Municipality/Organization: City of Cambridge

EPA NPDES Permit Number: MAR041076

MaDEP Transmittal Number: W-040464

Annual Report Number & Reporting Period: No. 10: March 12-March 13

NPDES PII Small MS4 General Permit Annual Report

Part I. General Information

Contact Person: Lisa Peterson Title: Commissioner, Dept. of Public Works

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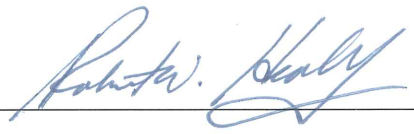
Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: 

Printed Name: Robert W. Healy

Title: City Manager

Date: May 1, 2013

Part II. Self-Assessment

The City of Cambridge has completed the required self-assessment and has determined that our municipality is in compliance with all permit conditions.

Part III. Summary of Minimum Control Measures (MCM)

MCM #1. Public Education and Outreach

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 10 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 11
1.a Revised	Develop Educational and Outreach Material for Residents and Businesses	Commissioner/ DPW	(i)Develop 3 brochures or fact sheets (**completed under year 1 activities**) - Continue the development of relevant materials. **Expanded BMP element in Year 3**	Information was developed on the following and included in the following city publications: *CityView* (Winter 2012-13) • Preventing Ice, Protecting Pedestrians and Local Waterways (p.5), promotes proper deicing strategies to minimize harm to life and the environment. Copies of *CityView* are provided in Appendix 1 and can be found on the following website: www.cambridgema.gov/citynewsandpublications/publications.aspx The DPW also distributes flyers and e-mails to residents near and adjacent to active and proposed construction sites which briefly describes the scope and purpose of these design and construction activities. An example of project that has a stormwater benefit includes: • Western Avenue Construction Starts (August 29, 2012) (flyer) • Fawcett Street Construction Starts (December 5, 2012) (flyer) • Hovey Avenue Closure (December 12, 2012) (flyer) Copies of these notices are included in Appendix 1. Construction notices are also posted on the DPW website and distributed through e-mail. DPW developed a new brochure *Protect Your Home from Sewer Backups (March 2013).* A copy of this brochure is included in Appendix 1and can be found on the following website: www.cambridgema.gov/theworks/permitsanddocuments/Documents.aspx	Continue to develop relevant information on stormwater management for residents and businesses.

1.a cont.		Commissioner/ DPW	(ii) Post information on the web	DPW continued to update its website and make information more readily accessible to the public. The NPDES Phase II Annual Report Year 9, Stormwater Management Program Phase II NPDES Public Meeting 2012 presentation, Joint Public Notice (April 2012) for the Alewife Brook CSO Progress Update, information on street sweeping and winter storm preparedness were added to the DPW/Stormwater web sites. For examples of some of the content updates made to the web page see Appendix 1 and on the Public Works website at: www.cambridgema/theworks and the Stormwater Management website at: www.cambridgema.gov/theworks/ourservices/stormwatermanagement.aspx During Year 9 DPW launched an official Facebook page in an effort to keep residents and other interested persons informed about programs, events, projects, and general updates. DPW continued to update its Facebook page and launched a Twitter account in 2012 The DPW Facebook page can be viewed at: www.facebook.com/CambridgeDPW The DPW Twitter feed can be viewed at: https://twitter.com/CambridgeDPW	Continue to update and expand information on our web site that is relevant to the implementation of our stormwater management program.
Revised		Commissioner/ DPW	(iii) Distribute materials **Expanded BMP element in Year 3**	The *CityView* newsletter referenced in BMP 1.a(i) above is distributed to every household in Cambridge actively receiving mail. *CityView* is a publication of the City of Cambridge. In addition, copies of *CityView* are available at various municipal buildings, on-line and are provided in Appendix 1, referenced above under BMP 1.a (i). DPW also distributed stormwater management materials/brochures at the Rain Barrel distribution event (June 7th). DPW also distributes information electronically (e-mails, e-line, web site, Facebook and now Twitter) and in hard copies, as well as, posting notices in local newspapers.	Distribute information on Stormwater /Watersheds to every household actively receiving mail in Cambridge and/or through electronic media.

1.a cont. Revised		Commissioner/ DPW	(iv) Assess local/regional mass media marketing campaigns **Revised in Year 3– new BMP element**	The Cambridge Science Festival is a multi-day public celebration offering a wide array of science and technology related activities including tours, displays, and hands-on experiments sponsored by the City of Cambridge, MIT and others. Water related events at the 2012 Science Festival Included: EPA Ecosystem Protection &Environmental Health, Rivers of Ice, Cambridge Water Department Tour, and Urban Wild Ecosystems. A copy of the programs offered throughout the 10 day celebration see Appendix 1.	Participate in the 2013 Cambridge Science Festival or other public event.
1.b Revised	Develop Outreach Materials/Activities for Children	Commissioner/ DPW	Include school children in stormwater outreach activities **Revised in Year 5 – [formerly 1.b (i) and (ii)]**	This activity was completed in Year 2. Outreach activities to children continue in general including the Cambridge Science Festival discussed in BMP 1.a (iv) above and: • DPW Vehicle Road Show held on May 21, 2012 which featured activities explaining how DPW keeps Cambridge Clean, including an hands on demonstration using the EnviroScape model to explain how local waters can become polluted. Pictures from the DPW Road Show are attached in Appendix 1. • DPW also worked with Friends of Alewife Reservation's Ecology Camp (August 1). Stormwater pollution and solutions were discussed via use of the EnviroScape model and airing of the "After the Storm" EPA video. The campers were taken to the Alewife Stormwater Wetland for a look at the wetland construction and a discussion of urban storm water management. • DPW sponsored a public planting day at the Alewife Stormwater Wetland on July 14, 2012. Volunteers planted 1,000 wetland plugs in a 1,000 SF area. See Appendix 1for copy of notice. • The Cambridge Water Department sponsors weeklong activities that highlight watershed protection, water treatment and other water related activities. Due to weather the week long activities were cancelled and only Fresh Pond Day (May 19th) was celebrated. A copy of the Fresh Pond Day May 7, 2011 flyer is attached in Appendix 1.	Schoolchildren will be included in stormwater outreach activities in general.
1.c	Develop a Stormwater Web Page	Commissioner/ DPW	(i) Develop a stormwater web page	DPW's Stormwater Management web pages can be viewed at www.cambridgema.gov/theworks/ourservices/stormwatermanagement.aspx Also refer to BMP 1.a (ii) above.	Completed
		Commissioner/ DPW	(ii) Update stormwater web page	See 1.a. (ii) above.	This site will continue to be updated and expanded

1.d	Create a Catch Basin Curb Marker Program	Commissioner/ DPW	(i) Install catch basin curb marker/plaques	DPW installed catch basin curb markers during sidewalk reconstruction projects and our remedial reconstruction projects. A total of 125 have been installed: 69 in the Charles (C) and 25 in the Alewife (A) watersheds under the following contracts: FY12 Misc Sidewalk: C (9) A (5) FY 12 Remedial: C (14) A (6) Chapter 90- Contract 14: C (29) Chapter 90 Contract 15: A (12) Broadway: C (16) Miscellaneous: C (1) A (2)	Continue to install catch basin curb markers during construction projects.
1.e	Reduce Stormwater Pollution from Automobiles	Assistant City Manager for Community Development/CDD	(i) Sponsor an event to promote alternative forms of transportation	The Community Development Department (CDD) sponsored and participated in many activities promoting alternative forms of transportation during 2012. The CitySmart program was available to all Cambridge residents and public employees. Activities included events for alternative forms of transportation, informational tables, giveaways to cyclists and pedestrians, participation in local bike events/tours/workshops. More information on CitySmart can be found at: www.cambridgema.gov/CDD/Transportation/CitySmart.aspx A sample of activities for City Employees can be viewed in calendar of events in Appendix 1	Alternative forms of transportation will be promoted through activities and events.

MCM #1. Additional Information

- The City of Cambridge's Community Development Department (CDD) monitors 38 currently active PTDM projects, 31 submitted complete monitoring reports in 2012, or 82%. 2012 monitoring reflects:
  - More than 7.7 million square feet of commercial development and 886,134 square feet of institutional development are subject to annual PTDM monitoring.
  - A total of 16,796 parking spaces come under the Ordinance, with facility sizes ranging between 3 and 4,576 parking spaces.
  - Approximately 26,553 employees, 8,893 graduate/middle school students, and 1,450 library patrons are covered by PTDM plans in Cambridge.
  - Twenty-two of the 38 projects, or 58% met or surpassed their mode split.
  - Thirty of the projects, or 79%, submitting reports had a response rate of greater than 60%, giving results a very high degree of reliability.

