Municipality/Organization: City of Cambridge

EPA NPDES Permit Number: MAR041076

MaDEP Transmittal Number: W-040464

Annual Report Number & Reporting Period: No. 7: March 09-March 10

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: Robert W. Healy

Printed Name: Robert W. Healy

Title: City Manager

Date: January 3, 2011

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, except for the following provision:

Part 11.F Did not submit annual report on or before May 1, 2009, annual report was submitted on July 29, 2009.

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 7 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 8
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: • The Brookline Street reconstruction project incorporated "pilot" low impact design environmental components including pervious pavement and bioretention system. • Launching of "City Smart" program in Cambridgeport, a social marketing effort to pilot neighborhood changes in mode of travel • Low Impact Development approaches for home and business, "*You Can Help Prevent Localized Flooding and Improve Water Quality...*" Copies of these items are provided in Appendix 1. The DPW also distributes flyers and e-mails to residents near and adjacent to upcoming and active construction sites regarding the scope and purpose of these construction activities. Examples of projects that have a stormwater benefit include: • Ellery Street Improvements • CAM400 Sewer Separation & Stormwater Management and CAM001, CAM002 and CAM401B Floatables Controls • Prentiss Street Improvements • Construction Starts This May on Brookline Street • Loomis St./Griswold St. Common Manhole Separation • Common Manhole Separation Project: Sunset Rd/S Normandy Ave/Normandy Ave/Normandy Terr. • Central Square Common Manhole separation • Western Avenue Improvements Copies of these notices are included in Appendix 1. These notices are also posted on the DPW website and distributed through e-mail.	Continue to develop relevant information on stormwater management for residents and businesses.

1.a (ii) Cont.		Commissioner/ DPW	(ii) Post information on the web	A Stormwater Management web page was developed as part of the DPW web site during program year 1. It can be viewed at http://www.cambridgema.gov/~TheWorks/stormwater/index.html. A copy of Year 6 annual report, annual meeting presentation, Joint Public Notice (April 2009) for the Alewife Brook CSO Progress Update was added to the site. During Year 5 a new page was created that is devoted to the Federal Emergency Management proposed changes to the flood insurance rate maps (flood plain in Alewife). During Year 7 this information was updated to reflect the end of FEMA's appeal period (September 2009), issuance by FEMA of their Letter of Final Determination (December 2009), adoption process and effective date schedules, meetings and technical information. Additional information on water quality and activities are posted throughout the City's website including the DPW homepage, Engineering homepage, Sewer homepage and City of Cambridge homepage throughout the year. Information included PSA's on the start and purpose of street sweeping (referenced above), rain barrels, a historic log of water quality sampling results, and information on "What to do after a flood" to help flood damaged areas following the March 2010 storms. Appendix 1contains examples of the above discussed updates. DPW continues work with a web designer to make information on the DPW website easier to find and to better promote the department's mission. The stormwater Management page and information will be easier to find and search in the new web design format.	Continue to update and expand information on our web site that is relevant to the implementation of our stormwater management program. DPW will continue to work on implementing a new web page design and format for all of DPW programs making information easier to find.
		Commissioner/ DPW	(iii) Distribute materials	Reconstruction of Brookline Street and City Smart: Fast, Flexible and Fun was published in the Spring/Summer 2009 edition of *CityView*. You Can Help Prevent Localized Flooding and Improve Water Quality... was published in Winter 2009/2010 edition of *CityView*. *CityView* is a publication of the City of Cambridge which is mailed to every household in Cambridge actively	Distribute information on Stormwater /Watersheds to every household actively

Revised			**Expanded BMP element in Year 3**	receiving mail. In addition, copies of *CityView* are available at various municipal buildings and on-line. Copies are provided in Appendix 1, referenced above under BMP 1.a (i). DPW also provided stormwater management materials to Friends of Alewife Reservation for distribution during Park Serve Day (April 25th), distributed materials at Household Hazardous Waste days, Rain Barrel distribution event (May 21st), Fresh pond Day (May 9th) and at the Container Gardening Workshop (April 4th). DPW also distributes information electronically (e-mails, e-line, web site) and in hard copies, as well as, posting notices in local newspapers.	receiving mail in Cambridge.
Revised		Commissioner/ DPW	(iv) Assess local/regional mass media marketing campaigns **Revised in Year 3– new BMP element**	The 3rd Annual Cambridge Science Festival is a multi day public celebration offering a wide range of science and technology related activities including tours, displays, and hands-on experiments sponsored and co-founded by the City of Cambridge, MIT and others. A copy of the programs offered during this week long celebration is included in Appendix I. Stormwater related events included Park Serve Day (Alewife clean up – FAR event), April 25; Eco Boat Trip on the Charles (CRWA event), April 26; and, Discover Black's Nook Pond (Cambridge Public School's event), May 3. In addition, Cambridge's local cable station CITY TV-8 continues to periodically air the Think Again Think Blue PSA which began running the week of February 19, 2007. This same PSA is also available through DPW's Stormwater Management webpage.	Participate in the 2011 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 at the Science Festival discussed in 1.a.(iv) above and during the DPW Vehicle Road Show held on May 19, 2009 which featured activities explaining how DPW keeps Cambridge Clean, including EnviroScape demonstration of stormwater pollution. Handouts were given to the children which includes DPW coloring book. Copies of the Road Show flyer, pictures of EnviroScape demonstration and a copy of the coloring book are attached in Appendix 1.	Schoolchildren will be included in stormwater outreach activities in general.

