TOWN of BROOKLINE
Massachusetts

Richard Kelliher
Town Administrator

April 8, 2008

Ann Herrick (CIP)
U.S. Environmental Protection Agency
One Congress Street
Boston, MA 02114

Re: NPDES PII Small MS4 General Permit Annual Report No.5, Town of Brookline, MA.
EPA NPDES Permit Number: M~~ARNEC813~~ MAR041075

Ms. Herrick:

The Town of Brookline is pleased to submit its fifth annual report to the U.S. Environmental Protection Agency as part of the NPDES Phase II General Permit requirements for Small Municipal Separate Storm Sewer Systems. Please review the attached annual report summarizing stormwater management activities for the fifth permit year.

If you have any questions please feel free to call.

Respectfully,

Richard Kelliher
Town Administrator

Attachment: NPDES PII Small MS4 General Permit Annual Report No.5
Comprehensive IDDE Plan

cc. A. Thomas DeMaio, Commissioner of Public Works
Peter M. Ditto, P.E., Director of Engineering/Transportation
Bill Walsh-Rogalski, EPA
Todd Borci, EPA
David Gray, EPA

333 Washington Street • Brookline, Massachusetts 02445-6863
Telephone: (617) 730-2139 Facsimile: (617) 264-6450
http://www.townofbrooklinemass.com

TOWN of BROOKLINE
Massachusetts

Richard Kelliher
Town Administrator

April 8, 2008

Massachusetts Department of Environmental Protection
Division of Watershed Management
627 Main Street
Worcester, MA 01608

Re: NPDES PII Small MS4 General Permit Annual Report No.5, Town of Brookline, MA.
EPA NPDES Permit Number: MARNEC813, MADEP Transmittal Number: W-035336

To Whom It May Concern:

The Town of Brookline is pleased to submit its fifth annual report to the Massachusetts Department of Environmental Protection as part of the NPDES Phase II General Permit requirements for Small Municipal Separate Storm Sewer Systems. Please review the attached annual report summarizing storm water management activities for the fifth permit year.

If you have any questions please feel free to call.

Respectfully,

Richard Kelliher
Town Administrator

Attachment: NPDES PII Small MS4 General Permit Annual Report No.5
Comprehensive IDDE Plan

cc. A. Thomas DeMaio, Commissioner of Public Works
Peter M. Ditto, P.E., Director of Engineering/Transportation

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4/10/08

Municipality/Organization: **Town of Brookline, MA**

EPA NPDES Permit Number: **MAR~~NEC813~~** 04/075

MaDEP Transmittal Number: **W- 035336**

Annual Report Number & Reporting Period: **No. 5: March 07-March 08**

NPDES PII Small MS4 General Permit Annual Report

Part I. General Information

Contact Person: Peter M. Ditto, P.E. Title: Director of Engineering and Transportation

Telephone #: (617) 730-2138 Email: Peter_Ditto@town.brookline.ma.us

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: Richard Kelliher

Title: Town Administrator

Date: 4/9/08

Part II.

II A. Self-Assessment

The Town of Brookline has completed the required self-assessment and has determined that our municipality is in compliance with all permit conditions, accept Minimum Control Measure (MCM) #3 Illicit Discharge Detection and Elimination (IDDE). Sources of bacterial contamination have been found in some of the Town drains. Currently, the Town is working on an EPA approved IDDE program to reduce sources of bacterial contamination in storm drains. Summary data on the IDDE program is presented in Parts IV and V of this report.

In general, the overall goal for the Town's stormwater program is to improve the quality of water discharged from storm drains. The Town tracks improvements in water quality through stormwater sampling and inspections of various drains.