New PTDM project approved in this period, but not yet implemented:

- 130 Brookline Street (Large Project PTDM Plan)
- 104 Monsignor Obrien Highway (Large Project PTDM Plan)
- MLK School on Putnam Ave (Large Project PTDM Plan)
- Concord Wheeler (Small Project PTDM Plan)

- The City continues to provide a comprehensive City Employee Commuter Benefits to all of its employees. These benefits include subsidized T passes, a free shuttle service, an internal car pool matching service, and new this year - free membership to Hubway. The City also supports bicycle use and walking through the respective city programs and provides an internal web site that provides information on other regional ride matching and sharing programs.

- DPW also sponsored a rain barrel event during Year 10: June 7th. Approximately 125 barrels were sold through this event. Stormwater management information on Healthy Household Habits, rain gardens, Household Hazardous Waste, etc was distributed with each rain barrel purchased. During our 2012 DPW partnered with GreenCambridge.org to provide assistance or advice on the installation of the rain barrels (see Appendix 1 for copy of assistance letter).

- The Federal Emergency Management Agency issued new Flood Insurance Rate Maps for a portion of Cambridge. During Year 10 DPW continued to assist residents with these changes through e-mail, phone and help-desk requests for information.

MCM #2. Public Involvement and Participation

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 10 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 11
2.a	Participate in Public Meetings on Water Quality and Quantity	Commissioner/ DPW	(i) Participate in/sponsor a public meeting on water quality/quantity and/or the stormwater management plan	A public meeting to discuss the accomplishments of Year 10 and to discuss potential issues/projects for Year 11 was held on March 28, 2013. A copy of the presentation and sign-in sheet is provided in Appendix 2. See MCM 2 "Additional Information" at the end of this section for more information on public meetings and outreach efforts.	Public meeting will be hosted by DPW regarding the status of the stormwater management program and/or stormwater issues.
		Commissioner/ DPW	(ii) Advertise meeting through various sources	The above meetings were advertised on the city's web site on the citywide calendar and DPW homepage. In addition the NPDES meeting was posted in the Cambridge Chronicles' on-line edition and posted at the City Clerk's office at City Hall. A copy of the NPDES meeting notice from the City calendar, DPW website and Cambridge Chronicle are provided in Appendix 2	Meeting will be publicly advertised in local newspapers, through the web site and/or other means.
2.b	Support Volunteer Efforts	Commissioner/ DPW	(i) Provide clean-up assistance for one event annually	The City provided support to the Friends of Alewife Reservation for a large clean up at Alewife on April 21, 2012 as part of Park Serve Day.	Support/assistance will be provided for one clean-up event.

2.b cont.		Commissioner/ DPW	(ii) Support educational efforts of local watershed groups as opportunities arise through talks and /or support of grant applications	The DPW participated in the Friends of Alewife Reservation's (FAR) Summer Ecology Camp (see 1.b above) and gave a tour of the Alewife Stormwater Wetland on December 10, 2012 to several interested FAR members. The Cambridge Water Department supported the efforts of the Friends of Fresh Pond Reservation in their stewardship and educational projects. A copy of their "The Year in Review" for 2012 is attached in Appendix 2 and details the various activities supported by the Water Dept. DPW provided a letter of support for a 319 Grant application for the Charles River Watershed Association for a permeable pavement project. A copy of the letter is attached in Appendix 2. See additional outreach and educational efforts listed under "MCM #2. Additional Information" at the end of this section.	The City will continue to provide support to local watershed associations as opportunities permit.
		Commissioner/ DPW	(iii) Seek permission to post links to local watershed groups' web sites	The Stormwater Management web site was totally reorganized in November 2010. Hyperlinks were confirmed to be current. New information was added and where appropriate additional hyperlinks were made.	As new information is added to the stormwater management web pages new hyperlinks will be added and updated as needed.
2.c	Sponsor Recycling of Hazardous and Solid Waste	Commissioner/ DPW	(i) Hold 4 Household Hazardous Waste Collection (HHW) days annually		

2.c cont. Revised		Commissioner/ DPW	Hold 3 Household Hazardous Waste Collection days annually **(Revised in Year 1)**	Three Household Hazardous Waste (HHW) collection days were held this permit year on April 21, July 21 and October 20, 2012. Approximately 15,870 tons of materials have been recycled, including .29 tons of HHW.	HHW collection will be held on June 8, July 13, and October 19, 2013.
		Commissioner/ DPW	(ii) Accept recycling materials at a drop off center on a regular basis	During 2012 DPW continued to operate a recycling drop-off center at the DPW yard on Tuesdays and Thursdays from 4 – 7:30 p.m. and Saturdays form 9 a.m. – 4 p.m. More information about the Cambridge Recycling Center can be found at: www.cambridgema.gov/theworks/ourservices/recyclingandtrash.aspx	DPW will continue to operate a recycling drop-off center.
		Commissioner/ DPW	(iii) Beginning in yr 2 provide information on illicit discharges and reporting	Information on proper disposal of household hazardous waste and reporting illicit discharge/dumping is provided in the Recycling and Trash Guidelines for Residents. The guidelines were last updated in the fall of 2010 and were mailed to every household. These guidelines were provided to residents when they picked up their 2012 rain barrels together with other storm water management information. Information on illegal dumping is also provided on the Stormwater Management Managemnet web page and under FAQ, see: www.cambridgema.gov/theworks/ourservices/stormwatermanagement/faq.aspx	DPW will continue to provide information on illicit discharges and reporting at Household Hazardous Waste events and/or in its meetings and through print materials.

The following BMP was relocated from BMP 5.b and further revised in Year 3.

2.d	Participate in Watershed and Planning Efforts	Assistant City Manager for Community Development/CDD and Commissioner/ DPW	(i) Complete Phase I of Concord-Alewife study	Not applicable in Year 10, completed in Year 1. Information from this process can be viewed at http://www.cambridgema.gov/cdd/cp/zng/concalew/index.html	Completed.
		Assistant City Manager for Community Development/CDD and Commissioner/ DPW	(ii) Complete Phase II if authorized	Not applicable in Year 10, completed in Year 3.	Completed.
		Assistant City Manager for Community Development/CDD and Commissioner/ DPW	(iii) Forward study recommendations to the City Manager for consideration	Not applicable in Year 10, completed in Year 4. The Planning Board submitted the Concord-Alewife rezoning petition to the City Council on April 25, 2005. This petition was based on the zoning recommendations of the Concord-Alewife Planning Study Committee. The petition was refilled by the City Council on February 21, 2006. The Concord-Alewife Rezoning and Design Guidelines were adopted by the City Council on June 26, 2006. The changes have been incorporated into the Cambridge Zoning Ordinance and Zoning Map.	Completed
		Commissioner/ DPW	(iv) Discuss Concord-Alewife Stormwater Management strategies at a public meeting	Not applicable in Year 10, completed in Year 4. DPW participated in a City Council Ordinance Committee meeting on environmental and infrastructure issues with regard to the Concord/Alewife proposed zoning amendment on June 13, 2006. Issues on water quality/quantity in the Concord-Alewife area were discussed.	Completed.
		Commissioner/ DPW	(v) Publish LID guidelines	Not applicable in Year 10, completed in Year 4. DPW published the Concord-Alewife Stormwater Management Guidelines in May 2006. A copy can be found at: www.cambridgema.gov/theworks/ourservices/stormwatermanagement/stormwaterresources.aspx	Completed.
		Commissioner/ DPW	(vi) Place LID document on the Stormwater web site	Not applicable in Year 10, completed in Year 4 (see BMP 2.d.(v) above).	Completed
		Commissioner/ DPW	(vii) Execute the Environmental Joint Powers Agreement (EJPA)		

2.d cont. *revised*			Work with EOEA to advance the EJPA to a final document **(Revised in Year 1)**	Not applicable in Year 10. The final EJPA was fully executed on March 4, 2005 and forwarded to EOEA.	Completed.
		Commissioner/ DPW	(viii) ABC Flooding Board to meet 4 times annually	The ABC Flooding Board met only one (1) time during Year10 on November 13, 2012. The Environmental Joint Powers Agreement (JPA) that authorized the ABC Flooding Board has expired. State Senator William Brownsberger filed a bill to extend the JPA. Currently this legislation has not been reauthorized and the ABC Flooding Board will suspend meetings until it is reauthorized.	The ABC Flooding Board will meet 4 times.
revised			**Schedule Revised in Year 1**		
		Commissioner/ DPW	(ix) Finalize Tri-Community Working Group's *Progress Report*	Not applicable in Year 10, this report was finalized in Year 3	Completed.
revised					
		Commissioner/ DPW	(x) Place Tri-Community Working Group's *Progress Report* on web site	Not applicable in Year 10. This report was placed on the web site in Year 4 see: www.cambridgema.gov/theworks/ourservices/stormwatermanagement/stormwaterresources.aspx	Completed.
revised					

