Municipality/Organization: **EASTHAMPTON, MA**

EPA NPDES Permit Number: **MAR041006**

MaDEP Transmittal Number: **W-036183**

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: Daniel J. Murphy Title: City Engineer

Telephone #: 413-529-1423 Email: engineer@easthamptondpw.org

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: Nicole LaChapelle

Title: Mayor

Date: 4/26/18

Part II. Self-Assessment

The City of Easthampton has completed the required self-assessment and has determined that our municipality is in compliance with all permit conditions, except for the following provisions:

Part II.B.1 The City's Public education and outreach program has continued and many applicants have now gone thru the City's stormwater permitting process. Meetings and public hearings for both groups are recorded for replay on the public access cable TV channel, which is available to the public. As this ordinance becomes more widely used, applicants have become more aware of the requirements. Additionally public hearings have been held to provide all interested citizens with updates on the Integrated Water Resource Management Plan (IWRMP) nearing completion that will indentify and prioritize the City's stormwater needs in the near and long term. The plan has also prepared the city for the new MS4 expected to take effect on July 1, 2018.

Part II.B.2 The Public Involvement and Participation Component of the permit has been instituted on an informal basis. An existing volunteer group has been in existence for a number of years and acts as a "watch dog" group for the Nashawannuck Pond and its tributaries. This group has been responsible for a number of improvements in the pond and its tributaries, with the goal of improving the water quality and removing the pond from the 303d listing of impaired waters.

Easthampton is a member of the Connecticut River Stormwater Committee (CRSW) as organized by the Pioneer Valley Planning Commission. Discussions at the meeting are centered around public involvement in stormwater issues. A major topic over the past several years has been preparing for the new MS4 permit Several stormwater related educational seminars and public participation events have been held in the Connecticut River valley area.

Part II.B.4 Construction Site Stormwater Runoff Control was bolstered by the adoption of a local stormwater ordinance. As this ordinance has been more widely used, applicants have become more aware of the requirements as are the local contractors that implement them on project sites.

Part III. Summary of Minimum Control Measures

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	Promote a Stormwater Program	DPW, Planning Board, Conservation Commission, Board of Health, Mayor	Easthampton will educate the public about the new Stormwater Ordinance	Applicants for permits have been educated on the need for a Stormwater permit.	Implementation of the Integrated Water Resource Master Plan (IWRMP) which includes preparation of a new permit and implementation of the new program
Revised					
2	Identify financial support for a Stormwater Program	DPW	Identify appropriate sources of funding assistance (grants) and apply for assistance in implementing portions of Stormwater Management Program	Upgrades to our existing stormwater system have been routinely funded as part of our annual road improvement program funded by state programs for highway improvements (Chapter 90). CDBG Project completed that included stormwater upgrades in Admiral St neighborhood.	Applying for an additional CDGB grant in the Admiral St area. Continue to identify needs within the stormwater system and seek additional funding for capital improvements based on IWRMP recommendations. Continue to consider a new stormwater fee.
Revised					
3	Target groups likely to impact stormwater	DPW	Produce literature targeting specific groups and activities which impact stormwater	Development proposals brought before the City in the past year have been made aware of the requirement to file for the federal stormwater permit (CGP), and notified that a local permit is now required. A video was prepared for DPW staff on good housekeeping for rollout in the current year.	PVPC will be utilized to help with targeted groups. A new video to advise the public on need for good stormwater practices will be rolled out this year.
Revised					
4	Identify alternative information sources	DPW	Post links on local website(s) to CT River Watershed Council website and to MA DEP and USEPA websites	The City of Easthampton website has been utilized by adding links to the appropriate websites pertaining to stormwater management.	Continue to post appropriate material on our municipal website.

5	Utilize local public access channel	DPW	Post public meeting notices concerning review of Easthampton Comprehensive Stormwater Management Program on local community access channel	Continued to work on the IWRMP. A final public hearing will be held during 2018	Broadcast any future open forums on Public Access channel. A total of 4 public meetings and one public hearing are planned to be held as part of the IWRMP.
Revised					
6	Develop, conduct, and document educational programs	DPW, CT River Watershed Council Liaison	City to appoint liaison to CRW Council to disseminate info on programs and activities of CRWC	We no longer have a local representative on the CRWC, however, we are kept informed of issues relating to that Council.	Continue to maintain communications with the CRWC through our Planning Department and Conservation Commission.
Revised					

1a. Additions

7	Promote household waste recycling	DPW, Board of Health	Sponsor Hazardous Waste Recycling Days	A local hazardous waste collection day was held in October 2016.	DPW directs residents to private disposal locations that accepts hazardous materials.

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
8	Storm Drain Stenciling	DPW/PVPC	Work with local youth groups to develop stenciling projects	No stenciling of catch basins was done this year.	Stenciling project planned for Spring of 2018 with elementary school class.
Revised					
9	Community Wetland Resource Area Clean-Up Days	DPW, Conservation Commission	City will encourage local stream clean-ups by local residents and youth groups. Solicit volunteers and sponsors in local access TV channel	Annual Community clean-up day held again this year. Clean-up along Nashawannuck Pond is always included. Local business owner group along the pond provide funding and volunteer labor to keep edge of pond clean. City hired part time Conservation Commissioner.	Try to expand clean-up day to include tributary streams feeding Nashawannuck Pond.
Revised					
10	Community Clean-Up Days	DPW	City to provide trucks and equipment for community clean-up efforts and disposal of waste	Annual Community Clean-up Day held in May 2017. Clean-up Day has been held for at least the last 15 years.	Continue Community Clean-up Day
Revised					

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
11	Identify Financial Assistance for inventory and Mapping of Storm Drain System	DPW	Identify appropriate sources of funding assistance (grants) and apply for assistance in implementing portions of Stormwater Management Program	Mapping of stormwater system nearing completion as part of IWRMP.	Maintain and update GIS mapping prepared as part of IWRMP.
Revised					
12	Mapping and identification of outfalls and receiving waters	DPW	Continue to maintain and update maps of all outfalls and receiving bodies of water	The existing GIS mapping has been updated with Record Documents as part of the IWRMP	Complete work on the IWRMP . New MS4 will require outfall location and inspection.
Revised					
13	Identification/description of problem areas	DPW	Continue to develop and implement an Illicit Discharge Detection and Elimination plan.	Prior mapping and dry weather sampling has already identified and prioritized outfalls which require additional investigation. Several suspect locationed resolved during 2017. Channel and arch culvert inspection at 1 Ferry St conducted.	Continue to investigate and correct, where feasible, known problem outfalls. Systematic inspections of all outfalls/ culverts forthcoming. Apply for grant for culvert replacement.
Revised					
14	Enforcement procedures addressing illicit discharges	Planning Board, City Council, Board of Health	Review whether local authority is appropriate and able to respond to potential illicit discharges. New bylaws, if necessary, to be proposed	Continued to enforce The Illicit Discharge Detection and Elimination Ordinance whenever evidence of illicit discharges comes to light. Began planning for anticipated new requirements to be included in next permit	Continue to enforce The Illicit Discharge Detection and Elimination Ordinance whenever evidence of illicit discharges comes to light. Implementation of new permit requirements.
Revised					

15	Public Information program regarding hazardous wastes and dumping	DPW, Board of Health	Provide educational brochures to residents promoting proper disposal of household hazardous wastes	A display is maintained by the Board of Health and the City Planner containing pamphlets and literature for a number of different good house keeping procedures as they pertain to household hazardous waste storage and disposal.	Maintain a supply of brochures in the halls of municipal office building which explains potential problems with illicit dumping of hazardous waste.
Revised					
16	Initiation of Recycling Programs	DPW, Board of Health	Apply for funding assistance from DEP Recycling Grant Program for assistance in public education and the purchase of recycling materials	The City currently maintains and operates a recycling center at the Highway Department Yard. Recyclables accepted are paper/cardboard products, glass, cans, bottles, plastics, metals, automotive batteries, and yard wastes. Waste oil is also collected and burned in waste oil furnaces in the Highway Department buildings. An annual sticker fee is charged. Large appliances, containing refrigerants, are accepted for a separate fee. The City now removes the refrigerants, utilizing licensed technicians.	City Departments will continue to apply for grants as they become available for all phases of the recycling program.
Revised					

3a. Additions

17	Watershed Assessments and studies	DPW, Conservation Commission, Board of Health Add Planning Department	Identify opportunities for funding assistance from 604b and 319 grant programs and from MA DEM Lakes and Ponds Grant Program to support watershed assessment and implementation activities. Tasks can include design and installation of stormwater BMP's and public outreach including storm drain stenciling. Emphasis will be on assessments and remediation of stormwater related problems impacting water quality in Nashawannuck Pond, which has been identified as impaired on the DEP 303d list.	No formal Watershed Assessments were done. However, with the dredging of Nashwannuck Pond now complete, attention has been diverted to the two main feeder streams to this water body. Dredging of the existing sedimentation basins on the two feeder streams has been permitted and funding for the work is being sought.	Funding for the project will continue to be sought.
18	Watershed Assessments and studies	DPW	DPW will apply for funding assistance from DEP's Source Water Protection Program for grant assistance to develop wellhead protection plans and stormwater management plans within Zone II's	No new grants or funding assistance were obtained for Watershed Assessment, however, a local college professor has continued to study the Easthampton watershed as a learning tool for his hydro-geology students. His studies are focused on the quality and quantity of our underground water supply as opposed to surface water quality.	Submit applications for grants to assist with a stormwater management plan within our Zone II's.

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
19	Bylaw: Stormwater Management regulations for constructions sites 10,000 sf or larger	Planning Board, Conservation Commission, City Council, Board of Health, ZBA	Adopt Stormwater Ordinance by City Council	The Stormwater Management Ordinance included language to cover construction sites smaller than 1 acre. A number of new large projects in town have submitted CGPs.	Continue enforcement of the new stormwater ordinances.
Revised					

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

20	Bylaw: Require post-construction runoff controls	Planning Board, Conservation Commission, City Council, Board of Health, ZBA	Adopt Stormwater Ordinance by City Council	The new ordinance includes language concerning post construction runoff controls.	Pursue the enforcement of the new stormwater ordinances. Subdivision Regulations are being updated to include LID Stormwater improvements.

