} \times (0.518-0.15)$$

$$P\text{-Reduction}_{\text{Bellingham}} = 2,131.93 \text{ lbs/yr} \times (0.368)$$

$$P\text{-Reduction}_{\text{Bellingham}} = 784.55 \text{ lbs/yr}$$

Similarly for RD sites, phosphorus load reductions were calculated for each RD site using draft full reduction requirement of 65% and the full reduction requirement less 15% or 50%(i.e., reduction factors of 0.65 and 0.50, respectively).

- 4. Storm Water Management Category Analysis:** A GIS spatial data analysis was conducted to identify potential storm water control technologies that would appear to be technically feasible based on available GIS spatial data layers of land characteristics. Storm water management categories were determined for all land area in the Charles River watershed of Milford, Bellingham and Franklin. Management categories were selected based on overlaying data layers associated with the following factors:

- Impervious cover;
- Pervious cover;
- Ground slope;
- Hydrologic soil group;
- Depth to ground water; and
- Depth to bedrock.

In this analysis, storm water management categories essentially identify the optimal type of storm water control practice that would be potentially applicable to treat and remove phosphorus from storm water runoff from a specific land-use category. The storm water management categories identified in Table 2 were used in this analysis and are listed in order of preference. Also provided in Table 2 are unit costs for each management category. These costs include a retrofit multiplier factor of 2 and a 35% add-on for engineering and contingencies.

Table 2: Storm water management categories and unit construction costs

Storm water Management Category (BMP Type)	Order of Preference for Use	Unit Cost (\$/cubic foot)*
Surface infiltration-high-A (IR = 1.02 inch/hr)**	1	10.80
Surface infiltration-high-B (IR = 0.52 inch/hr)**	2	10.80
Surface infiltration-high-C (IR = 0.17 inch/hr)**	3	10.80
Shallow infiltration (rain garden)-high-A (IR = 1.02 inch/hr)**	4	13.50
Shallow infiltration (rain garden)-high-B (IR = 0.52 inch/hr)**	5	13.50
Shallow infiltration (rain garden)-high-C (IR = 0.17 inch/hr)**	6	13.50
Shallow filtration	7	27.00
Bio-filtration	8	27.00
Gravel wetland (UNH style)	9	21.60
Sub-surface infiltration-high-A (IR = 1.02 inch/hr)**	10	32.40
Sub-Surface infiltration-high-B (IR = 0.52 inch/hr)**	11	32.40
Sub-surface infiltration-high-C (IR = 0.17 inch/hr)**	12	32.40

*- Unit costs include retrofit multiplier factor of 2 and a 35% add-on for engineering and contingencies

**- IR= infiltration rate

Only one management category is selected for any given land area, therefore, the most optimal cost effective practice was selected based on the GIS data and availability of suitable site conditions. As indicated, surface infiltration practices, which include basins and rain gardens, have the greatest preference for use because they are highly effective at capturing phosphorus and they have relatively lower costs. Subsurface infiltration practices were determined to be less preferable because of high unit costs and greater operation and maintenance requirements.

EPA's approach for applying storm water management categories is generally the same as used by Tetra Tech in the optimization study and the reader is encouraged to refer to the final Tetra Tech report for greater detail on the GIS analysis approach for developing the storm water management categories spatial layer. However, EPA's has modified the Tetra Tech methodology in two primary areas: 1) Bio-filtration was used in place of water quality swales; and 2) Areas with impervious surfaces (IA) were assumed to be suitable for subsurface infiltration when suitable soils and site conditions were determined to be available. Bio-filtration was selected over water quality swales because of its greater potential to remove phosphorus. With respect to IA, the Tetra Tech analysis deemed most IA as "not likely for a BMP" because of the high cost associated with construction of controls in existing impervious areas. For this analysis, EPA

removed this limitation and considered sub-surface infiltration as a viable option in impervious areas when the GIS spatial data analysis indicated suitable site conditions exist for subsurface infiltration (e.g., permeable soils with sufficient depths to ground water and/or bedrock).

Once the storm water management category areas were compiled for the Charles River watershed within the three towns, the area of each management categories was tabulated for each RD site and for each of the nine land-use categories for each town.