				DPW also worked with three separate youth programs during the summer of 2009, Team GreenSense (July 28, 2009), Break Through Cambridge (July 21, 2009), and FAR Ecology Camp (July 8, 2009). Campers were taught about sustainability issues relative to many environmental issues including stormwater management and tree maintenance. Information about these programs is also attached in Appendix 1. The Cambridge Water Department sponsor weeklong activities that highlight watershed protection, water treatment and other water related activities. A copy of the Fresh Pond Day May 9, 2009 flyer and event schedule is attached in Appendix 1.	
1.c	Develop a Stormwater Web Page	Commissioner/ DPW	(i) Develop a stormwater web page	A stormwater web page was developed during Year 1 and can be viewed at http://www.cambridgema.gov/~TheWorks/stormwater/index.html Also refer to 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 106 have been installed: 92 in the Charles (C) and 14 in the Alewife (A) watersheds under the following contracts: FY09/10 Misc Sidewalk: C (16) A (7) FY 09/10 Remedial: C (9) A (3) Brookline St: C (25) Riverside Open Space: C (1) Chapter 90 Contract 11: C (20) A (2) CDBG: C (19) A (2) Special Catch Basin markers (signs): C (2) (Appendix 1)	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 the May 2009 Go Green Month events. Activities included events for alternative forms of transportation, informational tables at all major squares in Cambridge, giveaways to cyclists and pedestrians, participation in local bike week events/tours. A listing of Go Green Month events is provided in Appendix I. In addition, CDD also began a pilot program in Cambridgeport to encourage and promote alternative modes of transportation entitled CitySmart: Fast, Flexible, Fun. See 1.a (i) above and Appendix 1 for more information.	Alternative forms of transportation will be promoted through activities and events.

MCM #1. Additional Information

- Cambridge CDD monitors 30 currently active PTDM projects, 28 submitted complete monitoring reports in 2009, or 93%. 2009 monitoring reflects:
  - More than 7.6 million square feet of commercial development are subject to annual PTDM monitoring.
  - A total of 15,043 parking spaces come under the Ordinance, with facility sizes ranging between 3 and 4576 parking spaces.
  - Approximately 26,524 employees and 10,627 graduate students are covered by PTDM plans in Cambridge.
  - Nineteen of the 28 projects, or 68%, that completed monitoring in 2009 met or surpassed their mode split.
  - Twenty-eight of the projects, or 100%, 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
  - 299 Prospect (Small Project PTDM Plan)
  - 99 Erie-167 Sidney-170 Sidney (three separate Large Project PTDM Plans operating as one project)

- 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, and an internal car pool matching service. 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 7: May 21st. Cambridge received a DEP grant to help subsidize the cost of 100 rain barrels, reducing the cost by $10/barrel. A total of 123 barrels were sold through this event. Stormwater management information on Healthy Household Habits, rain gardens, House Hold Hazardous Waste, etc was distributed with each rain barrel purchased.

- DPW sponsored a Container Gardening Workshop on April 4, 2009. Information tables included information on Healthy Household Habits and rain barrels. A rain barrel was awarded as a door prize at the workshop and stormwater management information /brochures were distributed (see Appendix 1 for more information).

- The Federal Emergency Management Agency is proposing new revisions to the city's 1982 flood plain maps. During Year 7 DPW provided residents and businesses with updated information as the preliminary Flood Insurance Rate Maps were finalized. Schedules, maps, general flood information and insurance information are posted on a DPW web page specific to these map revisions at http://www.cambridgema.gov/TheWorks/stormwater/fema.html .

MCM #2. Public Involvement and Participation

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 7 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 8
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 7 and to discuss potential issues/projects for Year 8 was held on March 24, 2010. A copy of the presentation and sign-in sheet is provided in Appendix 2. DPW also presented information on the City's Stormwater Management Program at a public meeting at the Conservation Commission (10/19/09). Copies of the presentations, agendas and sign-in sheets are attached in Appendix 2.	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 Chronicle. A copy of the NPDES meeting notice from the website and newspaper 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 25, 2009 as part of Park Serve Day during the Science Festival. DPW provided supplies and stormwater brochures for distribution. DPW also supported Clean Cambridge's "First Spring Cambridge Clean-Up-2009" on May 2nd and 3rd (see Appendix 2).	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). 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 2009 is attached in Appendix 2 and details the various activities supported by the Water Dept. The Cambridge Water Dept. sponsors many educational activities at Fresh Pond Reservation including: • Lusitania Meadow Tour on wetland restoration • Volunteer Programs – Reservation Stewardship and Pond Partners Programs • Urban Scientists – investigation of water quality at Black's Nook • Fresh Pond Day and water week • Northeast Sector Walkabouts More information on the Water Dept programs and volunteer opportunities is provided in Appendix 2.	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	No new links were listed this year on the stormwater web page.	As the stormwater management web page is expanded and updated additional links and resources will be added
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 25, June 20 and October 3, 2010. See Appendix 2 for a summary of recycling tonnage from Drop-off center, curbside and HHW collections. Approximately 12,630 tons of materials have been recycled.	HHW collection will be held on April 9, June 4, and October 1, 2011.
		Commissioner/ DPW	(ii) Accept recycling materials at a drop off center on a regular basis	During 2009 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 is in Appendix 2. The City began a residential food compost recycling pilot program in February 2008 and has since implemented this as a permanent program and expanded it to included curbside service for businesses (see Appendix 2 for more information). A summary of all of the recycling programs can be found at: http://www.cambridgema.gov/TheWorks/departments/recycle/index.html	DPW will continue to operate a recycling drop-off center.
2.c cont.		Commissioner/ DPW	(iii) Beginning in yr 2 provide information on illicit discharges and reporting	A pamphlet was developed in Year 2 and continues to be revised and distributed at the Household Hazardous Waste collection events. This pamphlet discussed illegal dumping into catch basins and the importance of proper disposal of wastes. A copy is provided in Appendix 2. Information on proper disposal of household hazardous waste and reporting illicit discharge/dumping is provided in the Recycling and Trash	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.