MCM #2. Additional Information

- The Cambridge Department of Public Works (DPW) began the design of the 1st phase of the Alewife Sewer Separation Project, Huron A, during Year 8. This project is a three phase program that is a part of the Massachusetts Water Resources Authority's Long Term CSO Control Plan for the Alewife Brook: Huron A, Huron B and Concord Avenue Neighborhood. In total the Alewife Sewer Separation Project will separate combined sewers in an area of approximately 220 acres. Huron A began construction in October 2012, the design of the 2nd phase (Huron B) began in May 2012 and the design of the 3rd phase (Concord Avenue Neighborhood) began in December 2012. Construction for Huron B and Concord Avenue Neighborhood is expected to begin in the Summer 2013 and Winter 2013-14 respectively. During Year 10 there were 3 meetings to discuss Huron A, 14 meetings for Huron B and 1 meeting to introduce Concord Avenue Neighborhood phase. Community design discussions have centered on the environmental goals of this project to separate the combined sewer system, how to best treat the newly separated stormwater and ways to manage/infiltrate the stormwater through the design of the street restoration

project. Detailed information regarding these three this projects and the meeting presentations can be found on the City Projects website at: www.cambridgema.gov/theworks/cityprojects.aspx under Huron A Improvements, Huron B Improvements and Concord Avenue Neighborhood respectively.

- The Cambridge Water Department began a design process for the restoration of Kingsley Park within the Fresh Pond Reservation. Restoration will include improvements to water quality and accessibility, ecological health, erosion impacts and compaction impacts due to invasive species. The first Public Meeting 1 was held on December 7th, 2011 to begin planning upcoming improvements to Kingsley Park. This was the first in a series of meetings concerning the design process. Kingsley Park Public Meeting 2 was held on April 4, 2012. The focus of the discussion was on drainage and circulation. Kingsley Park Public Meeting 3 was held on June 21, 2012. The focus of the discussion was on play areas and historic value of the site, and a presentation of schematic designs for pathways. The fourth public meeting was on September 20, 2012 focusing on pathways and discovery area opportunities. The fifth public meeting was on March 28, 2013 to discuss project phasing and the phase I site improvements. Copies of these presentations can be viewed at http://www2.cambridgema.gov/CWD/freshpond.cfm and a copy of the March 28, 2013 presentation is attached in Appendix 2.

- The City of Cambridge recognizes businesses and organization that are taking environmental action through the GoGreen Awards. This is the fourth year that the City included an award category for Stormwater Management in order to recognize local property owners/developers that are undertaking important stormwater management elements in their redevelopment projects and/or property maintenance practices. Other award categories include waste reduction, transportation, energy, climate leader, and community sustainability. The fourth Stormwater Management award was awarded on May 22, 2012 recognizing the Mystic River Watershed Association, a Community Organization, dedicated to the stewardship and protection through public outreach and education, water quality monitoring and advocacy. Information on the awardees and a copy of the Mystic River Watershed Association's GoGreen Award is provided in Appendix 2.

- DPW and city representatives attended EPA's Water Quality Forum for the Mystic River Watershed Initiative during Year 10 on January 24, 2013.

- The tri-community working group worked with the USGS on a cooperative watershed effort to install a flow gage along the Alewife Brook to obtain and share important hydraulic information. The gage became functional in August 2005. Arlington, Belmont and Cambridge are continuing to participate on an equal financial and resource basis for the gauging station's installation and maintenance. This will ensure that this gage will not be affected by Massachusetts funding cuts and Federal Sequestration. The real time flow measurements can be observed at http://waterdata.usgs.gov/ma/nwis/uv?01103025 .

- DPW began the construction of the CambridgePark Drive Area Drainage Improvements Project and Stormwater Wetland Project during Year 10. See the project website for more information:

http://www.cambridgema.gov/theworks/cityprojects.aspx?Category=Current+Construction . An extensive outreach program has surrounded this construction activity. Three (3) meetings/tours were held to discuss the stormwater wetland and its benefits and construction process:

- Public Planting Day, July 14, 2012
- Friends of Alewife tour – December 10, 2012
- Public Planting Committee discussion – March 13, 2013

- Climate Change, Resilience and Adaptation: Climate Change is caused primarily by the emission of greenhouse gases such as carbon dioxide (CO_2) and methane that accumulate in the atmosphere. The City has a number of initiatives to reduce Cambridge's contribution to atmospheric greenhouse gases through energy efficiency projects in buildings, renewable energy (e.g., solar), reduced reliance on automobiles, and other measures. Unfortunately, scientists tell us that greenhouse gases have built up in the atmosphere to the point that some degree of climate change is now unavoidable. And we are starting to see climate disruptions that back up that view. As a result, it is clear that steps need to be taken to make communities more resilient and adaptable to climate change impacts such as increased temperatures, more extreme storms, and storm surge flooding.

  The City has begun to assess Cambridge's vulnerabilities to climate change during Year 10 and will follow the assessment by preparing a climate change adaptation/resilience plan. The City Manager directed City departments to prepare a climate change vulnerability assessment and adaptation/resilience plan based on a recommendation from the City's Climate Protection Action Committee. The project is proceeding in two stages beginning with the vulnerability assessment followed by the preparation of an adaptation/resilience plan.

  The vulnerability assessment will be largely a technical study of the Cambridge population, infrastructure, public health, and local economy in terms of risks and vulnerabilities to impacts resulting from increased temperatures, more intense storms, and storm surge flooding associated with sea level rise.

  The assessment will be completed by the end of 2013. Using the vulnerability assessment as its technical foundation, the City will then develop an adaptation/resilience plan: a strategy to make Cambridge more resilient to climate change impacts. The City is expecting to conduct an extensive public involvement process as part of the plan development.

- The Cambridge Water Department sponsored "*Monday Nights at Fresh Pond*". A series of Fresh pond watershed activities providing information on volunteer opportunities and training, tours of the water treatment facility, workshops on plant identification, tours of recently restored, ongoing and future restoration areas and discussion of how these projects achieve the Fresh Pond Master Plan goals of accessibility, water quality and ecological sustainability. See a description and schedule of the Year 10 activities in Appendix 2.

MCM #3. Illicit Discharge Detection and Elimination

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 10 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 11
3.a	Update Stormwater Drainage System, Outfalls and Receiving Waters in GIS	Commissioner/ DPW	(i) Map Fresh Pond outfalls	Not applicable in Year 10	Completed.
		Commissioner/ DPW	(ii) Migrate existing GIS database to a new format	Completed in Year 3.	DPW staff will primarily be responsible to maintain the GIS database. As-built information will be added to keep the system up to date.
		Commissioner/ DPW	(iii) Track private structural controls in a database	Private structural controls are tracked in a database (see Appendix 3). Approximately 74 projects underwent DPW site plan review (see Appendix 3).	DPW will continue to track private structural controls through our site plan review and inspection process.
		Commissioner/ DPW	(iv) Catalogue record drawings	Cataloguing of record drawings was not necessary. The contract to update the GIS database included scanning record drawings and has been completed in Year 3. A catalogue of updated information is available to query.	Record drawings and as-built information will continue to be added on an ongoing basis.
		Commissioner/ DPW	(v) Train engineering staff on new GIS software	Not applicable in Year 10 this was completed in Year 3.	Completed.
		Commissioner/ DPW	(vi) Begin updating GIS information with as-built/record drawings	As-built and record drawings are updated on an ongoing basis.	Record drawings will be linked as they become available.

3.b	Detect and Eliminate Illicit Discharges	Commissioner/ DPW	(i) Perform routine water quality sampling	• In the Charles River watershed twenty-five (25) outfalls were inspected/ sampled for dry weather flow: ten (10) were sampled once, and fifteen (15) were inspected/sampled twice. Of the above outfalls, two (2) outfalls (River and Brewer) were inspected, but not sampled due to the lack of dry weather flow. • In the Alewife Brook watershed seventeen (17) outfalls were sampled: seven (7) were sampled/inspected once, two (2) were sampled/inspected two times, and eight (8) were sampled /inspected three times. Of the above outfalls, six (6) outfalls (Russell Field (5) and Blanchard Road) were inspected, but not sampled due to the lack of dry weather flow See Appendix 3 and Part IV of this report for sampling locations.	Water quality samples will continue in each watershed for all known City of Cambridge outfalls.
			Revised in Year 3 to include all Cambridge owned outfalls		
		Commissioner/ DPW	(ii) Test one location in each watershed for oil and grease annually	.	One location in each watershed will be tested for oil and grease.
Revised			**(Revised for Year 2 only)**	Two (2) oil & grease samples were done during Year 10: one (1) sample in the Charles and one (1) in Alewife. (See Appendix 3).	
		Commissioner/ DPW	(iii) Perform additional water quality testing and field investigations as necessary	Additional water quality testing was performed to isolate the location of illicit discharges and to confirm their successful removal.	We will perform additional water quality testing and field investigations as necessary.
Revised			**Revised in Year 3** Expand Water Quality testing in both watersheds	See 3.b (i) above	All known Cambridge Outfalls will be sampled in the Charles and Alewife watersheds.