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 5 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 6
1A	Informational Brochures	DPW/Engineering	Distribute brochures	Brochures placed at libraries, DPW facilities, and mailed to general public.	Continue to distribute brochures
Revised			Estimate the number of brochures handed out		
1B	Town Stormwater Website	DPW/Engineering, IT Dept, and Con Comm	Develop Website	Maintained Website.	Update Website as needed.
Revised			Start a counter on the website to track the number of viewers		
1C	"Infoline"	DPW/Engineering	Set up "Infoline"	Maintained "Infoline"	Continue to handle calls
Revised			Personnel have been assigned to handle these calls		
1D	Stormwater email account	DPW/Engineering	Website has an email account so residents may ask questions	Maintained Stormwater email account.	Maintain email account
Revised			Log the number of emails.		

1E	Posters/Videos in Schools	DPW/Engineering and School Dept.	Education material for schools and libraries	Town has added "Reining in the Storm" at the Public Library.	Update posters and videos as needed.
Revised			Track the number of times the video is checked out.		

1a. Additions

1D					

2. Public Involvement and Participation

BMP ID #	**BMP Description**	**Responsible Dept./Person Name**	**Measurable Goal(s)**	**Progress on Goal(s) – Permit Year 5** (Reliance on non-municipal partners indicated, if any)	**Planned Activities – Permit Year 6**
2A	Local Advertisements	DPW/Engineering	Annual Public Service Announcements	handouts placed at public locations (Town Hall and Public Library)	Continue to Distribute handouts
Revised			Count the number of handouts distributed.		
2B	Local Clean-ups	DPW, Con Comm, and local groups	Conduct Annual clean-ups around water resource areas.	DPW, Con Comm, and Local groups conducted annual clean-ups around Muddy River, Halls Pond, and other water resource areas.	Continue annual clean-ups.
Revised			Track the amount of materials cleaned-up (ex. Bags of trash).		
2C	Community "Hotline"	DPW/Engineering	Create "Hotline"	"Hotline" maintained by DPW/Engineering.	Continue to Maintain "Hotline"
Revised			Personnel have been assigned to handle these calls		
2D	Storm Drain Stenciling Program	DPW/Parks and Con Comm	Maintain Storm Drain Stenciling Program	Conducted annual stenciling	Continue stenciling program
Revised			Track number of basins stenciled.		

2a. Additions

3. Illicit Discharge Detection and Elimination

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 5 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 6
3A	Storm Drain System Map	DPW/Engineering and GIS dept.	Maps have been created	Updated maps	Continue to update GIS maps as needed based on changes and drain system.
Revised					
3B	Illicit Discharge Detection and Elimination (IDDE) Program	DPW/Engineering and Water and Sewer Division	Town has had an aggressive IDDE program for years	Continued to maintain an aggressive IDDE Program. Located and removed 6 Illicit discharges.	Continue to maintain an aggressive IIDDE Program.
Revised			Monitor improvements in water quality		
3C	IDDE Ordinance	DPW/Engineering	Create By-law	Maintained and enforced Storm Water By-law	Continue to maintain and enforce Storm Water By-law.
Revised					
3D	IDDE "Hotline"	DPW/Engineering	Create "Hotline"	"Hotline" maintained by DPW/Engineering.	Continue to Maintain "Hotline" and email account
Revised			Personnel have been assigned to handle these calls		
3E	Revise Sewer and Drain Use Regulations	DPW/Engineering	Revise and Adopt new regulations	DPW/Engineering in the process of revising Sewer and Drain Use Regulations.	Regulate Sewer and Drain use and work with contractors and public to eliminate non-storm water discharges
Revised					
Revised					

3a. Additions

3F	Comprehensive IDDE Plan	DPW/Engineering	Monitor improvements in water quality	Implement Plan	Continue to implement plan

