

Municipality/Organization: City of Cambridge

EPA NPDES Permit Number: MAR041076

MaDEP Transmittal Number: W-040464

Annual Report Number

& Reporting Period:

No. 15: March 17-March 18

NPDES PII Small MS4 General Permit Annual Report

Part I. General Information

Contact Person: Owen O'Riordan

Title: Commissioner, Dept. of Public Works

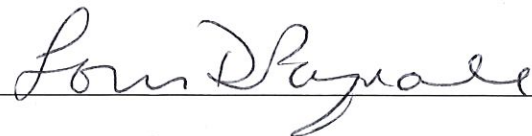
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Certification:

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: Louis A. DePasquale

Title: City Manager

Date: May 1, 2018

Part II. Self-Assessment

The City of Cambridge has completed the required self-assessment. Water quality sampling of all municipal outfalls was not completed this year. 60% of the outfalls were sampled.

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 15 (Reliance on non-municipal partners indicated, if any)	Planned Activities Permit Year 16
1.a	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.	Three new brochures were developed, one on the importance of the urban forest and the care of trees and two on the prevention of sewer backups and clogs at home and at businesses: • Urban Forestry, Tree Care Tips • Prevent the Clog, Fats Oils & Grease at Home • Prevent the Clog, Fats Oils & Grease at Work A flyer on how to build rain gardens and resources was updated: • Rain Gardens : Reuse Stormwater in your yard (updated) Information relevant to flooding, community participation, and other actions that impact Stormwater was developed for various activities and included in the following city publications: City View (Newsletter – Summer 2017) • Envision Cambridge (p3) • Community Investment (p5) • Community Sustainability (p.6) • Zero Waste Master Plan (p.6) • Urban Forestry (p6) The Cambridge Life (Magazine – September 2017) • Commonwealth Connect (p. 14) • Consider.It Envision Cambridge (p. 14-15) 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. Examples of projects that have stormwater benefits includes:	Continue to develop relevant information on stormwater management for residents and businesses.

Revised 1.a cont			Expanded BMP element in Year 3 • City Hall Annex Entry Plaza Accessibility Upgrades (includes creation of a new rain garden). • Cottage and Lopez Drainage Improvements (drainage improvement projects to address flooding) • Williard Street Drainage Improvements (The design will include replacing and/or rehabilitating the sewer and stormwater infrastructure and the construction of a new stormwater pipe and outfall at the Charles River, evaluation and implementation of stormwater best management practices, and water main replacement.) Construction notices are also posted on the DPW Construction Projects website.	
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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. Updates included during Year 15 include: • The NPDES Phase II Annual Report Year 14, • Stormwater Management Program Phase II NPDES Public Meeting 2017 presentation, • Joint Public Notice (April 2017) for the Alewife Brook CSO Progress Update The City also created a FloodViewer web tool aimed at helping residents and developers understand their flood risk and protecting their property. This tool was developed in concert with the City's efforts to understand and mitigate climate change impacts. A web page was developed Do Your Part for Cleaner Water and a Healthier Environment with information developed through the City's participation with the Mystic River Watershed Association's (MyRWA) Stormwater Education Collaborative. The Collaborative is developing a multimedia outreach campaign for each municipality to implement, allowing for consistent messaging across the watershed. Materials will include video public service announcements, social media graphics, website content, and posters to start, with additional educational materials to be developed in 2018. The Cambridge Water Department (CWD) also provides information on its website regarding projects related to protection of Fresh Pond Reservoir. An example of projects during Year 15 at Fresh Pond includes: • Drainage & Community Gardens Project: (April 2017 Presentation) The Drainage and Community Gardens restoration project will seek to improve existing conditions to be consistent with the Fresh Pond Master Plan vision of better drinking water quality, universal accessibility, and enhanced habitat and user experience. Existing conditions to be addressed by the project include flooding, pooling, and icing along the perimeter road, poor drainage, lack of accessibility and poor plot definition in gardens, and debris and invasive species along the rail corridor. The project design includes elements of corridor naturalization, visual buffering from the parkway, plantings, storm water treatment and improved pond visibility. More CWD project information can be found at: http://www.cambridgema.gov/Water/Projects/freshpondreservation	Continue to update and expand information on our web site that is relevant to the implementation of our stormwater management program.
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		Commissioner/ DPW	(iii) Distribute materials	The <i>CityView</i> newsletter referenced in BMP 1.a (i) above is distributed to over 50,000 households in Cambridge actively receiving mail. <i>CityView</i> is a publication of the City of Cambridge. In addition, copies of <i>CityView</i> are available at various municipal buildings and on-line and are referenced above under BMP 1.a (i). Construction notices are hand delivered to properties throughout construction project areas and are sent out in emails and posted on project web pages. Sample copies of these notices are available on-line and are referenced above under BMP 1.a (i). DPW also distributed stormwater management materials/brochures at the Rain Barrel distribution event (June 1 st) and at other public meetings and the annual Stormwater meeting. In addition to DPW's website DPW also distributes information electronically (e-mails, e-line, Cambridge web site , Facebook and Twitter) and in hard copies, as well as, posting notices in local newspapers and hand deliveries to individual homes/businesses.	Distribute information on Stormwater /Watersheds to every household actively receiving mail in Cambridge and/or through electronic media.
1.a cont Revised			Expanded BMP element in Year 3		
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 including water related events sponsored by the City of Cambridge, MIT and others. Water and sustainability related events at the 2017 Science Festival included: Singin’ of the Rain: Songs about Weather and Climate (p12), Marine Science Center Tidepooling and Tour (p16), New Perspectives: Thunder, Lightning and Climate Change (p19), Citizen Science on the Harbor! (p20), Climate Café (p34), Ocean Evolution Today: The Impact of Human Activity on the Ecology and Evolution of Marine Organisms (p35) and Tipping the Scales on Climate Change (p35). A copy of the program guide for the 10 day event is on file at DPW. Cambridge is also participating with other communities in the Mystic River and Charles River Watersheds working with the Mystic River Watershed Association’s Stormwater Education Collaborative [see additional information in BMP 1.a. (ii) above] and the Charles River Watershed Stormwater Collaborative on the development of a multimedia education program to increase awareness of stormwater pollution for a regional coalition of municipalities. During Year 15 the MyRWA Stormwater Education Collaborative worked with Water Words the Work to assist with the development of a poster and messaging for tweets and facebook posts directed at residents to “Do Your Part for Cleaner Water and a Healthier Environment”. The Charles River Watershed Stormwater Collaborative joined the MA Statewide Municipal Stormwater Coalition and will be utilizing public education and outreach materials developed in concert with Water Words that Work under a DEP grant award to the Coalition.	Participate in the 2018 Cambridge Science Festival or other public event. Continue participation in the MyRWA Stormwater Education Collaborative and the Charles River Watershed Stormwater Collaborative.