3.b cont.		Commissioner/ DPW	(iv) Identify and remove illicit discharges	Two (2) Illicit discharge/connection were discovered and four (4) were removed as follows:: • 201 Pearl Street (Remedial contract) discovered in Year 9 and removed in Year 10 • 203 Pearl Street (Remedial contract) discovered in Year 9 and removed in Year 10 • 602 Franklin Street (Remedial Contract) discovered and removed during Year 10 • 2 Ivy Street (Remedial Contract) discovered and removed during Year 10	We will continue to monitor for and remove illicit discharges.
		Commissioner/ DPW	(v) Perform water quality sampling at a Fresh Pond outfall annually	Nine (9) water quality samples were taken from three ponds that surround Fresh pond including: Little Fresh Pond, Black's Nook, and North Pond Eleven (11) samples were taken from Fresh pond at various locations (see Appendix 3for sampling data).	Water quality sample will be taken at Fresh Pond Reservation annually.
		Commissioner/ DPW	(vi) Purchase sampling equipment as recommended by EPA's Lower Charles IDDE Protocol	Not applicable in Year 10. Sampling equipment was purchased in Year 4.	Supplies will be purchased as needed.

3.b cont.		Commissioner/ DPW	(vii) Investigate Sparks Street drainage area	Investigation of the Sparks Street drainage area using the Charles River IDDE Protocol began in the Summer of 2006. Approximately 85% of this investigation is complete. A few pipes were found to be in disrepair and required rehabilitation before additional testing could resume in this area due to the influence these pipe have on the downstream system. Several illicit connections were identified and removed in previous years. In addition two (2) common manholes were discovered in a sewer easement on private property between Fernald Drive and Linnaean Street within the catchment. These CMHs will be separated during out CMH #7 contract. CMH #7 Contract includes approximately 34 remaining CMHs in separated areas. Investigations began for CMH #7 during 2011, design and bid packages were developed and project put out to bid in Year 10.	Investigation into the Sparks Street drainage area will continue following the repair of cracked pipes in this system. These pipes will be lined during Year 11 under a pipe lining contract. The separation of the 2 common manholes in the Sparks Street area is included in CMH contract #7. CMH#7 contract will be awarded and completed in Year 11 (December 2013).
		Commissioner/ DPW	(viii) Investigate Lechmere Canal drainage area.	Completed as far as possible due to influence of Charles River. Investigation of the Lechmere Canal drainage area using the Charles River IDDE Protocol was begun in Year 5. Approximately 75% of the manholes have been checked. The remaining manholes are influenced by back flow from the Charles River and are extremely difficult to isolate.	Completed.

3.b cont.		Commissioner/ DPW	(ix) Separate Common Manholes (CMH).	Two (2) CMHs were separated during Year 10 in the follows contracts:
				• CAM017 (1)
				  ○ Land Blvd @ Binney
				• Fawcett Street (1)
				  ○ 100 Main Street
					The number of Common Manholes separated in separated drainage areas will be counted. Also, the contract for the removal of the remaining 34 Common Manholes in separated areas of the city will begin construction in 2013 through the CMH #7 contract. Construction of CMH #7 will be completed by December 2013.

		Commissioner/ DPW	**(X) Perform wet weather water quality sampling at 2 outfalls annually**	Cambridge began a wet weather sampling program in Year 5 by sampling 2 outfalls in catchment areas not influenced by common manholes, one catchment in the Alewife watershed (Normandy Terrace) and one in the Charles River watershed (Sparks Street). Samples were not taken at these locations during Year 10. One wet weather samples was taken in the Charles River watershed at North Point instead. This sample results are provided in Appendix 3.	Cambridge will continue to take wet weather samples at the same 2 outfalls (Sparks Street and Normandy Terrace) and monitor sampling results.
3.c	Conduct Illicit Discharge Education Program	Commissioner/ DPW	(i) Advertise illicit discharge hotline number and information on illicit discharges	The hotline number was not added to any new material during Year 10. Hotline information was included in the *Recycling and Trash Guidelines for Residents* updated Fall 2010. The recycling guidelines are posted on the DPW website and are available in Spanish, Portuguese, Creole, Chinese and Ethiopian.	The Stormwater Hotline number for illicit discharges will be incorporated in public information where appropriate/applicable.
3.d	Develop Regulations Prohibiting Illegal Dumping of Non-Stormwater into the MS4	Commissioner/ DPW	(i) Develop a working draft	Not applicable in Year 10, completed in Year 1.	Complete.
		Commissioner/ DPW	(ii) Provide opportunity for peer and legal review of draft	Not applicable in Year 10, completed.	Completed.

3.d cont.		Commissioner/ DPW	(iii) Revise draft as necessary	Not applicable in Year 10, completed in Year 5.	Completed.
		Commissioner/ DPW	(iv) Present regulations/ordinance to City Council for consideration for adoption	Not applicable in Year 10, completed in Year 5. A copy of the Wastewater and Stormwater Drainage System ordinance can be viewed on line at DPW stormwater website.	Completed.

MCM #3. Additional Information

- CMHs are underground structures that allow people to access both sewer and storm drainpipes through a single structure. Typically, the drainage system runs above the sanitary system, separated by a steel plate. Over time the steel plate deteriorates causing sewerage to mix with stormwater. This can lead to two problems during storm events. First it can cause stormwater to enter and overwhelm the sanitary system causing sewerage to overflow and back-up on to the street or into basements. Second, untreated sewerage can enter the storm drain system and be released into either the Charles River or Alewife Brook. See Appendix 3 for a map of the common manholes that have been separated throughout Cambridge. Approximately 281 common manholes have been separated through March 1, 2013 in separated catchment areas.

- During Year 10 Cambridge completed the separation of 2 CMHs in the City. See above for more information.

- Effective January 1, 2010 the City enacted a new Ordinance governing the maintenance and operation of dumpsters of all new and existing dumpsters, including construction dumpsters. The ordinance requires that no dumpster be placed so that any liquid or runoff from the dumpster shall enter any catch basin or storm drain. In Year 10 the city issued 680 dumpster licenses under the new ordinance.

- Additional Sampling by others: The Mystic River Watershed Association (MyRWA) performs hot spot dry weather sampling for monitoring purposes in the Mystic River Watershed which includes Wellington Brook in Belmont and Cambridge. MyRWA shares this data with the local communities, DEP and EPA. Cambridge reviews these results and discusses exceedances with MyRWA. A copy of MyRWA's hot spot sampling report for Wellington Brook and Little Pond, dated May 21, 2012 is attached in Appendix 3.

MCM #4. Construction Site Stormwater Runoff Control

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 10 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 10
4.a	Develop Program for Construction Site Runoff Control	Commissioner/ DPW	(i) Review existing planning and construction procedures	Not applicable in Year 10, completed.	Complete
		Commissioner/ DPW	(ii) Clarify needed regulatory mechanism	Not applicable in Year 10, completed.	Complete
		Commissioner/ DPW	(iii) Develop draft regulatory mechanism, procedures and guidelines	Not applicable in Year 10, completed during Year 5. Land Disturbance Regulations were finalized following the adoption of the revisions to Cambridge Municipal Code Chapter 13.16 Wastewater and Stormwater Drainage System. http://www.cambridgema.gov/theworks/ourservices/stormwatermanagement/ordinanceandregulations.aspx	Completed.
		Commissioner/ DPW	(iv) Present draft to City Manager, City Council and the community for review	Not applicable in Year 10. On October 29, 2007 the City Manager submitted a comprehensive revision to Chapter 13.16 of the Cambridge Municipal Code "Sewer System Regulations" to ensure this ordinance fully complies with the NPDES Phase II requirements for stormwater management as it relates to construction site runoff. On January 28, 2008 the City Council ordained the Wastewater and Stormwater Drainage System ordinance by a vote of 9-0-0. This ordinance authorized the Commissioner of DPW to promulgate regulations to enforce the ordinance. A copy is posted on the DPW stormwater website. http://www.cambridgema.gov/theworks/ourservices/stormwatermanagement/ordinanceandregulations.aspx	Completed.