4. Construction Site Stormwater Runoff Control

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 5 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 6
4A	Site Runoff Control (Erosion and Sediment Control ESC By-law)	DPW/Engineering	Create ESC By-law	Maintained and enforced ESC component of Storm Water By-law.	Continue to maintain and enforce Storm Water By-law.
Revised					
4B	ESC Plan Review	DPW/Engineering	Conduct Plan review after adoption of Storm Water By-law	DPW/Engineering reviewed and approved 32 plans for construction projects	Continue ESC plan review.
Revised			Track number of plans reviewed.		
4C	Construction Inspection	DPW/Engineering	Conduct Inspections	DPW/Engineering inspected 32 construction sites	Continue Construction Site Inspections.
Revised			Track number of inspections.		
4D	"Hotline" for non-compliant construction sites	DPW/Engineering	Create "Hotline"	"Hotline" maintained by DPW/Engineering.	Continue to Maintain "Hotline"
Revised			Personnel have been assigned to handle these calls		
Revised					

4a. Deletions

4E	Creation of contractors BMP handbook for construction activities	DPW/Engineering	Did not create handbook. Information available instead on website		

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

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 5 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 6
5A	Post Construction Control By-law	DPW/Engineering	Create By-law	Implemented Post Construction Controls as part of Storm Water By-law	Continue to maintain and enforce Storm Water By-law.
Revised					
5B	Plan Review	DPW/Engineering and Building Dept.	Conduct Plan Review	Coordinated with Building and Planning Department to ensure plan review on all projects. Review 32 plans	Continue Plan Review Process
Revised			Track number of plans reviewed.		
5C	O&M of Runoff Control Structures/Practices	DPW/Engineering	Incorporate into all plans of Storm Water Management Structures and Practices	Worked with developers, contractors, engineers, and architects to include O&M into all plans. 32 sites incorporated O&M practices.	Continue to ensure O&M of Storm Water Structures and Practices.
Revised			Track number of sites with O&M practices.		
5D	Inspection of Runoff Control Structures/Practices	DPW/Engineering	Conduct Inspections	Conducted 32 inspections	Continue inspections.
Revised			Track number of inspections.		
Revised					
Revised					

5a. Additions

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 5 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 6
6A	DPW Employee Training	DPW/Engineering	Conduct Annual Training	Met with various Division Personnel (Highway/Sanitation, Water/Sewer, and Parks) to discuss Storm Water issues related to municipal operations.	Continue DPW personnel training and education.
Revised			Track education with a questionnaire.		
6B	Municipal Maintenance Activities	DPW/Engineering	Conduct Annual Inspection and review operation practices	Conducted inspections at DPW facilities. Constructed new DPW materials handling yard 2006-2007 (see Part IV for summary)	Continue inspections at DPW facilities
Revised			Log inspections and monitor progress on O&M practices		
6C	Household Hazardous Waste Collection Program	DPW	Conduct HHP day	Collected household hazardous Products in the Spring. See Part V for tracking summary.	Continue to maintain waste collection program
Revised			Track Waste Recovered, recycled, and disposed.		

6a. Additions

6D	Street Sweeping Program	DPW/Highway	Track tons of sweepings collected.	Conducted Street Sweeping. Documented material collected, transported and disposed (See Part V O&M Section).	Continue Street Sweeping Program
6E	Catch Basin Cleaning Program	DPW/Water and Sewer/Engineering	Track tons cleanings collected.	Cleaned catch basins (See Part V O&M Section).	Continue Catch Basin Cleaning Program.

7. BMPs for Meeting Total Maximum Daily Load (TMDL) Waste Load Allocations (WLA) *<<if applicable>>*

In 2007, TMDLs were assigned to the Muddy River and Charles River. The Town discharges in to the Muddy River which flows into the Charles River. The Muddy River has been listed as impaired by pathogens, while the Charles River has been listed for both pathogens and phosphorous. Both sources can be attributed to polluted stormwater discharges. Below is summary of proposed measures to reduce the amount of pathogens and phosphorous discharged to the Muddy and Charles Rivers.