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 22, 2017 which featured activities explaining how DPW keeps Cambridge Clean, including a hands on demonstration using the EnviroScape model to explain how local waters can become polluted. • The Cambridge Water Department sponsors weeklong activities that highlight watershed protection, water treatment and other water related activities. DPW was on hand to demonstrate the EnviroScape model and the Conservation Commission director also had an information table representing Cambridge Community Gardens, Conservation Commission and Urban Agriculture at Fresh Pond Day on May 20, 2017. • For the past ten years DPW has sponsored Team GreenSense, a worksite of the Mayor’s Summer Youth Employment Program. Each summer the DPW employs 10-15 teams for 6 weeks to learn about and work on solving environmental problems both locally and globally. During Year 15 the program ran from July 3 – August 10 and participants toured the Deer Island treatment facility, learned about rain gardens, composting, recycling, invasive plant management, urban farming, and toured the Alewife Stormwater Wetland on August 8, 2017, among many other activities.	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/stormwater 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. A total of 82 have been installed during Year 15: 48 in the Charles (C), and 34 in the Alewife (A) watersheds under the following contracts: Chapter 90 Contract 19: C (23) Chapter 90 Contract 21: C (20) 100 Binney Street Project.: C (5) Huron B: A (20) Chapter 90, Contract 21: A (14)	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 2017. The CitySmart program is 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. A sample of Sustainable Transportation activities can be viewed in Bikes in Cambridge webpage.	Alternative forms of transportation will be promoted through activities and events.
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MCM #1. Additional Information

- The City of Cambridge's Community Development Department (CDD) monitors 45 currently active PTDM projects, 44 submitted complete monitoring reports in 2016, or 98%. 2017 monitoring reflects:
 - More than 11.9 million square feet of commercial development and 17.5 million square feet of institutional development are subject to annual PTDM monitoring, including Harvard University.
 - A total of 19,766 parking spaces come under the Ordinance, with facility sizes ranging between 3 and 4,576 parking spaces.
 - Approximately 50,282 employees, 11,305 graduate/middle school students, and 2,000 library patrons are covered by PTDM plans in Cambridge.
 - Thirty-nine of the 45 projects, or 87% met or surpassed their mode split.
 - Forty-four of the 45 projects, or 98%, submitting reports had a response rate of greater than 60%, giving results a very high degree of reliability.

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

- 110 Fawcett RMD
 - Valente Branch Library
- To improve and expand outreach DPW launched an official Facebook page during Year 9 and launched a Twitter account in 2012 in an effort to keep residents and other interested persons informed about programs, events, projects, and general updates. DPW continues to update its Facebook and Twitter pages
 - The DPW Facebook page can be viewed at: www.facebook.com/CambridgeDPW
 - The DPW Twitter feed can be viewed at: <https://twitter.com/CambridgeDPW>
 - 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, Emergency Ride Home program, a regional car pool matching service, and

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 commuter benefits and workshops.

- ❑ DPW also sponsored a rain barrel event during Year 15: June 1st. Over 108 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 2017 event DPW again partnered with www.GreenCambridge.org to provide assistance or advice on the installation of the rain barrels.
- ❑ The Federal Emergency Management Agency issued new Flood Insurance Rate Maps for a portion of Cambridge in 2010. During Year 15 DPW continued to assist residents with these changes through [website](#), e-mail, phone and help-desk requests for information. DPW submitted a local Community Rating System (CRS) application during Year 12 that was approved in Year 13 effective October 1, 2015 providing Cambridge residents with a 5% discount on their flood insurance premiums. As part of the CRS program DPW issues an annual letter to property owners in the flood plain regarding flood preparedness and insurance. In addition, DPW created the [FloodViewer](#) to help residents understand their flood vulnerabilities as a result of climate change and sea level rise (for more information on Flood Viewer tool see BMP 1.a (ii) above).
- ❑ The DPW continues to maintain staff gauges within the Alewife Stormwater Wetland so that the City and the public could observe the elevation of the stormwater within the wetland. This will aid in understanding how the wetland responds to rain events and dry weather conditions.
- ❑ The DPW's Urban Forestry Division created a special week from April 24th through April 28th focused on activities and information to promote Cambridge's Urban Forest. Members of the Urban Forestry Division hung informational tree tags on different tree species around MBTA stations to teach residents about the benefits the urban canopy brings to the community, hosted an information table in front of City Hall, held an event outside the Main Library showcasing information about trees, distributing free seedlings, and showcased their skills in a "tree climbing" demonstration. The week wrapped up with an Arbor Day tree planting in Sennott Park. With over 19,000 public trees in Cambridge this event was targeted at educating the community on the importance of the Urban Forest and ways in which they can help maintain them.
- ❑ The City launched a new "[Adopt-A-Tree](#)" program and is asking for the public's help to support our City's street trees and help us maintain a healthy, vibrant urban forest. The Adopt-A-Tree program lets residents search for a street tree near an address (home, business, school, etc.) and commit to keeping it healthy by watering it and tending to the tree well.