				Guidelines for Residents. These are mailed to every household annually. A copy is attached in Appendix 2.	

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 7, 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 7, 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 7, 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
2.d cont.		Commissioner/ DPW	(iv) Discuss Concord-Alewife Stormwater Management strategies at a public meeting	Not applicable in Year 7, 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 7, completed in Year 4. DPW published the Concord-Alewife Stormwater Management Guidelines in May 2006. A copy can be found at: http://www.cambridgema.gov/TheWorks/stormwater/pdffiles/ConcordAlewifeStormwaterManagement.pdf	Completed.
		Commissioner/ DPW	(vi) Place LID document on the Stormwater web site	Not applicable in Year 7, completed in Year 4 (see BMP 2.d.(v) above).	Completed

		Commissioner/ DPW	(vii) Execute the Environmental Joint Powers Agreement (EJPA)		
revised			Work with EOEA to advance the EJPA to a final document **(Revised in Year 1)**	Not applicable in Year 7. 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 approximately 6 times during Year 7 on May 12, July 14, September 22, November 17, 2009, and January 12 and March 09, 2010. Discussion topics included proposed hydraulic changes in the upper watershed by the Town of Winchester, Blair Pond dredging, flooding from the March 2010 storms, and continue support of USGS Alewife gauge contract by each of the 3 communities.	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 7, this report was finalized in Year 3	Completed.
revised					
2.d cont.		Commissioner/ DPW	(x) Place Tri-Community Working Group's *Progress Report* on web site	Not applicable in Year 7. This report was placed on the web site in Year 4 see: http://www.cambridgema.gov/TheWorks/departments/engnr/pdfs/Tri-CommunityWorkingGroupReport.pdf	Completed.
revised					

MCM #2. Additional Information

- The Cambridge Arts Council funded several Water Dance events in Year 6 and continued into Year 7 (April 15: Little River, April 12: Charles River, and April 19: Charles River. These dances were public celebrations of the spirit of water and give thanks to the fresh waters of Cambridge. Water Dances 2009 also serve as a gesture of appreciation to local citizens and advocacy groups for their work to protect these waters. See events summary in Appendix 2.

- The City of Cambridge recognizes businesses and organization that are taking environmental action through the GoGreen Awards. Last year the City included a new category for Stormwater Management in order to recognize local property owners 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 first Stormwater Management awards were awarded on May 26, 2009 recognizing Forest City Enterprises for a green roof at 23 Sidney Street and Old Cambridge Baptist Church for a rainwater recovery and reuse system. Information on the awardees and GoGreen Awards are provided in Appendix 2.

- DPW and city representatives attended and participated in EPA meetings regarding the Mystic River Watershed Initiative during Year 7. These meeting include Steering Committee meetings on 7-15-09, 9-16-09 and 3-31-09; Municipal Subcommittee on 1-14-10; and Water Quality Subcommittee on 1-07-10

- 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. The real time flow measurements can be observed at http://waterdata.usgs.gov/ma/nwis/uv?01103025 .

MCM #3. Illicit Discharge Detection and Elimination

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 7 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 8
3.a	Update Stormwater Drainage System, Outfalls and Receiving Waters in GIS	Commissioner/ DPW	(i) Map Fresh Pond outfalls	The improvements constructed within the Fresh pond Reservation have been updated in GIS by the Cambridge Water Department (see Appendix 3).	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 61 projects underwent DPW site plan review (see Appendix 3). DPW reviewed 3 projects under our Land Disturbance Regulations.	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 7 this was completed in Year 3.	Completed.

3.a cont.		Commissioner/ DPW	(vi) Begin updating GIS information with as-built/record drawings	DPW staff has been trained to edit the GIS database. As-built and record drawings are being 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-three (24) outfalls were inspected/ sampled for Dry weather flow: ten (10) were sampled once, twelve (12) were inspected/sampled twice, and two (2) were sampled three times. Of the above outfalls three (3) outfalls (River, Brewer and JFK east) were inspected but not sampled due to the lack of dry weather flow. • In the Alewife Brook watershed ten (10) outfalls were sampled: three (3) were sampled twice, six (6) was sampled four times, and one (1) was samples five times. 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)**	Four (4) oil & grease samples were done during Year 7: two (2) sample in the Charles and two (2) 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.
3.b cont. 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.