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
21	Develop a municipal operations and maintenance plan	DPW	Using regulations and recommendations from DEP and EPA, develop and update an operations and maintenance plan to include proper disposal of street sweepings, catch basin cleanout, snow disposal, roadway de-icing procedures, vehicle washing, and outside storage of materials.	Continue to monitor the Spill Prevention and Control Plan, including regular inspections of facilities	Continue to monitor the Spill Prevention and Control Plan, including regular inspections of facilities.
Revised					

22	Develop Storm Sewer Inspection Program	DPW	Implement a formal inspection program, including maintenance logs and scheduling, for catch basin cleanings, repairs, and new installation.	City Engineer has continued worked with the public works departments to maintain a record of maintenance, repair, and construction of storm sewer system.	Continued improvement of documentation of maintenance, repair, and construction of storm sewer system. Improve formal record keeping procedure. Link this information to the City GIS system..
Revised					
23	Develop and implement training program for municipal employees	DPW	Develop training plan for employees.	DPW staff have continued to attend seminars and trade shows associated with public works related operations. Working with PVPC to develop new video training for City DPW employees.	Continue to promote attendance by operations level staff of snow removal and street cleaning operations, sewer system maintenance and repair, and sanitary sewer connection maintenance seminars and workshops.
Revised					
24	Review storm drainage infrastructure needs	DPW	Incorporate storm drain infrastructure review as part of Chapter 90 project work.	Continued to include storm drainage upgrades, wherever feasible, in all Chapter 90 work to be undertaken and any other road construction work funded by other sources.	Continue to include storm drainage upgrades, wherever feasible, in all Chapter 90 work to be undertaken and any other road construction work funded by other sources.
Revised					

7. BMPs for Meeting Total Maximum Daily Load (TMDL) Waste Load Allocations (WLA)

No TMDLs Established In Easthampton

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
Revised					

7a. Additions

Part IV. Summary of Information Collected and Analyzed

- Edits and corrections have been done to our stormwater system maps, as new information has been obtained. Original mapping project located all drainage system structures (catch basins, manholes, headwalls, and culverts) by GPS methods. Limited field verification program have been performed in areas where partial or incomplete plan information exists.

Part V. Program Outputs & Accomplishments (OPTIONAL)

Programmatic

Stormwater management position created/staffed	(y/n)	Y
Annual program budget/expenditures – Portion of City Engineers time allocated/	($)	$10,000

Education, Involvement, and Training

Estimated number of residents reached by education program(s)	(# or %)	Unknown
Stormwater management committee established	(y/n)	Yes
Stream teams established or supported	(# or y/n)	No new teams
Shoreline clean-up participation or quantity of shoreline miles cleaned	(y/n or mi.)	Yes .
Household Hazardous Waste Collection Days		
▪ days sponsored	(#)	1
▪ community participation	(%)	Unknown
▪ material collected	(tons or gal)	Unknown
School curricula implemented	(y/n)	No

Legal/Regulatory

	In Place Prior to Phase II	Under Review	Drafted	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**")				

Mapping and Illicit Discharges

Outfall mapping complete	(%)	97%
Estimated or actual number of outfalls	(#)	142
System-Wide mapping complete	(%)	97%
Mapping method(s)		
▪ Paper/Mylar	(%)	97%
▪ CADD	(%)	97%
▪ GIS	(%)	98%
Outfalls inspected/screened (since beginning of permit coverage)	(# or %)	100%
Illicit discharges identified (since beginning of permit coverage)	(#)	12
Illicit connections removed (since beginning of permit coverage)	(#) (est. gpd)	10
% of population on sewer	(%)	98%
% of population on septic systems	(%)	2%

Construction

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 %)	0
Fines collected	(# and $)	0
Complaints/concerns received from public	(#)	0

Post-Development Stormwater Management

Estimated percentage of development/redevelopment projects adequately regulated for post-construction stormwater control	(%)	100%
Site inspections completed	(# or %)	100%
Estimated volume of stormwater recharged	(gpy)	Unknown

Operations and Maintenance

Average frequency of street sweeping (non-commercial/non-arterial streets)	(times/yr)	2
Average frequency of street sweeping (commercial/arterial or other critical streets)	(times/yr)	3
Qty. of sand/debris collected by sweeping	(lbs. or tons)	Unknown
Disposal of sweepings (landfill, POTW, compost, beneficial use, etc.)	(location)	Compost/ DPW
Cost of sweepings disposal	($)	Unknown
Vacuum street sweepers purchased/leased	(#)	0
Vacuum street sweepers specified in contracts	(y/n)	0

Reduction in application on public land of: ("N/A" = never used; "100%" = elimination)		
▪ Fertilizers	(lbs. or %)	Unknown
▪ Herbicides	(lbs. or %)	Unknown
▪ Pesticides	(lbs. or %)	Unknown

Anti-/De-Icing products and ratios	% NaCl % $CaCl_2$ % $MgCl_2$ % CMA % Kac % KCl % Sand	80 20 0 0 0 0 0
Pre-wetting techniques utilized	(y/n)	Y
Manual control spreaders used	(y/n)	N
Automatic or Zero-velocity spreaders used	(y/n)	Y
Estimated net reduction in typical year salt application	(lbs. or %)	Unknown
Salt pile(s) covered in storage shed(s)	(y/n)	Y
Storage shed(s) in design or under construction	(y/n)	N

Connecticut River Stormwater Committee
Annual Report
April 1, 2017 to March 31, 2018

The Connecticut River Stormwater Committee

The Connecticut River Stormwater Committee is an intergovernmental compact of 17 municipalities that is organized to collaborate in meeting NPDES MS4 permit requirements for stormwater education and outreach (Minimum Control Measure #1). Facilitated and staffed by the Pioneer Valley Planning Commission, the Committee also works together to meet other permit compliance activities where appropriate and needed. Member communities are shown in Table 1 below.

Table 1: Connecticut River Stormwater Committee Member Communities

Member Community	Committee Representatives and Departments
Agawam	Tracey DeMaio, Department of Public Works
Belchertown	Steve Williams, Department of Public Works
Chicopee	Quinn Lonczak, Department of Public Works
East Longmeadow	Bruce Fenney, Department of Public Works
Easthampton	Dan Murphy, Department of Public Works
Granby	Dave Derosiers, Highway Department
Hadley	Marlo Warner, Department of Public Works
Holyoke	Michael McManus, Department of Public Works
Longmeadow	Mario Mazza and Peter Vancini, Department of Public Works
Ludlow	Jim Goodreau, Department of Public Works
Northampton	Doug McDonald, Department of Public Works
Southwick	Randall Brown, Department of Public Works
South Hadley	Melissa LaBonte, Department of Public Works
Springfield	Kevin Chaffee, Planning/Conservation
West Springfield	Jim Czach and Connor Knightly, Department of Public Works
Westfield	Casey Berube and Joe Kietner, Department of Public Works
Wilbraham	Tonya Basch, Department of Public Works

* Member that joined Committee this year.

Education and Outreach over the Past Year

The Connecticut River Stormwater Committee has moved forward several education and outreach activities under the 2003 permit. At the same time, the delayed start of the 2016 MS4 permit has provided time for the Stormwater Committee to lay further groundwork for its education and outreach program over the longer term. This includes developing a draft matrix of education and outreach activities for the next permit term, participating in the state-wide stormwater coalition education and outreach subcommittee to procure a consultant to develop a state-wide education and outreach campaign, and most recently, meeting with students from Worcester Polytechnic Institute

who are working with MassDEP to prepare a repository of stormwater education and outreach materials for use by MS4 permittees.

The narrative below summarizes the work of the Connecticut River Stormwater Committee during the 2017-2018 reporting year, which includes the following:

1. Produced 30-second radio spot as part of continued Soak up the Rain stormwater education campaign that will run on 3 stations throughout the Pioneer Valley in April 2018
2. Designed website for Connecticut River Stormwater Committee and began developing content
3. Worked with state-wide coalition on procuring services to help with design and materials for state-wide education program
4. Continued to lead urban tree planting project in Chicopee, Holyoke, and Springfield
5. Continued to lead project in Holyoke to reduce urban flows into Day Brook

In addition to these public education and outreach activities described in fuller detail below, members of the Stormwater Committee have joined PVPC in other MS4 permit related activities, including:

- Conducting a series of two training workshops for municipal staff that were videotaped and organized into specific modules that can now be used for subsequent annual training required by the new permit. Designed in consultation with consultant Wright Pierce, topics covered elements under the "good housekeeping" and the "illicit discharge detection and elimination" categories of the stormwater permit. Funding for these workshops was provided in part by the Massachusetts Department of Administration and Finance's Efficiency and Regionalization grant. The videos have already been shared with other MS4s in the state and are being loaded to YouTube for easy access by any other MS4 in Massachusetts who wishes to use them. Going forward, Connecticut River Stormwater Committee members have decided to use the video training modules as part of annual events where trainees from the region come together, watch the video modules, and then engage in discussion and problem solving. This will provide for more meaningful engagement than trainees watching videos on their own. Such an annual training event might also include field visits to learn about specific and/or sampling techniques. PVPC will plan to host these events as part of its Stormwater Committee work.

- Reviewing and updating municipal land use code in nine communities to meet new construction, and development and redevelopment standards within the 2016 federal stormwater permit. Funding for the code review was provided by the Massachusetts Department of Administration and Finance's Efficiency and Regionalization grant. A 10th stormwater committee member community elected to undertake code review through a fee for service arrangement with PVPC. This work included review and update of provisions for control of illicit discharges, erosion and sediment control, stormwater management permitting, subdivision regulations, and zoning. A detailed checklist with recommended code language was developed as part of this work to facilitate review in additional communities going forward.

  As there are still many issues to be worked out relative to code, including updating of the Massachusetts Stormwater Standards so that they better relate to the new MS4 permit requirements, and development of model language and procedures to help with off-site mitigation for redevelopment projects, PVPC staff has recommended that communities not immediately adopt code changes developed under this project. PVPC has noted that these

updates are not required to be in place until Year 2 of the permit effective date. PVPC staff is currently working with other members of the state-wide coalition of stormwater coalitions to fold these changes into a state-wide resource package on code updates, including a model bylaw, and the guidance being developed on off-site mitigation.

- Procuring services regionally of Wright Pierce to provide integrated stormwater system mapping and data collection to meet requirements of the new 2016 permit. Seven stormwater committee members—Agawam, Belchertown, Granby, Ludlow, Northampton, South Hadley, and Southwick – are participating in this work. Research conducted in concert with communities prior to this procurement showed significant cost savings in collaborating on this work rather than going it alone.

  To date, project work has entailed development of the mapping interface with stormwater infrastructure, and development of forms to ensure that all data required in the new permit (outfall screening and sampling, manhole inspections, catch basin cleaning, etc.) can be captured in the field during inspections and then uploaded to reference with geographically specific locations within Arc GIS mapping of the storm system for analysis in defining priority catchments and annual reporting to EPA.

1. Aired Soak up the Rain radio spot

The Stormwater Committee produced a 30-second radio spot to air, starting April 2. The Soak up the Rain spot is narrated by a local radio personality and calls on people to take notice and take action. It will air 183 times in a three-week period on three different radio stations in the region, covering all Stormwater Committee member communities. It will be aired at peak and non-peak listening hours to reach a variety of different audiences. The 30-second spot reads as follows:

> When stormwater flows across yards, driveways or parking lots, it picks up leaked car oil, lawn chemicals, litter and animal waste.
>
> This contaminated water ends up in the Connecticut River.
>
> Help keep our river clean. Don't let rain run – soak it up.
>
> Redirect downspouts to your lawn. Use a rain barrel. Create a rain garden or install porous pavement.
>
> Brought to you by the Connecticut River Stormwater Committee, a coalition of 17 Pioneer Valley communities.
>
> Learn more at soakuptherain.pvpc.org

Radio stations in the region that will air the Soak up the Rain radio spot.