MCM #2. Public Involvement and Participation

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 16
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 15 and to discuss potential issues/projects for Year 15 was held on March 28, 2017. A copy of the presentation can be viewed here. 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 at the City Clerk’s office at City Hall.	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 29, 2017 as part of Earth Day/Park Serve Day. The Conservation Commission provided support to the Charles River Watershed Association for an Invasive Control Program at Magazine Beach in previous years. CRWA continues to work with the Friends of Magazine Beach to manage invasive vegetation with the help of volunteers.	Support/assistance will be provided for one clean-up event, as needed.

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 Cambridge Water Department supported the efforts of the Friends of Fresh Pond Reservation in their stewardship and educational projects. Friends of Fresh Pond describe their various activities supported by the Cambridge Water Department in the annual The Year in Review. DPW received a MassDEP 604(b) grant and is working with the Charles River Watershed Association to develop green street designs for three public rights-of-way and integrate these plans with the City's five year street and sidewalk plan. CRWA produced a draft Design Report during Year 15 and will be finalizing the report during Year 16. 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		
Revised		Commissioner/ DPW	Hold 3 Household Hazardous Waste Collection days annually (Revised in Year 1)	Four (4) Household Hazardous Waste (HHW) collection days were held this permit year on April 8, June 17, September 9 and November 4, 2017. Approximately 11,777 tons (estimated) of materials have been recycled, including 32 tons (estimated) of HHW.	4 HHW collection days will be held on March 31, June 30, Sept 8 and Nov 17.

2.c cont.		Commissioner/ DPW	(ii) Accept recycling materials at a drop off center on a regular basis	During 2017 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 from 9 a.m. – 4 p.m. More information about the Cambridge Recycling Center can be found on the Recycling web page.	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 is provided on the DPW Household Hazardous Waste (HHW) web page. Distribution of pamphlets and written information was determined to be too complex when dealing with the number of vehicles coming to HHW drop off events so information will be delivered at other events. Information on HHW was provided to residents when they picked up their 2017 rain barrels together with other stormwater management information. In addition, proper recycling and HHW is provided through and eNewsletter. During Year 15 DPW created a new tool for residents to help them properly dispose of household waste, including hazardous waste. “Get Rid of It Right”, powered by ReCollect, is now featured on the Department of Public Works’ homepage at: www.CambridgeMA.gov/TheWorks. This new tool is a quick and easy way to determine how to get rid of unwanted items. Simply type in the name of an item and we’ll tell you how to dispose of it properly.	DPW will continue to provide information on illicit discharges and reporting at events and/or in its meetings, through print materials and online.

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	Completed in Year 1. Information from this process can be viewed at: Concord-Alewife Study See additional activities listed under “MCM #2. Additional Information” at the end of this section.	Completed.
		Assistant City Manager for Community Development/CDD and Commissioner/DPW	(ii) Complete Phase II if authorized	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	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	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	Completed in Year 4. DPW published the Concord-Alewife Stormwater Management Guidelines in May 2006	Completed.
		Commissioner/DPW	(vi) Place LID document on the Stormwater web site	Completed in Year 4 (see BMP 2.d.(v) above).	Completed
		Commissioner/DPW	(vii) Execute the Environmental Joint Powers Agreement (EJPA)		

2.d cont. <i>revised</i>			Work with EOEAA to advance the EJPA to a final document (Revised in Year 1)	The Environmental Joint Powers Agreement (EJPA) that authorized the ABC Flooding Board was fully executed on March 4, 2005. The EJPA was extended in Year 12 until December 31, 2017. During Year 15 on November 14, 2017, the EJPA was approved for continuation through 2022.	Completed.
		Commissioner/ DPW	(viii) ABC Flooding Board to meet 4 times annually	The ABC Flooding Board met was scheduled to meet four (4) times in Year 15 on May 9 th , July 13 th , September 12, 2017 and January 19, 2018. Meetings on November 11, 2017 was cancelled due to lack of agenda items and March 13, 2018 due to inclement weather.	The ABC Flooding Board will meet 4 times per year.
<i>revised</i>			Schedule Revised in Year 1		
		Commissioner/ DPW	(ix) Finalize Tri-Community Working Group's <u>Progress Report</u>	Completed in Year 3	Completed.
<i>revised</i>					
		Commissioner/ DPW	(x) Place Tri-Community Working Group's <u>Progress Report</u> on web site	Completed in Year 4, Progress Report	Completed.
<i>revised</i>					

MCM #2. Additional Information

- ❑ The City of Cambridge in partnership with the Charles River Watershed Association (CRWA), will develop conceptual green street design plans for three public rights of way and integrate these plans with the City's five-year roadway improvement plan. The three study area streets are Park Avenue in West Cambridge, Chestnut St. in Cambridgeport and Webster Ave. outside of Kendall Square.