		Commissioner/ DPW	(iv) Identify and remove illicit discharges	Ten (10) Illicit discharges/connections were discovered/removed as follows:: • Pearl Street (5) • Brookline Street (2) • Sunset Street (1) • Griswold Street (1) • Hingham Street (1) [discovered in Year 6]	We will continue to monitor for and remove illicit discharges.
		Commissioner/ DPW	(v) Perform water quality sampling at a Fresh Pond outfall annually	Two (2) water quality samples were taken from three ponds that surround Fresh pond including: Little Fresh Pond, Black's Nook, and North Pond (see Appendix 3for summary report).	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 7. 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 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. Design is expected to begin during 2011. A third common manhole was identified and has been plugged.	Investigation into the Sparks Street drainage area will continue following the repair of cracked pipes in this system.

		Commissioner/ DPW	(viii) Investigate Lechmere Canal drainage area.	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.	Investigation into the Lechmere Canal drainage area will continue in areas where pipe sections can be isolated..
		Commissioner/ DPW	(ix) Separate Common Manholes (CMH).	Thirty (30) CMHs were separated during Year 7 in the follows contracts: • FY09 Remedial /CMH #6 (17) • FY10 Remedial (1) • Brookline Street (1) • CMH #4 (11)	The number of Common Manholes separated in separated drainage areas will be counted. Also, the design for the removal of the remaining Common Manholes in separated areas of the city will begin in 2011.

3.b cont.		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). These results are provided in Appendix 3. In addition, wet weather sampling of hot spot areas in the Mystic watershed is conducted by the Mystic River Watershed Association (MyRWA) and is shared with various agencies including Cambridge. MyRWA sampling in and around the Alewife Brook was conducted on 01/19/2010 (See Additional Information below).	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	Hotline information was included in the *Recycling and Trash Guidelines for Residents* updated Fall 2009 and in the annually revised Household Hazardous Waste Collection Days brochure (see Appendix 2 for copies of these materials). The recycling guidelines are distributed annually by mail to every household receiving mail in the city, are posted on the DPW website and are available in Spanish, Portuguese, Creole and Chinese. Also see information under MCM#3 Additional Information below regarding presentations on proper management of food waste..	The Stormwater Hotline number for illicit discharges will be incorporated in additional public information.
3.d	Develop Regulations Prohibiting Illegal Dumping of Non-Stormwater into the MS4	Commissioner/ DPW	(i) Develop a working draft	Not applicable in Year 7, completed in Year 1.	Complete.
		Commissioner/ DPW	(ii) Provide opportunity for peer and legal review of draft	Not applicable in Year 7, completed.	Completed.

3.d cont.		Commissioner/ DPW	(iii) Revise draft as necessary	Not applicable in Year 7, completed in Year 5.	Completed.
		Commissioner/ DPW	(iv) Present regulations/ordinance to City Council for consideration for adoption	Not applicable in Year 7, 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 264 common manholes have been separated through March 31, 2010.

- During Year 5 Cambridge completed the design of the bid package for common manhole #6 (CMH) contract to separate 13 CMHs in the Alewife watershed. This contract was constructed under the FY09 Remedial contract and completed during Year 7. The FY09 Remedial contract separated 17 CMHs in total as follows:
    - Normandy Ave (6)
    - S. Normandy Ave (3)
    - Loomis Street (2)
    - Griswold Street (4)
    - Sunset Road (2)

- Cambridge issues an annual Remedial Construction Contract to address immediate infrastructure needs and illicit connection removals. During Year 7 the FY10 Remedial Construction Contract removed one (1) CMHs as follows:
    - 172 Pearl Street

- Common manholes contract #4A was designed and readied for bid during Year 5 and included the separation of approximately 23 CMHs. CMH #4A began construction during Year 6. Eleven (11) CMHs were separated during Year 7 as follows:
    - #2 Clinton Street
    - Clinton @ Mass Ave
    - Mass Ave @ Pearl
    - Mass Ave @ Temple
    - #575 Mass Ave
    - Mass Ave @ Norfolk
    - #546 Mass Ave
    - Mass Ave @ Brookline
    - Mass Ave @ Coolidge Pl
    - Bishop Allen Drive @ Essex
    - Putnam @ Kinnaird

- The Brookline Street Reconstruction contract separated one (1) CMH on Brookline Street.

- Additional Sampling by others: The MyRWA performs hot spot dry and wet weather monitoring in the Mystic River watershed which includes the Wellington Brook and Alewife Brook. The MyRWA shares this data with the associated municipalities, DEP and EPA. Cambridge reviews the report results and discusses exceedances with the MyRWA. Copies of the MyRWA reports are attached in Appendix 3.

- Cambridge DPW gave 3 presentations on proper managing of food waste including proper grease management, wash water disposal, information on illicit discharges and discussion of the new Wastewater and Stormwater Drainage System ordinance and Regulations to the managers of licensed liquor establishments in November 2009. Attendees included representatives from all the major restaurants and hotels. These meeting were held and organized by the Cambridge License Commission and are a mandatory annual liquor license renewal meetings. A copy of the presentation and sign-in sheets are attached in Appendix 3.

- 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. See Appendix 3 for a copy of the ordinance.