- 5. Selecting Storm Water Controls & Capacities for Residual Designation Sites to Independently Achieve Phosphorus Load Reductions:** For each RD site the area of each management category was tabulated and reviewed to select the most preferable control practices (see Table 2) to achieve the target phosphorus reduction. For this cost analysis, it was conservatively assumed that only runoff from impervious area (IA) of the RD site would be treated to achieve the needed phosphorus load reduction. Each RD site was evaluated to determine whether there is likely to be ample pervious area (PA) with the preferred management category to treat runoff from the site's IA and achieve the entire phosphorus load reduction. A threshold of two or more times the contributing IA (i.e., $\geq 2 \times \text{IA}$) was used to determine if one management category located in PA could achieve the require phosphorus load. For cases where a RD site's chosen management category may not have sufficient PA, then the load reduction was estimated to be achieved by either: (1) placing controls in the both the PA and IA on the RD site; or (2) placing controls only in the IA. In no case, were there more than two storm water management categories selected for a RD site. For estimating costs in this analysis, it was always assumed that controls placed in IA would be the most expensive and therefore, a unit cost of \$32/ft³ was applied (i.e., the sub-surface infiltration unit cost).

The capacities of storm water controls needed to achieve the required phosphorus load reductions were determined using the best management practice cumulative performance curves developed by Tetra Tech, Inc (2008, revised 2010). These performance curves reflect long-term cumulative pollutant removal performance of several types of storm water control practices for an eleven year rainfall record (1992-2002) for Boston, Massachusetts. Tetra Tech's final report, which can be found at the following link provides the curves and describes the methodology used to develop the performance curves: [Stormwater Best Management Practices \(BMP\) Performance Analysis, Revised March 2010 \(PDF\)](#) .

The control capacity was determined by multiplying the depth of runoff (physical storage capacity needed to achieve a specified reduction level determined from performance curve) by the amount of IA that would be treated by the control practice. For example, if 2.0 acres of IA could be treated with a bio-filtration system to achieve a 65% reduction in annual phosphorus load then the capacity of the bio-filtration system would be calculated as follows:

$$\begin{aligned}\text{Capacity}_{\text{bio-filtration } 65\%} (\text{ft}^3) &= \text{IA (ac)} \times \text{Runoff Depth}_{\text{bio-filtration } 65\%} (\text{in}) \times (43,560 \text{ ft}^2/\text{ac} \times 1 \text{ ft}/12 \text{ in}) \\ \text{Capacity}_{\text{bio-filtration } 65\%} &= 2 \text{ ac} \times 0.63 \text{ in} \times 43,560 \text{ ft}^2/\text{ac} \times 1 \text{ ft}/12 \text{ in} \\ \text{Capacity}_{\text{bio-filtration } 65\%} &= 4573.8 \text{ ft}^3\end{aligned}$$

6. **Estimate Storm Water Control Construction Cost for each RD Site:** Using the design capacity determined in step 5 above, the cost was estimated by multiplying the unit cost factor for the applicable control (see Table 2) by the needed storage capacity. For the example above, the estimated cost for the bio-filtration practice treating runoff from 2 acres of IA to achieve a 65% reduction in annual phosphorus load is:

$$\begin{aligned}\text{Construction cost}_{\text{bio-filt}} (\$) &= \text{storage capacity}_{\text{bio-filt}} (\text{ft}^3) \times \text{unit cost}_{\text{bio-filt}} (\$/\text{ft}^3) \\ \text{Construction cost}_{\text{bio-filt}} &= 4573.8 \text{ ft}^3 \times 27.00 \text{ } \$/\text{ft}^3 \\ \text{Construction cost}_{\text{bio-filt}} &= \$123,493\end{aligned}$$

7. **Optimized Cost Estimates for Residual Designation Sites Assuming Participation in a Certified Municipal Phosphorus Program (CMPP):** A second cost estimate analysis was performed to evaluate the potential cost savings that could be achieved assuming the RD sites participated in a CMPP. A CMPP would allow the RD sites to work collectively together in order to more cost effectively achieve the net total phosphorus load reduction needed by all the RD sites. This analysis was performed for each of four (4) groups of RD sites - one group for each town (e.g., Franklin RD sites) and one group for all RD sites within the three towns. For each group, an iterative process was undertaken to determine the optimal mix of management categories and storage capacities that would be needed among the RD sites in order to achieve the net total required phosphorus load reduction. This iterative process involved selecting the most cost-effective practices based on phosphorus removal performance and costs for varying storage capacities.