It his hoped that interested listeners will follow the reference to the soak up the rain web page and the Committee will be able to make some determination of the spot's effectiveness by counting the increase in clicks on the web site. Results will provide some direction to the Committee as it continues to develop its 5-year education and outreach program under the new 2016 permit.

Production of the radio spot follows on an unsuccessful 4-month effort toward adapting a stormwater video from West Michigan Environmental Action Council. Members had researched stormwater messaging videos, selected the West Michigan video, engaged a local video producer for the adaptation, and worked out the terms of an agreement with the West Michigan group. The problem arose, when the local video producer learned that the Michigan group had no high resolution video file from which to work. Given that the Connecticut River Stormwater Committee members had talked about more than website use of the adapted video, a low resolution file was not adequate. It was surprising that without a high resolution file of the video, the West Michigan group would take the conversation so far. Nonetheless, this was an important lesson in learning what the right first question is to ask when talking about video adaptation.

2. Designed website for Connecticut River Stormwater Committee

While each stormwater committee member continues to maintain and update stormwater information on each of their municipal websites, there is a need to promote stormwater information on a regional Connecticut River website. The regional stormwater website will provide one website reference for forthcoming publications and media outreach work. Links can be made from the local municipal websites to the regional website and vice versa.

Design of the Connecticut River stormwater website includes "portals" for exploring the site in two ways: as an audience enumerated in the MS4 permit (resident, business, developer, industry) and as someone interested in learning more about a specific stormwater best practice important to water quality issues in the region: lawn and yard care, pet waste management, car care, soak up the rain, turf management, and septic system care. Committee members have been talking too about the importance of finding ways to include materials for educators (stormwater curriculum lessons), and agriculture (perhaps connecting to resources through the Extension Program at the University of Massachusetts, Amherst, and any nonpoint source nitrogen reduction initiatives that may emerge).

Content for the website is currently under development by PVPC. It is expected that additional content will be available through the statewide coalition if stormwater coalitions, which has just hired Water Words that Work to outline a state-wide education and outreach Think Blue campaign with development of some associated materials.

One important facet of this regional Connecticut River stormwater website is building the connection between enjoying and appreciating the resource and connecting to action. As such, PVPC will be working with its current Connecticut River US website, maintained in partnership with the Connecticut River Conservancy, to draw stronger lines between getting out on the resource and taking action for stormwater. The Connecticut River US website has information on paddling, trails, and water quality.

Design of Connecticut River Stormwater website that is in development.

3. Collaborated with state-wide stormwater coalition of coalitions

On behalf of Connecticut River Stormwater Committee members, PVPC has been active on the larger coalition of state-wide stormwater coalitions committee and the group's education and outreach subcommittee. The group was successful in applying for and receiving a $200,000 MS4 assistance grant to lay the groundwork for a state-wide stormwater outreach campaign. The campaign will help to define messaging, lay out a plan of work to meet education and outreach permit requirements, and develop a selection of materials for use by coalitions and municipalities. Water Words that Work was just selected as the project consultant at the end of March. PVPC staff is excited by the prospect of working with such a talented consultant that has developed state-wide stormwater campaigns in several states already. At the same time, staff is hopeful that the 5-year education and outreach framework it has been developing with Connecticut River Stormwater Committee members can be further refined with consultant input.

The following two projects, while specific to certain municipalities, are expanding awareness regionally about stormwater. They also serve to build capacity and know-how in planning, design, and construction of better stormwater management practices. Each project has its own outreach and education component.

4. Continue to lead urban tree planting project in Chicopee, Holyoke, and Springfield

PVPC continues to lead an effort to promote urban tree planting in the region's 3 major cities in partnership with the US Forest Service, Massachusetts Executive Office of Energy and Environmental Affairs, the Valley Opportunity Council, Nuestras Raices, ReGreen Springfield, Conway School of Design, Mass DCR, and the Cities of Chicopee, Holyoke, Springfield. Aimed at reducing stormwater flows to combined sewer areas and promoting greater climate reslience, the project involves an integrated community outreach process involving multiple neighborhood workshops and workshops for public works officials. Once completed, the project will provide the following major deliverables:

- installation of 2,200 trees on local streets and yards
- final engineering design for a green streets in each municipality
- model stormwater tree rebate ordinance

The project is made possible thanks to a $239,000 grant award to PVPC from the US Forest Service under the State and Private Forestry FY15 Northeastern Area Landscape Scale Restoration Program.

5. Continue to lead project in Holyoke to reduce urban flows into Day Brook

Through an EPA Urban Small Waters Grant, PVPC is developing a green infrastructure plan for Day Brook in Holyoke, which flows from west to east, remaining above-ground from Anniversary Hill Park and Community Field before being conveyed underground beneath the City and routed through the Waste Water Treatment Plant.

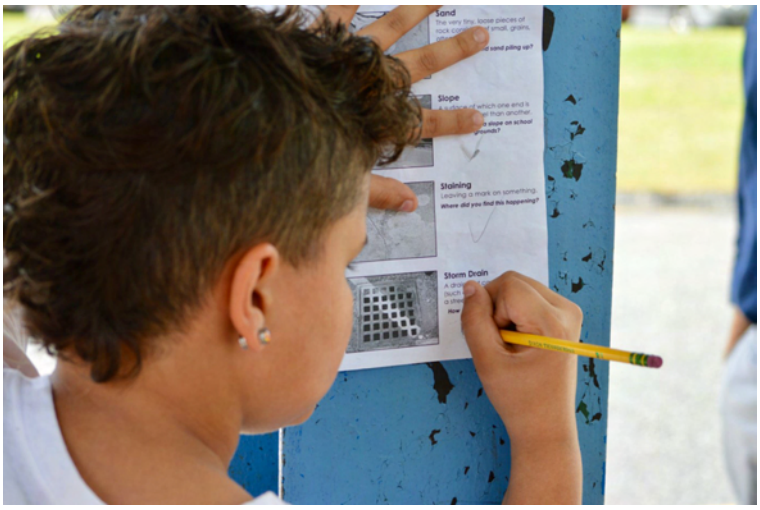
In this past year, the project completed work to increase awareness about this "secret stream" running unseen through the urban landscape. Conducted largely by project partner Enchanted

Circle Theater, awareness work this year followed a six-week lesson series that engaged third and fifth graders in learning about stormwater and producing artwork for use in a mural and "storywalk" about Day Brook.

The mural, which relates the unseen journey of Day Brook in Holyoke, was unveiled at a ribbon cutting event at Community Field in June. The event for the mural included stormwater learning stations, including rain gardens in a cup activities. The storywalk unveiling occurred at the Sullivan School in September as part of Arts in Education Week. Students participated in the unveiling and then spent time being stormwater detectives on the school grounds, working in teams to check off items on a treasure hunt list. The story walk, conceived as movable artwork that tells the story of Day Brook in a series of six panels, has been installed for periods of time at the Sullivan School, Community Field, City Hall, and the Public Library.

Students enjoyed the thrill of unveiling the Day Brook story walk at the Sullivan School in Holyoke. The story walk incorporated student artwork and words telling the history of Day Brook.

Local media provided good coverage of the story walk unveiling.



As part of the story walk unveiling event, a student records finding a storm drain in the stormwater detectives treasure hunt on school property in photo above. In photo at right, Sullivan School Principal John Breish talks with students about a pipe draining storm flow from the school's roof.

Two MS4 Permit Compliance Workshops for Connecticut River Stormwater Committee Members

Westfield State University, Scanlon Hall, Living Room

Wednesday, November 8, 2017
8:30 to 11 a.m.

Good Housekeeping

Learn about both the specific components and scope of the Stormwater Pollution Prevention Plan (SWPPP) and the control measures required under the MS4 permit for maintenance garages, public works yards, transfer stations, and other waste handling facilities where potential pollutants are exposed to storm water.

Best practices to be covered will include:

- Vehicle storage, fueling, and washing
- Storage of materials (salt & sand, petroleum products, and any other potential stormwater pollutants)
- Spill prevention and response
- Municipal facilities inspections as part of the SWPPP
- Catch basin inspection, cleaning, and maintenance
- Collection and recording of required data

Thursday, November 9, 2017
8:30 to 11 a.m.

Illicit Discharge Detection and Elimination (IDDE)

Learn about IDDE program requirements, how to detect and recognize illicit discharges and sanitary sewer overflows, and use of procedures and equipment.

The training will cover:

- IDDE program overview and key components
- Field screening of outfalls for dry weather flow
- Sampling and source tracking dry weather flows
- System vulnerability factors
- Sampling wet weather flows (where there is a minimum of 1 system vulnerability factor)
- Data collection and recording

Catalyst for Regional Progress
PVPC

WRIGHT-PIERCE
Engineering a Better Environment
70 YEARS 1947 - 2017

Workshops are made possible with funding from the Baker-Polito Administration's Community Compact Cabinet's *Efficiency and Regionalization Grant Program*

Registration by November 1 is required. Call Mary Mazik or Paula Delskey at 413-781-6045.

WRIGHT-PIERCE
Engineering a Better Environment

Agenda

Good Housekeeping Training
Westfield State University
November 8, 2017
8:30 p.m. – 11:00 a.m.

8:00 - 8:30	Registration and Introductions
8:30 - 9:00	Module 1 and Discussion • Background • SWPPPs 101
9:00 - 9:45	Module 2 and Discussion • Management Practices • Inspections
9:45 - 10:00	Break
10:00 - 10:45	Module 3 and Discussion • Catch basin inspection, cleaning, and maintenance
10:45 - 11:00	Evaluation
11:00	Adjourn

MS4 Permit Compliance Workshop - Good Housekeeping

November 8, 2017, 8:30 to 11 a.m.