MCM #4. Construction Site Stormwater Runoff Control

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 7 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 8
4.a	Develop Program for Construction Site Runoff Control	Commissioner/ DPW	(i) Review existing planning and construction procedures	Not applicable in Year 7, completed.	Complete
		Commissioner/ DPW	(ii) Clarify needed regulatory mechanism	Not applicable in Year 7, completed.	Complete
		Commissioner/ DPW	(iii) Develop draft regulatory mechanism, procedures and guidelines	Not applicable in Year 7, 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.	Completed.
		Commissioner/ DPW	(iv) Present draft to City Manager, City Council and the community for review	Not applicable in Year 7. 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.	Completed.

4.a Cont.		Commissioner/ DPW	(v) Amend draft as necessary and submit for consideration for adoption	Not applicable in Year 7, completed in Year 5.	Completed.
		Commissioner/ DPW	(vi) Record number of required Stormwater Management Permits submitted	Three (3) Stormwater Control Permits (formerly Land Disturbance Permits) were submitted for the following projects: • 200-300 Acorn Park Drive • 95-97 Pine Street • 87 New Street	The number of Stormwater Control Permit applications will be tracked.
		Commissioner/ DPW	(vii) Provide stormwater management guidance materials or references	Revisions were made to Appendix A Section 2 Construction Controls. Materials are made available to contractors. (See Appendix 4)	Continue to maintain and revise guidelines as necessary. Post Construction Controls BMP sheets on website.
		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.
		Commissioner/ DPW	(ix) Adopt procedures for enforcement and penalties for violations.	Compliance and enforcement procedures are included in the Land Disturbance Regulations (Article X).	Complete.

4.a cont.		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. One (1) stop work order was issued for stormwater complaints at 52 Loomis Street.	The number of enforcement action taken and reported will be tracked in our Cambridge Request System (CRS).
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	See 4.a (vii) above.	The guidance document and information for residents and contractors regarding erosion and sediment control practices will be placed on the DPW web site.
		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 3 of these meetings including: April 6th, July 27th, and Oct 5th. Copies of the sign-in sheets 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.	Guidance material for erosion and sediment control practices was revised. This document contained 21 new or revised fact sheets. See 4.a (vii) above.	Develop and/or revise specification, fact sheets or other guidance documents.
4.b cont.		DPW	(iv) Create a list of resources, which provides BMP suggestions for the targeted pollutants of concern.	Appendix A Section 2 contains Construction Control fact sheets. These fact sheets were revised. See 4.1.(vii) above.	Work on revisions/edits to other sections of the BMPs.
		Commissioner/ DPW	(v) Record the number of workshops or meetings with City departments to discuss implementation of plan requirements	No inter departmental meeting were held to discuss implementation of plan requirements. DPW coordinates reviews with the Inspectional Services Department on a routine basis.	Meetings will be held to discuss new ordinances and regulations as necessary.

MCM #4. Additional Information

- A construction coordination meeting notice inviting representatives from private utility companies, large contractors, MIT, Harvard, and city departments (Water Dept., Police, DPW, and Traffic Parking & Transportation) was distributed on March 30, 2010 to discuss upcoming construction season expectations and requirements for construction activities in the city (including stormwater management). A copy of the invitation letter and sign-in sheet is provided in Appendix 4.

- The City's new Wastewater (Stormwater) Compliance Officer passed the Certified Professional in Erosion and Sediment Control (CPESC) In-Training exam.

- The City's new Wastewater (Stormwater) Compliance Officer inspected twenty-six (26) active construction sites on sixty-six (66) different occasions.

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 7 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 8
5.a	Revise Sewer Use Regulations and Guidance	Commissioner/ DPW	(i) Complete a working draft	Not applicable in Year 7, 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 7, completed in Year 5. The Regulations and Ordinance can also be viewed on-line at: http://www.cambridgema.gov/TheWorks/stormwater/index.html	Completed.
		Commissioner/ DPW	(iii) Develop draft guidelines on BMPs	Sections updated in Year 7 include Appendix A (Section 2). See MCM 4.a. (vii) above and Appendix 4).	Stormwater management guidance will continue to be revised.

5.a cont.		Commissioner/ DPW	(iv) Discuss final draft and guidance with City Manager, City Council and the community	Not applicable in Year 7, 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 (see MCM 5.a (ii) above).	Completed.
		Commissioner/ DPW	(v) Present final regulation, guidance and monitoring program for consideration and adoption	Not applicable in Year 7, 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).	Guidance documents will continue to be revised. Land Disturbance Regulations (now Stormwater Control Regulations) will be revised to reflect new permits and permit names.

5.a cont.		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	During Year 6 DPW began a review of all DPW permits to streamline our permits and make them more user-friendly and to allow on-line filing. Permits required under the Wastewater and Stormwater Drainage and Land Disturbance Regulations are being revised as part of this process. A consultant was hired to assist DPW with integrating the permits into our Cambridge Request System (CRS) for better tracking and management.	Continue work on revising permits, guidance documents and check lists.
		Commissioner/ DPW	(viii) Administer procedures for enforcement and penalties for violations	Not applicable in Year 7, 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.	A data base for projects with private BMPs regulated under the Land Disturbance Regulations will be developed.
5.a cont.		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.	Continue to refine process and requirements and includeupdates in guidance document as necessary.