Table 3 summarizes phosphorus reduction performance and costs for varying storage capacities for each of the management categories. Information from Table 3 was used to iteratively identify the most cost effective combination of management practice and storage capacity available among the group of RD sites. The iterative process of selecting a control practice and capacity was continued among the RD sites until the overall mix of management categories and selected capacities achieved the total required phosphorus load reduction for the RD site group. For example, at the 50% level of phosphorus control the group of 114 RD sites in Milford needs to achieve a total phosphorus load reduction of 421 pounds. The most cost effective mix of controls selected included all management categories except gravel wetlands with storage capacities ranging from 0.4 to 0.8 inches depth of runoff per IA.

DRAFT AUGUST 8, 2011

Table 3: Summary of management category phosphorus removal performance and costs

increment of depth of runoff treated (in/1A ac)		0.0 - 0.2	0.2-0.4	0.4 -0.6	0.6 - 0.8	0.8 - 1.0	1.0 - 1.2	1.2 - 1.4		0.0 - 0.2	0.2-0.4	0.4 -0.6	0.6 - 0.8	0.8 - 1.0	1.0 - 1.2	1.2 - 1.4
cubic feet of runoff treated per imp ac, (= 0.2 in /12*43,560 ft ²), ft ³		726	726	726	726	726	726	726		726	726	726	726	726	726	726
BMP type	unit cost \$/ft ³	incremental increase in percent P removal, %								cost per incremental increase in % P removal, \$/%						
Infiltration-high-A IR= 1.02 in/hr	10.80	60%	21%	9%	4%	3%	1%	1%		\$131	\$373	\$871	\$1,960	\$2,614	\$7,841	\$7,841
Infiltration-high-B IR=0.52 in/hr		56%	21%	10%	5%	3%	1%	1%		\$140	\$373	\$784	\$1,568	\$2,614	\$7,841	\$7,841
Infiltration-likely IR=0.17 in/hr		51%	20%	11%	6%	4%	2%	2%		\$154	\$392	\$713	\$1,307	\$1,960	\$3,920	\$3,920
Shallow filtration-A IR=1.02 in/hr	13.50	60%	21%	9%	4%	3%	1%	1%		\$163	\$467	\$1,089	\$2,450	\$3,267	\$9,801	\$9,801
Shallow filtration-B IR= 0.52 in/hr		56%	21%	10%	5%	3%	1%	1%		\$175	\$467	\$980	\$1,960	\$3,267	\$9,801	\$9,801
Shallow filtration-C IR = 0.17 in/hr		51%	20%	11%	6%	4%	2%	2%		\$192	\$490	\$891	\$1,634	\$2,450	\$4,901	\$4,901
Shallow filtration-D	27.00	33%	20%	11%	7%	5%	3%	3%		\$594	\$980	\$1,782	\$2,800	\$3,920	\$6,534	\$6,534
Bio-filtration		33%	20%	11%	7%	5%	3%	3%		\$594	\$980	\$1,782	\$2,800	\$3,920	\$6,534	\$6,534
Gravel wetland	21.60	26%	15%	10%	6%	4%	2%	1%		\$603	\$1,045	\$1,568	\$2,614	\$3,920	\$7,841	\$15,682
Subsurface Infiltration A IR= 1.02	32.40	53%	33%	11%	7%	3%	1%	1%		\$444	\$713	\$2,138	\$3,360	\$7,841	\$23,522	\$23,522
Subsurface Infiltration B IR= 0.52		49%	23%	12%	7%	3%	2%	1%		\$480	\$1,023	\$1,960	\$3,360	\$7,841	\$11,761	\$23,522
Subsurface Infiltration C IR= 0.17		42%	22%	14%	8%	5%	3%	2%		\$560	\$1,069	\$1,680	\$2,940	\$4,704	\$7,841	\$11,761

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- 8. Selecting Storm Water Controls & Capacities for Land Use Categories in the Charles River Watershed to Achieve Town-Wide Phosphorus Load Reductions:** As described in 4 above, the storm water management categories were organized by land use for the Charles River watershed areas within each town and for all three towns together. Consistent with the approach used for the RD sites, this analysis also conservatively assumed that only runoff from IA would be treated to achieve the target phosphorus reductions.