Initial if present		Name	Title	City/Town	Phone	E-mail
TD	1	Tracy DeMaio	Environmental Project Coord.	Agawam	413-821-0624	Tdemaio@agawam.ma.us
[illegible]	2	Ron Pignatare	DPW Highway Dept.	Agawam	413-821-0624	
H.R.	3	Howard Rogers	DPW Highway Dept.	Agawam	413-821-0624	
SB	4	Steve Bonesteel	DPW Highway Dept.	Agawam	413-821-0624	
CL	5	Chris Laurenzo	Highway Superintendent	Belchertown	413-323-0415	claurenzo@belchertown.org
EB	6	Ed Burton	Highway Foreman	Belchertown	413-323-0415	eburton@belchertown.org
[illegible]	7	Quinn Lonczak	Project Supervisor	Chicopee	413-594-3585	glonczak@chicopeema.gov
	8	Jeff Neece	Superintendent	Chicopee	413-594-3557	jneece@chicopeema.gov
	9	Ela Soja	Assistant Superintendent	Chicopee	413-594-3557	esoja@chicopeema.gov
DJM	10	Dan Murphy	City Engineer	Easthampton	413-665-5555	dmurphy@easthamptonwater.com
	11	Bruce Fenney	Superintendent	East Longmeadow	413-246-3685	bruce.fenney@eastlongmeadow.gov
DD	12	Dave Desrosiers	Highway Superintendent	Granby	413-467-7575	daved@granbyma.org
~~BP~~	13	Brian Pike	Mechanic	Granby	413-467-7575	
RSA	14	Ross Aurnhammer	Mechanic	Granby	413-467-7575	
✓	15	Andy Krar	Town Engineer	Longmeadow	413-567-3400	akrar@longmeadow.org
✓	16	Pete Vancini	Engineering Aide	Longmeadow	413-567-3400	pvancini@longmeadow.org
✓	17	Doug McDonald	DPW Highway Dept.	Northampton	413-587-1582	dmcdonald@northamptonma.gov
✓	18	Rich Parasiliti	DPW Highway Dept.	Northampton	413-587-1582	

Initial if present		Name	Title	City/Town	Phone	E-mail
TRB	19	Randal Brown	Director	Southwick	413-569-3040	rbrown@southwickma.net
JB	20	John Broderick	Highway Superintendent	South Hadley	413-315-0200	JBroderick@SOUTHHADLEYMA.GOV
	21	Vivian Price	Operations Manager	South Hadley	413-315-0200	VPrice@SOUTHHADLEYMA.GOV
BKM	22	Bryan Manijak	DPW Highway Dept.	South Hadley	413-315-0200	
EB	23	Ed Beattie	DPW Highway Dept.	South Hadley	413-315-0200	
KC	24	Kevin Chaffee	Natural Resource Manager	Springfield	413-787-6234	kchaffee@springfieldcityhall.com
LM	25	Luca Mineo	Civil Engineer	Springfield	413-787-6214	lmineo@springfieldcityhall.com
	26	Matt Sokop	City Engineer	Springfield	413-784-4884	msokop@springfieldcityhall.com
CB	27	Casey Berube	Deputy Superintendent	Westfield	413-642-9397	c.berube@cityofwestfield.org
JK	28	Joe Kietner	Stormwater Coordinator	Westfield	413-642-9398	joseph.kietner@cityofwestfield.org
	29	Mike Walsh	Foreman	Westfield	413-572-6267	mike.walsh@cityofwestfield.org
	30	Jim Ruffo	Working Foreman	Westfield	413-572-6267	j.fuffo@cityofwestfield.org
CK	31	Connor Knightly	Project Manager	West Springfield	413-263-3249	Cknightly@townofwestspringfield.org
JC	32	Jim Czach	Town Engineer	West Springfield	413-263-3244	jczach@townofspringfield.org
TB	33	Tonya Basch	Assistant DPW Director/ Engineer	Wilbraham	413-495-2090	tbasch@wilbraham-ma.gov
	34	Alejandro Mendoza		Si		alejandro.mendoza@tuxtla.gob.mx
	35	Andrea Tang				andreatangvaldez@gmail.com
	36	STEVEN FREDERICK		LUDLOW		
	37					

Good Housekeeping Training

Presented by:

Christine T.M. Rinehart, PE

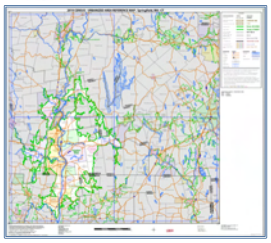
Presentation *Overview*

- Module 1
  - Background
  - SWPPPs 101
- Module 2
  - Management Practices
  - Inspections
- Module 3
  - Catch basin inspection, cleaning, and maintenance

Module 1

Background

- 2016 Massachusetts MS4 Permit
- MS4 = Municipal Separate Storm Sewer System
- 6 Minimum Control Measures



Background

6 Minimum Control Measures (MCMs)

1. Public Education and Outreach
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination Program
4. Construction Site Stormwater Runoff Control
5. Post Construction Stormwater Management
6. **Good Housekeeping and Pollution Prevention**

SWPPP 101

- Stormwater Pollution Prevention Plan (SWPPP)
- Written document, separate from Stormwater Management Plan (SWMP)
- Not needed if facility has SWPPP or no-exposure under Multi-Sector General Permit

What is a SWPPP?

SWPPP 101

- Side note – MSGP applies to:
  - Select industrial activities
  - Primary and co-located industrial activities
- Based on SIC code

Sector A – Timber Products	**Sector P** – Land Transportation
Sector B – Paper and Allied Products Manufacturing	**Sector Q** – Water Transportation
Sector C – Chemical and Allied Products Manufacturing	**Sector R** – Ship and Boat Building or Repairing Yards
Sector D – Asphalt Paving and Roofing Materials Manufactures and Lubricant Manufacturers	**Sector S** – Air Transportation Facilities
Sector E – Glass, Clay, Cement, Concrete, and Gypsum Product Manufacturing	**Sector T** – Treatment Works
Sector F – Primary Metals	**Sector U** – Food and Kindred Products
Sector G – Metal Mining (Ore Mining and Dressing)	**Sector V** – Textile Mills, Apparel, and other Fabric Products Manufacturing
Sector H – Coal Mines and Coal Mining-Related Facilities	**Sector W** – Furniture and Fixtures
Sector I – Oil and Gas Extraction	**Sector X** – Printing and Publishing
Sector J – Mineral Mining and Dressing	**Sector Y** – Rubber, Miscellaneous Plastic Products, and Miscellaneous Manufacturing Industries
Sector K – Hazardous Waste Treatment Storage or Disposal	**Sector Z** – Leather Tanning and Finishing
Sector L – Landfills and Land Application Sites	**Sector AA** – Fabricated Metal Products
Sector M – Automobile Salvage Yards	**Sector AB** – Transportation Equipment, Industrial or Commercial Machinery
Sector N – Scrap Recycling Facilities	**Sector AC** – Electronic, Electrical, Photographic and Optical Goods
Sector O – Steam Electric Generating Facilities	**Sector AD** – Reserved for Facilities Not Covered Under Other Sectors and Designated by the Director

SWPPP 101

- What facilities are required to have SWPPPs?
  - Maintenance garages
  - Public Works yards
  - Transfer stations
  - Other waste handling facilities
- Only one SWPPP for co-located facilities

SWPPP 101

- Side note – what is an O&M Program?
  - Written O&M procedures
  - "Mini SWPPPs"
    - Parks & Open Space
    - Building & Facilities
      - Schools, town office, police & fire stations, pools, parking garages
    - Vehicles & Equipment

SWPPP 101

- Example O&M Topics:
  - Use, storage, handling of products
  - Landscaping activities
  - Pet waste
  - Waterfowl
  - Training
  - Dumpsters
  - Parking lot sweeping
  - Spill prevention
  - Vehicle fueling, storage, washing

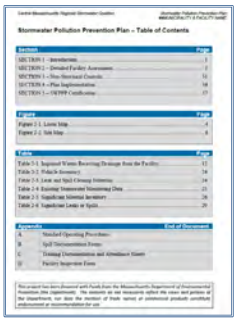
SWPPP 101

Required Elements

- Pollution Prevention Team
- Description of facility
  - Identification of potential pollutants
  - Map
- Identification of stormwater controls
- Management practices
- Inspections
- Recordkeeping

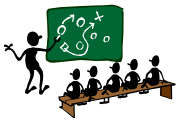
SWPPP 101

Template available from Central Mass Regional Stormwater Coalition


Stormwater Pollution Prevention Plan – Table of Contents

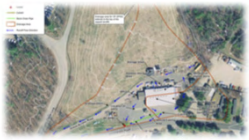
SWPPP 101

- Pollution Prevention Team
  - Identify staff on the team (name and title)
  - Identify roles
  - "The role of the team is to develop, implement, maintain, and revise, as necessary, the SWPPP for the facility."



SWPPP 101

- Description of Facility
  - Map
    - Stormwater outfalls
    - Receiving waters
    - Structural controls
  - Description of activities
    - Potential pollutants associated with activity
    - Location of any floor drains



SWPPP 101

- Activities that have potential to Impact stormwater
  - Vehicle and Equipment
    - Maintenance
    - Storage
    - Fueling
    - Washing
  - Material
    - Storage
    - Handling
    - Use

SWPPP 101

- Potential Pollutants
  - Fuel/oil, hydraulic fluid, antifreeze, solvents, paints
  - Sediment, nutrients, sand/salt
  - Wash water and detergents
  - Iron oxide, metals
  - Trash and misplaced recyclables

SWPPP 101

- Stormwater Controls
  - Measures to prevent or reduce discharge of pollutants
  - Discharges to water quality limited receiving waters require additional evaluation and/or controls
  - Structural
  - Non-structural

SWPPP 101

- Management practices
  - Minimize or prevent exposure
  - Good housekeeping
  - Preventative maintenance
  - Spill prevention and response
  - Erosion and sediment control
  - Management of runoff
  - Salt storage piles or piles containing salt
  - Employee training
  - Maintenance of control measures

More information provided in Module 2

SWPPP 101

- Example management practices:
  - Vehicle Storage
    - Store inside or under cover
    - Use drip pan under leaking vehicles
    - Conduct all maintenance inside
    - Cap hydraulic lines
  - Fueling
    - Under cover
    - Do not top off
    - Have spill kit nearby

SWPPP 101

- Examples of management practices:
  - Storage of materials – salt/sand
    - Stored in sheds or covered enclosure
    - Sweep spilled material
  - Storage of petroleum products
    - Label contents
    - Provide secondary containment
    - Protect from vehicular traffic
  - Storage of other materials
    - Label contents
    - Ensure containers are compatible, in good condition and tightly closed
    - No liquid storage near bay doors
    - Use funnels or fill reels to transfer materials

SWPPP 101

- Vehicle & Equipment Washing
  - Indoor Washing
    - Preferred method
    - Discharge to sewer thru oil/water separator or a MassDEP-approved, certified tight tank
    - Use a designated area
    - Limit detergents, use ones free of phosphates and regulated contaminates
    - Avoid using solvents, unless in self-contained parts washer
  - Commercial car wash or mobile vehicle washing business

SWPPP 101

- Vehicle & Equipment Washing
  - Outdoor Washing
    - Discharge to a tight-tank or implement pollution prevention procedures
    - Do not discharge to waterbody
    - Do not discharge to storm system without pretreatment
    - Remove particulate debris, sweep area
    - No power washing, steam cleaning or engine and undercarriage washing
    - No washing heavily soiled/salted vehicles

SWPPP 101

- Site Inspections:
  - Areas exposed to stormwater
  - Stormwater control measures
  - Required quarterly

More information provided in Module 2

SWPPP 101

- Recordkeeping
  - Maintain documentation of required activities
    - Maintenance
    - Inspections
    - Training
  - Maintain records associated with development and implementation SWPPP (for at least 5 years)
  - Make records available to public

Discussion

- Do you currently have a SWPPP?
- Did you self-prepare or hire a consultant?
- How do you address and document follow up for corrective actions?