		Commissioner/ DPW	(xi) Provide legal mechanism to require annual compliance for the operation and maintenance of BMPs	Not applicable in Year 7, 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 participated in outreach and education activities during Arbor day events. The arborist also works closely with the Public Planting Committee and administers Tree hearings for the removal of trees from the public way. DPW staff presented plans for a new Rain Garden to the Committee on Public Planting and members of the public on August 12, 2009. The importance of infiltration and stormwater management were discussed. See Appendix 5 for a copy of the Agenda and presentation.	DPW will continue outreach efforts on the importance and protection of trees.

MCM #5. Additional Information

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

- 2009 marked the 18th year that Cambridge received the "Tree City USA" award from the Arbor Day Foundation, which recognizes municipalities for their efforts to maintain the urban forest. The City also received the "Growth Award" for the 3rd year in a row.

- The Municipal Tree Protection Ordinance reinforces the City Councils finding that the preservation of existing trees and the promotion of new tree planting is a public purpose that protects the public health, welfare, environment and aesthetics of the City of Cambridge and its citizens. The Urban forest serves a wide variety of functions, which promote the health, safety and welfare of residents. To date trees have been replaced to maintain/exceed the total significant tree diameter inches on all project sites. Where this can not be met project proponents have contributed into a municipal tree fund for tree plantings in other areas. During Year 7 three (3) projects (625 Putnam Ave, 2419 Mass Ave and Cambridge Discover Park – Bldg 200/300 were reviewed under the Cambridge Tree Ordinance.

- The City Council issued a Proclamation in honor of Arbor Day and in support of the importance of trees to the environment. See Appendix 5 for a copy of the Council Resolution.

- The City's new Wastewater (Stormwater) Compliance Officer inspected four (4) facilities to inspect post-construction BMPs.

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 7 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 8
6.a	Educate Municipal Employees about Pollution Prevention	Commissioner/ DPW	(i) Provide stormwater training for municipal employees annually	A new Wastewater (Stormwater) Compliance Officer was hired during Year 7. He and other DPW staff assisted facility personnel during good housekeeping inspections. DPW personnel were trained on Erosion & Sediment Control and the purpose and benefits of the DPW Demonstration Rain Garden. See Appendix 6 for copies of the sign-in sheets and presentations. In addition eleven staff members attended the UNH Stormwater BMP Technology Demonstration Workshop on October 22, 2009 (see Appendix 6 for copy of Invoice with list of attendees)	Conduct training annually.
		Commissioner/ DPW	(ii) Work with managers to identify operations personnel with stormwater responsibilities	A list of responsible operations personnel with stormwater responsibilities was maintained. No formal training was held during Year 7 (see 6.a. (i) above), rather individual assistance with Good Housekeeping inspections was provided.	DPW will continue to work with facility managers to ensure Good Housekeeping inspections are done properly.
		Commissioner/ DPW	(iii) Develop and implement training protocols that are applicable to operations	Not applicable in Year 7, completed in Year 5.	Completed.
		Commissioner/ DPW	(iv) Record number of facility personnel who complete inspections on an annual basis	142 facility inspections were completed. (see summary sheet in Appendix 6).	Number of good housekeeping inspections completed by facility personnel on an annual basis will be recorded.

6.a cont.		Commissioner/ DPW	(v) Record number of facilities that have initial good housekeeping inspections conducted	Approximately 25 facilities had initial inspections.	Record additional facilities inspected.
		Commissioner/ DPW	(vi) Record the number of municipal facility site plans updated, including structural controls based upon initial site visits.	Cambridge Water Department updated all facility maps for property within their care and control (7): • Fresh Pond Reservation • Neville Manor/Maher Park • Water Treatment Facility • Watershed Field Office (Lincoln) • Payson Park (Belmont) • Stony Brook Gatehouse/Dam/Barn • Hobbs Brook Gatehouse/Dam/Wet Pond See Appendix 3 for the 1st 3 items and Appendix 6 for remaining facility site plans.	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	There were no new activities identified at the inspected facilities.	New activities at facilities should be noted and applicable BMPs implemented.
		Commissioner/ DPW	(ii) Identify municipal facilities in separated areas and identify structural controls	151 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 58 lie within a separated stormwater area (see Appendix 6 for facility map).	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 7, Good Housekeeping Inspection Manuals were developed for municipal facilities.	Completed.

		Commissioner/ DPW	(iv) Develop inspections procedures and maintenance schedules for long term structural controls	Over 1,884 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.
6.b cont.		Commissioner/ DPW	(v) Record percentage of City catch basins cleaned	1020 catch basins cleaned [approximately 26% (3,900 total)]	Keep record of City catch basins cleaned annually.
		Commissioner/ DPW	(vi) Record tons of street sweepings collected	1,808 tons	Keep record of tons of street sweepings collected annually.
		Commissioner/ DPW	(vii) Record tons of waste/recycling collected	12,628 tons	Keep record of tons of waste and recycling collected annually.
		Commissioner/ DPW	(viii) Record number of new trees planted	466 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.
		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.

- In addition to our regular street sweeping program the City is working in close collaboration with the U.S. Geological Survey (USGS), EPA, and DEP on a vacuum sweeping study. The goal of the study is 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. The effectiveness of a high-efficiency street cleaning program at reducing the City's phosphorus loads to the Lower Charles River is not known.

  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 (see Appendix 6 for Administrative Summary of grant application). The grant scope includes both sweeping and sampling protocols and requires 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. A Joint Funding Agreement is expected to be executed between USGS and the City in shortly. The study is scheduled to collect sweeping samples from April 1, 2010 through December 28, 2010 (Year 8).