The Team will also develop a general green street guidance document for use by the City of Cambridge Department of Public Works (Public Works), other City agencies and private developers. The document will provide guidance on green street implementation in space-constrained urban settings with a focus on typical residential street layouts in the City of Cambridge.

The activities completed this year include:

- Existing conditions mapping was completed for all three target streets. Site visits were conducted at each of the three streets. The existing conditions report and presentation are complete. Existing runoff volumes and pollutant loads were calculated for each of the project streets. A land survey of Webster Ave. was completed in June 2017. The City of Cambridge also provided preliminary land surveys of the other two streets as project match.
 - CRWA, with input from the City of Cambridge, has finalized conceptual designs that achieve our treatment target for each of the three streets. CRWA documented conceptual designs in a design report which are in the process of finalizing based on feedback from MassDEP. Together with the green streets guidance document this will be the final project report.
 - The green street guidance document is almost finalized and is anticipated to be completed by June 2018
- 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, Huron B (Phase 2) began construction in September 2013, and Concord Avenue Neighborhood (Phase 3) began construction in January 2014. Sewer separation was completed in December 2015 allowing separated stormwater to discharge to the newly constructed stormwater wetland. During Year 15 many community events were scheduled allowing different venues for the community to discuss the sewer separation projects, schedules and construction activities. 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, ways to manage/infiltrate the stormwater through the design of the street restoration project and private inflow removal benefits. Community outreach efforts are directed at trying to reach the broader community and included coffee talks (April 6, May 4, June 1, July 6, August 3 and September 7, 2017, an End of Construction Celebration (September 13, 2017) and an Alewife Stormwater Wetland Tour on June 10, 2017. Detailed information regarding these projects and the meeting presentations can be found on the [Huron A](#) Improvements, [Huron B](#) Improvements and [Concord Avenue Neighborhood](#) websites.
- During Year 13 DPW began an investigation and design process for The Port area of the City. Over the next five years, the City anticipates spending over \$35M for the design and construction of water, sewer, drainage, street and sidewalk improvements in this neighborhood. The improvements will focus on rehabilitating existing infrastructure, constructing two underground stormwater tanks, reducing flooding in the area, and reconstructing the streets and sidewalks. Phase 1 of the project includes building a stormwater tank in Parking Lot 6 (PL-6) across from St. Paul's AME Church and was put out to bid during Year 15.
- The tri-community working group (ABC Flooding Board) 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 amongst itself and members of the

public. 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 and was completed and open to the public on October 15, 2013. This project is a key component of the Alewife Sewer Separation program to reduce Combined Sewer Overflows to the Alewife brook. An extensive outreach program has surrounded this construction activity. During Year 15 three (3) tours of the stormwater wetland were conducted to discuss the stormwater wetland and its benefits and construction process:
 - CAM004 residents and Pedestrian Committee: June 10, 2017
 - Team GreenSense: August 8, 2017
 - Interested members of the public: November 2, 2017
- ❑ DPW began the design process for the [Willard Street Drainage Improvement Project](#). Two community meeting and [presentation](#) were held on [June 15th](#) and [October 19th](#) to discuss the project status, stormwater needs and treatment options, streetscape and next steps. The project includes replacing and/or rehabilitating the sewer and stormwater infrastructure and the construction of a new stormwater pipe and outfall at the Charles River, evaluation and implementation of stormwater best management practices, and water main replacement.
- ❑ Climate Change Preparedness and Resilience (CCPR) Plan: During Year 15 the City began developing Cambridge's first Climate Change Preparedness and Resilience (CCPR) Plan. The Climate Change Vulnerability Assessment (CCVA) serves as the technical foundation for the CCPR Plan. The development of the CCPR Plan has started with a focus on the Alewife/Fresh Pond area and will move onto a second neighborhood in 2018, and then finish with a full plan by the end of 2018. The City has issued a draft CCPR document for the Alewife/Fresh Pond area. The City has issued the [Climate Change Preparedness and Resilience \(CCPR\) Plan for Alewife](#) and solicited feedback from the public and stakeholders. The key documents are the [plan](#), which serves as an overview, and the [handbook](#), which contains the details about each individual strategy. Feedback will be used to refine the Climate Change Preparedness and Resilience (CCPR) planning for the Alewife area and comments will be reflected in the final citywide CCPR Plan.
- ❑ [Envision Cambridge](#) is a community-wide process to develop a comprehensive plan for a more livable, sustainable, and equitable Cambridge. In addition to [housing](#), [mobility](#), [economy](#), [climate & environment](#), [urban form](#) and [community wellbeing](#) are focus areas of the citywide planning process. In the second year, Envision Cambridge delved deeper into the plan's focus areas and developed draft goals, strategies, and actions for housing, economy, urban form, mobility, climate and the environment, and community wellbeing. During this past year residents were asked to weigh in on goals associated with these focus areas. Next year, community conversations and scenario planning will be used to balance recommendations across

each focus group to understand trade-offs and articulate priorities. We will build upon this work to create an action plan that identifies effective short-, medium-, and long-term actions to realize our shared vision. Over 75 meetings (presentations, workshops, community engagement, focus groups, etc) were held during Year 15.