Module 2

Management Practices

- Minimize or Prevent Exposure
  - Locate materials and activities inside or under cover
  - Prevent materials and activities from being exposed to rain, snow, snowmelt, runoff

Management Practices

Minimize or Prevent Exposure

Store materials and equipment indoors or under cover

Cover fuel island with a canopy

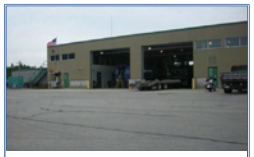
Conduct vehicle maintenance inside

Management Practices

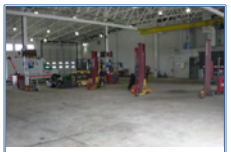
- Good Housekeeping
  - Clean all exposed areas that are potential sources of pollutants
    - i.e. sweep at regular intervals
  - Keep trash containers closed
  - Keep storage areas well swept and free from leaking or damaged containers
  - Store leaking vehicles needing repair indoors

Management Practices

Good Housekeeping



Sweep paved areas, and store leaking equipment inside until repaired



Sweep garage floor and keep tidy

Cover dumpster, and replace leaking dumpster or storage containers

Management Practices

Good Housekeeping

- Run a dry shop
- Fuel small equipment indoors
- Store oily rags in sealed, labeled metal containers for offsite laundering

Management Practices

- Preventative Maintenance
  - Regularly inspect, test, maintain, and repair equipment and systems
  - Prevent leaks, spills, and other releases of pollutants
  - Inspection required at least quarterly

Management Practices

- Preventative Maintenance
  - Keep equipment and systems in good working order
  - Routinely maintain equipment and systems
  - Conduct repairs in a timely manner

Management Practices

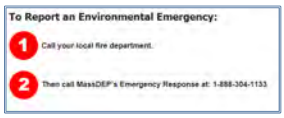
- Spill Prevention and Response
  - Minimize the potential for leaks, spills, and other releases
  - Develop plans for effective response
    - Preventative measures
    - Response procedures
    - Contact information

Management Practices

- Spill Prevention Procedures
  - Preventative barriers
  - Secondary containment
  - Material storage and handling

Management Practices

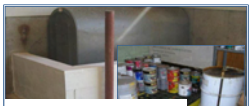
- Spill Response Procedures
  - Notification
  - Stopping, containing, cleaning up
  - Training
- Notify the fire department and MassDEP within 2 hours of any leak, spill or other environmental emergency, involving:
  - >10 gallons of petroleum,
  - >1 pound of hazardous chemicals,
  - or an imminent threat to public health or safety.
- Post contact info for individuals and agencies requiring notification



Notification to the National Response Center may be required

Management Practices

Spill Prevention & Response



Use secondary containment

Keep speedy dry and spill kits handy and well stocked

Management Practices

Spill Prevention & Response

Drain used oil filters and 1-quart containers

Use fill reels and funnels to transfer fluids

Transfer used-oil using upright oil drain or oil catty

Management Practices

- Erosion and Sediment Control
  - Structural and non-structural controls
  - Stabilize and contain runoff from exposed areas
  - Minimize or eliminate onsite erosion and sedimentation
    - Flow velocity dissipation devices
    - Seed bare areas
    - Stabilize slopes with erosion control blanket

Management Practices

- Management of Runoff
  - To prevent or reduce the discharge of pollutants
  - Divert runoff away from potential pollutant sources
  - Reuse, infiltrate, or treat stormwater

Management Practices

- Salt Storage Pile or Piles Containing Salt
  - Prevent exposure by enclosing or covering
  - Enclose or cover within 2 years of permit effective date
  - Implement measures to minimize exposure when adding to or removing material from pile

Management Practices

- Employee Training
  - Regularly train employees
    - Who work in areas where materials or activities are exposed to stormwater
    - Who are responsible for implementing activities identified in the SWPPP
    - Members of the pollution prevention team
  - Training shall include:
    - Specific components and scope of the SWPPP
    - Required control measures

Management Practices

- Recommended additional training
  - Site specific procedures
  - Individual responsibilities
  - BMP implementation
  - Spill prevention and response
    - location, use, and disposal of spill response equipment and supplies
    - Emergency instructions and contact list

Site Specific SOPs & BMPs

Management Practices

- Document training
  - Date
  - Title
  - Duration
  - List of attendees
  - Subjects covered


Pioneer Valley Planning Commission and Connecticut Stormwater Committee Good Housekeeping Training Workshop

Sign-In Sheet

DATE: November 8, 2017

SPECIFIC TOPICS DISCUSSED (list topics discussed below or provide a copy of the training agenda and/or materials covered):
Background for the need of the training, TMPP 101 (purpose and required elements) , TMPP management practices and inspections, and catch basin inspection, cleaning, and maintenance

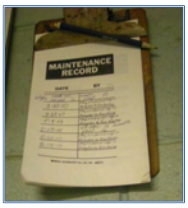
TRAINING GIVEN BY: Christine T. Elmhurst, PE, Wright-Pierce

IN ATTENDANCE:

Name	Signature	Position Title

Management Practices

- Maintenance of Control Measures
  - Maintain in effective operating condition
  - Have back-up measures in place
  - Develop regular schedule for preventative maintenance
  - Maintain non-structural controls (e.g. spill response supplies stocked, personnel trained)

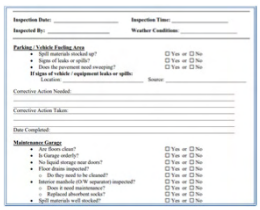


Management Practices

- Inspections
  - All Areas exposed to stormwater and all stormwater control measures
    - Once per quarter
    - While facility is in operation
  - One quarterly inspection to occur when stormwater is discharging from facility

Management Practices

- Document inspections:
  - Date and time
  - Name of inspector
  - Weather
  - Description of any discharges
  - Identification of any previously unidentified discharges
  - Control measures needing maintenance or repair
  - Failed control measures needing replacement
  - SWPPP changes required



Inspection Date: _____ **Inspection Time:** _____
Inspected By: _____ **Weather Conditions:** _____

Parking / Vehicle Fueling Area
- Spill materials stocked up? ☐ Yes or ☐ No
- Signs of leaks or spills? ☐ Yes or ☐ No
- Does the pavement need sweeping? ☐ Yes or ☐ No
- **If signs of vehicle / equipment leaks or spills:**
  Location: _____ Source: _____

Corrective Action Needed: _____

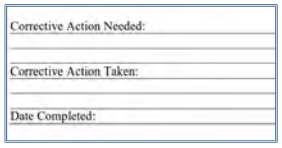
Corrective Action Taken: _____

Date Completed: _____

Maintenance Garage
- Are floors clean? ☐ Yes or ☐ No
- Is Garage orderly? ☐ Yes or ☐ No
- No liquid storage near doors? ☐ Yes or ☐ No
- Floor drains inspected? ☐ Yes or ☐ No
  - Do they need to be cleaned? ☐ Yes or ☐ No
- Interior manhole (O/W separator) inspected? ☐ Yes or ☐ No
  - Does it need maintenance? ☐ Yes or ☐ No
  - Replaced absorbent socks? ☐ Yes or ☐ No
- Spill materials well stocked? ☐ Yes or ☐ No

Management Practices

- Repair and replace control measures before next storm event, have back-up measures in place
- Include findings from inspections in annual report



Corrective Action Needed:

Corrective Action Taken:

Date Completed:

Incorporate a follow-up loop directly into the inspection form and/or link it to a work order system

Discussion

- Good
- Bad

Discussion

- What's good?

Discussion

- What's bad?

Discussion

- Can you spot the main difference?

That is not a product spill!

Discussion

- What's wrong?

Discussion

- Good
- Bad

Discussion

- What's wrong?

Module 3

Catch Basin Program

- Need to optimize:
  - Cleaning
  - Inspection
  - Maintenance

op·ti·mize
/ˈäptəˌmīz/
verb
make the best or most effective use of (a situation, opportunity, or resource).
"to optimize viewing conditions, the microscope should be correctly adjusted"

Catch Basin Program

- Catch basin program is one part of an infrastructure O&M Plan
- Template available from Central Mass Regional Stormwater Coalition


Table of Contents

Municipal Stormwater Infrastructure Operation and Maintenance Plan

Central Massachusetts Regional Stormwater Coalition

1 Introduction 1
2 Catch Basins 1
3 Streets and Parking Lots 2
4 Catch Basin Cleanings and Street Sweepings 3
5 Winter Road Maintenance 3
6 Structural Stormwater BMPs 4

Appendices:

Catch Basin Program

- Prioritize inspection and maintenance
  - Construction activity
    - Roadway, residential, commercial, or industrial development or redevelopment
  - Clean more often, if inspection and maintenance indicate excessive sediment or debris loading

Excessive Sediment / debris loading: sump >50% full

Catch Basin Program

- Cleaning Schedule
  - Routine
  - Goal of no catch basin sump >50% full at anytime
- If a catch basin sump is >50% full two consecutive times…

Catch Basin Program

- Document finding
- Investigate drainage area for sources of excessive sediment
- Abate contributing sources (to extent practicable)

Catch Basin Program

- Document your optimized catch basin cleaning plan
  - Metrics and other info used to reach determination that plan is optimal
- Log catch basins cleaned and inspected

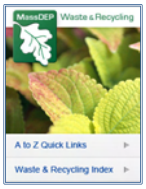
Document Log Report… and Repeat

Catch Basin Program

- Reporting
  - Total # of catch basins
  - # cleaned
  - # inspected
  - Total volume or mass of material removed
  - Actions taken re: excessive sediment

Catch Basin Cleanings

- Classified as solid waste by MassDEP
- May be disposed landfill permitted to accept solid waste
  Fine print: applies to catch basin cleanings from stormwater-only drainage systems
- Testing not required
  Fine print: unless there is evidence that they have been contaminated by a spill or other means
- Landfills can not accept materials with free draining liquids; free water should be removed
- Contaminated cleanings must be evaluated in accordance with the Hazardous Waste Regulations



http://www.mass.gov/eea/agencies/massdep/recycle/regulations/management-of-catch-basin-cleanings.html

Catch Basin Program

- Example methods to dewater cleanings
  - Use clam-shell bucket
  - Decant water back into CB or dispose of to sewer, if allowed
  - Decant pad / drying bed and manage to prevent pollution

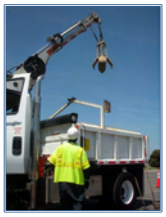


Photo by Wayne Savage from: http://littercleanup.com/2012/truck-touch-event-highlights-big-rigs-that-clean-cityscape/

Discussion

- What has worked for you in terms of determining if catch basin sump is 50% full?
- What methods do you use to dewater your catch basin cleanings?