4.a Cont.		Commissioner/ DPW	(v) Amend draft as necessary and submit for consideration for adoption	Not applicable in Year 10, completed in Year 5.	Completed.
		Commissioner/ DPW	(vi) Record number of required Stormwater Management Permits submitted	Twenty-five (22) Stormwater Control Permits (formerly Land Disturbance Permits) were submitted for the following projects: • 22 Cottage Park Ave • 58 Plympton St • 603 Concord Ave • 90 Fawcett Street • 67 Rogers Street • 159 First St • 22 Water Street • 169 Vassar St • 130 Brookline St • 8 Education Street • 2 Leighton Street • 127 Harvey St • 7 Temple Place • 125,150,180R Cambridgepark Dr. • 0 Norris St • 120 Rindge Ave • 10 Glassworks Ave • 160 Cambridgepark Dr • 355 Fresh Pond Parkway • 168 Hampshire St • 20 Child Street • 75 Binney St	The number of Stormwater Control Permit applications will be tracked.
		Commissioner/ DPW	(vii) Provide stormwater management guidance materials or references	No additional guidance materials or BMP fact sheets were developed during Year 10.	Continue to maintain and revise guidelines as necessary.
		Commissioner/ DPW	(viii) Adopt procedures for inspections during construction activities.	A peer review of inspection was completed. Inspection procedures are incorporated into the Land Disturbance Regulations (Article VII) and will be further clarified in the guidance documents as necessary.	Incorporate inspection procedure information in the guidance document as necessary.

4.a cont.		Commissioner/ DPW	(ix) Adopt procedures for enforcement and penalties for violations.	Compliance and enforcement procedures are included in the Land Disturbance Regulations (Article X). In Year 8 DPW developed a "WARNING" ticket to be used for stormwater violations. Implementation of the ticketing program began Year 9 (see BMP 4 (a) (ix) below).	Complete.
		Commissioner/ DPW	(x) Record the number of enforcement actions taken and reported	When DPW finds a site without proper erosion control in place we work with them to bring it into compliance. There were 15 Erosion and Sedimentation Control WARNING tickets issued for stormwater related violations at the following locations: • Broadway @ Tremont St • 1 Bowling Alley • 89 Appleton St • 610 Main Street • 4 Bond St • 31 Harris st • 25-29 Sergeant St • 225 Binney St • Rogers Street Park • 22 Cottage park Ave • 2-10 Brattle Circle • 181 Mass Ave • 181 Mass Ave • 130 Brookline St • 21 Standish St - (Dumping to CB) It was decided to track these Warnings in a database rather than using the Cambridge Request System (CRS).	The number of enforcement action taken and reported will be tracked in a database. The new Warning" ticket will be used to track stormwater violations.
4.b	Educate Contractors and Residents about the Construction Site Runoff Control Program	Commissioner/ DPW	(i) Make materials available on erosion and sediment control practices available through city web site and/or other means	Completed. See BMPs for Construction Controls: http://www.cambridgema.gov/theworks/ourservices/engineering/Rsources/standarddetails.aspx	Post erosion & sediment control information as it becomes available.

4.b cont.		Commissioner/ DPW	(ii) Discuss erosion and sediment control practices and problems at 3 construction coordination meetings annually	DPW holds weekly meetings with large contractors during April – November. Erosion and sediment control practices and problems with permitted contractors working in the City are discussed during these meetings. Erosion and sedimentation control was discussed during at least 9 of these meetings including: April 17 and 23, 2012, May 7 and 23, 2012, July 16 and 30, 2012, August 20, 2012, October 1 and 9, 2012 and March 18, 2013. Copies of sign-in sheets and meeting notes from three (3) of the above meetings are provided in Appendix 4.	The City Engineer will discuss erosion and sediment control practices and problems with contractors at 3 construction coordination meetings.
New		Commissioner/ DPW	(iii) Record the number of guidance materials or reference materials provided.	No additional fact sheets were developed during Year 10. See BMP 4.b (i) above for a link to the current fact sheets.	Develop and/or revise specification, fact sheets or other guidance documents, as necessary.
		DPW	(iv) Create a list of resources, which provides BMP suggestions for the targeted pollutants of concern.	Completed. See BMP 4.b (i) above for a link to the current fact sheets.	Completed.
		Commissioner/ DPW	(v) Record the number of workshops or meetings with City departments to discuss implementation of plan requirements	Meetings were held between DPW and the Inspectional Services Department (ISD) to improve inter-departmental review of building permits. Improvements were made to the ISD checklist for "Triggers for Site Plan Reviews by the DPW of Building Permit Applications". In March 2012 a contract was awarded to Energov for implementation of new permitting software for ISD that will facilitate electronic inter-departmental reviews. In February 2013 the new on-line permit process went live allowing for the on-line submittal and review of ISD permits. See http://www.cambridgema.gov/inspection/buildingelectricplumbingpermits/howtoapply.aspx and Appendix 4 for a copy of the Mandatory permit checklist that will require a DPW review and sign-off..	Meetings will be held to discuss new ordinances and regulations as necessary.

MCM #4. Additional Information

- Two construction coordination presentation were held during Year 10 before the start of the 2013 construction season (March 4 and 11, 2013) inviting representatives from private utility companies, large contractors, MIT, Harvard, and city departments (Water Dept., Police, DPW, and Traffic Parking & Transportation). These meetings discuss work zone expectations and permitting process for work within the public ways, specifically: Online Permitting, Traffic Management, Construction Safety, Erosion and Sediment Control, Tree Protection and Community Relations. A copy of the presentation and sign-in sheets are provided in Appendix 4.

- The City's Wastewater (Stormwater) Compliance Officer completed sixty-three (70) inspections:
    - 25 stormwater erosion and sediment control site inspections,
    - 45 sewer use compliance inspections, and
    - 15 violation sites for erosion and sediment control.

MCM #5. Post-Construction Stormwater Management in New Development and Redevelopment

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 10 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 11
5.a	Revise Sewer Use Regulations and Guidance	Commissioner/ DPW	(i) Complete a working draft	Not applicable in Year 10, this activity was competed in Year 4.	Completed.
Revised	Develop Program for Post Construction Site Runoff Control		**(Revised in Year 3)**		
		Commissioner/ DPW	(ii) Undertake and complete peer review and legal review of draft	Not applicable in Year 10, completed in Year 5. The Regulations and Ordinance can also be viewed on-line at: http://www.cambridgema.gov/theworks/ourservices/stormwatermanagement/ordinanceandregulations.aspx	Completed.
		Commissioner/ DPW	(iii) Develop draft guidelines on BMPs	No new fact sheets were developed in Year 10.	Stormwater management guidance will continue to be revised.
		Commissioner/ DPW	(iv) Discuss final draft and guidance with City Manager, City Council and the community	Not applicable in Year 10, complete in Year 5. On October 29, 2007 the City Manager submitted a comprehensive revision to Chapter 13.16 of the Cambridge Municipal Code "Sewer System Regulations" to ensure this ordinance fully complies with the NPDES Phase II requirements for stormwater management as it relates to construction site runoff. On January 28, 2008 the City Council ordained the Wastewater and Stormwater Drainage System ordinance by a vote of 9-0-0. This ordinance authorized the Commissioner of DPW to promulgate regulations and guidance documents to enforce the ordinance. A copy of the Ordinance and Regulations can be viewed on the DPW Stormwater website: http://www.cambridgema.gov/theworks/ourservices/stormwatermanagement/ordinanceandregulations.aspx	Completed.

5.a Cont.		Commissioner/ DPW	(v) Present final regulation, guidance and monitoring program for consideration and adoption	Not applicable in Year 10, completed in Year 5. The Commissioner of Public Works promulgated Land Disturbance Regulations and Wastewater and Stormwater Drainage Use Regulations. ❑ The Wastewater and Stormwater Drainage Use Regulations are intended to protect the public health, safety and welfare and the environment and to ensure proper and safe operation of the City's Sanitary Sewers, Combined Sewers and Stormwater Drains by regulating the direct and indirect discharge of Waste, stormwater and pollutants to the City's Wastewater and Stormwater Drainage system. These Regulations are also intended to prohibit and remove illicit connections and unauthorized discharges to the City's Stormwater Drainage system. This includes the legal authority to carry out all inspection, surveillance and monitoring procedures necessary to comply with this Regulation. ❑ The Land Disturbance Regulations are intended to reduce pollutants in stormwater runoff from construction activities and to address post construction stormwater runoff from new development and redevelopment projects. These Regulations include procedures for inspection and enforcement. A copy of the Ordinance and Regulations can be viewed on the DPW Stormwater website (see MCM 5.a (ii) above). Staff continued to review Regulations for revisions. These changes are still draft and have not yet been advertised.	Guidance documents will continue to be revised. Land Disturbance Regulations (now Stormwater Control Regulations) will be revised to reflect new permits and permit names.
		Commissioner/ DPW	(vi) Record the number of meetings held by the City for the regulatory process	The regulatory process is complete. No further regulatory meetings are planned.	Complete.
		Commissioner/ DPW	(vii) Administer stormwater management permit requirements	Administration of the Stormwater management permit [Stormwater Control Permit (SCP)] requirements is ongoing. A database was developed to track SCPs to facilitate reviews, construction inspections and post-construction inspections. There were 22 Stormwater Control Permits submitted in Year 10. Refer to summary attached in Appendix 5.	Track Stormwater Control Permits in a database.