BMP ID #	**BMP Description**	**Responsible Dept./Person Name**	**Measurable Goal(s)**	**Progress on Goal(s) – Permit Year 5** (Reliance on non-municipal partners indicated, if any)	**Planned Activities – Permit Year 6**
7A	Reduce Pathogens in stormwater discharges	DPW/Engineering	Track the number of cross-connections removed and measure improvements in stormwater sampling results	Implement measures to reduce pathogens in stormwater discharges to Muddy and Charles Rivers (This work is already a part of the Towns IDDE program).	Continue to implement pathogen reduction measures
Revised					
7B	Reduce Phosphorous in stormwater discharges	DPW/Engineering	Track the number of construction sites inspected and installation of stormwater structural BMPs and maintenance of non-structural BMP programs	Implement measures to reduce phosphorous in stormwater discharges (This work is already regulated under the stormwater by-law through construction site inspections and onsite retention/filtration of runoff through new site development). Other reduction measures include non-structural BMPs like street sweeping and catch basin cleaning.	Continue to implement phosphorous reduction measures
Revised					
Revised					
Revised					

7a. Additions

7b. WLA Assessment

As identified in the June 2007 - Final Report for TMDLs for Nutrients in the Lower Charles River Basin, Massachusetts CN 301.0 prepared by the MADEP and USEPA, the Muddy River Watershed has a WLA of 590 kg/year for phosphorous. The report also acknowledges the difficulty a NPDES permitted municipality (MS4) has in the task to measure sources of phosphorous loadings within a watershed. This is due to the fact that there are many potential sources of pollution within a watershed that are not contributed directly by the Town (ex., inter-municipal connections, plus other non-town owned and maintained facilities like commercial areas, college campuses, universities, and roadways).

At this time, the Town does not have the ability to measure the reduction of phosphorous within the entire watershed and will be reliant on watershed groups or other agencies to monitor the total phosphorous loading to the Charles from the Muddy River Watershed. However, the Town will continue to implement BMPs to reduce the amount of pathogens and phosphorous in stormwater discharges. This will be accomplished through an aggressive IDDE program (see Part V for GPD of wastewater removed from the storm drain system), construction site/new development regulations, installation of structural BMPs (onsite retention, detention, and filtration devices) where practical, and ongoing maintenance and funding of non-structural BMP programs like street sweeping and catch basin cleaning (see Part V of the report for Tons removed from the storm drain system).

Part IV. Summary of Information Collected and Analyzed

The following is a summary of information collected and analyzed for Permit Year 5:

Drainage System

- Continued to work aggressively on the Comprehensive IDDE plan. In 2007 the Town removed 6 cross-connections and approximately 1,050 GPD of wastewater flows from the drainage system. An estimated 7,912 GPD of wastewater flows have been removed from the drainage system from April 2005 to March 2008,
- continued to fund and maintain non-structural BMPs like street sweeping and catch basin cleaning programs (see Part V for tons removed),
- continued to work with Boston Water and Sewer Commission to address pollution issues at inter-municipal connections,
- completed construction of new DPW materials handling facility. The facility has specially designed containment bins for handling various materials like sand, gravel, and topsoil. Runoff from the facility flows through and oil/water separator, rip rap water quality swale, and a large detention basin,
- completed closure of Front Landfill and Park construction. Runoff from the Park is handled through a series of vegetated and rip rap water quality swales. The swales then drain into two detention basins,
- and regulated approximately 32 sites from plan development through construction. Each site implemented erosion control practices during construction and installation of structural BMPs like onsite retention/detention/filtration of stormwater for post-construction.

Pollution Sources

- Bacterial Contamination is the primary source of pollution in the drainage system. The Town has been following an aggressive Illicit Discharge Detection and Elimination (IDDE) Plan to locate and remove these wastewater flows.
- Small construction sites, illicit connections, and illegal discharges appear to be the main sources of pollution to the Town's drainage system. Inspections have helped to reduce the amount of sediment washing off construction sites.