Contact Information

- Pioneer Valley Planning Commission
  Patty Gambarini
  Principal Environmental Planner
  pgambarini@pvpc.org
  (413) 781-6045

- Wright-Pierce
  Christine Rinehart, PE
  Project Engineer
  christine.rinehart@wright-pierce.com
  (978) 416-8000

CT River Stormwater Committee

- Town of Agawam
- Town of Belchertown
- City of Chicopee
- Town of East Longmeadow
- City of Easthampton
- Town of Granby
- Town of Hadley
- City of Holyoke
- Town of Longmeadow
- Town of Ludlow
- City of Northampton
- Town of South Hadley
- Town of Southwick
- City of Springfield
- Town of West Springfield
- City of Westfield
- Town of Wilbraham
- University of Massachusetts
- Pioneer Valley Planning Commission

Two MS4 Permit Compliance Workshops for Connecticut River Stormwater Committee Members

Westfield State University, Scanlon Hall, Living Room

Wednesday, November 8, 2017
8:30 to 11 a.m.

Good Housekeeping

Learn about both the specific components and scope of the Stormwater Pollution Prevention Plan (SWPPP) and the control measures required under the MS4 permit for maintenance garages, public works yards, transfer stations, and other waste handling facilities where potential pollutants are exposed to storm water.
Best practices to be covered will include:

- Vehicle storage, fueling, and washing
- Storage of materials (salt & sand, petroleum products, and any other potential stormwater pollutants)
- Spill prevention and response
- Municipal facilities inspections as part of the SWPPP
- Catch basin inspection, cleaning, and maintenance
- Collection and recording of required data

Thursday, November 9, 2017
8:30 to 11 a.m.

Illicit Discharge Detection and Elimination (IDDE)

Learn about IDDE program requirements, how to detect and recognize illicit discharges and sanitary sewer overflows, and use of procedures and equipment.
The training will cover:

- IDDE program overview and key components
- Field screening of outfalls for dry weather flow
- Sampling and source tracking dry weather flows
- System vulnerability factors
- Sampling wet weather flows (where there is a minimum of 1 system vulnerability factor)
- Data collection and recording

Catalyst for Regional Progress
PVPC

WRIGHT-PIERCE
Engineering a Better Environment
70 YEARS 1947 - 2017

Workshops are made possible with funding from the Baker-Polito Administration's Community Compact Cabinet's *Efficiency and Regionalization Grant Program*

Registration by November 1 is required. Call Mary Mazik or Paula Delskey at 413-781-6045.

WRIGHT-PIERCE
Engineering a Better Environment

Agenda

Illicit Discharge Detection and Elimination (IDDE) Training
Westfield State University
November 9, 2017
8:30 a.m. – 11:00 a.m.

8:00 - 8:30	Registration and Introductions
8:30 - 9:00	Module 1 and Discussion • Background • Recognizing illicit discharges and SSOs
9:00 - 9:45	Module 2 and Discussion • IDDE Program
9:45 - 10:00	Break
10:00 - 10:45	Module 3 and Discussion • Field screening • Sampling and source tracking
10:45 - 11:00	Evaluation
11:00	Adjourn

MS4 Permit Compliance Workshop - Illicit Discharge and Detection

November 9, 2017, 8:30 to 11 a.m.

Initial if present		Name	Title	City/Town	Phone	E-mail
JM	1	John Decker	DPW ~~Highway Department~~	Agawam	413-821-0264	JDecker@agawam.ma.us
	2	~~Brian Blackak~~	DPW Highway Department	Agawam	413-821-0264	
✓	3	Mike Albro	DPW Highway Department	Agawam	413-821-0264	MAlbro@agawam.ma.us
✓	4	Ben Ashley	DPW Highway Department	Agawam	413-821-0264	BAshley@agawam.ma.us
CL	5	Chris Laurenzo	Highway Supervisor	Belchertown	413-323-0415	claurenzo@belchertown.org
EB	6	Ed Burton	Highway Foreman	Belchertown	413-323-0415	eburton@belchertown.org
QL	7	Quinn Lonczak	Project Supervisor	Chicopee	413-594-3585	qlonczak@chicopeema.gov
	8	Jeff Neece	Superintendent	Chicopee	413-594-3557	jneece@chicopeema.gov
	9	Ela Soja	Assistant Superintendent	Chicopee	413-594-3557	esoja@chicopeema.gov
DJM	10	Dan Murphy	City Engineer	Easthampton	413-665-5555	dmurphy@easthamptonwater.com
	11	Bruce Fenney	Superintendent	East Longmeadow	413-246-3685	bruce.fenney@eastlongmeadow.gov
D.D.	12	Dave Desrosiers	Highway Superintendent	Granby	413-467-7575	daved@granbyma.org
BP	13	Brian Pike	Mechanic	Granby	413-467-7575	
RA	14	Russ Aurnhammer	Mechanic	Granby	413-467-7575	
AK	15	Andy Krar	Town Engineer	Longmeadow	413-567-3400	akrar@longmeadow.org
PV	16	Pete Vancini	Engineering Aide	Longmeadow	413-567-3400	pvancini@longmeadow.org
DM	17	Doug McDonald	DPW Highway Department	Northampton	413-587-1582	dmcdonald@northamptonma.gov
KS	18	Katie Sadosiwitz	DPW Highway Department	Northampton	413-587-1582	

Initial if present		Name	Title	City/Town	Phone	E-mail
RDB	19	Randal Brown	Director	Southwick	413-569-3040 x308	rbrown@southwick.net
JB	20	John Broderick	Highway Supervisor	South Hadley	413-315-0200	
V.P.	21	Vivian Price	Operations Manager	South Hadley	413-315-0200	vprice@southhadley.ma.gov.
BKM	22	Bryan Manijak	DPW Highway Department	South Hadley	413-315-0200	
[illegible]	23	Ed Beattie	DPW Highway Department	South Hadley	413-315-0200	
KC	24	Kevin Chaffee	Natural Resource Mgr.	Springfield	413-787-6234	kchaffee@springfieldcityhall.com
	25	Luca Mineo	Civil Engineer	Springfield	413-784-4884	lmineo@springfieldcityhall.com
	26	Matt Sokop	City Engineer	Springfield	413-784-4884	msokop@springfieldcityhall.com
CB	27	Casey Berube	Deputy Superintendent	Westfield	413-642-9397	c.berube@cityofwestfield.org
JK	28	Joe Kietner	Stormwater Coordinator	Westfield	413-642-9398	joseph.kietner@westfield.org
MW	29	Mike Walsh	Foreman	Westfield	413-572-6267	mike.walsh@cityofwestfield.org
JR	30	Jim Ruffo	Working Foreman	Westfield	413-572-6267	j.ruffo@cityofwestfield.org
CNK	31	Connor Knightly	Project Manager	West Springfield	413-263-3249	cknightly@townofwestspringfield.org
JC	32	Jim Czach	Town Engineer	West Springfield	413-263-3244	jczach@townofwestspringfield.org
TB	33	Tonya Basch	Assistant DPW Director/ Engineer	Wilbraham	413-495-2090	tbasch@wilbraham-ma.gov
	34	MARY ANN BABINSKI	City Councilor	Westfield	413-548-8562	mababinski@cityofwestfield.org
	35	STEVEN FREDERICK	DPW Director	LUDLOW		SFREDERICK@LUDLOW.MA.US
	36					
	37					

Illicit Discharge Detection and Elimination (IDDE) Training

Presented by:

Christine T.M. Rinehart, PE

Presentation Overview

- Module 1
  - Background
  - Recognizing illicit discharges and SSOs
- Module 2
  - IDDE Program
- Module 3
  - Field screening
  - Sampling and source tracking

Module 1

Background

- 2016 Massachusetts MS4 Permit
- MS4 = Municipal Separate Storm Sewer System
- 6 Minimum Control Measures

Background

6 Minimum Control Measures (MCMs)

1. Public Education and Outreach
2. Public Involvement and Participation
3. **Illicit Discharge Detection and Elimination Program**
4. Construction Site Stormwater Runoff Control
5. Post Construction Stormwater Management
6. Good Housekeeping and Pollution Prevention

Illicit Discharges

What is an Illicit Discharge?

Anything that is not entirely made of stormwater that enters the storm sewer system

Exceptions: allowable, non-stormwater discharges, discharges pursuant to another NPDES permit, and discharges resulting from fire-fighting activities

Only rain down the storm drain!

Types of Illicit Discharges

Frequency:

- Continuous
  - Occurs continuously to nearly continuously
  - Usually easier to detect
  - Typically greatest pollutant load
- Intermittent
  - Occurs over a shorter period of time (a few hours per day, few days per year)
  - Harder to detect
- Transitory
  - Occurs in response to singular event (spill, sewer break, transport accident, illegal dumping)
  - Hardest to identify during routine screening

Cross Connection

Sump Pump

Dumping

Types of Illicit Discharges

Mode of Entry:

- Direct
  - Enter via piped connection
  - Usually continuous or intermittent
  - Sewer cross connections, straight pipe, industrial and commercial cross connections
- Indirect
  - Enter via storm drain inlets or by infiltration
  - Usually intermittent or transitory
  - Groundwater seepage, spills, dumping, outdoor washing, non-target irrigation

Stormwater Pollutants

- Heavy metals
- Toxics
- Oil and grease
- Solvents
- Surfactants / detergents
- Nutrients
- Bacteria
- Sediment

Stormwater Pollutants

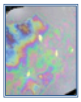
Activity	Pollutant
Vehicle washing / maintenance	• Heavy metals • Oils and grease • Surfactants / detergents • Solvents
Pet waste	• Bacteria
Lawn maintenance / landscaping	• Fertilizers and pesticides • Nutrients
Failing septic systems / sewer cross connections / SSOs	• Bacteria
Illegal dumping / spills from vehicular accidents	• Oil and grease • Toxics • Nutrients (from lawn waste dumping)
Swimming pool draining	• Chlorine
Construction sites	• Sediment
Cleaning greasy equipment and grease traps	• Fats, oils, and grease

Examples of Illicit Discharges

- Chlorinated pool water
- Spills from car accidents
- Failing septic fields
- Dumped material
- Cross connections
- Track out
- Sanitary sewer overflows
- Contaminated sump pumps
- Floor drains

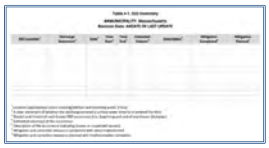
Indicators of an Illicit Discharge

- Unusual flow
- Pungent odors
- Excessive or dead vegetation
- Excessive sediment
- Discoloration or oils sheen or stains
- Residual evidence (i.e. toilet paper)



Sanitary Sewer Overflow (SSO)

- Untreated discharge of sanitary sewer
- Develop inventory of SSOs
- Oral (within 24 hours) and written notice (within 5 days) to EPA and/or MassDEP



Allowable Non-Stormwater Discharges

- Water line flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground water
- Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20))
- Uncontaminated pumped groundwater
- Discharge from potable water sources
- Foundation drains
- Air conditioning condensation
- Irrigation water, springs
- Water from crawl space pumps
- Footing drains
- Lawn watering
- Individual resident car washing
- De-chlorinated swimming pool discharges
- Street wash waters
- Residential building wash waters without detergents

Note: Allowable as long as the discharge is not identified as a significant contributor of pollutants to the MS4

Receiving Waters & Impairments

- Impaired waters do not meet water quality standards for a designated use(s)
- Impaired waters can be found on MassDEP's website (search for TMDL – Integrated Lists & Other Reports)

Integrated list updated every 2 years

Discussion

- Is this an illicit discharge?