5.a cont.		Commissioner/ DPW	(viii) Administer procedures for enforcement and penalties for violations	Not applicable in Year 10, completed in Year 6.	Completed.
		Commissioner/ DPW	(ix) Adopt procedures for post construction inspections	Completed. Procedures for Post-Construction inspections are incorporated in the Draft guidance documents and were included in the Land Disturbance Regulations in Year 5. On June 11, 2009 the City hired a full time Wastewater (Stormwater) Compliance Officer whose job responsibilities include performing post-construction inspections. The compliance officer created and maintains a private BMP database for use in post construction inspections. A copy of the Private Property BMPs installed during Year 10 is attached in Appendix 3. Twenty-two (22) post-construction inspections were performed during Year 10, 13 of these properties have Stormwater Control Permits. See more information in the "Additional Information" section below.	A data base for projects with private BMPs regulated under the Land Disturbance Regulations will be maintained. Track the number of Post-Construction inspections performed.
		Commissioner/ DPW	(x) Discuss alternatives to ensure adequate long-term operation and maintenance of BMPs	Completed. Owner's are required to perform long-term operation and maintenance of BMPs as follows: • Owner is responsible for ongoing maintenance, inspections, recordkeeping and reporting. • Owner is required to maintain log and update plan. New owner must submit a new plan. • Applicant is responsible for adhering to design standards. Plan requirements and guidance will be provided in the guidance documents • The Plan and Logs are required to be made available for inspection upon request by any public entity with administrative, health, environmental, or safety authority over the site. It is expected that the Wastewater Compliance Officer will work with property owners to ensure that their BMPs are being maintained.	DPW will continue to work with property owners by performing inspections on properties with Stormwater Control Permits. Stormwater Compliance officer will check his data base for inspection dates and will perform inspection following the sites long term O&M plan.

5.a cont.		Commissioner/ DPW	(xi) Provide legal mechanism to require annual compliance for the operation and maintenance of BMPs	Not applicable in Year 10, completed in Year 5. The Land Disturbance Regulations provide for Post-Construction inspection and enforcement of provisions in the Regulations.	Completed.
5.b	Undertake Tree Protection Activities	Commissioner/ DPW	(i) Provide one community outreach and education activity annually on the care, importance and protection of trees and their role in climate protection	The City Arborist participates in varied outreach activities each year. During Year 10 activities included: • Cambridge Science Festival – Showcased our tree inventory in GIS and gave out seedlings • May Fair in Harvard Square – How to use a gator bag display • Arbor Day – Planted 1 elm tree, and pruned many of the trees at the Morse School in Cambridgeport • Tree Walks – 4 tree walks (Agassiz, Cambridge Highlands, Huron B, and Huron Avenue) • Continued both of our Water by Bike/Tree Ambassador and Junior Forester Programs The arborist also works closely with the Public Planting Committee and administers Tree hearings for the removal of trees from the public way.	DPW will continue outreach efforts on the importance and protection of trees.

MCM #5. Additional Information

- DPW's arborist has monthly meetings with the Committee on Public Planting regarding the benefits of green space and trees.

- The City's Wastewater (Stormwater) Compliance Officer conducted twenty-two (22) post construction inspections. Thirteen (13) of these properties have Stormwater Control Permits (SCP) and post-construction O&M Plans as follows:
  - 87 New Street - SCP
  - 95-97 Pine St - SCP
  - 200-300 Acorn Park Dr - SCP
  - 517 Concord Ave - SCP
  - 61-69 Bolton Street - SCP
  - 265/281 Albany St - SCP
  - 61 Moulton St/665 Concord Ave - SCP
  - 277 Broadway - SCP
  - 1066 Cambridge Street - SCP
  - 259 Harvard Street - SCP

- 7 Cameron Ave - SCP
- 50 Rogers Street - SCP
- 25 Francis St - SCP
- 92 Gore St
- 72 Alpine St
- 180 Fawcett St
- 126 Charles St
- 66-72 Hamilton Street
- 298 Harvard St
- 54 Garden St
- 1 Follen Lane
- 66 Thorndike St

MCM #6. Pollution Prevention and Good Housekeeping in Municipal Operations

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 10 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 11
6.a	Educate Municipal Employees about Pollution Prevention	Commissioner/ DPW	(i) Provide stormwater training for municipal employees annually	During Year 10 one outside vendor (Porous Technologies, LLC - Gregg Novick) gave a presentation to staff on "Storm Crete" a precast porous concrete system used to facilitate infiltration and address the removal of phosphorous and particulates through infiltration of stormwater. Staff and outside consultants attended to be able to evaluate this material for application in upcoming stormwater management projects. Attached in Appendix 6 is a copy of the sign-in sheet and examples of the information provided. DPW purchased *RAINcheck Stormwater Pollution Prevention for MS4s* from Excal Visual as a training aid for employees. The first use of this program was used to train DPW division heads on March 26, 2013. Attached in Appendix 6 is a copy of the sign-in sheet and "Employee Quiz" used at the training.	Conduct training annually. Use the *RAINcheck Stormwater Pollution Prevention for MS4s* to train individual division personnel.
		Commissioner/ DPW	(ii) Work with managers to identify operations personnel with stormwater responsibilities	A list of responsible operations personnel with stormwater responsibilities is maintained. During Year 10 DPW trained DPW division heads on proper municipal Operation & Maintenance practices through the use of the *RAINcheck Stormwater Pollution Prevention for MS4s* (see BMP 6.a(i) above.	DPW will continue to work with facility managers to ensure Good Housekeeping inspections are done properly.

6.a Cont.		Commissioner/ DPW	(iii) Develop and implement training protocols that are applicable to operations	Not applicable in Year 10, completed in Year 5.	Completed.
		Commissioner/ DPW	(iv) Record number of municipal facilities inspected on an annual basis	112 facility inspection reports have been completed and returned to DPW (see summary sheet in Appendix 6). This represents 73% of the facilities in separated areas and 71% of the facilities in combined sewer areas.	Number of good housekeeping inspections completed by facility personnel on an annual basis will be recorded.
		Commissioner/ DPW	(v) Record number of facilities that have initial good housekeeping inspections conducted	Not Applicable in Year 10, completed in Year 8. All municipal facilities have had an initial inspection.	Completed.
		Commissioner/ DPW	(vi) Record the number of municipal facility site plans updated, including structural controls based upon initial site visits.	No municipal facility site plans were updated in Year 10.	Municipal facility site plans will be updated based upon revised information from the initial site inspections.
6.b	Maintain Strong Operations & Maintenance Program to Reduce Pollutants from Operations	Commissioner/ DPW	(i) Review operations and maintenance programs	Four (4) new fact sheets were developed: • Oil/Water Seperators • Green Roof • Pervious Pavement • Bio Retention Facilities See new fact sheets and the revised Good Housekeeping Inspection Form in Appendix 6	New activities at facilities should be noted and applicable BMPs implemented.