- In public construction projects the following stormwater best management practices (BMPs) were constructed (see Appendix 6 for a sample of project photos):
  - number of stormwater storage tanks = 1 (290,000 gallon tank at new library facility on Broadway)
  - number of new catch basins with 6' deep sumps and hoods installed = 72 [(9) FY08 Miscellaneous Sidewalks, (2) FY10 Miscellaneous Sidewalks, (12) Chapter 90, Contract 11, (4) Brookline Street, (10) Broadway/Ellery Street, (9) FY09 Remedial, (26) FY10 Remedial]
  - number of deep sump drainage manholes = 6 [(2) Broadway/Ellery Street, (2) Chapter 90 Contract 11, (1) FY09 Miscellaneous Sidewalk, (1) FY09 Remedial]
  - number of remodeled catch basins = 21 [(5) Brookline Street, (2) Broadway/Ellery Street, (14) Blanchard Road]

- number of diversion structures = 2 [(1) Broadway, (1) Cambridge Street]
- number of locations with permeable pavement = 3 [(142 SY) Brookline Street, (600 SY) King Open School, (67SY) Little Fresh Pond access area]
- number of bioretention systems (filterra) = 2 [(2) Brookline Street]
- number of rain gardens installed = 1 (DPW began the construction of a demonstration rain garden at 147 Hampshire Street)

- Additional maintenance activities were performed on stormwater drainage systems including:
  - Pump Inspections & Maintenance = 102 (FY09 and FY10 Pump Inspections Maintenance)
  - Storm drain cleaned and televised = 34,419 LF (FY09 and FY10 TV & Cleaning),

- During Year 7 the DPW's Master Mechanic, Sydney Cox received the 2009 Environmental Leadership Award from Government Fleet and Automotive Fleet magazines' staff for excelling in effective environmentally responsible operations. See Appendix 6 for Green Fleet Conference announcement.

- DPW constructed a rain garden at 147 Hampshire Street, porous asphalt parking lot at King Open School, filterra treatment systems on Brookline Street, and the Cambridge Water Department constructed and access area adjacent to Little Fresh Pond with flexipave materials as demonstration projects to assess maintenance issues for further implementation of these systems in Cambridge.

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 2009 through March 2010 and their associated summary of results.
  - Alewife Brook samples from April, 2009, July, 2009, November, 2009 and March, 2010.
  - Alewife Brook wet weather sample July 30, 2009 and January 25, 2010.
  - Charles River dry weather samples from July, 2009 and March 2010.
  - Charles River wet weather sample from July 30, 2009 and January 25, 2010.
  - Little Fresh Pond, North Pond and Black's Nook samples April 19, 2009 and July 9, 2009.
  - Alewife Brook Oil and Grease samples July 16, 2009 and March 8, 2010.
  - Charles River Oil and Grease sample from July 15, 2009 and March 9, 2010.
  - MyRWA wet weather samples from January 19, 2010.

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, 2009 through March 31, 2010)

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 %)	951 vehicles
▪ material collected **	(tons or gal)	30.88 tons[+]
School curricula implemented	(y/n)	

[+] A total of 58.63 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	(#)	34
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 **	(#)	9
Illicit discharges identified (Since beginning of permit coverage)	(#)	28
Illicit connections removed **	(#); and (est. gpd)	10
Illicit connections removed (Since beginning of permit coverage)	(#); and (est. gpd)	28
% of population on sewer	(%)	99.9%
% of population on septic systems	(%)	.1%

Construction

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

[+] 200-300 Acorn Park Drive
[++] 52 Loomis Street

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 **	(#)	1,020
Qty. of storm drain cleaned **	(%, LF or mi.)	34,419 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)**	($)	$250,000
• Hourly or per basin contract rate **	($/hr or $ per basin)	$124/basin

• Disposal cost**	($)	$64/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 **	(%)	95%
• % Structures cleaned with vactor **	(%)	5%

[+] Storm drain pipe maintenance

	(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)	1,868 tons
Disposal of sweepings (landfill, POTW, compost, beneficial use, etc.) **	(location)	landfill
Annual Sweeping Costs		
• Annual budget/expenditure (labor & equipment)**	($)	$293,000 (contract only)
• Hourly or lane mile contract rate **	($/hr. or ln mi.)	$72/hr/rotary sweeper $29/hr/vacuum sweeper [+]
• Disposal cost**	($)	$23 - $24.50/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 (2x/yr) [+++]
• % Roads swept with rotary brush sweepers **	%	100
• % Roads swept with vacuum sweepers **	%	100

[+] The cost of the labor and equipment for the USGS vacuum sweeper study is donated by Casey and Dupuis (equipment operator/owner)

[++] An additional vacuum sweeper is used for the USGS Vacuum Sweeper study discussed above in MCM#6 Additional Information