Discussion

- Could this be an illicit discharge?

Discussion

- Natural or man-made?

Module 2

IDDE Program

- Goal:
  - systematically find and eliminate illicit discharges
  - implement procedures to prevent future illicit discharges
- IDDE program must be a written document


Illicit Discharge Detection and Elimination (IDDE) Plan

Central Massachusetts Regional Stormwater Coalition

Sample template available from the Central Massachusetts Regional Stormwater Coalition

Major Components of IDDE Program

- Legal authority to prohibit illicit discharges
- Storm system mapping
- Inventory and ranking of outfalls
- Dry weather outfall screening
- Catchment investigations
- Identification/confirmation of illicit sources
- Illicit discharge removal
- Follow up screening
- Employee training

Legal Authority

- Ordinance or bylaw
- Adequate legal authority:
  - Prohibit illicit discharges
  - Investigate suspected illicit discharges
  - Eliminate illicit discharges into the MS4
  - Implement enforcement procedures and actions

Interdepartmental Responsibilities

- Implementing an IDDE program involves many departments
  - Department of Public Works
  - Highway Department
  - Sewer Department
  - Building Inspector and/or Code Enforcement Officer
  - Licensed Plumbing Inspector
  - Health Department
  - Engineering Department
  - Conservation Agent
  - Conservation Commission
  - Planning Board Chairperson
  - Board of Selectmen or Town Council
  - Town Administrator and/or Mayor

Stormwater System Mapping

- Phase I Mapping
  - Outfalls and receiving waters
  - Open channel conveyances (swales, ditches, etc.)
  - Interconnections with other storm sewer systems
  - Municipally owned stormwater treatment structures
  - Water bodies identified by name and indication of all use impairments
  - Initial catchment delineations

Stormwater System Mapping

- Phase II Mapping
  - Outfall spatial location (lat/long minimum accuracy of +/-30')
  - Pipes
  - Manholes
  - Catch basins
  - Refined catchment delineations
  - Municipal sanitary sewer system (if available)
  - Municipal combined sewer system (if applicable).

Assessment and Priority Ranking

- Assesses illicit discharge/SSO potential and related public health significance
- Identifies each outfall/ interconnection, location, condition; provides tracking framework
- Sets priority order for investigations
- Initial inventory and priority ranking based on existing information; updated annually

A catchment is the drainage area to an individual outfall

Outfall Categories

- Ranking Characteristics
  - Previous screening results
  - Past discharge complaints & reports
  - Poor receiving water quality
  - Density of generating sites
  - Sewer conversion
  - Historic CSOs
  - Density of aging septic systems
  - Culverted streams
  - Water quality limited waterbodies
  - Age of development & infrastructure

Problem Outfalls	High Priority Outfalls
Known or suspected illicit discharges Previous screening indicating sewer input	Discharging to an area of concern to public health due to proximity of public beaches, recreational areas, drinking water supplies or shellfish beds High potential for an illicit discharge
Low Priority Outfalls	**Excluded Outfalls**
Low potential for an illicit discharge	No potential for illicit discharge Limited to: 1. Roadway drainage in undeveloped areas 2. Athletic fields 3. Parks or undeveloped green space 4. X-country drainage

Sample Matrix

Table 9-1. Outfall Inventory and Priority Ranking Matrix
##MUNICIPALITY, Massachusetts
Revision Date: ##DATE OF LAST UPDATE

Outfall ID	Receiving Water	Previous Screening Results Indicate Likely Sewer Input[1]	Discharging to Area of Concern or Public Health[2]	Frequency of Past Discharge Complaints	Receiving Water Quality[3]	Density of Generating Sites[4]	Age of Development/ Infrastructure[5]	Historic Combined Sewers or Septic[6]	Aging Septic[7]	Culverted Streams[8]	Additional Characteristics	Score	Priority Ranking
Information Source		Outfall inspections and sample results	GIS Maps	Town Staff	Impaired Waters List	Land Use/GIS Maps, Aerial Photography	Land Use Information, Visual Observation	Town Staff, GIS Maps	Land Use, Town Staff	GIS and Storm System Maps	Other		
Scoring Criteria		Yes = 3 (Problem Outfall) No = 0	Yes = 3 No = 0	Frequent = 3 Occasional = 2 None = 0	Poor = 3 Fair = 2 Good = 0	High = 3 Medium = 2 Low = 1	High = 3 Medium = 2 Low = 1	Yes = 3 No = 0	Yes = 3 No = 0	Yes = 3 No = 0	TBD		
Sample 1	##2 River	3	0	2	0	2	1	0	0	3	None	11	Problem
Sample 2	##2 Lake	0	3	0	3	1	2	0	3	0	None	15	High Priority
Sample 3	##2 Stream	0	0	2	0	1	1	0	0	0	None	4	Low Priority

Scoring Criteria:
[1] Previous screening results indicate likely sewer input if any of the following are true:
- Olfactory or visual evidence of sewage,
- Ammonia > 0.5 mg/L, surfactants > 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
- Ammonia > 0.5 mg/L, surfactants > 0.25 mg/L, and detectable levels of chlorine

[2] Outfalls/interconnections that discharge to or in the vicinity of any of the following areas: public beaches, recreational areas, drinking water supplies, or shellfish beds

[3] Receiving water quality based on latest version of MassDEP integrated List of Waters.
- Poor = Waters with approved TMDLs (Category 4a Waters) where their discharges have the potential to contain the pollutant identified as the cause of the impairment
- Fair = Water quality limited waterbodies that receive a discharge from the MS4 (Category 5 Waters)
- Good = No water quality impairments.

[4] Generating sites are institutional, municipal, commercial, or industrial sites with a potential to contribute to illicit discharges (e.g., car dealers, car washes, gas stations, garden centers, industrial manufacturing, etc.)

[5] Age of development and infrastructure:
- High = Industrial areas greater than 40 years old and areas where the sanitary sewer system is more than 40 years old
- Medium = Developments 20-40 years old
- Low = Developments less than 20 years old

[6] Areas once served by combined sewers and but have been separated, or areas once served by septic systems but have been converted to sanitary sewers.

[7] Aging septic systems are septic systems 30 years or older in residential areas.

[8] Any river or stream that is culverted for distance greater than a simple roadway crossing

Outfall

What is an outfall?

- The point where the MS4 discharges to waters of the United States via a discrete conveyance
- Can be a pipe, can be a ditch outfall
- Does not include pipes that simply convey waters of the United States (such as cross culverts)

Interconnection

What is an interconnection?

- The point where one MS4 discharges to another MS4 or other storm sewer system via a discrete conveyance
- Treated similarly to an outfall

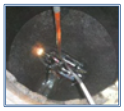
Outfall Screening and Sampling

- Inspect high & low priority outfalls & interconnections during dry weather
- Conduct dry weather screening based on priority ranking

More information provided in Module 3

Catchment Investigations

- Purpose
  - To trace the source
- Techniques
  - Review of maps, plans, records
  - Manhole observations
  - Sampling
  - CCTV inspection
  - Smoke and dye testing



More information provided in Module 3

Employee Training

- Required annually
- All employees involved in program
- How to identify illicit discharges and SSOs
- Maintain records
- This training counts as training!

Reporting

- Progress of mapping
- SSOs inventory, status of mitigation & corrective measures
- Outfall inventory and ranking
- Screening data
- Sampling results
- Data from catchment investigations
- System vulnerability factor (SVF) inventory
- Status of IDDE investigation & removal activities
- Info for each confirmed source removed
- Frequency and type of training
- Evaluation of IDDE program

Thorough tracking and documentation will make annual reporting easier

Discussion

- What stage of program development are you at?
- What portions do you feel comfortable with – what areas will be or have been a struggle?

Module 3

Dry Weather

- Dry weather
  - Less than 0.1 inches of rainfall in previous 24-hour period AND no significant snow melt
- Dry weather flow:
  - Flow from storm sewer system during dry weather
  - Indicator of potential illicit discharge

Dry Weather Screening

- Required for high and low priority outfalls
- Conducted during dry weather
- Order based on outfall inventory and priority ranking

General Procedure

- Outfall Screening
  - Photograph outfall
  - Conduct visual inspection
  - If flow observed, collect sample
  - If no flow observed, but evidence of illicit flow, follow up in one week
- Outfall Sampling
  - Collect sample of dry weather flow
    - Ammonia, Surfactants, Chlorine
    - Conductivity, Temperature, Salinity
    - Indicator bacteria, Pollutants of concern (impaired waterbodies)
- Document, update outfall inventory and priority ranking

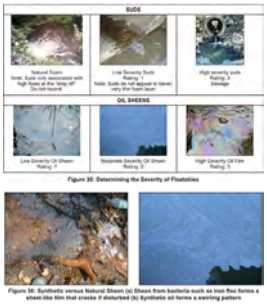
For submerged/inaccessible outfalls, move to the first accessible upstream structure

Visual/Olfactory Evidence

- Odor
- Color
- Turbidity
- Floatables
  - Suds
  - Bubbles
  - Sewage
  - Toilet paper
- Deposits
- Stains
- Vegetation
- Damage to outfall

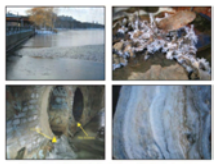
Images from the CWP IDDE Manual, October 2004

Visual/Olfactory Evidence



Images from the CWP IDDE Manual, October 2004

Visual/Olfactory Evidence



Images from the CWP IDDE Manual, October 2004

Field Equipment

- Clipboard
- Inspection form/tablet
- Chain-of-custody forms
- Pen/permanent markers
- Nitrile gloves
- Flashlight/headlamp
- Cooler with ice (for transporting samples)
- Digital camera
- PPE
- GPS receiver
- Water quality sonde/meter (if needed)
- Test kits
- Label tape
- Sample containers
- Pry bar/pick
- Sandbags
- Mallet/hammer
- Utility knife
- Measuring tape
- Safety cones
- Hand sanitizer
- Zip ties/duct tape
- Rubber boots/waders
- Sampling pole

Sample Parameters

- Test Kit Parameters
  - Ammonia
  - Surfactants
  - Chlorine
- Lab Parameters
  - Indicator bacteria
  - Pollutants of Concern (for impaired waters)
- Metered Parameters
  - Ammonia
  - Surfactants
  - Chlorine
  - Conductivity
  - Temperature
  - Salinity

Sample Parameters

A few things to consider:

- Same water quality parameters for dry and wet weather
- Surfactant field kit creates hazardous waste
- Indicator bacteria sample bottles come pre-sterilized and pre-preserved
- PVPC can provide guidance on water quality sampling elements

Indicator Use

Table 39: Indicator Parameters Used to Detect Illicit Discharges

Parameter	Discharge Types It Can Detect				Laboratory/Analytical Challenges
	Sewage	Washwater	Tap Water	Industrial or Commercial Liquid Wastes	
Ammonia	●	◉	○	◉	Can change into other nitrogen forms as the flow travels to the outfall
Boron	◉	◉	○	N/A	
Chlorine	○	○	○	◉	High chlorine demand in natural waters limits utility to flows with very high chlorine concentrations
Color	◉	◉	○	◉	
Conductivity	◉	◉	○	◉	Ineffective in saline waters
Detergents – Surfactants	●	●	○	◉	Reagent is a hazardous waste
E. coli Enterococci Total Coliform	◉	○	○	○	24-hour wait for results Need to modify standard monitoring protocols to measure high bacteria concentrations
Fluoride*	○	○	●	◉	Reagent is a hazardous waste Exception for communities that do not fluoridate their tap water
Hardness	◉	◉	◉	◉	
pH	○	◉	○	◉	
Potassium	◉	○	○	●	May need to use two separate analytical techniques, depending on the concentration
Turbidity	◉	◉	○	◉	

● Can almost always (>90% of samples) distinguish this discharge from clean flow types (e.g., tap water or natural water). For tap water, can distinguish from natural water.
◉ Can sometimes (>50% of samples) distinguish this discharge from clean flow types depending on regional characteristics, or can be helpful in combination with another parameter.
○ Poor indicator. Cannot reliably detect illicit discharges, or cannot detect tap water.
N/A: Data are not available to assess the utility of this parameter for this purpose.
Data sources: PBI (this study)
*Fluoride is a poor indicator when used as a single parameter, but when combined with additional parameters (such as detergents, ammonia and potassium), it can almost always distinguish between sewage and washwater.