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MCM #3. Illicit Discharge Detection and Elimination

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 16
3.a	Update Stormwater Drainage System, Outfalls and Receiving Waters in GIS	Commissioner/ DPW	(i) Map Fresh Pond outfalls	Not applicable in Year 15	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 (BMPs) are tracked in a database. Approximately 122 projects underwent DPW site plan review in Year 15.	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	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 of the twenty-six (26) municipal outfalls thirteen (13) outfalls were not inspected/sampled and one (1) outfall	

3.b cont.			Revised in Year 3 to include all Cambridge owned outfalls	was inspected/sampled two (2) times, twelve (12) outfalls were inspected/sampled one (1) time over the permit year. During these inspections No Dry Weather Flow was discovered at JFK east and Brewer St. Of the thirteen outfalls not sampled two (2) outfalls, River St and Cambridge Cemetery Range 104, historically have No Flow. In the Alewife Brook watershed of the sixteen (16) municipal outfalls five (5) outfalls were not samples. Eleven (11) outfalls were inspected/sampled for dry weather flow. two (2) were inspected/sampled five (5) times, two (2) outfalls were inspected/ sampled four (4) times and seven (7) outfalls were inspected/sampled three (3) times. Of the above sampled outfalls the Blanchard Road (18”) was inspected, but not sampled due to the lack of dry weather flow. Of the five (5) outfalls not inspected/sampled all five historically have No Flow. See the Water Quality Sampling web page and Part IV of this report for sampling locations and information. During Year 15 DPW worked on QA/QC efforts for gathering bacteria sampling at the automatic stormwater sampling stations. Additional samples were collected at the five (5) sampling stations: • CambridgePark Drive • Wetland Outlet • Harrison Avenue • Sparks Street • Western Avenue	Water quality samples will continue in each watershed for all known City of Cambridge 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.

3.b cont. Revised			(Revised for Year 2 only)	Ten (10) oil & grease samples were done during Year 15: No sample in the Charles Watershed and two (2) dry weather samples in Alewife Watershed (Blanchard Road at Wellington Brook and Wetland Forebay) and eight (8) wet weather samples from the automatic sampler at the CambridgePark Drive Sampling Station on November 16, 2017.	
		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.
		Commissioner/ DPW	(iv) Identify and remove illicit discharges	DPW began investigations into the Normandy Terrace and Matignon Road areas due to elevated e.Coli results from water quality sampling at outfalls. Two (2) manhole structures were found to have unblocked connections between the drainage and sewer system in the Matignon Road Neighborhood (Murray Hill Road). These manholes were repaired and the connections removed. Water quality sample results in the Matignon Road area have improved. We will continue to monitor the Normandy Terrace area, sampling results remain slightly elevated.	We will continue to monitor for and remove illicit discharges.
		Commissioner/ DPW	(v) Perform water quality sampling at a Fresh Pond outfall annually	Water quality samples were taken at Little Fresh Pond, Black's Nook, and North Pond on May 31, August 2, November 29, 2017 and February 21, 2018. These results are analyzed in the 2017 Water Quality Report .	Water quality sample will be taken at Fresh Pond Reservation annually.

3.b cont.		Commissioner/ DPW	(vi) Purchase sampling equipment as recommended by EPA's Lower Charles IDDE Protocol	Not applicable in Year 15. Sampling equipment was purchased in Year 4.	Supplies will be purchased as needed.
		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. With the completion of the water quality sampling station we will be able to monitor this area under wet weather conditions. See BMP 3.b (x) below.	Investigation into the Sparks Street drainage area will continue.
		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.
		Commissioner/ DPW	(ix) Separate Common Manholes (CMH).	All known CMHs in separated areas have been eliminated. Separation of future CMHs will help to separate sections of combined sewer areas combined through CMH structures. No CMHs were removed in separated areas during Year 15.	The number of Common Manholes separated in combined drainage areas will be tracked.
		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	Cambridge will continue to take wet weather samples as part of the water quality sampling station program.

3.b cont.				not influenced by common manholes, one catchment in the Alewife watershed and one in the Charles River watershed. During Year 14 the City has completed the installation of 5 automatic sampling stations three in the Alewife Watershed (wetland outlet, upstream of wetland and Columbus Ave) two in the Charles Watershed (Sparks St and Western Ave). During Year 15 DPW began a QA/QC program and successfully collected wet weather samples on November 16, 2017 at CambridgePark Drive and Western Ave sampling stations. These stations will aid in obtaining wet weather sampling data. The CambridgePark Drive station will replace the sampling previously done at Normandy Terrace in the Alewife watershed. The Sparks St and CambridgePark Dr stations include multiparameter Sondes that transmit live data to DPW on water quality conditions. Due to contractual issues the link to the City's website was not completed during Year 15, but will be underway in 2018.	Live data from the Sondes will be linked to the DPW website.
3.c	Conduct Illicit Discharge Education Program	Commissioner/ DPW	(i) Advertise illicit discharge hotline number and information on illicit discharges	The hotline number and webpage was added to the DPW website. Non-emergency citizen requests can now be reported through the Commonwealth Connect Program. This allows residents to report issues	The Stormwater Hotline number for illicit discharges will be incorporated in public information where appropriate/applicable. DPW will track Commonwealth Connect "Dumping Into Catch Basin" complaints reported.