6.b cont.		Commissioner/ DPW	(ii) Identify municipal facilities in separated areas and identify structural controls	Completed. 156 municipal facility sites were mapped in GIS according to location in separated or combined sewer areas. 93 facilities lie within a combined sewer area and 63 lie within a separated stormwater area.	Continue to incorporate facility inspection drainage findings into the City's GIS system. Continue to develop updated facility maps as necessary for staff (refer to 6.a. (vi) above.
		Commissioner/ DPW	(iii) Document inspections procedures and maintenance schedules in a procedures manual	Not applicable in Year 10, Good Housekeeping Inspection Manuals have already been developed for municipal facilities.	Completed. Update as necessary.
		Commissioner/ DPW	(iv) Develop inspections procedures and maintenance schedules for long term structural controls	Over 3,777 work orders were tracked for catch basin and drainage system inspection, repairs, maintenance, clean, clear in the Cambridge Request System. A summary of all work orders submitted relative to the stormwater drainage system is in Appendix 6.	The DPW will keep track of the number and type of drainage system work orders completed, as recorded in the Cambridge Request System.
		Commissioner/ DPW	(v) Record percentage of City catch basins cleaned	1859 catch basins cleaned [approximately 31% (6,000 total)]	Keep record of City catch basins cleaned annually.
		Commissioner/ DPW	(vi) Record tons of street sweepings collected	1,520 tons	Keep record of tons of street sweepings collected annually.
		Commissioner/ DPW	(vii) Record tons of waste/recycling collected	15,870 tons	Keep record of tons of waste and recycling collected annually.
		Commissioner/ DPW	(viii) Record number of new trees planted	346 trees were planted by the forestry division. See Appendix 6 for location of trees planted. New tree plantings are now mapped in GIS.	Keep record of new trees planted.

6.b Cont.		Commissioner/ DPW	(ix) Record number of public structural controls constructed/repaired.	Refer to information provided below under "Additional Information"	Keep record of public structural controls constructed or repaired.

MCM #6. Additional information

- The Street Cleaning Division is responsible for maintaining clean public ways through a contractual street sweeping operation, which runs from April through December each year. Two contract sweepers are used to clean both residential streets and major City squares. The City squares are cleaned very early in the morning (between 4:00 AM and 8:00 AM) 7 days per week. Residential streets are swept city wide on a monthly basis, resulting in approximately 11,000 street miles being cleaned each year.

  Additionally, beginning in 2006 the city started a pilot program which utilized two vacuum sweepers to supplement the mechanical sweepers during the months of April and November. Through these months the two vacuum sweepers were sent out behind the mechanical sweepers on a daily basis in an effort to further remove fine material that was being left on the roadway after mechanical sweepers had made a first pass. Because of the success of this pilot, the city has continued using these two additional sweepers twice a year as part of our standard operations. A new street sweeping contract was approved for 2012 (Year 10). This new contract provides for a third vacuum sweeping of all municipal streets at the City's discretion.

- In addition to our regular street sweeping program the City had worked in close collaboration with the U.S. Geological Survey (USGS), EPA, and DEP on a vacuum sweeping study. The goal of the study was to better quantify the effectiveness of high efficiency (HE) street sweeping activities on phosphorous, metals and polycyclic aromatic hydrocarbons (PAHs) that are removed by two types of street sweeping technologies from a well-defined urban area representing a single land-use category during monthly street sweeping periods. A Total Maximum Daily Load (TMDL) for total phosphorus has been established for the Lower Charles River basin. Urban areas are highly impervious, meaning water 'runs off' its surfaces rather than infiltrating. To meet the total phosphorus criteria in the TMDL, the City of Cambridge is implementing a 65 percent reduction in total phosphorus load. A portion of this reduction is expected from the management of non-point source runoff, or water 'running off' urban surfaces.

  During Year 7 the City worked with USGS to develop a scope for a grant to fund the study. A grant application was submitted to DEP in May 2009. The grant scope included both sweeping and sampling protocols and required that the City designate a single High Efficiency vacuum sweeper over a two day period in a designated established sweeping area and work with USGS to obtain samples from sweepers and separate vacuum sweepings at the yard where samples can be weighed independently of other sweeping loads. DEP approved the grant application in November 2009. A final study scope was approved by DEP in

December 2009.

During Year 8 a Joint Funding Agreement was executed between USGS and the City. The study collected sweeping samples from May 2010 through December 2010; and USGS continued sampling, processing and analyzing the samples and data into Year 9. A draft report was release in Year 9. During Year 10 a final report titled "Potential Reductions of Street Solids and Phosphorus in Urban Watersheds from Street Cleaning, Cambridge, Massachusetts, 2009 – 11" was published by the United States Geological Survey. Source Loading and Management Model simulation (SLAMM) using productivity function coefficients for the more traditional mechanical and vacuum assisted street sweepers and the regenerative-air street sweeper productivity results from the City of Cambridge experiments suggested the following results. For average climatic conditions, and sweeping on a monthly basis a 3, 5 and 16% reductions in total solids could be anticipated from mechanical, vacuum and regenerative air sweepers respectively. Estimated phosphorus reductions were calculated as 1, 3 and 8% respectively for the three different sweepers.

- In public construction projects the following stormwater best management practices (BMPs) were constructed:
  - Number of new catch basins with deep sumps and hoods: 106
  - Number of deep sump drain manholes (grit pits): 5
  - Infiltrating Catch Basins: 2
  - Drywells: 7
  - Flap gate manhole: 1

- Additional maintenance activities were performed on stormwater drainage systems including:

  - Pump Inspections & Maintenance = 146 (Pump Inspections Maintenance Contract)

  - Storm drain cleaned and televised = 11,228 LF (FY12 TV & Cleaning),

Part IV. Summary of Information Collected and Analyzed

- See Appendix 3 for the results of water quality sampling at Alewife Brook, Charles River and Fresh Pond from April 2012 through March 2013 and their associated summary of results.
  - Alewife Brook samples from June 2012, August 2012 and November, 2012.
  - Alewife Brook wet weather sample: NA
  - Charles River dry weather samples from June 2012 and November 2012.
  - Charles River wet weather sample from November 2013.
  - Fresh Pond samples: July, September and December 2012
  - Little Fresh Pond, North Pond and Black's Nook samples April, October and November 2012.
  - Alewife Brook Oil and Grease samples August 23, 2012.
  - Charles River Oil and Grease sample from November 2012.

Part V. Program Outputs & Accomplishments (OPTIONAL)
(Since beginning of permit coverage unless specified otherwise by a **, which indicates response is for period covering April 1, 2011 through March 31, 2012)

Programmatic

	(Preferred Units)	Response
Stormwater management position created/staffed	(y/n)	Y[+]
Annual program budget/expenditures **	($)	
Total program expenditures since beginning of permit coverage	($)	
Funding mechanism(s) (General Fund, Enterprise, Utility, etc)		

[+] New Stormwater compliance officer was hired during Year 7.

Education, Involvement, and Training

Estimated number of property owners reached by education program(s)	(# or %)	100% residents
Stormwater management committee established	(y/n)	N
Stream teams established or supported	(# or y/n)	1
Shoreline clean-up participation or quantity of shoreline miles cleaned **	(y/n or mi.)	Y
Shoreline cleaned since beginning of permit coverage	(mi.)	
Household Hazardous Waste Collection Days		
▪ days sponsored **	(#)	3
▪ community participation **	(# or %)	1075 vehicles
▪ material collected **	(tons or gal)	29 tons[+]
School curricula implemented	(y/n)	

[+] A total of 29 tons were collected including at local DPW drop-off center

Legal/Regulatory

	In Place Prior to Phase II	Reviewing Existing Authorities	Drafted	Draft in Review	Adopted
Regulatory Mechanism Status (indicate with "**X**")					
▪ Illicit Discharge Detection & Elimination					X
▪ Erosion & Sediment Control					X
▪ Post-Development Stormwater Management					X
Accompanying Regulation Status (indicate with "**X**")					
▪ Illicit Discharge Detection & Elimination					X
▪ Erosion & Sediment Control					X
▪ Post-Development Stormwater Management					X

Mapping and Illicit Discharges

	(Preferred Units)	Response
Outfall mapping complete	(%)	100%
Estimated or actual number of outfalls	(#)	42
System-Wide mapping complete (complete storm sewer infrastructure)	(%)	99%
Mapping method(s)		
▪ Paper/Mylar	(%)	
▪ CADD	(%)	100%
▪ GIS	(%)	100%
Outfalls inspected/screened **	(# or %)	100%
Outfalls inspected/screened (Since beginning of permit coverage)	(# or %)	100%
Illicit discharges identified **	(#)	2
Illicit discharges identified (Since beginning of permit coverage)	(#)	37
Illicit connections removed **	(#); and (est. gpd)	4
Illicit connections removed (Since beginning of permit coverage)	(#); and (est. gpd)	37
% of population on sewer	(%)	99.9%
% of population on septic systems	(%)	.1%

Construction

	(Preferred Units)	Response
Number of construction starts (>1-acre) **	(#)	8[+]
Estimated percentage of construction starts adequately regulated for erosion and sediment control **	(%)	100%
Site inspections completed **	(# or %)	100%
Tickets/Stop work orders issued **	(# or %)	14 tickets
Fines collected **	(# and $)	0
Complaints/concerns received from public **	(#)	8

[+] 90 Fawcett Street, 67 Rogers Street, 8 Education Street, 2 Leighton Street, 127 Harvey St, 125,150,180R Cambridgepark Dr., 120 Rindge Ave and 160 Cambridgepark Dr