Table 39, CWP IDDE Manual, October 2004

Sample Collection and Analysis

- Fill out info on bottle and field form
- Wear protective gloves
- Collect sample directly from flow
- Do not disturb the sediment or touch inside of sample container
- Use test strips, test kits, field meters (measurement taken from sample in bottle)
- For lab samples:
  - Place on ice
  - Fill out chain-of-custody
  - Deliver samples to lab
- Dispose of used test strips and test kit ampules properly
- Decontaminate all testing personnel and equipment

Sample bottles and devices should be triple rinsed with distilled water and then rinsed with sample water IF the sample bottle is not pre-filled with a preservative

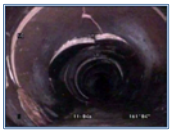
Interpreting Sampling Results

Benchmark field measurements for select parameters

Analyte or Parameter	Benchmark
Ammonia	>0.5 mg/L
Conductivity	>2,000 µS/cm
Surfactants	>0.25 mg/L
Chlorine	>0.02 mg/L (detectable levels per the 2016 MS4 Permit)
Indicator Bacteria[9]: *E.coli* *Enterococcus*	*E.coli*: the geometric mean of the five most recent samples taken during the same bathing season shall not exceed 126 colonies per 100 ml and no single sample taken during the bathing season shall exceed 235 colonies per 100 ml *Enterococcus*: the geometric mean of the five most recent samples taken during the same bathing season shall not exceed 33 colonies per 100 ml and no single sample taken during the bathing season shall exceed 61 colonies per 100 ml

System Vulnerability Factors (SVFs)

- Factors making a catchment more susceptible to an illicit discharge
- SVFs to be identified for each catchment
- Catchments with identified SVFs to be sampled during wet weather



Example SVFs

- ✓ *History of SSOs*
- ✓ *Crossings of storm and sanitary sewer alignments*
- ✓ *Areas formerly served by combined sewer systems*
- ✓ *Common or twin-invert manholes serving storm and sanitary sewer alignments*
- ✓ *Sanitary sewer systems constructed with an underdrain*
- ✓ *Sanitary sewer infrastructure defects such as leaking laterals, cracked, broken, or offset infrastructure*
- ✓ *Common trench construction serving both storm and sanitary sewer alignments*
- ✓ *Inadequate sanitary sewer level of service resulting in regular surcharging, customer back-ups or frequent complaints*
- ✓ *Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power equipment has failed or blockages could result in an SSO*
- ✓ *Any storm or sanitary infrastructure greater than 40 years old*
- ✓ *Widespread code-required septic system upgrades required at property transfers*
- ✓ *History of multiple Board of Health actions addressing widespread septic system failures*

Dry Weather Manhole Inspections

- Systematic and progressive
- Observe, sample, and evaluate key junction manholes
- Update mapping, catchment delineations, and SVF inventory

Dry Weather Manhole Inspections

- Inspect MH for visual and olfactory evidence
- If flow observed, collect sample for ammonia, chlorine, and surfactants
- If evidence of a potential illicit discharge, flag for additional upstream investigation
- Conduct key junction MH inspections until suspected illicit discharge is isolated to a pipe segment between two MHs
- If no evidence of an illicit discharge found, catchment investigation considered complete (once key junction MHs sampled)

Junction Manholes

- Junction Manholes
  - Structure with two or more inlets from two or more MS4 alignments
- Key Junction Manholes
  - Junction structures that represent one or more junction manholes that can be used to rule out tributary areas of the system during investigation

Example SVF Inventory

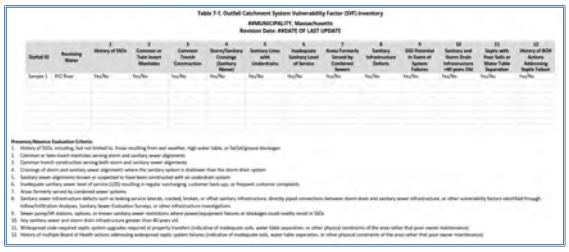


Table 7-1. Outfall Catchment System Vulnerability Factor (SVF) Inventory

##MUNICIPALITY, Massachusetts

Revision Date: ##DATE OF LAST UPDATE

Outfall ID	Receiving Water	1 History of SSOs	2 Common or Twin Sewer Manholes	3 Common Trench Construction	4 Storm/Sanitary Crossings (Sanitary Sewer)	5 Sanitary Lines with Underdrains	6 Inadequate Sanitary Level of Service	7 Areas Formerly Served by Combined Sewers	8 Sanitary Infrastructure Defects	9 SSO Potential in Event of System Failures	10 Sanitary and Storm Drain Infrastructures +40 years Old	11 Septic with Poor Soils or Water Table Separation	12 History of BOH Actions Addressing Septic Failure
Sample 1	XYZ River	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

Presence/Absence Evaluation Criteria:

1. History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages
2. Common or twin-invert manholes serving storm and sanitary sewer alignments
3. Common trench construction serving both storm and sanitary sewer alignments
4. Crossings of storm and sanitary sewer alignments where the sanitary system is shallower than the storm drain system
5. Sanitary sewer alignments known or suspected to have been constructed with an underdrain system
6. Inadequate sanitary sewer level of service (LOS) resulting in regular surcharging, customer back-ups or frequent customer complaints
7. Areas formerly served by combined sewer systems
8. Sanitary sewer infrastructure defects such as leaking service laterals, cracked, broken, or offset sanitary infrastructure, directly piped connections between storm drain and sanitary sewer infrastructure, or other vulnerability factors identified through Inflow/Infiltration Analyses, Sanitary Sewer Evaluation Surveys, or other infrastructure investigations
9. Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs
10. Any sanitary sewer and storm drain infrastructure greater than 40 years old
11. Widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather that poor owner maintenance)
12. History of multiple Board of Health actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather that poor owner maintenance)

Wet Weather Outfall Sampling

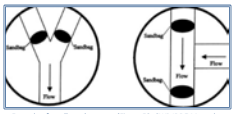
- Outfalls located in catchments with ≥1 SVF
- During a storm event producing a discharge
- During spring (higher groundwater levels)
- To determine if illicit discharge is due to wet weather-induced high flows in sewer or high groundwater in areas served by septic systems

Wet Weather What's next?

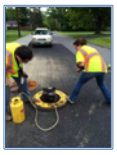
- If sampling indicates potential illicit discharge
  - Additional source sampling, isolation, and confirmation needed
- If sampling does not indicate potential illicit discharge AND no indicators during MH inspection
  - Catchment investigation considered complete

Source Isolation and Confirmation

- Sandbagging
  - Useful to isolate intermittent flows
  - Dam water at manhole inlet
  - Left in place <48 hours, during dry weather
  - Time consuming (2+ trips/MH), limiting
- Smoke Testing
  - Introduce into storm drain, look for escaping smoke in sewer, vents, or leaks in system
  - Smoke bombs/liquid smoke, blower, plugs
  - Notify residents, businesses, police, and fire
- Dye Testing
  - Introduce into plumbing fixtures and observe outfalls and structures for presence of dye
  - Sufficient amount of water to flush dye
  - Notify residents, businesses, police, and fire
  - Relatively quick, effective, and inexpensive

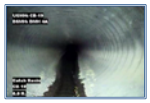


Example of sandbag placement (Figure 59, CWP IDDE Manual, October 2004)



Source Isolation and Confirmation

- CCTV/Video Inspections
  - Video inspection using a remotely guided camera
  - Effective, costly, and time consuming
- Optical Brightener Monitoring
  - Fluorescent dyes used in detergents and paper products
  - Optical brightener traps
    - using cotton pad in a wire cage
    - Secure trap to pipe/structure, retrieve, and place under UV light
  - Hand-held fluorometer – more quantitative; more costly and not as effective at isolating intermittent discharges
- IDDE Canines
  - Dogs trained in detecting human related sewage
  - Not widespread, cost-effect
  - Tool to supplement conventional methods



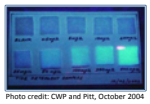


Photo credit: CWP and Pitt, October 2004

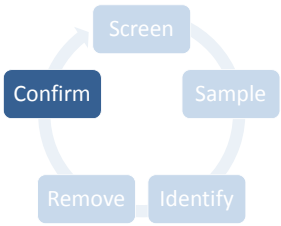
Photo credit: FBE, August 2012

Illicit Discharge Removal

- Removal necessary when source is identified
- Eliminate discharge within 60 days of identification or establish a schedule
- Rely on established legal authority

Confirmatory Screening

- Conducted during dry weather
  - If SVF identified, both dry and wet weather needed
- Conducted within 1 year of removal of identified illicit discharge
- Evidence of illicit discharge requires additional investigation



Ongoing Screening

- Reprioritize outfalls
- Screen once every 5 years
- Dry weather
- Wet weather, as required

on·go·ing
/ˈän ˌgōiNG, ˈôn ˌgōiNG/
adjective
continuing; still in progress.
"ongoing negotiations"
synonyms: in progress, under way, advancing; More

Discussion

- Do or will you conduct your own outfall sampling or do you hire a consultant?
- Do or will you utilize a laboratory or field kits?
- What has worked well / not so well?

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- Town of Belchertown
- City of Chicopee
- Town of East Longmeadow
- City of Easthampton
- Town of Granby
- Town of Hadley
- City of Holyoke
- Town of Longmeadow
- Town of Ludlow
- City of Northampton
- Town of South Hadley
- Town of Southwick
- City of Springfield
- Town of West Springfield
- City of Westfield
- Town of Wilbraham
- University of Massachusetts
- Pioneer Valley Planning Commission