Muddy River Flood Control, Water Quality, and Habitat Enhancement Project

- The Muddy River Project, managed jointly by the Town of Brookline and City of Boston Parks Department, involves improving flood storage, developing and implementing storm water management controls to improve water quality, and enhancing habitat areas along the riverway and associated water bodies. In the past year, The City and the Town have signed a design agreement with the Army Corps of Engineers and the design process has begun. The field survey work and test pit activity has been completed and the Corps is preparing fifty percent design documents for the first portion of the project. This first phase of design will include the new culverts and headwalls at the former Sears parking lot as well as the daylighting sections of the Muddy River. The 100% design of this portion of the project is expected to be complete in June 2008.

Funding

- Budget for Capital Improvement Projects (CIP) = approx. $1,000,000 for Drain Improvements.
- Operations, Maintenance, and Management Costs (See Part V for breakdown)

Part V. Program Outputs & Accomplishments (OPTIONAL)

Programmatic

Storm water management position created/staffed – Town created and staffed Environmental Engineer and Civil Engineer	(y/n)	Y
Estimated Annual program budget/expenditures	($)	
Catch Basin Cleaning/Drain Maintenance (Personnel, equipment, and maintenance)		$155,000.00
Street Sweeping (Personnel, equipment, and maintenance)		$425,000.00
DPW/Engineering (Program Management-Personnel and equipment)		$120,000.00
Annual Cleaning of 2-Oil/Sediment/Water Separators – does not include installation (approx. $120K/unit)		$5,000.00
Household Hazardous Waste Collection, Transport, and Disposal		$26,466.00
Total Storm Water Management Program Expenditures (Note: Does not include CIP)		**$737,937.00**

Education, Involvement, and Training

Estimated number of residents reached by education program(s)	(# or %)	10,000
Stormwater management committee established	(y/n)	N
Stream teams established or supported (6 different "Friends Groups" associated with waters resource areas in and around Brookline)	(# or y/n)	6
Shoreline clean-up participation or quantity of shoreline miles cleaned	(y/n or mi.)	Y
Household Hazardous Waste Collection Days		
▪ days sponsored	(#)	1
▪ community participation	(%)	675
▪ material collected (type of waste collected: Pesticides, Bug sprays, Cathode Ray Tubes (CRTs or TVs), Rodent poisons, Paint thinner, Urethanes, Oil or enamel based paints, Weed killers, Concentrated fertilizers, Cleaning solvents, Caustic cleaners, Photo chemicals, Antifreeze, Kerosene, Diesel oil, Aerosol cans, Waste motor oil, Auto and household batteries, Fluorescent bulbs, Tires, and Propane tanks	(tons or gal)	3,465 gallons liquid waste

Tires	251
Propane Tanks	150
Automobile Batteries	62
Fluorescent Bulbs (2/4/8 ft)	2655 ft
Batteries (mercury, lithium ion, lead acid, alkaline)	10 gallons

School curricula implemented (Note: videos placed in schools and public libraries)	(y/n)	See Note

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**")				
▪ Illicit Discharge Detection & Elimination				X
▪ Erosion & Sediment Control				X
▪ Post-Development Stormwater Management				X

Mapping and Illicit Discharges

Outfall mapping complete	(%)	100
Estimated or actual number of outfalls	(#)	10
System-Wide mapping complete	(%)	100
Mapping method(s)		
▪ Paper/Mylar (Drainage System Range Plans)	(%)	95
▪ CADD (as-builts from new projects)	(%)	5-10
▪ GIS (Drain and sewer mains and service connections)	(%)	98
Outfalls inspected/screened (Visual Inspections of each outfall during dry and wet weather conditions – estimated observations per outfall = 5)	(# or %)	5
Illicit/Illegal discharges identified (found under IDDE plan)	(#)	6
Illicit/Illegal connections/discharges removed = # Cross-connections removed	(#) (est. gpd)	6 1,050 GPD
% of population on sewer	(%)	99.9
Number of houses with septic systems	(#)	29