Post-Development Stormwater Management

Estimated percentage of development/redevelopment projects adequately regulated for post-construction stormwater control	(%)	100%
Site inspections (for proper BMP installation & operation) completed **	(# or %)	100%
BMP maintenance required through covenants, escrow, deed restrictions, etc.	(y/n)	Y
Low-impact development (LID) practices permitted and encouraged	(y/n)	Y

Operations and Maintenance

Average frequency of catch basin cleaning (non-commercial/non-arterial streets) **	(times/yr)	
Average frequency of catch basin cleaning (commercial/arterial or other critical streets) **	(times/yr)	
Qty of structures cleaned **	(#)	1,859
Qty. of storm drain cleaned **	(%, LF or mi.)	11,228 LF
Qty. of screenings/debris removed from storm sewer infrastructure **	(lbs. or tons)	
Disposal or use of screenings (landfill, POTW, compost, beneficial use, etc.) **	(location)	Landfill
Basin Cleaning Costs		
• Annual budget/expenditure (labor & equipment)**	($)	$200,000

• Hourly or per basin contract rate **	($/hr or $ per basin)	$74/basin
• Disposal cost**	($)	$136/ton
Cleaning Equipment		
• Clam shell truck(s) owned/leased	(#)	2
• Vacuum truck(s) owned/leased	(#)	2
• Vacuum trucks specified in contracts	(y/n)	Y [+]
• % Structures cleaned with clam shells **	(%)	80%
• % Structures cleaned with vactor **	(%)	20%

[+] Storm drain pipe maintenance TV and Cleaning Contract

	(Preferred Units)	Response
Average frequency of street sweeping (non-commercial/non-arterial streets) **	(times/yr)	10 times/yr
Average frequency of street sweeping (commercial/arterial or other critical streets) **	(times/yr)	Approximately daily
Qty. of sand/debris collected by sweeping **	(lbs. or tons)	1,520 tons
Disposal of sweepings (landfill, POTW, compost, beneficial use, etc.) **	(location)	Landfill & transfer station
Annual Sweeping Costs		
• Annual budget/expenditure (labor & equipment)**	($)	$310,150 (contract only)
• Hourly or lane mile contract rate **	($/hr. or ln mi.)	$73.00/hr/rotary sweeper $30.00/hr/vacuum sweeper
• Disposal cost**	($)	$28.00-30.00/ton
Sweeping Equipment		
• Rotary brush street sweepers owned/leased	(#)	2
• Vacuum street sweepers owned/leased	(#)	2
• Vacuum street sweepers specified in contracts	(y/n)	Y (3x/yr) [+]
• % Roads swept with rotary brush sweepers **	%	100
• % Roads swept with vacuum sweepers **	%	100

[+] New street Sweeping contract provides for a 3rd vacuum sweeping, to be determined when needed by the City in addition to Spring and Fall.

Reduction (since beginning of permit coverage) in application on public land of: ("N/A" = never used; "100%" = elimination)		
▪ Fertilizers	(lbs. or %)	IPM followed – only organic fertilizers used
▪ Herbicides	(lbs. or %)	NA
▪ Pesticides	(lbs. or %)	NA
Integrated Pest Management (IPM) Practices Implemented	(y/n)	Y

	(Preferred Units)	Response
Average Ratio of Anti-/De-Icing products used ** (also identify chemicals and ratios used in specific areas, e.g., water supply protection areas)	% NaCl % $CaCl_2$ % $MgCl_2$ % CMA % Kac % KCl % Sand	80% 0 20% 0 0 0 0
Pre-wetting techniques utilized **	(y/n or %)	Y
Manual control spreaders used **	(y/n or %)	Y (75%)
~~Zero-velocity spreaders used~~ ** Automatic – control spreader	(y/n or %)	N (25%)
Estimated net reduction or increase in typical year salt/chemical application rate	(±lbs/ln mi. or %)	N/A
Estimated net reduction or increase in typical year sand application rate **	(±lbs/ln mi. or %)	100% reduction
% of salt/chemical pile(s) covered in storage shed(s)	(%)	100%
Storage shed(s) in design or under construction	(y/n or #)	N
100% of salt/chemical pile(s) covered in storage shed(s) by May 2008	(y/n)	Y

Water Supply Protection

Storm water outfalls to public water supplies eliminated or relocated	# or y/n	0
Installed or planned treatment BMPs for public drinking water supplies and their protection areas	# or y/n	Y
• Treatment units induce infiltration within 500-feet of a wellhead protection area	# or y/n	

List of Appendices

Appendix 1 – Public Education and Outreach

- *CityView* - Winter 2012-13: Preventing Ice, Protecting Pedestrians and Local Waterways (p.5)
- Construction/Design Notice examples:
  - Western Avenue Construction Starts (August 29, 2012) (flyer)
  - Fawcett Street Construction Starts (December 5, 2012) (flyer)
  - Hovey Avenue Closure (December 12, 2012) (flyer)
- Brochure - *Protect Your Home from Sewer Backups (March 2013)*
- Examples of website updates:
  - Alewife Brook Combined Sewer Overflows (CSO) Progress Update (4/23/12)
  - Winter Storm Preparedness (12/18/12)
  - Street Cleaning Resumes Monday, April 1 (3/21/13)
- Cambridge Science Festival brochure (April 20-29, 2012)
- DPW Vehicle Road Show photos – Enviroscape demonstration
- Alewife Reservation Constructed Wetland Public Planting Day, July 14, 2012
- Fresh Pond Day flyer (May 2012)
- CitySmart for City Employees sample calendar
- Rain Barrel installation assistance – GreenCambridge.org

Appendix 2 – Public Involvement and Participation

- NPDES Phase II public meeting information: Presentation and sign-in sheet (March 28, 2013)
- Public Meeting on Stormwater Management Citywide calendar posting, DPW News and Events posting and Cambridge Chronicle publication
- Friends of Fresh Pond *The Year in Review* 2012
- DEP 319 Grant Proposal letter of support for Charles River Watershed Association.
- Kingsley Park Improvements, Public Meeting #5 presentation, March 28, 2013
- 2012 GoGreen Awards –Stormwater Management Award display board
- Monday Nights at Fresh Pond, calendar and description

Appendix 3 – Illicit Discharge Detection and Elimination

- Private BMP's Installed
- Site Plan Review Listing
- Water Quality Samples, Reports and Maps
  - Charles River:
    - Charles River Dry Weather Sampling (November 2011 – June 2012, June 2012 – November 2012),
    - Charles River oil & grease sample: North Point (11/13/12)
    - Charles River: East, Central and West sampling location maps
  - Alewife Brook:
    - Alewife Brook Dry Weather Sampling (February 2012 – June 2012, June 2012 – August 2012, August 2012 – November 2012), includes oil & grease sample for Blanchard Road @ Wellington Brook (08-23-12)
    - Alewife Brook: North and South sampling location maps
- 2012 Water Quality sample results – Fresh Pond Reservation
- Charles River wet weather sample results (November 13, 2012)
- Map of Separated Common Manhole through March 1, 2013
- MyRWA Bacterial Assessment Wellington Brook and Little Pond Survey (May 21, 2012)

Appendix 4 – Construction Site Stormwater Runoff Control

- Construction Coordination Meeting - sign-in sheet and meeting notes (May 7, 2012, October 9, 2012 and March 19, 2013).
- Mandatory Permit Checklist (Energov) for building and demolition permits applied for at Inspectional Services Department (ISD): requires a Site Plan Review and sign-off by the DPW
- Construction Coordination Meetings presentation (Contractor's Guide to Permits & Work Zones) and sign-in sheets (March 4, 2013 and March 11, 2013)

Appendix 5 – Post-Construction Stormwater Management in New Development and Redevelopment

- Stormwater Control Permit database, summary for Year 10

Appendix 6 – Pollution Prevention and Good Housekeeping in Municipal Operations

- Sign-In Sheet for Storm Crete Porous Paving demonstration/training and example materials
- Sign-In Sheet for *RAINcheck Stormwater Pollution Prevention for MS4s* and employee quiz used for training DPW division managers
- Municipal Facilities Good Housekeeping Inspections summary
- New O&M Fact Sheets for Municipal Good Housekeeping and revised Good Housekeeping Inspection Form
    - BMP 18: Oil/Water Separators
    - BMP 19: Green Roof
    - BMP 20: Pervious Pavement
    - BMP 21: Green Roof Systems
- Stormwater Work Order Requests Submitted - summary (CRS)
- Trees Planted in Cambridge in 2012

Appendixes are provided under separate cover