				via easy to use GPS enabled mobile apps on an online mobile interface. During Year 14 we added “dumping in catch basins” as a reportable issue. During Year 15 we received and investigated 10 complaints through SeeClickFix and an additional fifteen (15) submitted through email or phone.	
3.d	Develop Regulations Prohibiting Illegal Dumping of Non-Stormwater into the MS4	Commissioner/DPW	(i) Develop a working draft	Completed in Year 1.	Complete.
		Commissioner/DPW	(ii) Provide opportunity for peer and legal review of draft	Not applicable in Year 15, completed.	Completed.
		Commissioner/DPW	(iii) Revise draft as necessary	Completed in Year 5.	Completed.
		Commissioner/DPW	(iv) Present regulations/ordinance to City Council for consideration for adoption	Completed in Year 5. Click on the link to see a copy of Wastewater and Stormwater Drainage System Ordinance .	Completed.

MCM #3. Additional Information

- ❑ Common Manholes (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. A [Combine Sewer and Stormwater Catchment Areas](#) map of the combined and separated catchment areas shows areas where CMHs have been separated and the associated outfall areas. All known CMHs in separated areas have been separated. DPW will separate CMHs in combined sewer areas when sewer improvement projects are undertaken in those areas.

- ❑ 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 15 the city managed 650 permanent and 167 temporary dumpster licenses under the new ordinance.
- ❑ During Year 13 the DPW began working on a Five Year Plan for the Cambridge Cemetery, which includes survey and design services to address issues associated with drainage, roadway delineation, and roadway pavement condition and reconstruction. Aerial and ground survey and drainage videos and investigations have been completed. During Year 14 DPW completed the first construction contract which included roadway reconstruction and improving localized drainage and erosion issues. During Year 15 the report was finalized and includes construction phasing of drainage and roadway infrastructure. During Year 15 design for a new gravity sewer and sanitary pump station began to replace three cesspools associated with the buildings at the cemetery.

MCM #4. Construction Site Stormwater Runoff Control

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 16
4.a	Develop Program for Construction Site Runoff Control	Commissioner/ DPW	(i) Review existing planning and construction procedures	Not applicable in Year 15, completed.	Complete
		Commissioner/ DPW	(ii) Clarify needed regulatory mechanism	Not applicable in Year 15, completed.	Complete
		Commissioner/ DPW	(iii) Develop draft regulatory mechanism, procedures and guidelines	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 15. 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: ▪ Wastewater and Stormwater Drainage Use Regulations ▪ Land Disturbance Regulations	Completed.

4.a Cont.		Commissioner/ DPW	(v) Amend draft as necessary and submit for consideration for adoption	Completed in Year 5.	Completed.
		Commissioner/ DPW	(vi) Record number of required Stormwater Management Permits submitted	Thirty-one (31) Stormwater Control Permits (formerly Land Disturbance Permits) were issued during Year 15 for the following projects:	The number of Stormwater Control Permit applications submitted and approved will be tracked.

				• 1 BROADWAY • 399 Binney St • 145 Broadway • 77 Massachusetts Ave • 1607 MASSACHUSETTS AVE • 50 ALBANY ST • 55 REGENT ST • 47 BISHOP ALLEN DR • 50 York St • 457 MASSACHUSETTS AVE • 195 CONCORD TPK • 305 Webster Ave • 471 Memorial Dr • 1699 MASSACHUSETTS AVE • 42 Spinelli Pl • 110 FAWCETT ST • 671-675 CONCORD AVE • 10 North Point Blvd • 1350 Massachusetts Ave • 249 THIRD ST • 1868 MASSACHUSETTS AVE • 121 First St • 35 Cambridgepark Dr • 907 MAIN ST • 75 NEW ST • 84 RAYMOND ST • 10 Holyoke Pl • 850 Cambridge St • 1 NorthPoint Boulevard • 2551 Massachusetts Ave • 64 PEARL STREET Thirteen (13) of the above projects submitted applications in Year 14 and eighteen (18) applications were submitted in Year 15..	
		Commissioner/ DPW	(vii) Provide stormwater management guidance materials or references	A new web tool, FloodViewer , was developed to help residents/developers understand the risk of flooding to property and how to protect against it. .	Continue to maintain and revise guidelines as necessary in conjunction with adaptation strategies.

4.a cont.		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.
		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 twenty-six (26) Erosion and Sedimentation Control WARNING issued either verbally or through a warning ticket for stormwater related violations.	The number of enforcement action taken and reported will be tracked in a database.
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	Post erosion & sediment control information as it becomes available.
		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 at the following meetings including: April 4 (Presentation), April 24, May 22, July 24, September 18, 2017 and March 26, 2018.	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 15 (see BMP 4.b (i) above for a link to the current fact sheets.), but the FloodViewer was developed to provide guidance on flood related issues (see BMP 1.a (ii) above for more information).	Develop and/or revise specification, fact sheets or other guidance documents, as necessary.
4.b cont.		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	No meetings were held in Year 15.	Meetings will be held to discuss new ordinances and regulations as necessary.