Construction

Estimated Number of construction starts (>1-acre)	(#)	2
Estimated percentage of construction starts adequately regulated for erosion and sediment control (Sites regulated by new Town by-law)	(%)	95
site inspections (multiple visits per site)	(# or %)	32 sites
Tickets/Stop work orders issued	(# or %)	0
Fines collected	(# and $)	0
Estimated Complaints/concerns received from public	(#)	10

Post-Development Stormwater Management

Estimated percentage of development/redevelopment projects adequately regulated for post-construction stormwater control (Note: Sites currently under construction)	(%)	95
Site inspections completed (32 Sites, inspections per site = est. 32)	(# or %)	32
Estimated volume of stormwater recharged (Note: No info – difficult to estimate)	(gpy)	

Operations and Maintenance

Average frequency of catch basin inspection and/or cleaning (non-commercial/non-arterial streets)	(times/yr)	1/yr
Average frequency of catch basin inspection and/or cleaning (commercial/arterial or other critical streets)	(times/yr)	2/yr
Total number of structures cleaned (Approximate)	(#)	1,015
Storm drain cleaned (Note: Drain lines are cleaned as needed)	(LF or mi.)	See Note
Qty. of screenings/debris removed from storm sewer infrastructure Catch Basin Cleanings	(lbs. or tons)	1,414 tons
Disposal or use of sweepings (landfill, POTW, compost, recycle for sand, beneficial use, etc.)		Landfill
Est. Cost of catch basin cleanings disposal ($45/ton)	($)	$63,630.00

Average frequency of street sweeping (non-commercial/non-arterial streets)	(times/yr)	Once a week
Average frequency of street sweeping (commercial/arterial or other critical streets)	(times/yr)	Every Night
Qty. of sand/debris collected by sweeping (Note: Approximately 10,300 lane miles swept)	(lbs. or tons)	1,775 tons
Disposal of sweepings (landfill, POTW, compost, beneficial use, etc.)	(location)	Landfill
Cost of sweepings disposal ($20/Ton)	($)	$35,515.00
Vacuum street sweepers purchased/leased (Own and operate)	(#)	4
Vacuum street sweepers specified in contracts	(y/n)	N

Reduction in application on public land of: ("N/A" = not used; "100%" = elimination)		
▪ Fertilizers (Note: Park Division uses approx. 9000 lbs/yr on athletic fields)	(lbs. or %)	0 (See Note)
▪ Herbicides	(lbs. or %)	N/A
▪ Pesticides	(lbs. or %)	N/A

Anti-/De-Icing products and ratios (Note: An estimated 3,275 tons of salt (NaCL) and 1,072 tons of sand mix were applied during the winter season. Fourteen trucks conduct the de-icing operations. All trucks are automated to dispense 200 pounds of sand/salt mixture per lane mile. Sand to salt ratio 7:1)	% NaCl % $CaCl_2$ % $MgCl_2$ % CMA % Kac % KCl % Sand	See Note
Pre-wetting techniques utilized	(y/n)	N
Manual control spreaders used	(y/n)	Y
Automatic or Zero-velocity spreaders used	(y/n)	Y
Estimated net reduction in typical year salt application	(lbs. or %)	0
Salt pile(s) covered in storage shed(s)	(y/n)	Y
Storage shed(s) in design or under construction (Note: New DPW materials handling facility should be constructed by Summer 2007 will include covered material storage bins and storm water management facilities ex. Oil/sediment separators and detention basins.)	(y/n)	See Note

Part VI. Discussion of activities for the next reporting cycle

The following is a discussion of activities planned for the next reporting cycle:

- Continue to maintain an aggressive IDDE program,
- continue funding Storm Water Program management, maintenance, operations, and CIP,
- work on educating the general public and Town staff of storm water related issues,
- and continue to implement best management practices (drainage swales, onsite retention/detention, and other water quality improvement work) and other techniques like Low Impact Design (LID) where feasible on new developments, re-developments, and Town owned sites.