[+++] The study area for the USGS vacuum sweeper study is swept monthly

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% 20% 0 0 0 0 0
Pre-wetting techniques utilized **	(y/n or %)	Y
Manual control spreaders used **	(y/n or %)	Y (100%)
Zero-velocity spreaders used **	(y/n or %)	N
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* - Spring/Summer 2009, Reconstruction of Brookline Street (page 2) and CitySmart Fast. Flexible. Fun. (page 7)
- *CityView* - Winter 2009-10, You Can Help Prevent Localized Flooding and Improve Water Quality… (page 4).
- Construction Notice examples:
  - Ellery Street project information e-mail to neighbors
  - Ellery Street Improvements webpage
  - CAM400 Sewer Separation & Stormwater Management webpage
  - Prentiss Street Improvements webpage
  - Brookline Street flyer
  - Loomis St/Griswold St Common Manhole Separation Project flyer
  - Normandy Ave Common Manhole Separation Project flyer
  - Central Square Common Manhole flyer
  - Western Avenue notice of upcoming improvements letter
- Examples of website updates:
  - Joint Public Notice: Alewife Brook Combined Sewer Overflows Progress Update, April 2009
  - Street Cleaning Starts April 1
  - After the Storm, Flood Related Information and Resources
  - Outfall Monitoring – Water Quality Sampling
  - Updated Flood Insurance Rate Maps for Cambridge & Middlesex County
- Science Festival information April 25 – May 3, 2009
- DPW Vehicle Road Show 2009 flyer, EnviroScape demonstration photos and coloring book
- Youth Programs:
  - Breakthrough Cambridge - meeting confirmation and outline of presentation
  - Team GreenSense 2009 – Curriculum and Tentative Schedule, photos of EnviroScape Demonstration, Program Narrative
  - FAR Ecology Camp – calendar of events
- 2nd Annual Fresh Pond Day flyer and event schedule (May 2009)
- Special Catch Basin marker sign
- GoGreen Month, May 2009 calendar and events
- CitySmart Fast.Flexible.Fun. program information
- Container Gardening Workshop flyer

Appendix 2 – Public Involvement and Participation

- NPDES Phase II public meeting information. Presentation and sign-in sheet (March 24, 2010)
- Conservation Commission informational meeting on the City's Stormwater Improvement Projects: agenda, sign-in sheet and presentation
- Public Meeting on Stormwater Management Citywide calendar posting and newspaper posting
- CleanCambridge.Org Spring Cleanup flyer, project information, and City Council Resolution
- Friends of Fresh Pond *The Year in Review* 2009
- Cambridge Water Department's Watershed Management program and volunteer opportunities
- Recycling and Household Hazardous Waste collection summaries
- Cambridge Recycling Center information
- Compost That Stuff – information for businesses
- Household Hazardous Waste Collection Days 2009 brochure
- Recycling and Trash Guidelines for Residents (updated fall 2009)
- Artforce Cambridge – event summary
- 2009 GoGreen Awards – press release, website information, reception invitation, Stormwater Management Award display board for Large business and Small Organization winners

Appendix 3 – Illicit Discharge Detection and Elimination

- Fresh Pond Reservation map
- Private BMP's Installed
- Site Plan Review Listing
- Water Quality Samples, Reports and Maps
    - Charles River Dry Weather Sampling (March 2009 – July 2009 and July 2009 – March 2010)
    - Alewife Brook Dry Weather Sampling (March 2009 – May 2009, May 2009 – July 2009, July 2009 – November 2009, and November 2009 – March 2010)
- Oil & Grease sampling results
    - Wheeler Street (7-16-09 and 3-8-10)
    - Endicott Street (7-15-09)
    - Wadsworth Street (3-9-10)
- 2009 Water Quality Report and sample results – Fresh pond Reservation
- Charles River and Alewife Brook wet weather sample results (July 2009 and January 2010)
- Map of Separated Common Manhole through March 31, 2010
- MyRWA Bacterial Assessment: Wellington Brook, Claypit Pond, Hotspot sampling date: January 19, 2010 (Report Date: July 29, 2010)
- Managing Food Waste – presentation and sign-in sheets
- Dumpster Licenses (Ordinance)

Appendix 4 – Construction Site Stormwater Runoff Control

- Appendix A (DRAFT BMPs) for Construction Controls (Section 2)
- Construction Meeting Sign-In Sheets (April 6, 2009, July 27, 2009, October 5, 2009)
- Construction Coordination Meeting - letter and sign-in sheet (March 30, 2010 invitation, April 5, 2010 sign-in sheet).

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

- Committee on Public Planting – Agenda and copy of DPW Demonstration Rain Garden presentation (August 12, 2009)
- City Council Resolution for Arbor Day, April 24, 2009

Appendix 6 – Pollution Prevention and Good Housekeeping in Municipal Operations

- Erosion and Sediment Control Training: sign-in sheet and copy of presentation (7-16-09)
- DPW Demonstration Rain Garden Training: sign-in sheet and copy of presentation (8-07-09)
- UNH Stormwater BMP Technology Demonstration Workshop Invoice (October 22, 2009)
- Municipal Facilities Good Housekeeping Inspections summary
- Cambridge Water Department – Watershed Facility Maps
    - Watershed Field Office (Lincoln)
    - Payson Park (Belmont)
    - Stony Brook Gatehouse/Dam/Barn
    - Hobbs Brook Gatehouse/Dam/Wet Pond
- Municipal Facilities in Combined and Separated Catchment Areas map
- Stormwater Work Order Requests Submitted (CRS)
- Trees Planted in Cambridge
- Vacuum Sweeper grant application – Administrative Summary
- Stormwater Management Projects – sample project photos
- Green Fleet Conference: 2009 Environmental Leadership Awards announcement