Amount of potential IA treated by each available management category - For a given land use category, available management categories were set to treat runoff from a portion of the total IA for the land use based on the proportion of the specified management category area to the total area of all management categories available within the land use category. For example, within the commercial land use of the Charles River watershed area in Milford, the gravel wetland management category accounts for 4.3% of the total area of all management categories available in commercial land use (23.08 acres of 535.17 acres). Therefore, the amount of IA potentially treated by the gravel wetland is equal to 4.3% of the commercial IA (414.60 acres):

$$IA_{\text{Gravel wetland}} = 0.043 \times 414.60 \text{ acres}$$

$$IA_{\text{Gravel wetland}} = 17.88 \text{ acres}$$

An additional step was added to determine the amount of IA that could be potentially treated by surface infiltration and subsurface infiltration practices. To reflect the possibility that site conditions may necessitate construction of storm water controls in IA, it was assumed that the area of IA to be treated by surface infiltration and subsurface infiltration would be divided equally. This was deemed to be a reasonable assumption, but may result in over-estimates of costs because as indicated in Table 2, subsurface infiltration practices are the most expensive.

A second approach was performed to evaluate the potential cost savings that could be achieved through avoiding the placement of costly subsurface practices in IA. Under this approach it was assumed that phosphorus reductions could be accomplished by applying only surface management controls and that subsurface infiltration practices would not be needed. The same method to determine the potential amount of IA to be treated by a given a management category was used except the subsurface infiltration practices were excluded from the mix of available management categories. For example, excluding subsurface infiltration from the mix of potential management categories (total area of potential management categories is reduced from 535.17 to 129.66 acres) results in the gravel wetland category in the Milford's commercial area as having the potential to treat more IA than under the first approach described above:

$$IA_{\text{Gravel Wetland}} = (23.08 \text{ acres} / 129.66 \text{ acres}) \times 414.60 \text{ acres}$$

$$IA_{\text{Gravel Wetland}} = 73.80 \text{ acres}$$

Varying the amount of impervious area treated – For both approaches described above, costs were estimated for several scenarios where the amount of IA to receive treatment by the management practices was varied. All of the scenarios with varying levels of IA treated were developed to achieve the same target phosphorus load reductions (e.g., 57% and 42% for Milford). Cost estimates for varying amounts of IA treated were developed to evaluate the

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differences in potential costs for applying fewer larger capacity regional controls rather than many smaller capacity distributed controls such Low Impact Development (LID) practices. For each scenario, a set percentage (e.g., 65%) of IA was assumed to be available for treatment by the management categories. For example, the 65% scenario assumes that only 65% of the potential IA (as calculated above) receives treatments, while the 100% scenario assumes that all of the potential IA receives treatment. For this analysis, the lowest percentage IA evaluated represents the minimum amount of IA that would require treatment in order to achieve the target phosphorus load reduction. This value is likely to be an over-estimate of the IA needing treatment since this analysis assumes that only IA will be treated to achieve the reduction targets, when in reality some of the pervious watershed areas would also be treated.

Determining storage capacity for each management category – Similar to the approach used for the RD sites, an iterative process was applied for selecting management categories and capacities in order to more cost-effectively achieve the target phosphorus load reduction targets. For the watershed analysis, management categories and capacities are grouped by land use categories instead of by parcel boundary as was done for the RD sites.

For the watershed area in each town, an iterative process was undertaken to determine the optimal mix of management categories and storage capacities for each of the land use categories that would result in achieving the target phosphorus load reduction. This iterative process involved selecting the most cost-effective practices based on phosphorus removal performance and costs for varying storage capacities.

Table 3 (above) summarizes phosphorus reduction performance and costs for varying storage capacities for each of the management categories. This information was used to iteratively identify the most cost effective combination of management practices and storage capacities for the land use groups. For each scenario, the iterative process of selecting a control practice and capacity was continued until the overall mix of management categories and selected capacities achieved the total required phosphorus load reduction for the town. This process was repeated for multiple scenarios (with varying amounts of IA treated, e.g., 65%, 75%....100%) for each phosphorus load reduction target and with and without applying subsurface infiltration practices. Table 4 summarizes the scenarios and variations for which cost estimates were developed.