MCM #4. Additional Information

- ❑ In addition to the thirty-one (31) Stormwater Control Permits issued during Year 15 an additional seven (7) applications were submitted for review, but not yet approved as follows:
 - 307 Fresh Pond Parkway
 - 85 First Street
 - 10 North Point Blvd
 - 1991 Massachusetts Ave
 - 300 Putnam Avenue
 - 227 Cambridge Street
 - 189 Vassar St
- ❑ The City's Wastewater (Stormwater) Compliance Officer completed two hundred and ninety six (296) inspections:
 - 296 stormwater erosion and sediment control site inspections at 49 construction sites, and
 - Issued 26 inspection violation/warnings [written (3), verbal (23)] for erosion and sediment control
- ❑ DPW transitioned to the Energov system in November 2015 to process all permits, inspections and code enforcement

investigations. This DPW is no longer using the Cambridge Request System for permitting. The Energov system allows for permitting, inspection and code enforcement (post construction inspections, erosion and sediment control inspections, and fats, oils and grease inspections) to be conducted within the Energov system. Currently the DPW and Inspection Services Department are using Energov.

- ❑ During Year 15 the Conservation Commission received ten (10) Notice of Intents for various projects and has issued eight (8) permits for this work, and received seven (7) Requests for Determination of Applicability and has issued seven (7) conditioned negative determinations. No violations were issued this year.

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 15 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 16
5.a	Revise Sewer Use Regulations and Guidance	Commissioner/ DPW	(i) Complete a working draft	Completed 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	Completed in Year 5. 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	The FloodViewer was developed to provide guidance on flood related issues (see BMP 1.a (ii) above for more information).	Stormwater management guidance will continue to be revised, as necessary.
		Commissioner/ DPW	(iv) Discuss final draft and guidance with City Manager, City Council and the community	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	Completed in Year 5. The Commissioner of Public Works promulgated Land Disturbance Regulations and Wastewater and Stormwater Drainage Use Regulations. ❑ 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) and by clicking on the links 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 thirty-one (31) Stormwater Control Permits issued in Year 15.	Track Stormwater Control Permits in a database.

5.a cont.		Commissioner/ DPW	(viii) Administer procedures for enforcement and penalties for violations	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 private BMP database is maintained for use in post construction inspections. One hundred and ten (110) post-construction inspections were performed during Year 15. Seventy five properties have Stormwater Control Permits Currently there are one hundred and seventeen (117) projects with a Stormwater Control Permit either completed or in construction.	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.	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

				• 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. During Year 15 DPW continued to work with both Harvard and MIT on a tracking system and reporting format for all of the university owned properties covered under Stormwater Control Permits to allow the universities to better track maintenance activities of post construction Stormwater control devices.	inspection dates and will perform inspection following the sites long term O&M plan.
		Commissioner/ DPW	(xi) Provide legal mechanism to require annual compliance for the operation and maintenance of BMPs	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	DPW working embarked upon the selection of a consultant to develop an Urban Forest Master Plan (UFMP) which will guide the development of the urban forest into the future and includes a strategic plan to evaluate, maintain and expand the urban forest canopy while being more resilient to climate change, reducing the urban heat island effect, mitigating stormwater runoff, reducing nutrient runoff, and contributing to community well-being. The UFMP will coordinate with the efforts of the citywide comprehensive plan (Envision Cambridge) and the Climate Change Preparedness & Resilience Plan. The City Arborist participates in varied outreach activities each year. During Year 15 activities included: • The City's first "Arbor Week." This special week is focused on activities and information to promote Cambridge's Urban Forest and runs from April 24th through Arbor Day, April 28th. 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. DPW will work with its consultant and a resident Task Force to begin development of the UFMP.
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MCM #5. Additional Information

- DPW's arborist had nine (9) meetings with the Committee on Public Planting regarding the benefits of green space and trees.

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 15 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 16
6.a	Educate Municipal Employees about Pollution Prevention	Commissioner/ DPW	(i) Provide stormwater training for municipal employees annually	During Year 15 DPW purchased <u>SPCC by the Numbers</u> from Excal Visual as a training aid for employees. During Year 15 eight (8) Cambridge Department of Public Works employees were trained using <i>SPCC by the Numbers</i> on June 20, 2017. Eight (8) employees were trained on Good Housekeeping inspections and measures as follows: (1) School Dept., Feb 12, 2018 (1) Fire Dept., Feb 14, 2018 (5) Water Dept., March 22, 2018 (1) Cambridge Cemetery, March 21, 2018	Conduct training annually. Use the <i>RAINcheck Stormwater Pollution Prevention for MS4s</i> and/or <i>SPCC by the Numbers</i> 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.	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	Completed in Year 5.	Completed.
		Commissioner/ DPW	(iv) Record number of municipal facilities inspected on an annual basis	One hundred and thirty-three (133) facility inspection reports have been completed and returned to DPW. This represents 78% of the facilities in separated areas and 91% 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	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 site plans were updated in Year 15.	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	DPW is working on a multi-year sewer capital repair program using Infomaster software to characterize code defects. This information is used to implement rehabilitation projects. During Year 15 the second sewer lining contract was designed and readied for bidding for Year 16 construction.	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	Changes are updated annually. 157 municipal facility sites were mapped in GIS according to location in separated or combined sewer areas. During Year 15, 85 facilities were within a combined sewer area and 72 were within a separated stormwater area. These numbers changed due to the completion of Sewer Separation projects.	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 15, 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	5,308 work orders were tracked for storm and sanitary system inspection, repairs, maintenance, clean and clear activities. Over 2,998 work orders were tracked for stormwater system activities and 2,310 for sanitary system activities during Year 15.	Continue to track of the number and type of drainage system work orders completed.
		Commissioner/ DPW	(v) Record percentage of City catch basins cleaned	1,956 catch basins cleaned (287 tons) [approximately 33% (6,000 total)]	Keep record of City catch basins cleaned annually.
		Commissioner/ DPW	(vi) Record tons of street sweepings collected	1,142 tons	Keep record of tons of street sweepings collected annually.
		Commissioner/ DPW	(vii) Record tons of waste/recycling collected	15,589 tons trash 9,119 tons recycling 2,400 tons organics	Keep record of tons of waste and recycling collected annually.
		Commissioner/ DPW	(viii) Record number of new trees planted	727 trees were planted during Year 15.	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.
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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 three times a year as part of our standard operations, vacuum sweeping of all municipal streets in done in April, July and November.