- 9. Optimized Cost Estimates for Charles River Watershed Areas in Milford, Bellingham and Franklin:** Costs were estimated for the combinations of selected management categories and storage capacities using the same approach as described for the RD sites in step 5 above. Using the selected storage capacities for each management category determined in step 8 above, the costs were calculated by multiplying the unit cost factor for the applicable management category (see Table 2) by the storage capacity. The individual estimated costs for each management category by land use were summed to determine the total estimated cost.

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Table 4: Summary of Cost Estimates prepared for Milford, Bellingham & Franklin, MA

Community	Phosphorus reduction Target,%	% of watershed IA evaluated	Subsurface infiltration practices included	Number of cost estimates
Milford	57%	85%, 90% & 100%	1) yes & 2) no	6
Milford	42%	65%, 70%, 80%, 85%, 90% & 100%	1) yes & 2)no	12
Bellingham	51.8%	80%, 86%, 90% & 100%	1) yes & 2)no	8
Bellingham	36.8%	60%, 65%, 70%, 80%, 85%, 90% & 100%	1) yes & 2)no	14
Franklin	52.1%	86%, 90% & 100%	1) yes & 2)no	6
Franklin	37.1%	61%, 65%, 70%, 80%, 85%, 90% & 100%	1) yes & 2)no	14
Milford, Bellingham & Franklin	53.7%	83%, 86%, 90% & 100%	1) yes & 2)no	8
Milford, Bellingham & Franklin	38.7%	60%, 65%, 70%, 80%, 85%, 90% & 100%	1) yes & 2)no	14

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Table A-1: 2005 MassGIS land use and aggregated land use categories				
Mass GIS LU_CODE	Description	Aggregated land use for applying TP export rates	Composite TP export rate for aggregating LU lb/acre/yr	Lit. source for export rate
1	Crop Land	Agriculture	0.446	2
2	Pasture (active)	Agriculture	0.446	2
3	Forest	Forest	0.116	3
4	Wetland	Forest	0.116	3
5	Mining	open land	0.267	3
6	Open Land includes inactive pasture	open land	0.267	3
7	Participation Recreation	Agriculture	0.446	2
8	spectator recreation	open land	0.267	3
9	Water Based Recreation	open land	0.267	3
10	Multi-Family Residential	High Density Residential	0.997	1
11	High Density Residential	High Density Residential	0.997	1
12	Medium Density Residential	Medium Density Residential	0.499	1
13	Low Density Residential	Low Density Residential	0.267	3
15	Commercial	Commercial	1.497	1
16	Industrial	Industrial	1.297	1
17	Urban Open	open land	0.267	3
18	Transportation	Freeway/(ind)	0.802	1
19	Waste Disposal	open land	0.267	3
23	cranberry bog	Agriculture	0.446	2
24	Powerline	Forest	0.116	3
25	sandy beach	open land	0.267	3
26	Golf Course	Agriculture	0.446	2
29	Marina	Commercial	1.497	1
31	Urban Public	Commercial	1.497	1
34	Cemetery	open land	0.267	3
35	Orchard	Forest	0.116	3
36	Nursery	Agriculture	0.446	2
37	Forested Wetland	Forest	0.116	3
38	Very Low Density residential	Low Density Residential	0.267	3
39	Junkyards	Industrial	1.297	1

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Table A-2: Phosphorus Export Rates by Land Use

Aggregated Land use	TP load export rate (lb/ac/yr)***	Land surface cover	P load (lb/ac/yr)	*** Source of export rate
Agriculture *	0.446	Pervious	0.446	1
Commercial **	1.497	Impervious	2.229	2
		Pervious	0.267	
Forest	0.116	Impervious	0.891	3
		Pervious	0.089	
Freeway	0.802	Impervious	1.337	2
		Pervious	0.267	
High-density residential	0.997	Impervious	2.229	2
		Pervious	0.267	
Industrial	1.297	Impervious	1.783	2
		Pervious	0.267	
Low-density residential (rural)	0.267	Impervious	0.891	3
		Pervious	0.134	
Medium-density residential	0.499	Impervious	1.337	2
		Pervious	0.267	
Open space	0.267	Impervious	0.891	3
		Pervious	0.223	

Sources: (1) Budd and Meals 1994; (2) Shaver et al. 2007; (3) Mattson and Isaac 1999

Notes:

* Agriculture includes row crops, actively managed hay fields and pasture land.

** Institutional type land uses such as government properties, hospitals, and schools are included in the commercial land use category for the purpose of calculating phosphorus loadings.