- ❑ In public construction projects the following stormwater best management practices (BMPs) were constructed:
 - Number of new catch basins with deep sumps and hoods: 109 (citywide)
 - Number of infiltrating catch basins: 27 [(Chapter 90 Contract #22 (16), SOMA (11))]
 - Porous Pavement: 2,907 Square Yards [(Concord Ave Project (1,676), Huron B Project (1,231))]
 - Number of Biobasins installed: 1 (Concord Ave Project on Fayerweather Street)
- ❑ Additional maintenance activities were performed on stormwater drainage systems including:
 - Pump Inspections & Maintenance = 169 (Pump Inspections Maintenance Contract)
 - Storm drain cleaned = 10,615 LF (TV and Cleaning Contract)
 - Sewer lines cleaned – 28,342 LF (TV and Cleaning Contract)
- ❑ DPW began an inspection program for privately owned sewer holding tanks. There are a total of nineteen (19) private sanitary holding tanks within Cambridge and one (1) in construction, during Year 15. Sixteen (16) tanks have been inspected.

Part IV. Summary of Information Collected and Analyzed

- The following [water quality samples](#) were collected and analyzed at Alewife Brook, Charles River and Fresh Pond from April 2017 through March 2018.
 - ❑ Alewife Brook dry weather samples 2017 (various dates) includes Alewife Brook Oil and Grease samples: Blanchard Road at Wellington Brook (May 10, 2017), Alewife Wetland Forebay (March 6, 2018).
 - ❑ Alewife Brook wet weather sample: CambridgePark Drive (November 16, 2017) includes Oil and Grease samples.
 - ❑ Charles River dry weather samples 2017 (various dates)
 - ❑ Charles River wet weather sample: Western Ave (November 16, 2017)
 - ❑ Fresh Pond: Little Fresh Pond, North Pond and Black's Nook Water Quality Samples: May 31, August 2, November 29, 2017 and February 21, 2018.

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, 2017 through March 31, 2018)

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)		

⁺ 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 **	(#)	4
▪ community participation **	(# or %)	1,125 vehicles
▪ material collected **	(tons or gal)	32 tons ⁺
School curricula implemented	(y/n)	

⁺ A total estimate of 32 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	(#)	45
System-Wide mapping complete (complete storm sewer infrastructure)	(%)	99%
Mapping method(s)		
▪ Paper/Mylar	(%)	
▪ CADD	(%)	100%
▪ GIS	(%)	100%
Outfalls inspected/screened **	(# or %)	60%
Outfalls inspected/screened (Since beginning of permit coverage)	(# or %)	100%
Illicit discharges identified **	(#)	2
Illicit discharges identified (Since beginning of permit coverage)	(#)	42
Illicit connections removed **	(#); and (est. gpd)	2
Illicit connections removed (Since beginning of permit coverage)	(#); and (est. gpd)	42
% of population on sewer	(%)	99.9%
% of population on septic systems	(%)	.1%

Construction

	(Preferred Units)	Response
Number of construction starts (>1-acre) **	(#)	3 ⁺
Estimated percentage of construction starts adequately regulated for erosion and sediment control **	(%)	100%
Site inspections completed **	(# or %)	100%
Tickets/Stop work orders issued **	(# or %)	3 warning tickets ⁺⁺
Fines collected **	(# and \$)	0
Complaints/concerns received from public **	(#)	25 ⁺⁺⁺

⁺ 35 CambridgePark Drive, 75 New Street, 1 North Point Boulevard

⁺⁺ Several other warnings were verbally issued, but corrected without a written warning.

⁺⁺⁺ Not all of these complaints were related to construction activities

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 **	(#)	1,956
Qty. of storm drain cleaned **	(%, LF or mi.)	10,615 LF
Qty. of screenings/debris removed from storm sewer infrastructure **	(lbs. or tons)	335 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)	\$76/basin
• Disposal cost**	(\$)	\$152/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 vector **	(%)	20%

+ Storm drain pipe maintenance TV and Cleaning Contract

Average frequency of street sweeping (non-commercial/non-arterial streets) **	(times/yr)	9 times/yr (April – Dec)
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)	1,142 tons
Disposal of sweepings (landfill, POTW, compost, beneficial use, etc.) **	(location)	Landfill & transfer station
Annual Sweeping Costs		
• Annual budget/expenditure (labor & equipment)**	(\$)	\$450,020 (contract only)
• Hourly or lane mile contract rate **	(\$/hr. or ln mi.)	\$99.00/hr/rotary sweeper \$71.00/hr/vacuum sweeper
• Disposal cost**	(\$)	\$37/ton (apr-sept) \$97/ton (sept-dec)
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

+ Vacuum sweepers accompany rotary brush sweepers for the months of April, July, and November

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/lb mi. or %)	N/A
Estimated net reduction or increase in typical year sand application rate **	(±lbs/lb 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	